

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Catawba Nuclear Station, Unit 1										DOCKET NUMBER (2) 0 5 0 0 0 4 1 3 1 OF 0 4				PAGE (3) 1 OF 0 4		
TITLE (4) Inadvertent Cooldown During Natural Circulation Testing																
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 NAMES				DOCKET NUMBER(S)			
0 1	2 0	8 5	8 5	0 0 6	0 0	0 2	1 9	8 5					0 5 0 0 0			
														0 5 0 0 0		
OPERATING MODE (9) 2			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)													
POWER LEVEL (10) 0 0 0			20.402(b)				20.405(c)				50.73(a)(2)(iv)				73.71(b)	
			20.405(a)(1)(i)				50.36(c)(1)				50.73(a)(2)(v)				73.71(c)	
			20.405(a)(1)(ii)				50.36(c)(2)				50.73(a)(2)(vii)				X OTHER (Specify in Abstract below and in Text, NRC Form 356A)	
			20.405(a)(1)(iii)				X 50.73(a)(2)(i)				50.73(a)(2)(viii)(A)				50.72(b)(i)(A)	
			20.405(a)(1)(iv)				50.73(a)(2)(ii)				50.73(a)(2)(viii)(B)					
			20.405(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(x)					
LICENSEE CONTACT FOR THIS LER (12)																
NAME Roger W. Ouellette, Assistant Engineer - Licensing										TELEPHONE NUMBER 7 0 4 3 7 3 - 7 5 3 0						
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC						
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR		
YES (If yes, complete EXPECTED SUBMISSION DATE)										X NO						

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

On January 20, 1985, at 0100 hours, Reactor Coolant Average Temperature (Tave) decreased to less than 541°F during the performance of Procedure TP/1/A/2650/13 (Natural Circulation Verification Test). Because of this, the Action Statement of Technical Specification 3.10.3 was entered, which requires that Tave be increased to greater than 541°F in 15 minutes or be in Mode 3 (Hot Standby) within the next 15 minutes. Since Tave could not be increased above 541°F in 15 minutes, Unit 1 was placed in Hot Standby at 0128 hours on January 20, 1985.

The Unit was in Mode 2 (Startup) at the time of the incident.

Due to the nature of this incident and as the Action Statement of Technical Specification 3.10.3 was complied with throughout, an Event Cause Category is not assigned. This incident is reportable pursuant to 10 CFR 50.73 (a)(2)(i)(A) and 10 CFR 50.72 (b)(i)(A).

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

FACILITY NAME (1) Catawba Nuclear Station, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 4 1 3 8 5 —	LER NUMBER (6)			PAGE (3)		
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Test Procedure TP/1/A/2650/13 (Natural Circulation Verification) was performed during low power physics testing of Unit 1, in accordance with FSAR Section 14.2.12-2. The purpose of the test was:

- 1) To demonstrate the capability of the Nuclear Steam Supply System to remove sensible heat by natural circulation flow in the primary loop.
- 2) To verify that pressurizer pressure and level control systems can respond automatically to a loss of forced circulation and can maintain Reactor Coolant System (NC) pressure within acceptable limits.
- 3) To verify that steam generator level and feedwater flow can be maintained under natural circulation conditions in order to maintain effective heat transfer from the NC System.
- 4) To provide operator training to satisfy NUREG-0737 requirements.

Several prerequisite conditions were established prior to the performance of the test. For example, the reactor was critical at a power level of 3% full power with all NC pumps in operation. Rod control was placed in manual with Bank D positioned to maintain a slightly negative isothermal temperature coefficient. Pressurizer pressure and level control were placed in automatic. Steam dump control was placed in the pressure control mode. Steam generator level was maintained through use of the auxiliary feedwater header. The intermediate and power range (low set point) high level reactor trips were reduced to 7% rated thermal power. Upper Head Injection (UHI) isolation valves were gagged closed. Over-temperature and over-power ΔT reactor trip signals were blocked.

Technical Specification 3.10.3 was a Special Test Exception required for the conduct of the test. The part of the Technical Specification related to this event stated:

Limiting Conditions For Operation:

The limitations of Technical Specifications 3.1.1.3, 3.1.1.4, 3.1.3.1, 3.1.3.5, and 3.1.3.6 may be suspended during the performance of Physics Test provided:

c. $T_{ave} \geq 541^{\circ}\text{F}$

Action:

- b. With $T_{ave} < 541^{\circ}\text{F}$, restore T_{ave} to within its limit in 15 minutes or be in at least Hot Standby within the next 15 minutes.

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TP/1/A/2650/13 was initiated at 2138 hours on January 19, 1985, when all four operating NC pumps were tripped. The establishment of natural circulation was verified by observing the response of wide range hot and cold leg temperatures as well as core exit thermocouples (narrow range Tave instrumentation is not functional with NC pumps tripped).

At approximately 0058 hours, on January 20, 1985, recovery from the test began when the NC pumps were restarted. At 0100 hours, temperature decreased rapidly from 543°F to 537°F as read from the core exit thermocouples. The Operator at the Controls (OATC), knowing that he had entered the Action Statement of Technical Specification 3.10.3, withdrew Control Rod Banks C and D 4 steps in an attempt to increase system Tave within the 15 minute time frame specified by the Technical Specification. However, at 0113 hours, NC Tave had decreased to 534°F. The OATC realized that the time frame to increase temperature above 541°F expired in 2 minutes. To avoid violation of Technical Specification 3.10.3, the OATC initiated action to achieve Mode 3 within the next 15 minutes. Control Rod Bank D was fully inserted, and Control Rod Bank C was inserted to 72 steps. Mode 3 was entered at 0128 hours.

Tave began increasing due to NC Pump operation. At 0300 hours, on January 20, 1985, temperature increased to 541°F. The Unit did not re-enter Mode 2 until late the next day because of other nonrelated problems. On January 20, 1985, at 1708 hours, Reactor Startup commenced per Procedure OP/1/A/6100/05 (Unit Fast Recovery) in order to enter Mode 2. The Unit entered Mode 2 at 1732 hours.

During the test, forced circulation ceased. This allowed the primary coolant at the steam generators to become cooler than other portions of the NC System. When the NC Pumps were restarted, the cooler water circulated throughout the system, thus decreasing Tave. A factor that caused the primary coolant in the steam generators to decrease was that Auxiliary Feedwater was inservice instead of Main Feedwater (Auxiliary Feedwater temperature is less than Main Feedwater temperature). Therefore, more heat was being removed from the primary system than may have otherwise been expected.

In this report a cause category was not assigned since Technical Specifications were complied with. Also, any planned corrective action that could be suggested would be of no value as this test is to be performed only once for Catawba Unit 1.

CORRECTIVE ACTION

1. OATC withdrew Control Rod Banks C and D four steps in an unsuccessful attempt to heatup.
2. Complied with Action Statement of Technical Specification 3.10.3 by entering Mode 3.
3. After Tave increased above 541°F and stabilized, Unit re-entered Mode 2.

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SAFETY EVALUATION

During a decrease in average Reactor Coolant temperature, a reactivity insertion results due to the effects of the negative moderator coefficient of reactivity. Per FSAR Section 15.1.1.1, the rate of energy change is reduced as load decreases, so the no-load transient described in this incident is much less severe than a full power case. Since the Operators recognized the decrease in NC System temperature and brought the Unit to a shutdown mode as required by Technical Specification 3.10.3, the transient was kept under control. The health and safety of the public were not affected by this incident.

DUKE POWER COMPANY

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VICE PRESIDENT
NUCLEAR PRODUCTION

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February 19, 1985

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

Subject: Catawba Nuclear Station, Unit 1
Docket No. 50-413

Gentlemen:

Pursuant to 10 CFR 50.73 Section (a) (1) and (d), attached is Licensee Event Report 413/85-06 concerning an inadvertent cooldown during natural circulation testing. This event was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

H.B. Tucker / slb

Hal B. Tucker

RWO:slb

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator
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