LICENSEE EVENT REPORT (LER)

Facility Name (1)	Docket Number (2)	Page (3)
QUAD-CITIES, NUCLEAR POWER STATION, UNIT TWO	0 5 0 0 0 2 6 5	1 of 0 4

Title (4)
UNIT TWO TORUS/DRYWELL VACUUM BREAKER FAILED TO CLOSE DUE TO DIMPLED BUSHING OR CORRODED SOLENOID

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 5 0 0 0
0 2	1 8	8 7	8 7	0 0 4	0 0	0 3	0 9	8 7		0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)					
4		___ 20.402(b)	___ 20.405(c)	___ 50.73(a)(2)(iv)	___ 73.71(b)		
POWER LEVEL (10)	1 0 0	___ 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)	___ Other (Specify in Abstract below and in Text)		
		___ 20.405(a)(1)(iii)	X 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
	AREA CODE
Suzette Walters, Technical Staff Engineer Ext. 2152	3 0 9 6 5 4 - 2 2 4 1

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	
X	B F	V A C B	A 5 8 5	Y							

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 February 18, 1987, Unit Two was in the RUN mode at 100 percent of core thermal power. At 0118 hours, while performing QOS 1600-1, "Suppression Chamber to Drywell Vacuum Breakers Monthly Exercise", vacuum breaker 2-1601-33A would not return to its normal closed position after being tested. Based on Technical Specification 3.7.A.4.b., a separation test between the drywell and suppression chamber was performed and this confirmed that the vacuum breaker was stuck open. A Generating Station Emergency Plan (GSEP) Unusual Event was declared and appropriate notifications were completed. Subsequently it was determined that Technical Specification 3.0.A should also be considered to assure that no set of equipment outages be allowed to persist that would result in the facility being in an unprotected condition. Therefore, Unit Two was placed in hot SHUTDOWN at 1147 hours and cold SHUTDOWN at 1645 hours on February 18, 1987. The GSEP Unusual Event was then terminated.

The cause for this failure was determined to be the result of either a slightly dimpled valve bushing or a rusted and corroded solenoid associated with the air operated testing mechanism. Both of these problems were corrected and the vacuum breaker was retested successfully. This report is submitted to comply with the requirements of 10CFR50.73(a)(2)(i).

IE22
1/1

PLANT AND SYSTEM IDENTIFICATION:

General Electric - Boiling Water Reactor - 2511 MWt rated core thermal power. Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

EVENT IDENTIFICATION: Unit Two Suppression Chamber/Drywell Vacuum Breaker 2-1601-33A failed to close while performing the Suppression Chamber to Drywell Vacuum Breakers Monthly Exercise (QOS 1600-1).

A. CONDITIONS PRIOR TO EVENT:

Unit: Two Event Date: February 18, 1987 Event Time: 0118
Reactor Mode: 4 Mode Name: RUN Power Level: 100%

This report was initiated by Deviation Report D-4-2-87-14

RUN Mode(4) - In this position the reactor system pressure is at or above 825 psig, and the reactor protection system is energized, with APRM protection and RBM interlocks in service (excluding the 15% high flux scram).

B. DESCRIPTION OF EVENT:

On February 18, 1987 at 0118 hours, Unit Two was in the RUN mode at 100 percent of rated core thermal power. While performing QOS 1600-1, "Suppression Chamber [NH] to Drywell [NH] Vacuum Breakers Monthly Exercise", vacuum breaker 2-1601-33A [BF] would not give a closed indication after being stroked. At this time, QOS 1600-27, "Suppression Chamber to Drywell Pressure Separation Test with Greater Than or Equal to 1.2 PSID Established Between Drywell and Suppression Chamber" was performed. This was implemented according to Technical Specification 3.7.A.4.b. which allows any pressure suppression chamber to drywell vacuum breaker to be not fully closed as indicated by the position indication and alarm systems provided that the drywell to suppression chamber differential pressure decay rate is demonstrated to be not greater than twenty-five percent of the differential pressure decay rate for all vacuum breakers open the equivalent of 1/16 of an inch at all points along the seal surface of the disk. At 0320 hours, as differential pressure could not be restored, it was concluded that the vacuum breaker 2-1601-33A was stuck in the open position making the vacuum breaker inoperable. Unit Two shutdown was begun according to Technical Specification 3.7.A.6.a.3. This specification states that if differential pressure can not be restored within six hours, an orderly shutdown shall be initiated and the reactor shall be in a cold shutdown condition in the following 24 hours. At this time, a Generating Station Emergency Plan (GSEP) Unusual Event was declared, Nuclear Accident Reporting System (NARS) notification was made, and the NRC was notified at 0355 hours. It was later decided that as the vacuum breaker was stuck in the open position a more conservative approach should be taken because

specification 3.7.A.4.b. also was applicable. Therefore, Technical Specification 3.0.A. was implemented which states that the unit should be in a hot SHUTDOWN condition within twelve hours and cold SHUTDOWN within the following twenty-four hours. This specification assures that no set of equipment outages would be allowed to persist that would result in the facility being in an unprotected condition. A hot SHUTDOWN condition was achieved at 1147 hours on February 18, 1987 and a cold SHUTDOWN condition was achieved at 1645 on the same day. Both hot and cold SHUTDOWN were completed within the required time limits set by Technical Specification 3.0.A. The GSEP Unusual Event was terminated at 1645 hours.

C. APPARENT CAUSE OF EVENT:

Following the Unit Two shutdown, the vacuum breaker was lubricated and additionally, as part of a more thorough investigation the vacuum breaker was disassembled, inspected, and reassembled. During the inspection, a slightly dimpled bushing was discovered. This is believed to have been caused during installation. In addition, the solenoid used in the air-operated testing mechanism of the vacuum breaker was found to be rusted and corroded which could have prevented the air from exhausting, thereby keeping the vacuum breaker in the open position. It had been field tested prior to disassembly and bench tested after disassembly, and in both cases results were found acceptable. However, when tested in the field following reassembly the solenoid did not always work properly. Therefore, the solenoid or the bushing, singularly or together, could theoretically have caused the vacuum breaker failure.

This report is submitted in accordance with the requirements of the Code of Federal Regulations 10CFR50.73(a)(2)(i) which requires the reporting of the completion of any nuclear plant shutdown required by the plant's Technical Specifications and any operation or condition prohibited by the plant's Technical Specifications.

D. SAFETY ANALYSIS OF EVENT:

The vacuum breaker in question along with eleven other operable vacuum breakers are used to equalize pressure between the drywell and the suppression chamber to prevent a vacuum from being created in the drywell. With the vacuum breaker stuck in the open position, the designed differential pressure between the Suppression Chamber and the Drywell could not be maintained. As a result, there was an increased volume of water in the downcomers between the drywell and suppression chamber. In a worse case scenario, during a loss of coolant accident (LOCA), steam would force large amounts of water through the downcomers. This could damage the suppression chamber. In addition, with the vacuum breaker stuck open, steam could bypass directly to the suppression chamber during a LOCA and less effective steam condensation and energy dissipation would result. Since the other eleven vacuum breakers were operable and the 2-1601-33A vacuum breaker was only stuck open a brief period of time before shutting down, the safety consequences were minimal.

E. CORRECTIVE ACTIONS:

Three Work Requests (Q55458, Q55492, Q55494) were written on the failed vacuum breaker. These Work Requests had the vacuum breaker lubricated and exercised, the dimpled bushing filed smooth, and the solenoid replaced. When the work was completed, the Monthly Surveillance was reperformed and found acceptable. This is considered an isolated incident, because no recent License Event Reports (LER) have been written at Quad Cities Station describing a similar failure. No further corrective action is deemed necessary at this time.

F. PREVIOUS EVENTS:

There were no recent LERs written that reflected the cause of the vacuum breaker being stuck in the open position due to a failed solenoid or dimpled bushing. However, there were two LERs written due to the vacuum breakers being stuck in the open position: 265/82-22/03L (due to the stainless steel packing and stuffing box bushing being bound to the shaft) and 265/82-06/03L (due to the counterweight being mispositioned).

G. COMPONENT FAILURE DATA:

The vacuum breaker is an 18 inch swing-check valve manufactured by the Atwood and Morril Company, Inc. The solenoid was manufactured by AZCO, type HT 8317-30.

Commonwealth Edison

DEVIATION REPORT

DVR NO. 04 - 02 - 87 - 014
STA UNIT YEAR NO.

PART 1 TITLE OF DEVIATION

U2 TORUS/DRYWELL VACUUM BREAKER FAILED TO CLOSE

OCCURRED 2-18-87 DATE 0118 TIME

SYSTEM AFFECTED: 1600 PRIMARY CONT.

PLANT STATUS AT TIME OF EVENT: MODE RUN, POWER(%) 100

WORK REQUEST NO.:

TESTING: [X] YES [ ] NO

DESCRIPTION OF EVENT

WHILE PERFORMING QOS 1600-1, SUPPRESSION CHAMBER TO DRYWELL VACUUM BREAKERS MONTHLY EXERCISE, VACUUM BREAKER 2-1601-33A FAILED TO RECLOSE AFTER THE TEST PUSHBUTTON WAS RELEASED. SEVERAL ATTEMPTS WERE MADE TO CLOSE THE VALVE, BUT IT REMAINED FULL OPEN. UNIT 2 BEGAN SHUTTING DOWN PER T.S. 3.7.A.6.a(3) AND GSEP UNUSUAL EVENT DECLARED AT 0320 HOURS. NARS NOTIFICATIONS COMPLETED AT 0325 HOURS.

POTENTIALLY SIGNIFICANT EVENT PER NSD DIRECTIVE A-07 [ ] YES [X] NO

10CFR50.72 NRC RED PHONE NOTIFICATION MADE [X] 1 HOUR [ ] 4 HOUR 0355 TIME [ ] NO

PAUL D. KNOESPEL RESPONSIBLE SUPERVISOR 2-18-87 DATE

PART 2 OPERATING ENGINEER'S COMMENTS

SINCE THE VACUUM BREAKER IS STUCK OPEN, THIS LER WAS RE-CLASSIFIED TO FALL UNDER T.S. 3.0.A, REQUIRING A HOT SHUDOWN CONDITION WITHIN 12 HOURS AND COLD SHUTDOWN WITHIN 24 HOURS.

[ ] NON REPORTABLE EVENT

[X] 30 DAY REPORTABLE/10CFR 50.73 (a) (2) (i) A & B

[ ] 5 DAY REPORT PER 10CFR21

[ ] ANNUAL/SPECIAL REPORT REQUIRED

A.I.R. #

L.E.R. # 87-004

NOTIFICATION REGION III DATE TIME

NSD DATE TIME

[ ] CECO CORPORATE NOTIFICATION MADE IF ABOVE NOTIFICATION IS PER 10CFR21

TELECOPY CECO CORPORATE OFFICER DATE TIME

PRELIMINARY REPORT COMPLETED AND REVIEWED B. STRUB OPERATING ENGINEER 2-18-87 DATE

INVESTIGATION REPORT & RESOLUTION ACCEPTED BY STATION REVIEW

RESOLUTION APPROVED AND AUTHORIZED FOR DISTRIBUTION

STATION MANAGER 3-17-87 DATE

5178 11-85 (FORM 15-52-1)

Commonwealth Edison
Quad Cities Nuclear Power Station
22710 206 Avenue North
Cordova, Illinois 61242
Telephone 309/654-2241

RLB-87-71

March 9, 1987

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

Reference: Quad-Cities Nuclear Power Station
Docket Number 50-265, DPR-30, Unit Two

Enclosed please find Licensee Event Report (LER) 86-004, Revision 00, for Quad-Cities Nuclear Power Station.

This report is submitted to you in accordance with the requirements of the Code of Federal Regulations, Title 10, Part 50.73(a)(2)(i), which requires the reporting of the completion of any nuclear plant shutdown required by the plant's Technical Specifications and any operation or condition prohibited by the plant's Technical Specifications.

Respectfully,

COMMONWEALTH EDISON COMPANY
QUAD-CITIES NUCLEAR POWER STATION

R. L. Bax
Station Manager

RLB/MSK/clr

Enclosure

cc: I. Johnson
A. Morrongiello
INPO Records Center
NRC Region III

IE22
1/1

0370H/0183Z