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PHILADELPHIA ELECTRIC COMPANY

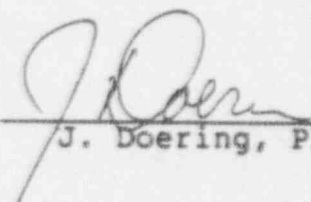
LIMERICK GENERATING STATION  
UNIT NO. 1 and UNIT NO. 2

DOCKET NO. 50-352 (Unit 1)  
DOCKET NO. 50-353 (Unit 2)

SEMI-ANNUAL EFFLUENT RELEASE REPORT  
NO. 17  
JULY 1, 1992 THROUGH DECEMBER 31, 1992

Submitted to  
The United States Nuclear Regulatory Commission  
Pursuant to  
Facility Operating Licenses NPF-39 (Unit 1)  
and NPF-85 (Unit 2)

Preparation Directed by:  
D. R. Helwig, Vice President  
Limerick Generating Station

 2/25/93  
\_\_\_\_\_  
J. Doering, Plant Manager

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PDR ADOCK 05000352  
R PDR

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## I. INTRODUCTION

This submittal complies with the format described in Regulatory Guide 1.21, "Measuring, Evaluating and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water Cooled Nuclear Power Plants", Revision 1, June, 1974.

Throughout this report "Technical Specifications" and "ODCM Controls" may be used concurrently due to the use of dual controls during implementation of NRC Generic letter 89-01.

The following information is included as Tables to this report:

- A summary of the gaseous and liquid effluent releases for the report period. Where "0.00E+00" is used, it denotes the less than detectable level for the given isotope.
- Composite particulate air samples counted for beta emitters (eg. Sr-89, Sr-90) are submitted to an offsite vendor laboratory for analysis. Since data for the fourth quarter particulate air samples had not yet become available at the time this report was prepared, it will be necessary to submit an addendum in the future if fourth quarter particulate air samples results are reported >LLD.
- Since Limerick Technical Specifications/ODCM Controls for liquid and gaseous effluent releases are prescribed in terms of quarterly and annual offsite doses, "percent Technical Specification/ODCM Control" is entered as 0.00E+00.
- A summary of solid waste dispositioned during the report period, to include: total activity shipped by waste type and an estimate of the error in the reported totals; the estimated composition of each type of waste by isotope; the number of shipments, mode of transportation, destination, type of container, total container volume, and solidification agent.

II. TABLES

A. SUMMARY OF RADIOACTIVE GASEOUS EFFLUENTS

July 1, 1992 to December 31, 1992

Thirteen (13) pages are included in Table A

SITE: LIMERICK  
UNIT: U1  
USER: MART  
DATE: 02/11/93 18:20

EFFLUENT AND WASTE DISPOSAL REPORT

BASEDUS EFFLUENTS -- SUMMATION OF ALL RELEASES

-----  
: UNITS : QUARTER : QUARTER : EST. TOTAL :  
: : 3 : 4 : ERROR, % :  
-----

FISSION AND ACTIVATION GASES

-----  
1. TOTAL RELEASE : CI : 0.531E+03 : 0.189E+03 : 0.453E+02 :  
-----  
2. AVERAGE RELEASE :UCI/SEC: 0.668E+02 : 0.238E+02 :  
RATE FOR PERIOD : : : :  
-----  
3. PERCENT OF TECHNICAL: % : 0.000E+00 : 0.000E+00 :  
SPECIFICATION LIMIT : : : :  
-----

IODINES

-----  
1. TOTAL IODINE-131 : CI : 0.271E-03 : 0.500E-03 : 0.453E+02 :  
-----  
2. AVERAGE RELEASE :UCI/SEC: 0.341E-04 : 0.629E-04 :  
RATE FOR PERIOD : : : :  
-----  
3. PERCENT OF TECHNICAL: % : 0.000E+00 : 0.000E+00 :  
SPECIFICATION LIMIT : : : :  
-----

PARTICULATES

-----  
1. PARTICULATES WITH : CI : 0.578E-05 : 0.618E-04 : 0.453E+02 :  
HALF-LIVES >8 DAYS : : : :  
-----  
2. AVERAGE RELEASE :UCI/SEC: 0.727E-06 : 0.777E-05 :  
RATE FOR PERIOD : : : :  
-----  
3. PERCENT OF TECHNICAL: % : 0.000E+00 : 0.000E+00 :  
SPECIFICATION LIMIT : : : :  
-----  
4. GROSS ALPHA : CI : 0.000E+00 : 0.000E+00 :  
RADIOACTIVITY : : : :  
-----

TRITIUM

-----  
1. TOTAL RELEASE : CI : 0.000E+00 : 0.000E+00 : 0.453E+02 :  
-----  
2. AVERAGE RELEASE :UCI/SEC: 0.000E+00 : 0.000E+00 :  
RATE FOR PERIOD : : : :  
-----  
3. PERCENT OF TECHNICAL: % : 0.000E+00 : 0.000E+00 :  
SPECIFICATION LIMIT : : : :  
-----

ENTER [ C ] TO ERASE SCREEN AND CONTINUE : C

SITE: LIMERICK  
 UNIT: U1  
 OPER: MART  
 DATE: 02/11/93 18:20

 EFFLUENT AND WASTE DISPOSAL REPORT
 

---

 GASEOUS EFFLUENTS FOR RELEASE POINT: 1 NORTH STACK
 

---

CONTINUOUS MODE

BATCH MODE

NUCLIDES	UNITS	QUARTER	QUARTER	QUARTER	QUARTER
RELEASED	:	3	4	3	4

---

## FISSION GASES

AR41	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KRB3M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KRB5M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KRB5	: CI	: 0.000E+00	: 0.882E-03	: 0.000E+00	: 0.000E+00
KRB7	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KRB8	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KRB9	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KR90	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
XE131M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
XE133M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
XE133	: CI	: 0.515E+03	: 0.481E+02	: 0.000E+00	: 0.000E+00
XE135M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
XE135	: CI	: 0.407E+01	: 0.134E+02	: 0.000E+00	: 0.166E+00
XE137	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
XE138	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
TOTAL FOR	:	:	:	:	:
PERIOD	: CI	: 0.519E+03	: 0.615E+02	: 0.000E+00	: 0.166E+00
(ABOVE)	:	:	:	:	:

---

ENTER [ C ] TO ERASE SCREEN AND CONTINUE : C

SITE: LIMERICK  
 UNIT: U1  
 OPER: MART  
 DATE: 02/11/93 18:21

## EFFLUENT AND WASTE DISPOSAL REPORT

GASEOUS EFFLUENTS FOR RELEASE POINT: 1 NORTH STACK

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNITS	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
IODINES					
I131	CI	0.271E-03	0.442E-03	0.000E+00	0.906E-05
I133	CI	0.281E-03	0.448E-02	0.000E+00	0.757E-04
TOTAL FOR PERIOD (ABOVE)	CI	0.551E-03	0.492E-02	0.000E+00	0.848E-04

## PARTICULATES

C14	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CR51	CI	0.000E+00	0.000E+00	0.000E+00	0.102E-04
MN54	CI	0.000E+00	0.000E+00	0.000E+00	0.578E-05
FE59	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO58	CI	0.000E+00	0.000E+00	0.000E+00	0.723E-05
CO60	CI	0.000E+00	0.000E+00	0.000E+00	0.952E-05
ZN65	CI	0.000E+00	0.000E+00	0.000E+00	0.108E-04
SR89	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR90	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR95	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB124	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS134	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS136	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS137	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00

ENTER [ C ] TO ERASE SCREEN AND CONTINUE : C

SITE: LIMERICK  
 UNIT: U1  
 USER: MART  
 DATE: 02/11/93 18:21

EFFLUENT AND WASTE DISPOSAL REPORT

GASEOUS EFFLUENTS FOR RELEASE POINT: 1 NORTH STACK

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES	UNITS	QUARTER	QUARTER	QUARTER	QUARTER
RELEASED	:	3	4	3	4

PARTICULATES (CONTD)

BA140	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
CE141	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
CE144	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
TOTAL FOR	:	:	:	:	:
PERIOD	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.435E-04
(ABOVE)	:	:	:	:	:

ENTER [ C ] TO ERASE SCREEN AND CONTINUE : C



SITE: LIMERICK  
 UNIT: U1  
 USER: MART  
 DATE: 02/11/93 18:22

## EFFLUENT AND WASTE DISPOSAL REPORT

HAZARDOUS EFFLUENTS FOR RELEASE POINT: 2 UNIT 1 - SOUTH STACK

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES	UNITS	QUARTER	QUARTER	QUARTER	QUARTER
RELEASED	:	3	4	3	4
FISSION GASES					
AR41	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KR83M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KR85M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KR85	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KR87	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KR88	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KR89	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KR90	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
XE131M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
XE133M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
XE133	: CI	: 0.107E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
XE135M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
XE135	: CI	: 0.000E+00	: 0.835E-05	: 0.000E+00	: 0.000E+00
XE137	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
XE138	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
TOTAL FOR	:	:	:	:	:
PERIOD	: CI	: 0.107E+00	: 0.835E-05	: 0.000E+00	: 0.000E+00
(ABOVE)	:	:	:	:	:

ENTER [ C ] TO ERASE SCREEN AND CONTINUE : C

ITE: LIMERICK  
 RIT: U1  
 SER: MART  
 DATE: 02/11/93 18:22

## EFFLUENT AND WASTE DISPOSAL REPORT

SEMI-CONTINUOUS EFFLUENTS FOR RELEASE POINT: 2 UNIT 1 - SOUTH STACK

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES	UNITS	QUARTER	QUARTER	QUARTER	QUARTER
RELEASED		3	4	3	4

## IODINES

I131	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
I133	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
TOTAL FOR	:	:	:	:	:
PERIOD	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
(ABOVE)	:	:	:	:	:

## PARTICULATES

C14	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
CR51	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
MN54	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
FE59	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
CO58	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
CO60	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
ZN65	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
SR89	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
SR90	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
ZR95	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
SB124	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
CS134	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
CS136	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
CS137	: CI	: 0.571E-05	: 0.000E+00	: 0.000E+00	: 0.000E+00

ENTER [ C ] TO ERASE SCREEN AND CONTINUE : C

ITE: LIMERICK  
 UNIT: U1  
 OPER: MART  
 DATE: 02/11/93 18:23

## EFFLUENT AND WASTE DISPOSAL REPORT

LIQUID EFFLUENTS FOR RELEASE POINT: 2 UNIT 1 - SOUTH STACK

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES	UNITS	QUARTER	QUARTER	QUARTER	QUARTER
RELEASED		3	4	3	4

## PARTICULATES (CONTD)

BA140	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE141	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE144	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL FOR					
PERIOD	CI	0.571E-05	0.000E+00	0.000E+00	0.000E+00
(ABOVE)					

ENTER [ C ] TO ERASE SCREEN AND CONTINUE : C

ITE: LIMERICK  
 UNIT: U1  
 OPER: MART  
 DATE: 02/11/93 18:23

## EFFLUENT AND WASTE DISPOSAL REPORT

LIQUEFIED EFFLUENTS FOR RELEASE POINT: 3 UNIT 2 - SOUTH STACK

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES	UNITS	QUARTER	QUARTER	QUARTER	QUARTER
RELEASED	:	3	4	3	4

## FISSION GASES

AR41	: CI	: 0.144E-01	: 0.000E+00	: 0.115E+00	: 0.000E+00
KR83M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KR85M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KR85	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KR87	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KR88	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KR89	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
KR90	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
XE131M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
XE133M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
XE133	: CI	: 0.911E+01	: 0.588E+02	: 0.167E+01	: 0.000E+00
XE135M	: CI	: 0.000E+00	: 0.154E+02	: 0.000E+00	: 0.000E+00
XE135	: CI	: 0.778E-01	: 0.534E+02	: 0.623E+00	: 0.000E+00
XE137	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
XE138	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
TOTAL FOR	:	:	:	:	:
PERIOD	: CI	: 0.920E+01	: 0.128E+03	: 0.241E+01	: 0.000E+00
(ABOVE)	:	:	:	:	:

ENTER [ C ] TO ERASE SCREEN AND CONTINUE : C

ITE: LIMERICK  
 MIT: U1  
 SER: MART  
 DATE: 02/11/93 18:23

EFFLUENT AND WASTE DISPOSAL REPORT

AQUEOUS EFFLUENTS FOR RELEASE POINT: 3 UNIT 2 - SOUTH STACK

NUCLIDES RELEASED	UNITS	CONTINUOUS MODE		BATCH MODE	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
IODINES					
I131	CI	0.000E+00	0.497E-04	0.550E-06	0.000E+00
I133	CI	0.000E+00	0.781E-03	0.000E+00	0.000E+00
TOTAL FOR PERIOD (AFOVE)	CI	0.000E+00	0.831E-03	0.550E-06	0.000E+00

PARTICULATES

C14	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CR51	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MN54	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FE59	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO58	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO60	CI	0.000E+00	0.182E-04	0.201E-07	0.000E+00
ZN65	CI	0.000E+00	0.000E+00	0.449E-07	0.000E+00
SR89	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR90	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR95	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB124	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS134	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS136	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS137	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00

ENTER [ C ] TO ERASE SCREEN AND CONTINUE : C

SITE: LIMERICK  
 UNIT: U1  
 USER: MART  
 DATE: 02/11/93 18:24

EFFLUENT AND WASTE DISPOSAL REPORT

BASE/US EFFLUENTS FOR RELEASE POINT: 3 UNIT 2 - SOUTH STACK

CONTINUOUS MODE

BATCH MODE

NUCLIDES	UNITS	QUARTER	QUARTER	QUARTER	QUARTER
RELEASED		3	4	3	4

PARTICULATES (CONTD)

BA140	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE141	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE144	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL FOR					
PERIOD	CI	0.000E+00	0.182E-04	0.650E-07	0.000E+00
(ABOVE)					

ENTER [ C ] TO ERASE SCREEN AND CONTINUE : C

SITE: LIMERICK  
 UNIT: U1  
 USER: MART  
 DATE: 02/11/93 18:24

## EFFLUENT AND WASTE DISPOSAL REPORT

BASEOUS EFFLUENTS FOR RELEASE POINT: 4 HOT MAINTENANCE SHOP

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNITS	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
FISSION GASES					
AR41	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
KRB3M	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
KRB5M	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
KRB5	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
KRB7	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
KRB8	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
KRB9	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
KR90	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE131M	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE133M	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE133	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE135M	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE135	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE137	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE138	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTAL FOR PERIOD (ABOVE)	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00

ENTER [ C ] TO ERASE SCREEN AND CONTINUE : C

ITE: LIMERICK  
 UNIT: U1  
 OPER: MART  
 DATE: 02/11/93 18:25

## EFFLUENT AND WASTE DISPOSAL REPORT

BASED EFFLUENTS FOR RELEASE POINT: 4 HOT MAINTENANCE SHOP

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES	UNITS	QUARTER	QUARTER	QUARTER	QUARTER
RELEASED	:	3	4	3	4

## IODINES

I131	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
I133	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
TOTAL FOR	:	:	:	:	:
PERIOD	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
(ABOVE)	:	:	:	:	:

## PARTICULATES

C14	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
CR51	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
MN54	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
FE59	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
CO58	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
CO60	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
ZN65	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
SR89	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
SR90	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
ZR95	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
SB124	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
CS134	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
CS136	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
CS137	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00

ENTER [ C ] TO ERASE SCREEN AND CONTINUE : C



ITE: LIMERICK  
 UNIT: U1  
 OPER: MART  
 DATE: 02/11/93 18:26

EFFLUENT AND WASTE DISPOSAL REPORT

AQUEOUS EFFLUENTS FOR RELEASE POINT: 4 HOT MAINTENANCE SHOP

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES	UNITS	QUARTER	QUARTER	QUARTER	QUARTER
RELEASED	:	3	4	3	4

PARTICULATES (CONTD)

BA140	:	CI	:	0.000E+00	:	0.000E+00	:	0.000E+00	:	0.000E+00
CE141	:	CI	:	0.000E+00	:	0.000E+00	:	0.000E+00	:	0.000E+00
CE144	:	CI	:	0.000E+00	:	0.000E+00	:	0.000E+00	:	0.000E+00
TOTAL FOR	:		:		:		:		:	
PERIOD	:	CI	:	0.000E+00	:	0.000E+00	:	0.000E+00	:	0.000E+00
(ABOVE)	:		:		:		:		:	

ENTER [ C ] TO ERASE SCREEN AND CONTINUE : C

II. TABLES

B. SUMMARY OF RADIOACTIVE LIQUID EFFLUENTS

July 1, 1992 to December 31, 1992

Six (6) pages are included in Table B

SITE: LIMERICK  
UNIT: U1  
USER: MART  
DATE: 02/11/93 18:26

EFFLUENT AND WASTE DISPOSAL REPORT

LIQUID EFFLUENTS -- SUMMATION OF ALL RELEASES

-----  
: UNITS : QUARTER : QUARTER : EST. TOTAL :  
: : 3 : 4 : ERROR, % :  
-----

FISSION AND ACTIVATION PRODUCTS

-----  
1. TOTAL RELEASE (EXCL.: CI : 0.171E-02 : 0.297E-02 : 0.628E+01 :  
TRIT., GASES, ALPHA): : : : :  
-----  
2. AVERAGE DILUTED :UCI/ML : 0.124E-07 : 0.190E-07 :  
CONC. DURING PERIOD : : : :  
-----  
3. PERCENT OF : % : 0.000E+00 : 0.000E+00 :  
APPLICABLE LIMIT : : : :  
-----

TRITIUM

-----  
1. TOTAL RELEASE : CI : 0.120E+01 : 0.176E+01 : 0.628E+01 :  
-----  
2. AVERAGE DILUTED :UCI/ML : 0.871E-05 : 0.113E-04 :  
CONC. DURING PERIOD : : : :  
-----  
3. PERCENT OF : % : 0.000E+00 : 0.000E+00 :  
APPLICABLE LIMIT : : : :  
-----

DISSOLVED AND ENTRAINED GASES

-----  
1. TOTAL RELEASE : CI : 0.896E-04 : 0.165E-01 : 0.628E+01 :  
-----  
2. AVERAGE DILUTED :UCI/ML : 0.650E-09 : 0.105E-06 :  
CONC. DURING PERIOD : : : :  
-----  
3. PERCENT OF : % : 0.325E-03 : 0.527E-01 :  
APPLICABLE LIMIT : : : :  
-----

GROSS ALPHA RADIOACTIVITY

-----  
1. TOTAL RELEASE : CI : 0.000E+00 : 0.000E+00 : 0.628E+01 :  
-----

-----  
VOLUME WASTE RELEASED :LITERS : 0.152E+07 : 0.171E+07 : 0.000E+00 :  
(PRIOR TO DILUTION) : : : :  
-----

-----  
VOLUME DILUTION WATER :LITERS : 0.138E+09 : 0.156E+09 : 0.000E+00 :  
USED DURING PERIOD : : : :  
-----

ENTER [ C ] TO ERASE SCREEN AND CONTINUE : C

SITE: LIMERICK  
 UNIT: U1  
 OPERATOR: MART  
 DATE: 02/11/93 18:26

 EFFLUENT AND WASTE DISPOSAL REPORT
 

---

 LIQUID EFFLUENTS FOR RELEASE POINT: 1 LIQUID RAD WASTE DISCHARGE TO SCHUYLKILL RIVER
 

---

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNITS	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
H3	CI	0.000E+00	0.000E+00	0.120E+01	0.176E+01
C14	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NA24	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
P32	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CR51	CI	0.000E+00	0.000E+00	0.583E-04	0.000E+00
MN54	CI	0.000E+00	0.000E+00	0.289E-03	0.562E-04
MN56	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FE55	CI	0.000E+00	0.000E+00	0.697E-03	0.436E-05
FE59	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO58	CI	0.000E+00	0.000E+00	0.618E-04	0.000E+00
CO60	CI	0.000E+00	0.000E+00	0.486E-03	0.501E-03
NI63	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NI65	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CU64	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZN65	CI	0.000E+00	0.000E+00	0.438E-04	0.183E-03
ZN69	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BR83	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BR84	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BR85	CI	0.000E+00	0.000E+00	0.000E+00	0.000E+00

ENTER [ C ] TO ERASE SCREEN AND CONTINUE : C

ITE: LIMERICK  
 MIT: U1  
 SER: MART  
 DATE: 02/11/93 18:27

EFFLUENT AND WASTE DISPOSAL REPORT

LIQUID EFFLUENTS FOR RELEASE POINT: 1 LIQUID RAD WASTE DISCHARGE TO SCHUYLKILL RIVER

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES	UNITS	QUARTER	QUARTER	QUARTER	QUARTER
RELEASED	:	3	4	3	4

LIQUID EFFLUENTS (CONTD)

RBB6	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
RBB8	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
RBB9	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
SRB9	: CI	: 0.000E+00	: 0.000E+00	: 0.697E-04	: 0.996E-03
SR90	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.607E-04
SR91	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
SR92	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
Y90	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
Y91M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
Y91	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
Y92	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
Y93	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
ZR95	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
ZR97	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
NB95	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
M099	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
TC99M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
TC101	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00

TER [ C ] TO ERASE SCREEN AND CONTINUE : C

SITE: LIMERICK  
 UNIT: U1  
 OPER: MART  
 DATE: 02/11/93 18:27

 EFFLUENT AND WASTE DISPOSAL REPORT
 

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 EFFLUENT FOR RELEASE POINT: 1 LIQUID RAD WASTE DISCHARGE TO SCHUYLKILL RIVER
 

---

	CONTINUOUS MODE	BATCH MODE
--	-----------------	------------

NUCLIDES	UNITS	QUARTER	QUARTER	QUARTER	QUARTER
RELEASED	:	3	4	3	4

---

 EFFLUENTS (CONTD)
 

---

RU103	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
RU105	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
RU106	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
AG110M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
TE125M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
TE127M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
TE127	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
TE129M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
TE129	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
TE131M	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
TE131	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
TE132	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
I130	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
I131	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
I132	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
I133	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
I134	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
I135	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00

---

ENTER [ C ] TO ERASE SCREEN AND CONTINUE : C

SITE: LIMERICK  
 UNIT: U1  
 USER: MART  
 DATE: 02/11/93 18:28

EFFLUENT AND WASTE DISPOSAL REPORT

LIQUID EFFLUENTS FOR RELEASE POINT: 1 LIQUID RAD WASTE DISCHARGE TO SCHUYLKILL RIVER

CONTINUOUS MODE

BATCH MODE

NUCLIDES : UNITS : QUARTER : QUARTER : QUARTER : QUARTER :  
 RELEASED : : 3 : 4 : 3 : 4 :

LIQUID EFFLUENTS (CONTD)

CS134 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.397E-03 :

CS136 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.000E+00 :

CS137 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.774E-03 :

CS138 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.000E+00 :

BA139 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.000E+00 :

BA140 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.000E+00 :

BA141 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.000E+00 :

BA142 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.000E+00 :

LA140 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.000E+00 :

LA142 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.000E+00 :

DE141 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.000E+00 :

DE143 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.000E+00 :

DE144 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.000E+00 :

PR143 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.000E+00 :

PR144 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.000E+00 :

ND147 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.000E+00 :

AS76 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.000E+00 :

W187 : CI : 0.000E+00 : 0.000E+00 : 0.000E+00 : 0.000E+00 :

ENTER [ C ] TO ERASE SCREEN AND CONTINUE : C

ITE: LIMERICK  
 KIT: U1  
 SER: MART  
 DATE: 02/11/93 18:28

## EFFLUENT AND WASTE DISPOSAL REPORT

LIQUID EFFLUENTS FOR RELEASE POINT: 1 LIQUID RAD WASTE DISCHARGE TO SCHUYLKILL RIVER

CONTINUOUS MODE

BATCH MODE

NUCLIDES	UNITS	QUARTER	QUARTER	QUARTER	QUARTER
RELEASED	:	3	4	3	4

## LIQUID EFFLUENTS (CONTD)

NDNE	: CI	: 0.000E+00	: 0.000E+00	: 0.000E+00	: 0.000E+00
------	------	-------------	-------------	-------------	-------------

TOTAL FOR	:	:	:	:	:
PERIOD	: CI	: 0.000E+00	: 0.000E+00	: 0.120E+01	: 0.176E+01
(ABOVE)	:	:	:	:	:

XE-133	: CI	: 0.000E+00	: 0.000E+00	: 0.388E-04	: 0.143E-01
--------	------	-------------	-------------	-------------	-------------

XE-135	: CI	: 0.000E+00	: 0.000E+00	: 0.509E-04	: 0.214E-02
--------	------	-------------	-------------	-------------	-------------

## EFFLUENT RELEASE SUMMARY OPTIONS

-- TERMINATE  
 -- ACCUMULATE GASEOUS RELEASES  
 -- ACCUMULATE LIQUID RELEASES  
 -- PRINT WASTE SUMMARY REPORT

ENTER OPTION SELECTION [ 1-4 ] : 1  
 JOB 4826 ENTERED ON QUEUE LPA0

## ROUTINE RELEASE CALCULATION OPTIONS (LEVEL 2)

-- RETURN TO TOP LEVEL  
 -- CALCULATE X/Q OR DOSE  
 -- CALCULATE DOSES FOR GASEOUS PATHWAYS  
 -- CALCULATE HYPOTHETICALLY HIGHEST EXPOSED RECEPTOR  
 -- CALCULATE DOSES FOR LIQUID PATHWAYS  
 -- PREPARE PATHWAYS DOSE SUMMARY FOR APPENDIX I REPORTS  
 -- PREPARE GASEOUS AND LIQUID EFFLUENT SUMMARY REPORT  
 -- PREPARE SOLID WASTE REPORT

ENTER OPTION SELECTION [ 1-8 ] : 1



II. TABLES

C. SOLID WASTE DISPOSITION REPORT

July 1, 1992 to December 31, 1992

Five (5) pages are included in Table C

# SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

PERIOD 07/01/92 TO 12/31/92

## A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (NOT IRRADIATED FUEL)

1. TYPE OF WASTE	UNIT	6 - MONTH PERIOD	ESTIMATE TOTAL ERROR %
a. SPENT RESINS, FILTERS SLUDGES, EVAPORATOR BOTTOMS, ETC.	m(3)	2.11E+02	2.50E+01
	Ci	6.52E+02	
b. COMPRESSIBLE WASTE, CONTAMINATED EQUIPMENT, ETC.	m(3)	3.83E+01	2.50E+01
	Ci	5.31E+00	
c. IRRADIATED COMPONENTS, CONTROL RODS, ETC.	m(3)	5.08E+00	2.50E+01
	Ci	9.30E+04	
d. OTHER (ASH FROM INCINERATION)	m(3)	2.86E+00	2.50E+01
	Ci	1.57E+00	

2. ESTIMATE OF MAJOR NUCLIDE COMPOSITION (BY TYPE OF WASTE)

ISOTOPE	CATEGORY A - SPENT RESINS, FILTER SLUDGE, EVAPORATOR BOTTOMS, ETC		CATEGORY A - SPENT RESINS, FILTER SLUDGE, EVAPORATOR BOTTOMS, ETC		CATEGORY A - SPENT RESINS, FILTER SLUDGE, EVAPORATOR BOTTOMS, ETC	
	CLASS A	ACTIVITY	CLASS B	ACTIVITY	CLASS C	ACTIVITY
		% ABUNDANCE		% ABUNDANCE		% ABUNDANCE
Zn-65	1.19E+05	25.55%	1.07E+04	33.01%	9.20E+03	5.99%
Cr-51	1.52E+05	32.63%	5.82E+03	17.95%	4.30E+03	2.80%
Cs-137	1.51E+04	3.24%	2.50E+02	0.77%	4.50E+03	2.93%
Cs-134	1.39E+04	2.98%	0.00E+00	0.00%	0.00E+00	0.00%
I-131	1.25E+03	0.27%	0.00E+00	0.00%	0.00E+00	0.00%
Co-60	6.53E+04	14.02%	6.49E+03	20.02%	4.30E+04	28.00%
Ce-58	3.35E+04	7.19%	2.78E+03	8.58%	6.10E+03	3.97%
Fe-55	5.65E+03	1.21%	6.88E+02	2.12%	7.60E+03	4.95%
Sr-89	1.99E+02	0.04%	0.00E+00	0.00%	0.00E+00	0.00%
C-14	6.19E+02	0.13%	5.00E-01	0.00%	1.50E+02	0.10%
Mn-54	5.67E+04	12.17%	5.60E+03	17.28%	3.60E+04	23.44%
Nb-95	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
H-3	5.32E+01	0.01%	3.23E+00	0.01%	0.00E+00	0.00%
Ba/La-140	2.63E+02	0.06%	0.00E+00	0.00%	0.00E+00	0.00%
Ni-63	2.02E+03	0.43%	8.50E+01	0.26%	0.00E+00	0.00%
Ag-110m	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
Zr-95	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
P-32	1.80E+02	0.04%	0.00E+00	0.00%	0.00E+00	0.00%
Sr-90	3.67E+01	0.01%	0.00E+00	0.00%	0.00E+00	0.00%
I-129	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
Tc-99	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
Nd-94	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
Ni-59	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
Np-237	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
Ce-141	5.90E-02	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
Ce-144	0.00E+00	0.00%	0.00E+00	0.00%	1.90E+03	1.24%
Sb-125	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
Pu-124	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
Pu-238	2.30E+01	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
Pu-239	4.60E-01	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
Pu-241	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
Cr-242	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
Cr-243	8.90E-03	0.00%	0.00E+00	0.00%	2.60E+01	0.02%
Am-241	1.80E-03	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
Am-243	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
Fe-59	0.00E+00	0.00%	0.00E+00	0.00%	0.00E+00	0.00%
TOTALS	4.66E+05	100.00%	3.24E+04	100.00%	1.54E+05	100.00%

ISOTOPE	CATEGORY B - DRY COMPRESSIBLE WASTE, CONTAMINATED EQUIPMENT, ETC.			CATEGORY C - IRRADIATED REACTOR OR POOL COMPONENTS			CATEGORY D - OTHER (ASH FROM INCINERATION)		
	CLASS A	ACTIVITY	% ABUNDANCE	CLASS C	ACTIVITY	% ABUNDANCE	CLASS A	ACTIVITY	% ABUNDANCE
Zn-65		1.05E+03	19.78%		0.00E+00	0.00%		2.57E+02	16.37%
Cr-51		8.95E+02	16.86%		4.30E+05	0.46%		3.88E+02	24.72%
Cs-137		1.99E+02	3.75%		0.00E+00	0.00%		2.34E+01	1.49%
Cs-134		5.50E+01	1.04%		0.00E+00	0.00%		3.52E+00	0.22%
I-131		2.53E+01	0.48%		0.00E+00	0.00%		2.26E-01	0.01%
Co-60		1.22E+03	22.99%		3.40E+07	36.62%		3.51E+02	22.36%
Co-58		1.43E+02	2.69%		0.00E+00	0.00%		4.40E+01	2.80%
Fe-55		1.29E+03	24.30%		5.30E+07	57.08%		3.90E+02	24.84%
Sr-89		3.00E-01	0.01%		0.00E+00	0.00%		0.00E+00	0.00%
C-14		1.73E+01	0.33%		2.40E+03	0.00%		0.00E+00	0.00%
M-54		3.30E+02	6.22%		3.80E+06	4.09%		9.34E+01	5.95%
Nb-95		2.10E-01	0.00%		0.00E+00	0.00%		0.00E+00	0.00%
H-3		5.10E-01	0.01%		1.50E+01	0.00%		0.00E+00	0.00%
Ba/La-140		2.90E+00	0.05%		0.00E+00	0.00%		1.15E+00	0.07%
Ni-63		7.18E+01	1.35%		1.60E+06	1.72%		7.06E-02	0.00%
Ag-110m		0.00E+00	0.00%		0.00E+00	0.00%		1.64E+01	1.04%
Zr-95		0.00E+00	0.00%		0.00E+00	0.00%		0.00E+00	0.00%
P-32		0.00E+00	0.00%		0.00E+00	0.00%		0.00E+00	0.00%
Sr-90		1.70E-02	0.00%		0.00E+00	0.00%		0.00E+00	0.00%
I-129		0.00E+00	0.00%		0.00E+00	0.00%		0.00E+00	0.00%
Tc-99		0.00E+00	0.00%		0.00E+00	0.00%		0.00E+00	0.00%
Nb-94		0.00E+00	0.00%		1.40E+01	0.00%		0.00E+00	0.00%
Ni-59		0.00E+00	0.00%		2.50E+01	0.00%		0.00E+00	0.00%
Np-237		0.00E+00	0.00%		9.40E+03	0.01%		0.00E+00	0.00%
Ce-141		2.05E-01	0.00%		4.90E-04	0.00%		0.00E+00	0.00%
Ce-144		6.30E-02	0.00%		0.00E+00	0.00%		1.70E-02	0.00%
Sb-125		7.10E+00	0.13%		0.00E+00	0.00%		1.20E-02	0.00%
Sb-124		0.00E+00	0.00%		9.70E+03	0.01%		1.60E+00	0.10%
Pu-238		0.00E+00	0.00%		6.10E-03	0.00%		0.00E+00	0.00%
Pu-239		0.00E+00	0.00%		4.10E+00	0.00%		0.00E+00	0.00%
Pu-241		0.00E+00	0.00%		3.80E-03	0.00%		0.00E+00	0.00%
Cm-242		0.00E+00	0.00%		4.30E-01	0.00%		0.00E+00	0.00%
Cm-243		0.00E+00	0.00%		4.90E-02	0.00%		0.00E+00	0.00%
Am-241		0.00E+00	0.00%		6.10E-03	0.00%		0.00E+00	0.00%
Am-243		0.00E+00	0.00%		3.40E-04	0.00%		0.00E+00	0.00%
Fe-59		0.00E+00	0.00%		2.30E-05	0.00%		0.00E+00	0.00%
TOTALS		5.31E+03	100.00%		9.29E+07	100.00%		1.57E+03	100.00%

3. SOLID WASTE DISPOSITION

<u>NUMBER OF SHIPMENTS</u>	<u>MODE OF TRANSPORTATION</u>	<u>DESTINATION</u>
27	TRUCK	LIMERICK TO BARNWELL
169	TRUCK	SEG TO BEATTY NV
11	TRUCK	QUADREX TO BARNWELL
2	TRUCK	QUADREX TO BEATTY NV

B. IRRADIATED FUEL SHIPMENTS (DISPOSITION)

NUMBER OF SHIPMENTS  
NONE

MODE OF TRANSPORTATION  
N/A

DESTINATION  
N/A

COMMENTS:

3 IRRADIATED HARDWARE SHIPMENTS  
1 IRRADIATED HARDWARE AND FILTER SHIPMENT  
18 SHIPMENTS TO SEG FOR PROCESSING  
1 SHIPMENT TO QUADREX FOR PROCESSING  
NO SOLIDIFICATION SHIPMENTS WERE MADE.  
THE PCP WAS CHANGED DURING THIS PERIOD TO CHANGE THE FORMAT  
INTO A COMMON NUCLEAR PROCEDURE; RW-C-100 FROM RW-800.  
IN ADDITION WE REMOVED REFERENCES TO WASTE FORMS WHICH ARE  
ALREADY IN A FORM ACCEPTABLE FOR BURIAL. THESE INCLUDE DAW AND  
IRRADIATED CORE COMPONENTS.

II. TABLES

D. OFFSITE RADIATION DOSE ASSESSMENT

January 1, 1992 to December 31, 1992

One (1) page is included in Table D.

SITE: LIMERICK  
 UNIT: U1  
 USER: MART  
 DATE: 02/25/93 15:34

SUMMARY OF MAXIMUM INDIVIDUAL DOSES

TOTAL ACCUMULATION FOR PERIODS:

LIQUID: FROM 01/01/92 0:00 TO 12/31/92 23:00  
 GASEOUS: FROM 01/01/92 0:00 TO 12/31/92 23:00  
 AIR: FROM 01/01/92 0:00 TO 12/31/92 23:00

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (MREM)	AGE GROUP	LOCATION (M) (TOWARD)	% OF APPLICABLE LIMIT	LIMIT (MR)
LIQUID	TOTAL BODY	1.87E-02	ADULT	RECEPTOR 1	3.1E-01	5.0
LIQUID	LIVER	3.04E-02	TEEN	RECEPTOR 1	1.5E-01	20.0
DOUBLE GAS	AIR DOSE (GAMMA-MRAD)	4.57E-02		762. ESE	2.3E-01	20.0
DOUBLE GAS	AIR DOSE (BETA-MRAD)	7.49E-02		762. ESE	1.9E-01	40.0
DOUBLE GAS	T. BODY (GAMMA)	1.25E-02	ALL	965. ESE	6.3E-02	20.0
DOUBLE GAS	SKIN (BETA)	3.24E-02	ALL	965. ESE	8.1E-02	40.0
ODINE+ ARTICULATES	THYROID	2.08E-02	INFANT	965. ESE	6.9E-02	30.0

SUMMARY OF POPULATION DOSES

TOTAL ACCUMULATION FOR PERIODS:

LIQUID: FROM 01/01/92 0:00 TO 12/31/92 23:00  
 GASEOUS: FROM 01/01/92 0:00 TO 12/31/92 23:00

EFFLUENT	APPLICABLE ORGAN	ESTIMATED POPULATION DOSE (PERSON-REM)
LIQUID	TOTAL BODY	6.9E-01
LIQUID	THYROID	5.1E-01
GASEOUS	TOTAL BODY	5.1E-01
GASEOUS	THYROID	7.8E-01



II. TABLES

E. RADIATION DOSES TO MEMBERS OF THE PUBLIC DUE TO THEIR  
ACTIVITIES INSIDE SITE BOUNDARY

January 1, 1992 to December 31, 1992

Two (2) pages are included in Table E

## RADIATION DOSES TO MEMBERS OF THE PUBLIC DUE TO THEIR ACTIVITIES INSIDE SITE BOUNDARY

Per ODCM Control 3.6, the Semi-Annual Effluent Release Report shall include an assessment of the radiation doses from radioactive liquid and gaseous effluents to members of the public due to their activities inside the Site Boundary during the report period. Technical Specifications/ODCM Controls state that Members of the Public shall include all persons not occupationally associated with the plant. This category does not include employees of the utility or contractors. Also excluded from this category are persons who enter the site to service equipment or to make deliveries. This category does include persons who use portions of the site for recreational, occupational education, or other purposes not associated with the plant. The Limerick Information Center on Longview Road near the rear exit of the plant, Frick's Lock Environmental Laboratory on the west shore of the river and the railroad tracks which run above the east shore of the Schuylkill River are all areas within the site boundary where radiation dose of this type could occur. The radiation doses to Members of the Public have been estimated using methodology stated in the ODCM. The maximum gaseous dose to members of the public at these locations is based on the following assumptions:

1. Real time meteorology and actual effluent releases.
2. Beta air dose attributed to noble gas releases.
3. Highest exposed sector of the railroad tracks (W), and the sectors enclosing Frick's Lock and the Information Center available for occupancy.
4. The maximum expected occupancy factor is a working year (or 25%) in any of the locations.
5. Distance to the railroad tracks, which pass through the Site Boundary in the W sector, is approximately 225 meters.
6. Distance to the Limerick Information Center is approximately 884 meters in the ESE sector.
7. Distance to Frick's Lock Environmental Laboratory is approximately 450 meters in the WSW sector.

A summary of gaseous radiation doses to members of the public at these locations is included in this Attachment.

RADIATION DOSE TO MEMBERS OF PUBLIC WITHIN LIMERICK GENERATING  
STATION SITE BOUNDARY FOR AFFECTED SECTORS AND DISTANCES

LOCATION	SECTOR	APPROXIMATE DISTANCE (METERS)	GAMMA AIR DOSE, MRAD	BETA AIR DOSE, MRAD	IODINE/PARTICULATE ORGAN DOSE, MREM	H-3/BETA-EMITTER INGESTION DOSE, MREM
FRICK'S LOCK	WSW	450	3.29E-7	1.91E-7	3.62E-2	0.00E0
INFO. CENTER	ESE	884	3.33E-7	1.94E-7	4.90E-2	0.00E0
R.R. TRACKS	W	225	1.33E-6	7.73E-7	1.25E-1	0.00E0

# I. ATTACHMENTS

## A. SUPPLEMENTAL INFORMATION

ility: Limerick Generating Station - Unit 1 and Unit 2  
ense: NPF-39 (Unit 1) and NPF-85 (Unit 2)

### Regulatory Limits (ODCM Control Limits)

#### A. Noble Gases:

1.  $\leq 500$  mRems/Yr - total body  
 $\leq 3000$  mRems/yr - skin - "instantaneous" limits per ODCM Control I 3.3.2
2.  $\leq 10$  mRads - air gamma  
 $\leq 20$  mRads - air beta - quarterly air dose limits per ODCM Control I 3.3.3
3.  $\leq 20$  mRads - air gamma  
 $\leq 40$  mRads - air beta - yearly air dose limits per ODCM Control I 3.3.3

#### B. Iodines, tritium, particulates with half life > 8 days:

1.  $\leq 1500$  mRems/yr - any organ  
(inhalation path) - "instantaneous" limits per ODCM Control I 3.3.2
2.  $\leq 15$  mRems - any organ - quarterly dose limits per ODCM Control I 3.3.4
3.  $\leq 30$  mRems - any organ - yearly dose limits per ODCM Control I 3.3.4

#### C. Liquid Effluents:

1. Concentration  $< 10$ CFR20  
Appendix B, Table II, Col. 2 - "instantaneous" limits per ODCM Control I 3.2.2
2.  $\leq 3$  mRems - total body  
 $\leq 10$  mRems - any organ - quarterly dose limits per ODCM Control I 3.2.3
3.  $\leq 6$  mRems - total body  
 $\leq 20$  mRems - any organ - yearly dose limits per ODCM Control I 3.2.3

### Maximum Permissible Concentrations

Per LGS ODCM Control I 3.2.2, MPCs are not used to calculate permissible release rates and concentrations for gaseous releases.

The MPCs specified in 10CFR20, Appendix B, Table II, Column 2 for identified nuclides are used to calculate permissible release rates and concentrations for liquid releases.

3. Average Energy

Based on gaseous effluent releases for the report period, average beta energy is 0.167 MeV and average gamma energy is 0.176 MeV.

4. Measurements and Approximations of Total Radioactivity

A. Fission and Activation Gases

The method used is the Canberra Series 90 Counting System; GS - Gas Marinelli.

B. Iodine:

The method used is the Canberra Series 90 Counting System; CH - Charcoal Cartridge.

C. Particulate:

The method used is the Canberra Series 90 Counting System; PT - Air Particulate Sample, 47 mm filter.

D. Liquid Effluents:

The method used is the Canberra Series 90 Counting System and the Radwaste Liquid Discharge Pre-Release Method with a 3.5 liter Marinelli.

Batch Releases

A. <u>Liquid</u>	<u>Q3</u>	<u>Q4</u>
# of Batch Releases:	25	30
Total Time period for batch releases, *	1680	2175
Maximum time period for a batch release, *	80	120
Average time period for batch release, *	67.2	72.5
Minimum time period for a batch release, *	60	60
Average stream flow (Schuylkill River) during periods of release of effluents into a flowing stream, gpm	4.15E5	8.97E5

\* = Minutes

B. <u>Gaseous</u>	<u>Q3</u>	<u>Q4</u>
# of Batch Releases:	6	2
Total Time period for batch releases, *	4680	2460
Maximum time period for a batch release, *	2040	1380
Average time period for batch release, *	780	1230
Minimum time period for a batch release, *	60	1080

\* = Minutes

Abnormal Releases

A. Liquid

None

B. Gaseous

None

Description of LGS Effluent Release Points

- Release Point 1 = North Stack, Common
- Release Point 2 = South Stack, Unit 1
- Release Point 3 = South Stack, Unit 2
- Release Point 4 = Hot Maintenance Shop
- Liquid Release Point = LGS Liquid Radwaste Discharge

Description of LGS Liquid Dose Receptors

- Receptor 1 = LGS Liquid Radwaste Discharge Point
- Receptor 2 = Citizens Home Water Company
- Receptor 3 = Phoenixville Water Company
- Receptor 4 = Philadelphia Suburban Water Company
- Receptor 5 = City of Philadelphia Crew Course

II. ATTACHMENTS (continued)

B. RADIATION MONITORS OUT-OF-SERVICE CONDITION

On 10/29/92 at 0425, the Unit 1 Service Water Rad. Monitor was declared inoperable based on the monitor being in HI ALARM and a sample taken at 0425 showed no identified activity. With a liquid effluent monitor inoperable, ODCM Control 3.2 Action Statement "B" was entered. This action states in part:

With less than the minimum number of radioactive liquid effluent monitoring instrumentation channels OPERABLE, take the ACTION shown in Table I3.2-1. The ACTION from Table I3.2-1 states in part to take grab samples and analyze for radioactivity by gamma isotopic analysis at least once per 8 hours.

Pursuant to the ACTION Statement, a grab sample should have been obtained by 1225 for gamma isotopic analysis, however, the required sample was not obtained until 1600 on 10/29. The cause of the event was the failure to clearly communicate the INOP status of the Unit 1 Service Water Rad Monitor to the Shift Chemist. The root causes and corrective actions to prevent recurrence were determined through the station event investigation program. (RE/EIF #92-11-07). During the period where liquid samples for isotopic analysis were not taken, Unit 1 was maintaining steady state operation at 100% power. No significant evolutions resulting in the release of radiation to the environment occurred and samples taken which "bracket" this time period show no identified activity. This noncompliance was evaluated to be "not reportable" under 10CFR50.73, however, it is included in this report for information since a LER is not required.

II. ATTACHMENTS (continued)

C. PROCESS CONTROL PROGRAM (PCP), RW-C-100 , Revision 0.

The Process Control Program has been revised on 12/28/92 and is now incorporated into procedure RW-C-100, Revision 0. The PCP was revised to reflect installation of Modification 5983 - Deep Bed Condensate Demineralizer System. This modification introduces Condensate Deep Bed Demineralizer Waste as a new waste stream into the plant. Condensate Deep Bed Demineralizer Waste is the contaminated waste product generated by the backwash of the condensate deep bed demineralizers consisting of contaminated contaminated bead resins at varying degrees of exhaustion and small concentrations of various solids and corrosion products. During normal operations, this resin will be reused in the radwaste deep beds. Equipment was also installed to allow direct processing of these resins to the vendor dewatering equipment should the resin be determined excess or unacceptable for radwaste use. This is documented in LGS Surveillance Test ST-0-RRR-990-0.



III. ATTACHMENTS (continued)

D. ODCM, Revision 11

This revision was made to clarify those Radiation Effluent and Meteorological Monitoring Technical Specifications now incorporated in the ODCM per NRC Generic Letter 89-01. The present revision also incorporates a more user friendly page numbering format and reinstated previously deleted maps.

A copy of the ODCM Revision 11 is submitted under separate cover.