NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

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McGuire Nuclear Station - Unit 1	0 5 0 0 0 3 6 9	1 OF 0 5

TITLE (4)
Failure to Fully Test the Nuclear Service Water System Due to a Management Deficiency

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 3	1 1	8 6	8 6	0 0 6	0 0	0 4	1 0	8 6	McGuire Unit 2	0 5 0 0 0 3 7 0
										0 5 0 0 0

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)	0 6 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(a)(1)	X 50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(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	TELEPHONE NUMBER
Julio G. Torre, Licensing	AREA CODE 7 0 4 3 7 3 - 8 0 2 9

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

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 March 11, 1986, while discussing the Nuclear Service Water (RN) system in preparation for a meeting with the NRC, Duke Power discovered that the Unit 1 and Unit 2 RN systems had not been fully tested until January 30, 1986. According to the design basis, the RN systems should have been tested with suction from the Standby Nuclear Service Water Pond (SNSWP) with one unit in a loss-of-coolant-accident (LOCA) alignment and the other unit in a blackout alignment during the RN system pre-operational test procedures which were completed on July 25, 1979, and November 12, 1982, for Units 1 and 2 respectively. The appropriate tests were completed by January 30, 1986 as part of an RN system review. The tests revealed that RN flow to some equipment was lower than FSAR requirements. However, if an accident had occurred which resulted in a LOCA on one Unit and a blackout on the other Unit, adequate flow could have been established to all essential equipment.

Unit 1 was in Mode 1, Power Operation, at 60% power, and Unit 2 was in Mode 1, Power Operation, at 100% power, at the time of the discovery.

This incident is attributed to a Management Deficiency because the RN Preoperational Test Procedures did not include testing with suction from the SNSWP with one Unit in a LOCA alignment and the other Unit in a blackout alignment as required. Subsequently, periodic flow balance test procedures were written which will allow test personnel to annually verify all required RN flows are met.

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

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

On March 11, 1986, while discussing the Nuclear Service Water (RN) [EIIS:BI] system in preparation for a meeting with the NRC, Duke Power discovered that the Unit 1 and Unit 2 RN systems had not been fully tested until January 30, 1986. According to the design basis, the RN systems should have been tested with suction from the Standby Nuclear Service Water Pond (SNSWP) with one unit in a loss-of-coolant-accident (LOCA) alignment and the other unit in a blackout alignment during the RN system pre-operational test procedure which were completed on July 25, 1979, and November 12, 1982, for Units 1 and 2 respectively. The appropriate tests were completed by January 30, 1986 as part of an RN system review. The tests revealed that RN flow to some equipment was lower than FSAR requirements. However, if an accident had occurred which resulted in a LOCA on one unit and a blackout on the other unit, adequate flow could have been established to all essential equipment.

Unit 1 was in Mode 1, Power Operation, at 60% power, and Unit 2 was in Mode 1, Power Operation, at 100% power, at the time of the discovery.

BACKGROUND:

The RN system is a nuclear safety related, open cooling system that provides cooling water from Lake Norman or the SNSWP to various station heat exchangers during all modes of operation. In addition, the system acts as a assured source of makeup water for various requirements and the normal supply of water for the Containment Ventilation [EIIS:BK] Cooling Water [EIIS:CC] (RV) system.

During normal operation, the RN pumps take suction from the low level intake, supply cooling water, supply makeup and backwash as required, and discharge to the Condenser Cooling Water (RC) system discharge crossover. Since the nonessential header supply crossover is normally open, either or both RN pumps can supply the nonessential and RN system normal requirements. During normal operation, the number of RN pumps operating will correspond to the number of Component Cooling (KC) heat exchangers required. Should pressure drop in the nonessential header, all three RV pumps will start automatically.

On receipt of a blackout signal, train A valves automatically assume the low level alignment; and train B valves assume the SNSWP alignment. Isolation valves for all heat exchangers which are required open automatically and both RN pumps start. All nonessential discharge flow is isolated except the containment ventilation units and Reactor Coolant [EIIS:AB] (NC) pumps motor coolers discharge flow. The containment ventilation units and the NC pumps motor coolers are supplied with cooling water form the 1A RN pump.

On receipt of a safety injection signal, the same automatic actuation occurs as after a blackout signal. The exceptions are that the supply to all nonessential equipment, except the NC pumps motor coolers and crossovers between essential trains, is isolated. The RV pumps will start automatically and supply the containment ventilation units if a blackout does not occur concurrently with the LOCA.

On receipt of a containment spray signal the RV pumps suction is isolated to conserve water. The containment isolation valves close to isolate the NC pump motor coolers. The nonessential supply is isolated providing double isolation at this time between all essential and nonessential equipment. The Containment Spray (NS) [EIIS:BE] heat exchanger inlet isolation valve is opened from the control room when required.

During all modes of operation, water is available for assured makeups.

Cowans Ford Dam is not designed to withstand all design basis events; therefore, both trains of the RN system must be capable of operating after its loss. Upon loss of Lake Norman the operator must be prepared to switch the suction of the RN system from low level or RC crossover alignment to the SNSWP.

DESCRIPTION OF EVENT:

On March 11, 1986, Duke Power personnel began discussing the RN system in preparation for an NRC conference in Atlanta, Georgia. At approximately 1920, it was discovered that the RN systems on Unit 1 and Unit 2 had not been fully tested until January 30, 1986. According to the Design Basis of section 9.2.2 of the Final Safety Analysis Report (FSAR), the RN system "is further designed to tolerate a single failure following a LOCA, and/or seismic event causing loss of Lake Norman and/or loss of station power plus offsite power (station blackout)".

The RN system pre-operational test procedures for Unit 1 and Unit 2 were completed on July 25, 1979, and November 12, 1982, respectively. Both procedures did not test the RN system with suction from the SNSWP with one unit in a LOCA alignment and the other unit in a blackout alignment. Test personnel responsible for these tests stated that the pre-operational tests were conducted as outlined in the FSAR abstract and as interpreted by the responsible Duke Power personnel. Test results were verified to comply with the appropriate Preoperational Test procedures. However, no specific Preoperational Test procedure existed for the RN system which ensured that all requirements were met during pre-operational testing.

On January 27, 1986, a RN flow verification test was performed on train A of Unit 1 in response to Duke Power and NRC concerns. This flow balance test was run for information purposes only, and it revealed that RN flow to some equipment was lower than FSAR requirements. Duke Power personnel reviewed the test data and issued an operability letter dated January 28, 1986 which would allow lower RN flow to the KC and NS heat exchangers. However, this test simulated LOCA conditions only, and Duke Power and NRC personnel were concerned that blackout conditions were not simulated for Unit 2 in this test. Another test was performed again on January 28, 1986, with Unit 1 RN train A in a LOCA alignment and Unit 2 RN train A in a blackout alignment. The same test was performed on Unit 1 RN train B and Unit 2 RN train B on January 30, 1986. Both tests revealed that the RN system could supply adequate flow to essential equipment in the event of a LOCA on one unit concurrent with a blackout on the other unit although flow was lower than FSAR requirements.

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CONCLUSION:

During pre-operational testing, the RN Preoperational Test Procedures did not ensure all testing requirements were being met. Test and supervisory personnel stated that tests were performed to meet the criteria outlined in the FSAR abstract and as interpreted by the responsible Duke Power personnel. Therefore, a test to verify proper flow to essential equipment during a LOCA and a blackout had not been performed. Tests which verified these flows were completed on January 30, 1986. However, personnel involved in these tests were not aware that this incident was reportable. The incident was discovered and determined to be reportable on March 11, 1986 during an RN system review. Appropriate NRC personnel were informed of the incident at the time of the discovery.

This incident is attributed to a Management Deficiency because the RN Preoperational Test Procedures did not ensure all requirements were met during pre-operational testing.

A review of past Licensee Event Reports indicated that there are no previous reportable incidents similar to this one. Therefore, this is considered an isolated event.

CORRECTIVE ACTIONS:

Immediate: The NRC was informed of the discovery.

Subsequent: Periodic flow balance test procedures were written which will allow test personnel to verify annually that all required RN flows are met.

SAFETY ANALYSIS:

The Nuclear Service Water System is designed to withstand a safe shutdown earthquake and to prevent any single failure from curtailing normal station operation or limiting the ability of the engineered safety features to perform their functions. Sufficient pump capacity is included to provide design cooling water flow under all conditions, and the headers are arranged in such a way that loss of a header does not jeopardize unit safety. Radiation monitors are located in the system for determination of potentially radioactive leaks. The system is designed to operate at either maximum drawdown of the lake or pond and also at a maximum water elevation. Sufficient margin is provided in the equipment design to accommodate anticipated corrosion and fouling without degradation of system performance.

The Nuclear Service Water System is designed to tolerate a loss of all normal station power during a unit LOCA and/or a unit cooldown simultaneous with loss of Lake Norman. By adhering to channel A and B separation with a double valved main supply crossover, both units are assured of having a source of water, two 100 percent capacity pumps, and two redundant trains of heat exchangers essential for safe shutdown. Channels A and B are connected together only at 4 places by crossover piping, and in these cases double isolation valves, actuated

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automatically or normally locked closed, protect channel integrity, and meet single failure criteria.

The SNSWP Dam was designed for the individual occurrences of the probable maximum flood and the design basis earthquake. The design of the SNSWP Dam also takes into account a possible failure of Cowans Ford Dam and subsequent loss of Lake Norman. No known site related events have occurred or are expected to occur during the plant lifetime which would affect the SNSWP or dam and were therefore not considered in the SNSWP Dam design. Two 100 percent capacity intake and discharge pipes route water to the auxiliary building and return to the SNSWP. These pipes are separated and protected from missiles so that failure of one does not induce failure of the other. The SNSWP intake structure is designed for a design basis earthquake (DBE), wind, and missiles.

If an accident had occurred which resulted in a loss of Lake Norman and a LOCA on one unit (with a single failure of the RN system) and a blackout on the other unit, there may not have been sufficient RN system flow to essential equipment as required by the FSAR. Flows lower than FSAR values have been justified by calculations, and RN system trains have been rebalanced to FSAR or required flows. However, the flows to essential equipment before rebalancing is not known. No incident occurred during this event which required the emergency actuation of the RN system.

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

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VICE PRESIDENT
NUCLEAR PRODUCTION

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April 10, 1986

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

Subject: McGuire Nuclear Station, Unit 1
Docket No. 50-369
LER 369-86-06

Gentlemen:

Pursuant to 10 CFR 50.73 Section (a)(2)(V), attached is Licensee Event Report 369-86-06 concerning a Failure to Fully Test the Nuclear Service Water System Due to a Management Deficiency. This event was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

Hal B. Tucker

Hal B. Tucker

JGT/jgm

Attachment

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