



**CENTERIOR  
ENERGY**

**PERRY NUCLEAR POWER PLANT**

10 CENTER ROAD  
PERRY, OHIO 44081  
(216) 259-3737

Mail Address:  
PO. BOX 97  
PERRY, OHIO 44081

**Robert A. Stratman**  
VICE PRESIDENT - NUCLEAR

April 26, 1993  
PY-CEI/NRR-1643 L

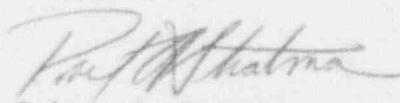
U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555

Perry Nuclear Power Plant  
Docket No. 50-440  
LER 93-009

Dear Sir:

Enclosed is Licensee Event Report 93-009 for the Perry Nuclear Power Plant.

Sincerely,



Robert A. Stratman

RAS:AHL:ss

Enclosure: LER 93-009

cc: NRC Project Manager  
NRC Resident Inspector  
NRC Region III

290016

Operating Companies  
Cleveland Electric Illuminating  
Toledo Edison

9304290252 930423  
PDR ADOCK 05000440  
S PDR

*JEH*

## LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

Perry Nuclear Power Plant, Unit 1

DOCKET NUMBER (2)

05000 440

PAGE (3)

1 OF 4

TITLE (4)

Containment Vessel and Drywell Purge Isolation Due to High Radiation Signal

EVENT DATE (5)			LER NUMBER (6)			REPORT NUMBER (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
03	25	93	93	009	00	04	23	93	FACILITY NAME	DOCKET NUMBER
										05000
OPERATING MODE (9)		1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more) (11)							
POWER LEVEL (10)		100	20.402(b)		20.405(c)		X		50.73(a)(2)(iv)	73.71(b)
			20.405(a)(1)(i)		50.36(c)(1)				50.73(a)(2)(iv)	73.71(c)
			20.405(a)(1)(ii)		50.36(c)(2)				50.73(a)(2)(vii)	OTHER
			20.405(a)(1)(iii)		50.73(a)(2)(i)				50.73(a)(2)(vii)(A)	Specify in Abstract below and in Text, NRC Form 366A
			20.405(a)(1)(iv)		50.73(a)(2)(ii)				50.73(a)(2)(vii)(B)	
			20.405(a)(1)(v)		50.73(a)(2)(iii)				50.73(a)(2)(x)	

## LICENSEE CONTACT FOR THIS LER (12)

NAME

Al Lambacher, Compliance Engineer

Extension 5520

TELEPHONE NUMBER (include Area Code)

(216) 259-3737

## 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)

YES (If yes, complete EXPECTED SUBMISSION DATE)	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X			07	23	93

## ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On March 25, 1993 at 1726, the Containment Vessel and Drywell Purge System A train isolated due to a valid high radiation signal, following the initiation of a Reactor Water Cleanup (RWCU) Filter/Demineralizer backwash.

The immediate cause of the event was a high radiation signal. Further investigation of the cause of the high radiation signal will continue when plant conditions permit. Portable airborne sampling equipment will be used to analyze the performance of the High Efficiency Particulate Air (HEPA) filter, installed between the RWCU Backwash Receiving Tank Vent and the Containment Vessel and Drywell Purge System exhaust duct, and determine the source of the high radiation levels. Additionally, Radwaste samples from RWCU Filter/Demineralizer backwashes will be analyzed for activity and compared with previous sample history. Further analysis of the RWCU backwash vent exhaust has been limited due to current plant conditions (plant shutdown). Corrective actions will be established based on the results of our investigation. A supplemental report will be submitted, detailing the results of our investigation and further corrective actions.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST, 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)		DOCKET NUMBER (2)		LER NUMBER (6)			PAGE (3)
Perry Nuclear Power Plant, Unit 1		05000 440		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
				93	- 009 -	00	

TEXT (If more space is required, use additional copies of NRC Form 365A) (17)

## I. Introduction

On March 25, 1993 at 1726, the Containment Vessel and Drywell Purge [VA] System A train isolated due to a high radiation signal, following the initiation of a Reactor Water Cleanup [CE] System Filter/Demineralizer [FDM] backwash. At the time of the event, the plant was in Operational Condition 1 at 100 percent rated thermal power. The reactor pressure vessel [RPV] was at 1002 psig and saturated conditions. On March 25, 1993, at 2004, the required non-emergency four-hour notification was made to the NRC pursuant to the requirements of 10CFR50.72(b)(2)(ii). This event is being reported under the requirements of 10CFR50.73(a)(2)(iv).

## II. Event Description

On March 25, 1993, at approximately 1715, Containment Vessel and Drywell Purge System A train was started in the intermittent mode to support the backwash evolution of a Reactor Water Cleanup (RWCU) Filter/Demineralizer (F/D). The RWCU Filter/Demineralizer had been in service for approximately two weeks, after plant startup following an outage to replace a leaking fuel pin. A nonlicensed operator manually initiated the backwash for automatic operation.

Immediately following commencement of the backwash evolution, at approximately 1726, the following alarms were received in the Control Room: Containment Vessel and Drywell Purge Exhaust Radiation Monitor (Alert, High and Containment Evacuation) Alarms [RA], and the Containment Ventilation Exhaust Radiation Monitor Channels A, B, C, and D, HIGH-HIGH Alarms [RA]. The Containment Vessel and Drywell Purge System Exhaust Isolation Valves automatically closed in response to the radiation level, isolating the system.

Upon receipt of the above alarms, control room operators entered Off Normal Instruction (ONI-D17), "High Radiation Levels Within Plant (Unit 1)". Chemistry and Health Physics personnel were notified. The operator performing the RWCU Filter/Demineralizer backwash exited the containment by 1733 and the backwash operation was completed without additional operator assistance. At 2157 ONI-D17 was exited.

## III. Cause Analysis

The immediate cause of the event was a high radiation signal. Further investigation of the cause of the high radiation signal will continue when plant conditions permit. The initial investigation of the high radiation levels detected by the Containment Ventilation Exhaust Radiation Monitors [RI], which isolated the Containment Vessel and Drywell Purge Exhaust System, determined that the system isolation was in response to a valid high radiation signal.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 80.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)		DOCKET NUMBER (2)		LER NUMBER (6)			PAGE (3)
Perry Nuclear Power Plant, Unit 1		05000 440		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 4
				93	- 009	- 00	

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

8.4 to 13.5 millirem per hour. It was estimated from Emergency Response Information System (ERIS) data that the Containment Ventilation and Drywell Purge System isolated within the radiation monitor trip setpoint range.

Peak activities recorded by the Containment Vessel and Drywell Purge Radiation Monitor [RI] during the event were approximately  $3.8E5$  counts per minute for the gas detector,  $2.8E5$  counts per minute for the particulate detector and  $1.4E4$  counts per minute for the iodine detector. The particulate and iodine levels were both below their monitor ALERT alarm setpoints. Additionally, weekly isotopic analysis of the particulate filter and charcoal cartridge from the Containment Vessel and Drywell Purge Exhaust Radiation Monitor show particulate activity ( $5.36E-12$  microcuries per cubic centimeter total activity) and iodine activity ( $1.88E-10$  microcuries per cubic centimeter total activity) largely attributable to the backwash evolution.

Analysis of a noble gas sample obtained from the Plant Unit 1 Vent during the event indicated that noble gas levels in the Containment Vessel and Drywell Purge System exhaust alone were insufficient to produce the system isolation signal. These results indicated that a potential for particulate carry-over existed with the High Efficiency Particulate Air (HEPA) filter [FTR], installed between the RWCU Backwash Receiving Tank [TK] Vent and the Containment Vessel and Drywell Purge System exhaust duct [DUCT]. The HEPA filter was replaced and visually examined for damage, since it was suspected that its failure may have contributed to the high activity level. No apparent damage to the HEPA filter was found.

Reactor water source inventory has increased as a result of leaking fuel (Reference LER 93-005). However, this was the first RWCU Filter/Demineralizer backwash which initiated a Containment Vessel and Drywell Purge System isolation, even though several RWCU backwashes had been completed under these conditions. Further analysis of the RWCU backwash vent exhaust has been limited due to plant conditions as a result of a plant shutdown (to Operational Condition 4) on 3/26/93 following an unrelated event. Appropriate plant conditions needed to complete this analysis are not anticipated before plant startup following the current outage. Additional investigation is needed to determine the cause of the elevated levels of radioactive material trapped by the RWCU Filter/Demineralizer.

## IV. Corrective Action

Portable airborne sampling equipment will be used to analyze the performance of the HEPA filter and the cause of the high radiation levels. Corrective actions will be established based on the results of our investigation. Additionally,

# LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Perry Nuclear Power Plant, Unit 1	05000 440	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 4
		93	009	00	

TEXT (if more space is required, use additional copies of NRC Form 356A) (17)

Radwaste samples from RWC Filter/Demineralizer backwashes will be analyzed for activity and compared with previous sample history. A supplemental report will be submitted, detailing the results of our investigation and further corrective actions.

## V. Safety Analysis

The Containment Vessel and Drywell Purge System is designed to reduce airborne radioactivity in the containment vessel and drywell to a safe level for entry of personnel, to maintain a safe atmosphere during operating and shutdown conditions, and provide a controlled filtered release path to the environment.

Containment areas purged include the Reactor Water Cleanup Filter/Demineralizer equipment areas. Flow in the Containment Vessel and Drywell Purge System is established prior to the start of backwashing the Reactor Water Cleanup Filter/Demineralizers. A separate in-line HEPA filter is installed between Reactor Water Cleanup Backwash Receiving Tank vent and the Containment Vessel and Drywell Purge System exhaust to remove particulates.

Radioactivity in the Containment and Drywell Purge System exhaust duct is monitored upstream of two parallel filter/charcoal adsorber unit and exhaust fan trains by the Containment Ventilation Exhaust Radiation Monitor. This monitor is designed to initiate isolation of the Containment Vessel and Drywell Purge System if high radiation levels are detected. During this event high radiation levels were detected, exceeding the high-high radiation level setpoint (1.5 millirem per hour), and the Containment Vessel and Drywell Purge System Exhaust Isolation Valves closed, isolating the system as designed.

This event resulted in the release of 0.59 Curies of Xenon noble gas through the plant Unit 1 Vent to the environment. This radiation release was within the normal values expected for this evolution. The calculated air doses for this event were 1.2E-03 millirad-gamma and 4.76E-04 millirad-beta. Technical Specification 3.11.2.2 gaseous effluent limits for noble gas air dose are 5 millirads for gamma radiation and 10 millirads for beta radiation during any calendar quarter. The gaseous effluent doses resulting from this event were significantly below these limits, therefore this event is not safety significant.

Energy Industry Identification System Codes are identified in the text as [XX].