NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION

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

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Peach Bottom Atomic Power Station Unit 2	0 5 0 0 0 2 7 7	1 OF 4

TITLE (4)

Unmonitored Liquid Release to River

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	2 8	8 4	8 4	— 0 0 6	— 0 0	0 4	2 7	8 4		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	9 3	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)	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)	
		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
B. L. Clark, Senior Engineer - Special Projects	AREA CODE 2 1 5 8 4 1 - 5 0 1 7

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	BO	H X	P 1 60	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)

Abstract 2-84-06

While at power, a routine sample of water taken from the high pressure service water (HPSW) piping was discovered to be contaminated. Investigation determined that the origin of contamination into the HPSW system was the Peach Bottom Unit 2 2B Residual Heat Removal (RHR) heat exchanger. The 2B RHR heat exchanger was isolated by closing valves in the high pressure service water system on March 26, 1984. Based on a leak rate test of the 2B RHR heat exchanger, the estimated rate of activity released per day prior to isolation of system was calculated as 65 microcuries per day. Investigation determined that the 2B RHR heat exchanger leaked 65 microcuries per day into the discharge pond via the high pressure service water piping system. The total unmonitored release into the discharge pond is estimated to be approximately 1170 microcuries to 2150 microcuries. An examination of the heat exchanger revealed that the leak was in the bellows portion of the heat exchanger. The 2B RHR heat exchanger was repaired, leak tested, and returned to service April 26, 1984.

IE22

Description of the Event:

On March 26, 1984, the results of the laboratory analysis of a sample taken from the Unit 2 2B HPSW sampling point revealed that the 2B RHR heat exchanger was leaking slightly radioactive water into the high pressure service water piping. The discovery of a relatively short-lived radioactive isotope (Iodine 131) indicated an active leak. A laboratory analysis of a previous sample taken March 9, 1984, had not identified Iodine 131.

The 2B RHR heat exchanger was isolated by closing valves in the high pressure service water system on each side of the heat exchanger on March 26, 1984. Leak rate testing performed on March 27, 1984, discovered a leak rate of 0.5 gallons per minute from the 2B RHR heat exchanger.

Consequences of the Event:

The sampling performed before the isolation of the 2B RHR heat exchanger was analyzed to determine a 'best estimate' of the activity of the water that reached the pond. Based on our analysis, it is estimated that the activity of the unmonitored liquid discharge is 1.2 x 10(-11) microcuries per milliliter. The basis for this calculation was as follows:

(1) Leak rate: 0.5 gallons per minute
(2) Activity of sample: 2.4 x 10(-5) microcuries per milliliter
(3) Circulating Water Flow (Dilution factor): 1.0 x 10(+6) gallons per minute
(4) Activity concentration after dilution: $\frac{(1) \times (2)}{(3)}$

This calculation determined the activity concentration after dilution as approximately 1.2 x 10(-11) microcuries per milliliter. This calculation was considered conservative as the assumed circulating water flow (1.0 x 10(+6) gallons per minute) is the minimum circulation flow required when both Units 2 and 3 are at full power. Both Units 2 and 3 were at full power most of the month of February except for a brief shutdown of each unit. The circulating water flow was maintained during these shutdowns.

The driving force behind the leak was the condensate services system which maintains a pressure of 160 pounds per square inch on the shell side of the RHR heat exchanger when the RHR system is not in use.

The sample used for the above calculation was taken from the condensate services supply where it connects to the RHR system. The previously referenced sample taken from the Unit 2 2B HPSW sampling point, as discussed in 'Description of the Event', was discovered to contain a total activity of 3.6 x 10(-6) microcuries per milliliter, an order of magnitude less than the activity discovered in the condensate services supply (2.4 x 10(-5) microcuries per milliliter) the activity utilized in calculating the unmonitored liquid discharge.

Laboratory analysis of a sample taken from the 2B RHR heat exchanger, following isolation of the heat exchanger, discovered a total activity of 5.4 x 10(-4) microcuries per milliliter. This activity was considered to be in excess of the actual unmonitored release because the RHR system had been run in the torus-to-torus test mode on March 26, 1984, and it has been assumed that following such a RHR run mode, any leakage from the shell side would be predominantly torus water. The torus water activity on March 26, 1984 is assumed to be approximately 3.5 x 10(-3) microcuries per milliliter, the measured torus water activity on April 4, 1984. This is typical for torus water activity.

Our investigation has not determined the start of the 2B RHR heat exchanger leak. The 2B RHR system was last used for shutdown cooling on February 23, 1984. During shutdown cooling, any leakage in the RHR heat exchanger would be from the tube side to shell side and would be identified by a conductivity increase in the reactor coolant system. No such increase was observed. Therefore, it has been concluded that no evidence of a leak existed prior to February 23, 1984. On March 9, 1984, laboratory analyses of a water sample taken from the Unit 2 2B RHR HPSW sampling point discovered an activity of 2.9 x 10(-6) microcuries per milliliter. This activity was initially assumed baseline activity because the laboratory analyses identified only long-lived radioactive isotopes. However, following the March 26, 1984, laboratory findings of short-lived radioactive isotopes in a subsequent sample, it has been postulated that the activity discovered in the March 9, 1984, sample may have been indicative

of a leak. As the March 9, 1984, water sample was the sole sample taken from the Unit 2 2B RHR HPSW sampling point prior to March 26, 1984, it has been conservatively concluded that the March 9, 1984, activity represents a bounding of the leak; that is, the leak began either on or prior to March 9, 1984.

A continuous leak rate of 0.5 gallons per minute at a activity of 2.4 x 10(-5) microcuries per milliliter would result in a discharge of 65 microcuries (0.065 millicuries) per day to the river.

Assuming the leak began on February 23, 1984, the total release from February 23 to March 26 is estimated to be approximately 2150 microcuries (2.15 millicuries). Assuming the leak began on March 9, 1984, the date of the postulated initial discovery of evidence of a leak, the total release from March 9 to March 26 is estimated to be approximately 1170 microcuries (1.17 millicuries). Since a concentration 1.2 x 10 (-11) microcuries per milliliter is below minimum detectable limits, and since the total activity released is small, it has been concluded that no environmental affects are anticipated.

Cause of the Event:

The cause of this event was a leak in the 2B RHR Heat Exchanger. Examination of the 2B RHR heat exchanger began April 22, 1984, and led to the discovery of a leak between the inner floating head and the drain connection of the heat exchanger.

Corrective Actions:

The unmonitored release was terminated upon isolation of the 2B RHR heat exchanger on March 26, 1984.

The expansion bellows between the inner floating head and the drain connection of the heat exhcanger was replaced April 26, 1984.

Previous Event:

A previous similar occurrence was reported by LER 3-82-22.

PHILADELPHIA ELECTRIC COMPANY

2301 MARKET STREET

P.O. BOX 8699

PHILADELPHIA, PA. 19101

(215) 841-4000

April 27, 1984

Docket No. 50-277

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

SUBJECT: Licensee Event Report

This LER concerns an unmonitored release of radioactive water from the Unit 2 2B RHR heat exchanger into the discharge pond via the high pressure service water piping system.

Reference:	Docket No. 50-277
Report Number:	2-84-06
Revision Number:	00
Event Date:	March 28, 1984
Report Date:	April 27, 1984
Facility:	Peach Bottom Atomic Power Station RD #1, Box 208, Delta, PA 17314

This LER is submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(i)(B).

Very truly yours,

W. T. Ullrich
Superintendent
Nuclear Generation Division

cc: Dr. Thomas E. Murley, Administrator
Region I, USNRC

Mr. A. R. Blough
Site Inspector

IE22
1/1