

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Catawba Nuclear Station, Unit 1										DOCKET NUMBER (2) 0 5 0 0 0 4 1 1 3 1										PAGE (3) 1 OF 0 5		
TITLE (4) Unit Shutdown Due to Excess Reactor Coolant Unidentified Leakage																						
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 N/A						DOCKET NUMBER(S) 0 5 0 0 0 0							
1	0	1	8	8	5	8	5	0	6	1	0	0	1	1	8	8	5	0	5	0	0	0
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)																						
OPERATING MODE (9) 1		20.402(b)				20.405(c)				50.73(a)(2)(iv)				73.71(b)								
POWER LEVEL (10) 11010		20.405(a)(1)(i)				50.38(c)(1)				50.73(a)(2)(v)				73.71(e)								
		20.405(a)(1)(ii)				50.38(c)(1)				50.73(a)(2)(vi)				X OTHER (Specify in Abstract below and in Text, NRC Form 366A)								
		20.405(a)(1)(iii)				X 50.73(a)(2)(i)				50.73(a)(2)(viii)(A)				50.72(b)(1)(i)								
		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)(ix)												
LICENSEE CONTACT FOR THIS LER (12)																						
NAME Roger W. Ouellette, Associate 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												
X	AIB	I I V R	3 4 4	Yes		X	AIB	I I V R	3 4 4	Yes												
X	AIB	I I V R	3 4 4	Yes		X	AIB	I I V R	K 0 8 5	Yes												
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)

At 1448 hours on October 18, 1985, the Technical Specification limit of 1 gpm unidentified Reactor Coolant (NC) System leakage was determined to be exceeded. An Unusual Event was declared at 1841 hours, and reactor shutdown was commenced at 2000 hours. Catawba Unit 1 was at 100% power at the time this incident was discovered, and subsequently entered Mode 3 (Hot Standby) at 0010 hours on October 19, 1985.

The NC leakage of greater than 1 gpm was attributed to several leak sources. There were various component failures such as several valve stem packing leaks and an NC pump main flange leak. Therefore, this incident is given Cause Code X, Other. The Unusual Event was secured at 1224 hours on October 21, 1985, when unidentified leakage was determined to be less than 1 gpm. Unit 1 subsequently entered Mode 5 (Cold Shutdown) at 2050 hours on October 22, 1985. The leaking valves were repaired during the subsequent plant outage. The bolts on the NC pump main flange were also retightened.

This incident is reportable pursuant to 10 CFR 50.73, Section (a)(2)(i)(A), and 10 CFR 50.72, Section (b)(1)(i)(A).

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

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TEXT (If more space is required, use additional NRC Form 356A's) (17)

BACKGROUND:

Technical Specification Section 3.4.6.2 requires that unidentified Reactor Coolant (NC) System (EIIS:AB) leakage be limited to 1 gpm. If this limit is exceeded, the leakage rate must be below 1 gpm within 4 hours, or the unit must be in at least Hot Standby within the next 6 hours and in Cold Shutdown within the following 30 hours. After the unidentified NC leakage is found to be in excess of Technical Specification limits, an Unusual Event must be in excess of Technical Specification limits, an Unusual Event must be declared per procedure RP/0/A/5000/01, Classification of Emergency, if the leakage is not reduced to below 1 gpm in 4 hours. Once every 72 hours, an NC System Water Inventory Balance is performed to determine the amount of NC leakage.

DESCRIPTION OF INCIDENT:

At 1448 hours on October 18, 1985, during the performance of periodic test PT/1/A/4150/01D, NC System Leakage Calculation, NC System unidentified leakage was determined to be approximately 1.3 gpm. Operations attempted to identify and reduce leakage by manipulating the Power Operated Relief Valve (PORV) Isolation Valves. After unsuccessful attempts to lower NC System unidentified leakage below 1.0 gpm, at 1841 hours, an Unusual Event was declared, and the proper notifications were made per procedure RP/0/A/5000/02. At 2000 hours, Operations commenced unit shutdown per the applicable procedures. The unit entered Mode 3 (Hot Standby) at 0010 hours on October 19, 1985.

Following entry into Mode 3, Operators made containment entries to search for NC leakage. Leakage from the area of NC Pump 1D was discovered. On October 19, 1985, NC Pump 1D was shutdown to allow for clean-up and inspection. It was verified that the leakage was coming from NC Pump 1D main flange. NC Pump 1D was returned to service.

Containment entries were made to search for other leaks. The following valves were found to have stem leakages that were contributing to the NC System unidentified leakage being greater than 1 gpm: 1NC31B, 1NC33A, 1NC35B (Pressurizer PORV Isolation), 1NC77 (Loop B Hot Leg RTD Manifold Inlet), 1NC85 (Loop C Hot Leg RTD Manifold Inlet), 1ND1B (Residual Heat Removal (ND) System (EIIS:BP) Pump 1A Suction from Loop B), and 1NV38 (Chemical and Volume Control (NV) System (EIIS:CB) Supply to Pressurizer Auxiliary Spray Check Valve).

To avoid personnel heat stress, Containment entries were limited to 45 minutes. It was decided by Station Management to reduce NC System temperature and pressure, so that repairs to the leaking components could be made. At 2100 hours on October 20, 1985, Operations commenced NC System cooldown to 375 degrees F. At 0700 hours on October 21, the unit reached 375 degrees F and 1500 psig. Another leakage calculation was performed, and results showed that NC unidentified leakage was now less than 1 gpm. At 1224 hours on October 21, 1985, Operations secured the Unusual Event. Mode 4 (Hot Shutdown) was reached on October 22, 1985, at 1208 hours, and Mode 5 (Cold Shutdown) was reached later the same day at 2050 hours.

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

On October 20, 1985, the packing nuts on valve 1NC31B were torqued to the appropriate value and no leaks were observed. On October 21, 1985, 1NC-77 was Furmanited to stop the leak at the valve stem. Also, on the same day, 1ND1B was repaired by torquing the packing nuts, correcting the leakage problem. On October 22, 1985, work began to repair the leakage on 1NV38. The valve bonnet was torqued to specification, and the leak slowed to a drip, but did not stop completely. The valve was checked the next day, and the leak had stopped. It was decided to seal weld the valve bonnet to the body of the valve to prevent any further leakage. On November 4, 1985, 1NC35B was repaired by tightening the packing nuts. The temperature of the leakoff line was measured to verify the valve was not leaking. The packing nuts for 1NC33A were tightened and the temperature of the leak off line was measured to be about 170 degrees F, indicating that the valve was still leaking. The packing nuts and packing gland were removed. It was discovered that only six packing rings were in the valve, whereas eight were required. Eight new packing rings were installed and the packing nuts were torqued to specifications. On November 8, 1985, it was decided that the leak on 1NC85 would be Furmanited. The leak from NC Pump 1D flange is being corrected by retightening the main flange bolts.

CONCLUSION:

All of the NC leaks found contributed to the unidentified leakage being greater than 1 gpm. Valves 1NC77, 1NC85, 1NC35B, 1ND1B, and 1NV38 all leaked due to packing problems. 1NC33A also had stem leakage, and when disassembled, it was discovered that two rings of packing were missing. Past work request history on 1NC33A showed that it had exhibited leakage problems in the past. However, they were corrected without disassembling the valve. A Staff Engineer indicated that it would be difficult to determine the cause of the missing packing rings. The cause for the failure of NC Pump 1D flange is also unknown at this time. Maintenance records show that the flange bolts were initially tightened to the required specifications. Since the pump was not disassembled, it is not possible at this time to determine whether the flange gasket suffered any degradation. Because of these various equipment failures and the unknown reason for 1NC33A to be missing two rings of packing, this incident is classified as Cause Code X, Other.

When the NC System is returned to full pressure, a close watch will be made on the pump flange to determine if retightening the flange bolts has corrected the leakage problem.

Research into the work request history on the leaking valves described in this report revealed that only 1NV28 and 1NC33A had exhibited past leakage problems. Stem leakage on 1NC33A had been corrected on May 30, 1985. At this time the packing gland was torqued per the appropriate procedure. Leakage from 1NV38 had been previously corrected on January 2, 1985. At this time, the valve bonnet was torqued to 1300 ft/lbs per the maintenance procedure and no leaks were observed when the NV System was at operating pressure.

1NV38 is a Kerotest 2" series 1513 Y-type check valve. 1NC77 and 1NC85 are Kerotest 2" series 1513 Y-type globe valves. 1NC31B, 1NC33A, and 1NC35B are Rockwell model 12511 gate valves. 1ND18 is a Borg-Warner 12" gate valve, specifically ordered for Catawba (no model no. available).

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

A survey of the Nuclear Plant Reliability Data System (NPRDS) for stem leakage problems for each type of valve was performed. The NPRDS showed that out of 311 engineering records of Kerotest valves, there were 17 failures of check valves in Chemical and Volume Control Systems. Six were body to bonnet leaks. In all cases the problem was corrected by seal welding the valve cover to the body. For Rockwell gate valves used in Reactor Coolant Systems, there were no reported failures. There were 210 engineering records of Kerotest globe valves used in Reactor Coolant Systems. The NPRDS showed only six failures of these valves, indicating a small percentage of failures. Finally, there were no failures out of seven engineering records of Borg-Warner gate valves (1ND1B) used in Residual Heat Removal Systems.

There is only one previous incident of a unit shutdown due to unidentified leakage at Catawba. That leakage was from an instrument compression tube fitting (see LER 413/85-59).

CORRECTIVE ACTION:Immediate

Operations commenced unit shutdown per applicable procedures.

Subsequent

- 1) Operations identified leak sources during containment entry.
- 2) Work Requests were completed to repair valve leaks.
- 3) A Work Request was issued to retighten Reactor Coolant Pump 1D main flange bolts.

Planned

NC Pump 1D flange will be monitored for leakage during unit startup.

SAFETY ANALYSIS:

All leakage from valves 1NC31B, 1NC33A, 1NC35B, and 1ND1B went to the Reactor Coolant Drain Tank. All other leakage went to the Containment Floor and Equipment Sump, and to the Floor Drain Tank or Waste Evaporator Feed Tank. All water was eventually processed through the Waste Monitor Tank, and discharged through the liquid waste systems. NC System inventory was maintained throughout the incident. The unit was safely shutdown in a controlled manner.

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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November 18, 1985

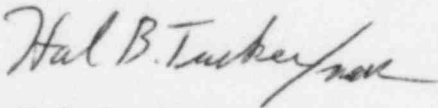
Document Control Desk  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

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 413/85-61 concerning a unit shutdown required due to excess unidentified Reactor Coolant leakage from various failed components. 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

RWO:slb

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator  
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