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Vol. 14

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# Radioactive Materials Released from Nuclear Power Plants

Annual Report 1993

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Prepared by  
J. Tichler, K. Doty, K. Lucadamo

Brookhaven National Laboratory

Prepared for  
U.S. Nuclear Regulatory Commission

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## PREVIOUS REPORTS IN THIS SERIES

1. "Report on Releases of Radioactivity in Effluents and Solid Wastes from Nuclear Power Plants for 1972." Directorate of Regulatory Operations, August 1973.
2. "Summary of Radioactivity Releases in Effluents from Nuclear Power Plants During 1973." NUREG-75/001, January 1975.
3. "Radioactive Materials Released from Nuclear Power Plants, 1974." NUREG-0077, June 1976.
4. "Radioactive Materials Released from Nuclear Power Plants, 1975." NUREG-0218, March 1977.
5. "Radioactive Materials Released from Nuclear Power Plants, 1976." NUREG-0367, March 1978.
6. "Radioactive Materials Released from Nuclear Power Plants, 1977." NUREG-0521, January 1979.
7. "Radioactive Materials Released from Nuclear Power Plants, 1978." NUREG/CR-1497, BNL-NUREG-51192, March 1981.
8. "Radioactive Materials Released from Nuclear Power Plants, 1979." NUREG/CR-2227, BNL-NUREG-51416, November 1981.
9. "Radioactive Materials Released from Nuclear Power Plants, 1980." NUREG/CR-2907, BNL-NUREG-51581, Vol. 1, January 1983.
10. "Radioactive Materials Released from Nuclear Power Plants, 1981." NUREG/CR-2907, BNL-NUREG-51581, Vol. 2, June 1984.
11. "Radioactive Materials Released from Nuclear Power Plants, 1982." NUREG/CR-2907, BNL-NUREG-51581, Vol. 3, February 1986.
12. "Radioactive Materials Released from Nuclear Power Plants, 1983." NUREG/CR-2907, BNL-NUREG-51581, Vol. 4, August 1986.
13. "Radioactive Materials Released from Nuclear Power Plants, 1984." NUREG/CR-2907, BNL-NUREG-51581, Vol. 5, August 1987.
14. "Radioactive Materials Released from Nuclear Power Plants, 1985." NUREG/CR-2907, BNL-NUREG-51581, Vol. 6, January 1988.
15. "Radioactive Materials Released from Nuclear Power Plants, 1986." NUREG/CR-2907, BNL-NUREG-51581, Vol. 7, November 1988.
16. "Radioactive Materials Released from Nuclear Power Plants, 1987." NUREG/CR-2907, BNL-NUREG-51581, Vol. 8, October 1989.
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19. "Radioactive Materials Released from Nuclear Power Plants, 1990." NUREG/CR-2907, BNL-NUREG-51581, Vol. 11, October 1993.

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20. "Radioactive Materials Released from Nuclear Power Plants, 1991," NUREG/CR-2907, BNL-NUREG-51581, Vol. 12, May 1994.
21. "Radioactive Materials Released from Nuclear Power Plants, 1992," NUREG/CR-2907, BNL-NUREG-51581, Vol. 13, August 1995.

## ABSTRACT

Releases of radioactive materials in airborne and liquid effluents from commercial light water reactors during 1993 have been compiled and reported. The summary data for the years 1974 through 1992 are included for comparison. Data on solid waste shipments as well as selected operating information have been included. This report supplements earlier annual reports issued by the former Atomic Energy Commission and the Nuclear Regulatory Commission. The 1993 release data are summarized in tabular form. Data covering specific radionuclides are summarized.

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## ACKNOWLEDGMENT

Carmen Benkovitz was responsible for the original design of the computer data base in which the effluent data, beginning with the 1978 data, is stored. She was involved in the redesign of the data base when, in 1982, the decision was made to transfer the data base from one computer to another and to change the data base management system being used.

Andrew Slavinsky converted most of the 1993 data in this report to computer form.

## 1.0 Introduction

### 1.1 Purpose

This report, prepared annually for the staff of the U.S. Nuclear Regulatory Commission, presents measured data on radioactive materials in effluents released from licensed commercial reactor power plants. These data were reported by licensees for plant operations during 1993. This information supplements earlier annual reports issued by the former Atomic Energy Commission and Nuclear Regulatory Commission.<sup>1</sup>

### 1.2 Scope

Releases of radioactive materials are governed by 10 CFR Part 20 and 50 and by limits established in the Technical Specifications for each facility. The requirement for reporting effluent releases by nuclear power plant operators is described in 10 CFR 50.36a. Through its Office of Nuclear Reactor Regulation, the Nuclear Regulatory Commission maintains a knowledge of radioactive releases from licensed nuclear reactors to ensure that they are within regulatory requirements. This report summarizes data from the licensed nuclear power plants that were declared by the utilities to be in commercial operation as of December 31, 1993. Data are included for several licensed facilities which are permanently or indefinitely shut down (Browns Ferry 1 & 3, Brunswick 1, Dresden 1, Fort St. Vrain, Humboldt Bay, Indian Point 1, LaCrosse, Rancho Seco 1, San Onofre 1, Three Mile Island 2, Trojan 1, Yankee Rowe 1) and Shoreham which was never in commercial operation.

### 1.3 Source of Data

The information included in this report was obtained from data reported by the licensees. Individual licensee reports are available in the NRC Public Document Room, Gelman Building, 2120 L Street, Washington, D.C. 20555 and in local Public Document Rooms located near each licensed facility. Licensee reports varied in the format and extent of information provided.

Data from prior years used in the comparison tables were obtained from the previous annual summaries.

## 2.0 Tabulated Data

### 2.1 Airborne and Liquid Effluents

Tables 1 through 4 list for each reactor, the measured quantities of total noble gases and of I-131 and particulates (with half lives greater than 8 days) released in effluents to the atmosphere during each of the years 1974 through 1993. Tables 5 and 6 list the total measured quantities of tritium released in liquid effluents in each of the years. Tables 7 and 8 list the mixed fission and activation products not including noble gases, tritium and alpha released in liquid effluents in each of the years.

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<sup>1</sup> Previous reports in this series are listed on page ii and iii.

## 2.2 Solid Waste

The total volumes, activity and the number of shipments of solid waste for each plant during 1993 are summarized in Tables 9 and 10. A comparison for the years 1978 through 1993 is made in Tables 11 and 12.

## 2.3 Energy Generation

Tables 13 and 14 present a summary of net electrical energy generated by each plant during 1979-1993. Tables 15 and 16 present a summary of the thermal energy generated by each plant during 1993 and previous years from 1979. The reader is cautioned against making simplistic comparisons of radioactive releases with the energy generated because of the many factors which affect the amount of radioactive materials released; factors include the condition of the fuel, primary system integrity, effluent and radioactive waste treatment systems, maintenance activities and the extent to which these systems are used.

## 2.4 Individual Plant Summaries

Individual plant summaries are presented in alphabetical order. The summaries include general plant information, power production, effluent and solid waste data, and a summary of specific radionuclides measured in effluents. When the only type of solid waste reported is type "A", this may be because the plant did not break solid waste into different types but reported all types together. The activity released for each nuclide for the year for both airborne and liquid effluents is calculated by summing releases for each quarter. More detailed summaries in the format of Regulatory Guide 1.21 such as were used in the 1978 report<sup>2</sup> can be made available since all the data for 1978-1993 are stored in digital form.

A wide variation exists in the lists of specific radionuclides reported by utilities (licensees). Individual licensee Technical Specifications require the measurement and reporting of specific sets of radionuclides and "any others identified." The disparities result because of differing analytical methods used by various licensees for their measurements, and their differing operating histories and effluent and emission control methods.

Copies of the summaries included in this report as well as the more detailed summaries maintained in the computer data base were submitted to the licensees for verification before publication. In most cases, the licensees responded either verifying the included data for their plants or providing corrections. Individuals interested in obtaining the more detailed summaries should contact the Office of Nuclear Reactor Regulations of the Nuclear Regulatory Commission.

Volume 14 is the last report of NUREG/CR-2907, BNL-NUREG-51581 because the NRC has terminated the support for this work.

<sup>2</sup>"Radioactive Materials Released from Nuclear Power Plants, 1978," NUREG/CR-1497, BNL-NUREG-51192, March, 1981.

## 2.5 Notation

The following notation is used:

$$1.86\text{E}+06 = 1.86 \times 10^6$$

$$1.86\text{E}-03 = 1.86 \times 10^{-3}$$

N/R = Not Reported

N/D = Not Detected

N/A = Not Applicable

< may actually mean ≤

## 3.0 Summary

Nearly all of the radioactive material reported as being released in effluents are from planned releases. Planned releases result from normal operation or from anticipated operational occurrences. The latter include unplanned releases of radioactive materials from miscellaneous actions such as equipment failure, operator error or procedure error; these releases are not of such consequence as to be considered an accident.

At present, it is difficult to compare effluent releases with those of previous years due to, among other contributors, variability in reporting structure and release requirements. Comparisons with respect to power generation are similarly difficult due to factors which strongly affect the releases such as level of fuel cladding defects, design features of plant radioactive waste treatment systems, operational occurrences and equipment performance.

Though perhaps not identifiable as an important factor at any specific plant from the data in this report, the generic improvement in fuel performance over the last several years has either reduced or has had the potential to reduce the amount of radioactive material released in effluents from most plants. In addition, at Boiling Water Reactors (BWRs), the reduction in the amount of airborne radioactive materials being released at some plants since the early and mid-1970s is due in large part to the installation of augmented offgas (AOG) systems, many of which were required to be installed to meet the provisions of Appendix I to 10CFR Part 50, which was promulgated by the NRC in May 1975.



TABLES

Table 1

## Airborne Effluents Comparison By Year

## Fission and Activation Gases (Total Curies)

## Boiling Water Reactors

Facility	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Big Rock Point 1	1.88E+05	5.06E+04	1.52E+04	1.34E+04	1.89E+04	6.67E+03	2.15E+04	1.97E+04	1.29E+04	1.10E+04
Browns Ferry 1,2,& 3	6.40E+04	9.24E+04	< 8.05E+04	< 1.66E+05	1.57E+05	< 2.71E+05	< 1.66E+05	4.52E+04	2.76E+05	4.79E+05
Brunswick 1&2		1.90E+02	1.90E+04	2.46E+05	9.14E+04	1.16E+05	6.93E+04	5.22E+05	4.65E+05	4.87E+05
Clinton 1										
Cooper	2.00E+03	1.98E+04	3.80E+04	1.27E+03	4.09E+03	3.04E+04	5.03E+03	2.48E+03	1.42E+04	1.54E+03
Dresden 1	9.80E+04	5.20E+05	4.52E+05	5.20E+05	8.50E+05	1.83E+02	7.03E+01	N/D	N/D	N/D
Dresden 2-3	6.27E+05	3.69E+05	3.23E+04	3.13E+05	4.06E+04	6.91E+04	4.30E+04	3.74E+04	1.04E+04	8.43E+03
Duane Arnold		1.58E+03	5.26E+03	3.87E+03	1.56E+03	8.71E+03	2.70E+03	< 4.87E+02	9.99E+01	4.81E+02
Fermi 2										
James A. Fitzpatrick		4.08E+03	4.41E+04	2.33E+04	5.88E+03	3.38E+03	7.68E+04	2.00E+05	2.11E+05	8.57E+04
Grand Gulf 1										4.51E+01
Edwin I. Hatch 1		2.70E+02	2.80E+03	1.90E+03	1.62E+03	1.71E+03	3.82E+04	2.77E+04	4.23E+03	1.96E+04
Edwin I. Hatch 2							2.95E+02	2.06E+02	1.04E+03	1.28E+04
Hope Creek 1										
Humboldt Bay 3	5.72E+05	2.97E+05	9.30E+04	4.40E+05	4.40E+05	< 4.40E+05	< 4.40E+05	< 4.40E+05	N/D	N/D
LaCrosse	4.90E+04	5.71E+04	1.24E+05	4.25E+04	8.45E+03	1.04E+04	4.71E+03	5.03E+03	4.26E+03	7.08E+03
LaSalle 1&2									3.46E+00	1.17E+01
Limerick 1&2										
Millstone 1	9.12E+05	2.97E+06	5.07E+05	6.20E+05	5.66E+05	2.06E+04	1.19E+04	1.43E+04	8.33E+03	6.34E+03
Monticello	1.57E+06	1.55E+05	1.14E+04	6.87E+03	6.42E+03	4.03E+03	3.83E+03	3.74E+03	7.22E+03	3.21E+03
Nine Mile Point 1	5.58E+05	1.30E+06	1.76E+05	3.53E+03	3.02E+03	1.04E+03	5.87E+02	6.10E+02	5.11E+01	2.66E+02
Nine Mile Point 2										
Oyster Creek 1	2.79E+05	2.06E+05	1.67E+05	1.77E+05	9.98E+05	1.01E+06	3.12E+04	5.28E+04	2.29E+04	2.14E+03
Peach Bottom 2&3	< 1.00E+00	1.30E+04	2.09E+05	7.11E+04	3.85E+04	1.90E+05	1.53E+04	1.58E+04	1.31E+04	3.48E+04
Perry 1										
Pilgrim 1	5.46E+05	4.60E+04	1.83E+05	4.13E+05	3.27E+04	1.39E+04	2.62E+04	< 5.30E+03	< 1.94E+04	2.01E+04
Quad-Cities 1&2	9.50E+05	1.10E+05	3.36E+04	2.56E+04	3.24E+04	3.48E+04	2.15E+04	3.20E+04	1.17E+04	1.20E+04
River Bend 1										
Shoreham 1										
Susquehanna 1&2									< 5.61E+02	1.03E+02
Vermont Yankee 1	6.40E+04	4.06E+03	3.03E+03	3.35E+03	4.94E+03	< 8.08E+03	1.63E+03	< 3.17E+03	< 3.07E+03	< 3.13E+03
WNP-2										
<b>Total</b>	< 6.48E+06	6.22E+06	< 2.20E+06	< 2.65E+06	2.86E+06	< 1.80E+06	< 5.40E+05	< 9.88E+05	< 1.09E+06	< 1.19E+06
* Fort St. Vrain						9.30E+01	9.13E+01	4.34E+01	2.96E+02	1.51E+02

\* High temperature gas cooled reactor  
N/D = Not Detectable

Table 1

## Airborne Effluents Comparison By Year

## Fission and Activation Gases (Total Curies)

Boiling Water Reactors										
Facility	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Big Rock Point 1	1.41E+05	6.26E+04	6.79E+04	8.35E+03	7.77E+03	7.08E+03	5.55E+03	4.50E+03	1.79E+03	5.14E+03
Browns Ferry 1,2 & 3	< 6.64E+05	< 2.64E+04	< 2.26E+03	3.22E-01	N/D	N/D	N/D	2.10E+03	1.67E+04	4.00E+03
Brunswick 1&2	1.67E+05	1.75E+04	4.51E+04	2.64E+04	1.58E+03	1.36E+03	1.12E+03	6.77E+02	4.88E+02	3.41E+02
Clinton 1				6.83E+00	4.34E+00	1.29E+01	1.09E+01	7.08E-01	7.38E+00	8.35E+00
Cooper	< 1.44E+03	< 1.39E+03	1.72E+03	1.20E+03	1.81E+03	3.44E+02	1.87E+02	2.58E+01	1.40E+01	6.42E+00
Dresden 1	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Dresden 2-3	1.81E+03	2.94E+03	4.38E+02	2.77E+02	1.68E+02	3.67E+01	2.04E+01	1.26E+01	1.32E+01	4.83E+01
Duane Arnold	4.16E+02	2.51E+02	3.10E+02	2.19E+02	7.06E+02	4.38E+01	4.57E+01	3.30E+01	4.74E+01	5.70E+01
Fermi 2			N/D	N/D	1.11E+00	1.64E+02	1.61E+02	6.22E+01	2.08E+02	1.55E+02
James A. Fitzpatrick	3.41E+04	1.46E+04	2.65E+03	4.72E+03	3.89E+03	5.60E+02	1.35E+03	2.05E+03	1.71E+02	4.15E+02
Grand Gulf 1	1.14E+02	1.51E+02	1.34E+02	2.08E+02	9.44E+01	1.44E+02	1.36E+02	3.17E+01	2.12E+02	9.43E+01
Edwin 1. Hatch 1	1.02E+04	9.86E+03	8.95E+03	7.40E+03	**	**	**	**	**	**
Edwin 1. Hatch 2	2.36E+03	2.76E+03	1.09E+04	1.37E+04	3.46E+03	5.02E+02	1.10E+03	2.80E+02	1.05E+03	3.81E+03
Hope Creek 1			3.80E+01	1.19E+03	1.76E+02	3.34E+02	8.30E+02	1.92E+02	1.39E+02	7.32E+01
Humboldt Bay 3	N/D	N/D	N/D	N/D	< 6.48E+01	< 6.40E+01	N/D	N/D	N/D	N/D
LaCrosse	1.09E+04	8.58E+03	3.53E+03	2.33E+03	N/D	N/D	N/D	N/D	N/D	N/D
LaSalle 1&2	5.66E+02	1.95E+02	2.98E+03	6.51E+03	3.79E+03	1.08E+03	6.87E+02	1.06E+02	1.18E+02	1.04E+03
Limerick 1&2	N/D	N/D	3.70E-01	2.41E+01	1.69E+02	2.58E+02	3.44E+01	7.11E+01	8.57E+02	1.61E+02
Millstone 1	2.80E+03	1.11E+03	3.31E+03	5.84E+03	8.76E+02	1.81E+02	1.17E+02	2.35E+01	4.46E+00	3.28E+02
Monticello	5.15E+02	2.72E+03	2.53E+03	3.95E+03	5.88E+03	3.98E+03	2.96E+03	1.99E+03	1.30E+03	5.99E+02
Nine Mile Point 1	1.02E+03	9.84E+02	4.92E+02	1.97E+02	1.80E+01	1.52E-04	N/D	5.05E+01	3.43E+02	2.65E+02
Nine Mile Point 2				6.00E+00	4.03E+01	8.42E+01	1.63E+02	1.00E+02	3.11E+01	2.75E+02
Oyster Creek 1	3.93E+03	4.15E+04	7.67E+04	3.39E+03	5.05E+03	3.24E+02	7.35E+02	4.60E+02	4.10E+02	2.19E+02
Peach Bottom 2&3	8.09E+04	1.29E+05	2.78E+04	1.15E+04	1.19E+03	2.64E+03	1.12E+04	2.40E+04	8.43E+03	1.11E+04
Perry 1			1.23E+00	1.06E+01	1.25E+03	1.92E+02	8.37E+01	1.11E+02	3.28E+02	6.84E+02
Pilgrim 1	< 1.84E+01	3.26E+03	1.26E+02	N/D	N/D	6.78E+02	9.07E+02	2.22E+03	1.18E+03	9.42E+02
Quad-Cities 1&2	6.02E+03	2.95E+03	1.48E+03	3.73E+02	3.77E+00	2.87E+02	7.96E+01	4.21E+01	4.93E+01	3.80E+01
River Bend 1			1.70E+03	1.39E+00	2.05E+00	8.31E-01	1.03E+03	1.12E+03	4.66E+02	6.97E+02
Shoreham 1			N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Susquehanna 1&2	1.18E+02	5.15E+02	2.35E+02	1.23E+02	7.25E+01	1.19E+02	7.21E+01	5.76E+01	5.72E+01	1.69E+01
Vermont Yankee 1	< 3.18E+03	< 3.44E+03	< 1.56E+03	N/D	N/D	1.03E+03	5.07E+03	3.02E+03	5.94E+03	3.59E+02
WNP-2	2.28E+02	2.12E+02	1.66E+02	5.35E+02	9.03E+02	5.46E+03	8.90E+02	7.23E+02	1.51E+02	1.41E+02
<b>Total</b>	< 1.13E+06	< 3.33E+05	< 2.63E+05	9.85E+04	< 3.90E+04	< 2.70E+04	3.45E+04	4.41E+04	4.05E+04	3.10E+04
* Fort St. Vrain	1.17E+02	2.03E+00	5.57E+01	2.03E+02	2.60E+02	1.96E+02	N/D	N/D	N/D	N/D

\* High temperature gas cooled reactor

\*\* Included with Edwin 1. Hatch 2 total

N/D = Not Detectable

Table 2

## Airborne Effluents Comparison By Year

## Fission and Activation Gases (Total Curies)

## Pressurized Water Reactors

Facility	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Arkansas One 1	1.96E+02	1.03E+03	5.69E+03	1.39E+04	7.50E+03	8.51E+03	3.80E+04	3.73E+03	2.10E+03	9.83E+02
Arkansas One 2						4.53E+03	9.37E+03	4.35E+03	9.78E+03	1.34E+03
Beaver Valley 1&2			1.07E+00	4.73E+01	3.90E+02	1.75E+03	8.64E+01	8.06E+02	1.31E+02	1.98E+02
Braidwood 1										
Braidwood 2										
Byron 1&2										
Callaway 1										
Calvert Cliffs 1&2		7.72E+03	9.40E+03	2.23E+04	2.76E+04	1.02E+04	2.96E+03	2.18E+03	8.00E+03	9.75E+03
Catawba 1										
Catawba 2										
Comanche Peak 1										
Donald C. Cook 1&2		2.64E+00	9.75E+02	3.80E+03	4.85E+04	1.09E+04	3.76E+03	5.42E+03	3.88E+03	3.28E+02
Crystal River 3				3.35E+03	6.86E+03	7.26E+04	3.65E+04	3.96E+04	6.85E+03	3.38E+03
Davis-Besse 1				1.27E+03	2.10E+03	< 1.68E+03	< 3.35E+03	1.01E+03	5.35E+02	9.15E+02
Diablo Canyon 1&2										
Joseph M. Farley 1					3.53E+03	3.18E+03	1.92E+04	2.21E+02	3.81E+04	2.20E+04
Joseph M. Farley 2								2.60E+00	3.54E+03	8.47E+02
Fort Calhoun 1	3.03E+02	4.29E+02	1.94E+03	3.81E+03	1.36E+03	7.06E+02	2.97E+02	1.22E+03	3.46E+02	8.79E+02
R. E. Ginna	7.57E+02	1.04E+04	5.52E+03	3.20E+03	9.72E+02	7.62E+02	8.61E+02	5.46E+02	1.95E+03	7.12E+02
Haddam Neck	7.00E+00	4.80E+02	4.52E+02	3.12E+03	2.14E+03	5.53E+03	2.68E+03	1.83E+03	7.54E+02	2.76E+03
Harris 1										
Indian Point 1&2	5.58E+03	8.20E+03	1.16E+04	1.60E+04	1.41E+04	9.03E+03	9.38E+03	9.13E+03	7.27E+03	9.58E+03
Indian Point 3			Shown with	Other Unit	8.09E+02	2.47E+02	1.11E+03	6.57E+03	2.58E+03	5.60E+02
Kewaunee	3.35E+03	2.45E+03	1.40E+03	2.43E+03	4.44E+02	1.52E+02	1.22E+02	1.18E+02	1.66E+02	< 2.25E+02
** Maine Yankee	6.36E+03	4.09E+03	1.30E+03	3.57E+03	1.55E+03	2.09E+03	4.07E+03	3.28E+02	1.53E+03	5.07E+01
McGuire 1								1.58E-01	1.65E-03	1.60E+03
McGuire 2										1.60E+03
Millstone 2			1.57E+03	2.28E+03	7.64E+02	3.59E+02	1.33E+03	2.24E+03	9.09E+03	9.06E+03
Millstone 3										
North Anna 1&2					1.51E+04	6.28E+03	3.50E+03	5.30E+03	4.34E+03	2.22E+04
Oconee 1,2,& 3	1.94E+04	1.51E+04	4.39E+04	3.56E+04	4.33E+04	4.79E+04	1.92E+04	1.63E+04	2.41E+04	2.40E+04
Palisades	< 1.00E+00	2.61E+03	2.99E+01	5.99E+01	3.23E+02	6.84E+01	1.40E+02	3.00E+03	7.38E+03	3.00E+03
Palo Verde 1										
Palo Verde 2										
Palo Verde 3										
Point Beach 1&2	9.74E+03	4.45E+04	1.91E+03	1.13E+03	5.16E+02	9.68E+02	6.41E+02	6.11E+02	9.93E+02	7.68E+02
Prairie Island 1&2	3.62E+02	2.17E+03	1.74E+03	6.73E+02	1.26E+03	6.97E+02	2.60E+02	4.65E+01	5.47E+02	2.76E+02
Rancho Seco 1		1.18E+02	1.27E+02	2.00E+03	7.10E+03	8.81E+03	1.58E+03	1.37E+03	1.48E+03	6.89E+02
H. B. Robinson 2	2.31E+03	1.17E+03	6.40E+02	4.76E+02	8.84E+02	1.52E+03	5.82E+02	5.13E+02	1.75E+02	2.93E+02
Salem 1			< 1.00E-02	1.96E+01	1.02E+01	2.49E+02	7.82E+01	1.06E+03	2.34E+02	1.25E+02
Salem 2							7.74E+00	6.09E+02	1.11E+03	7.44E+02
San Onofre 1	1.78E+03	1.11E+03	4.16E+02	1.54E+02	1.81E+03	6.37E+02	1.05E+03	4.17E+02	8.61E+01	1.06E+01
San Onofre 2-3									6.40E+00	7.43E+03
Seabrook 1										
Sequoyah 1&2							3.01E+03	9.03E+03	5.74E+03	3.92E+03
South Texas 1										
South Texas 2										
St. Lucie 1			1.72E+03	2.54E+04	2.93E+04	1.54E+04	8.97E+03	2.30E+04	2.33E+04	2.16E+04
St. Lucie 2										1.25E+03
Summer 1									1.40E+02	3.88E+02
Surry 1&2	6.86E+03	8.04E+03	1.91E+04	1.90E+04	4.36E+03	1.78E+03	6.17E+03	1.41E+04	2.11E+04	5.49E+03
Three Mile Island 1	9.16E+02	3.63E+03	2.76E+03	1.66E+04	1.57E+04	2.24E+03	4.64E+03	5.81E+02	7.56E+03	2.01E+01
Three Mile Island 2					8.73E+00	9.97E+06	4.72E+04	2.88E+02	4.89E+02	1.73E+02
TMI 2/Epicor							2.16E+00	1.84E+02	4.26E+02	3.61E+01
* Trojan			7.66E+02	4.45E+03	3.26E+02	9.47E+02	4.10E+02	1.24E+03	9.02E+02	2.29E+02

\* Changes to the entries for Trojan for 1976 - 1987 represent corrections which were reported and explained in the Trojan July-December 1990 Effluent and Waste Disposal Report.

\*\* Changes to the entries for Maine Yankee for 1977 - 1988 represent corrections which were reported and explained in the Maine Yankee report "Revised Semiannual Effluent Release Report for 770131 - 901231" Docket Date 92/01/08.

Table 2

## Airborne Effluents Comparison By Year

## Fission and Activation Gases (Total Curies)

Pressurized Water Reactors

Facility	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Turkey Point 3&4	4.66E+03	1.34E+04	1.56E+04	2.33E+04	2.35E+04	1.06E+04	4.24E+03	4.33E+03	2.00E+04	1.61E+04
Turkey Point 3										
Turkey Point 4										
Vogtle 1&2										
Waterford 3										
Wolf Creek 1										
Sankee Rowe 1	4.00E+01	2.24E+01	2.57E+01	1.25E+02	6.56E+02	1.82E+02	7.07E+01	1.72E+02	1.55E+02	7.51E+02
Zion 1&2	2.99E+03	4.88E+04	1.14E+05	3.22E+04	6.77E+04	3.41E+04	5.78E+03	6.91E+03	1.61E+04	6.34E+03
<b>Total</b>	< 6.56E+04	1.75E+05	< 2.43E+05	2.40E+05	3.30E+05	< 1.02E+07	< 2.36E+05	1.68E+05	2.25E+05	< 1.83E+05

Table 2

## Airborne Effluents Comparison By Year

## Fission and Activation Gases (Total Curies)

Pressurized Water Reactors Facility	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Arkansas One 1	2.90E+03	8.10E+03	1.71E+03	3.26E+02	1.24E+03	2.33E+03	7.00E+02	4.95E+02	8.93E+02	1.79E+01
Arkansas One 2	3.26E+03	8.91E+03	3.46E+03	2.06E+02	2.16E+03	2.76E+03	1.89E+02	1.59E+03	1.70E+03	5.21E+01
Beaver Valley 1&2	1.16E+03	3.92E+01	7.57E+01	2.25E+02	9.41E+01	1.57E+02	8.17E+01	1.49E+02	1.55E+02	5.56E+02
Braidwood 1				2.81E-01	4.19E+01	1.17E+03	1.42E+03	5.24E+03	7.71E+01	3.49E+02
Braidwood 2					3.82E+01	5.07E+02	1.02E+03	5.28E+03	1.56E+02	2.40E+03
Byron 1&2		2.79E+02	6.36E+02	1.30E+03	1.78E+03	8.16E+02	1.24E+03	1.04E+02	3.77E+02	1.22E+02
Callaway 1	2.00E+02	1.67E+03	5.19E+03	2.90E+03	6.89E+02	7.22E+02	9.02E+02	1.36E+02	4.01E+02	8.08E+02
Calvert Cliffs 1&2	3.83E+03	3.98E+03	7.65E+03	4.55E+03	5.70E+03	3.28E+03	6.72E+02	2.57E+03	5.87E+03	2.14E+02
Catawba 1		2.77E+02	1.36E+03	2.41E+03	1.56E+03	3.15E+02	5.33E+02	4.01E+02	4.28E+02	6.48E+02
Catawba 2			1.36E+03	2.41E+03	1.56E+03	3.15E+02	5.33E+02	4.01E+02	4.28E+02	6.48E+02
Comanche Peak 1							9.06E+02	5.89E+03	1.76E+03	1.92E+02
Donald C. Cook 1&2	3.50E+03	4.94E+03	3.29E+02	8.75E+02	2.58E+02	1.15E+02	1.88E+02	8.10E+01	2.04E+02	2.06E+03
Crystal River 3	1.96E+03	1.05E+03	2.76E+03	1.10E+03	3.41E+03	4.54E+03	7.31E+03	1.41E+03	7.86E+02	3.82E+01
Davis-Besse 1	5.02E+02	1.18E+02	5.09E-04	3.80E+02	1.09E+02	3.78E+02	1.09E+03	1.16E+03	3.62E+01	3.48E+02
Diablo Canyon 1&2	5.86E-02	5.72E+02	2.32E+03	7.14E+02	3.27E+02	3.35E+02	5.63E+01	4.62E+01	2.46E+00	2.14E+00
Joseph M. Farley 1	3.73E+03	1.70E+03	1.28E+03	1.30E+03	9.60E+02	9.92E+01	8.72E+01	1.09E+02	6.82E+02	1.94E+02
Joseph M. Farley 2	3.99E+03	6.63E+02	1.84E+03	7.22E+02	5.92E+02	1.60E+02	3.38E+01	3.56E+02	2.68E+01	2.61E+01
Fort Calhoun 1	1.52E+03	1.48E+03	5.68E+02	4.23E+02	7.85E+02	1.64E+02	4.59E+02	3.58E+02	1.51E+02	9.26E+00
R. E. Ginna	2.96E+02	4.06E+02	2.09E+02	1.77E+02	5.17E+01	5.11E+02	5.95E+02	5.14E+02	5.41E+02	1.40E+02
Haddam Neck	7.52E+03	2.76E+03	2.33E+03	3.58E+03	2.55E+03	1.71E+04	1.46E+03	6.11E+03	2.79E+02	2.08E+03
Harris 1				1.71E+03	2.25E+03	1.15E+03	5.96E+02	8.62E+02	1.36E+03	3.49E+02
Indian Point 1&2	3.78E+03	1.88E+03	2.05E+03	4.68E+03	2.27E+02	8.77E+01	2.23E+03	1.41E+03	5.25E+03	1.68E+03
Indian Point 3	1.88E+03	1.54E+03	1.93E+03	1.82E+03	3.10E+02	3.14E+02	6.26E+02	6.05E+01	2.15E+01	4.17E+01
Kewaunee	< 4.04E+01	< 4.97E+01	< 6.55E+01	< 3.19E+01	< 2.91E+01	6.52E+01	2.31E+00	1.81E+00	1.60E+00	3.67E-01
** Maine Yankee	1.54E+02	4.41E+02	1.07E+03	8.34E+02	9.19E+01	2.02E+01	9.46E+02	1.13E+03	4.01E+02	4.50E+01
McGuire 1	2.28E+03	1.93E+03	1.05E+03	2.04E+03	1.95E+03	7.19E+02	5.18E+02	4.49E+02	4.05E+02	4.84E+02
McGuire 2	2.28E+03	1.93E+03	1.05E+03	2.04E+03	1.95E+03	7.19E+02	5.18E+02	4.49E+02	4.05E+02	4.84E+02
Millstone 2	4.19E+03	4.00E+02	1.02E+02	3.97E+02	6.34E+02	2.46E+02	2.89E+03	3.89E+02	6.36E+02	1.32E+01
Millstone 3			2.39E+01	1.05E+02	8.44E+01	2.96E+02	2.11E+02	1.25E+02	1.13E+00	3.00E+01
North Anna 1&2	1.76E+04	8.05E+03	5.71E+03	1.05E+03	4.83E+02	1.44E+03	9.52E+02	2.24E+03	1.23E+03	2.51E+02
Oconee 1,2 & 3	2.28E+04	2.35E+04	2.43E+04	1.05E+04	2.59E+04	8.97E+03	8.84E+03	3.45E+03	3.29E+03	6.58E+02
Palisades	2.84E+01	3.68E+03	1.73E+02	1.75E+03	2.43E+03	1.52E+02	1.21E+02	6.26E+01	7.46E+01	9.29E+01
Palo Verde 1		2.53E+02	2.67E+03	1.27E+03	1.84E+03	6.41E+02	7.08E+02	2.91E+03	2.22E+03	5.79E+02
Palo Verde 2			1.97E+03	5.47E+03	2.97E+03	4.29E+02	6.76E+02	5.29E+02	2.01E+02	2.62E+02
Palo Verde 3				2.52E-02	1.36E+02	8.34E+02	1.20E+03	4.38E+02	4.35E+01	1.97E+02
Point Beach 1&2	9.30E+01	1.16E+02	2.78E+01	4.82E+01	8.08E+01	1.50E+01	8.03E+00	2.00E+01	5.06E+01	1.01E+01
Prairie Island 1&2	7.58E+01	4.59E+01	3.03E+01	8.77E-01	1.42E-01	1.73E+02	8.28E+01	5.60E+01	2.54E+01	3.68E+01
Rancho Seco 1	3.83E+03	4.67E+03	9.30E+01	2.16E-02	1.52E+03	2.00E+03	2.20E-01	N/D	6.93E-02	N/D
H. B. Robinson 2	4.90E+01	2.14E+03	6.59E+02	7.70E+02	1.04E+03	2.79E+01	7.20E+00	2.26E+00	7.59E+00	3.99E+02
Salem 1	1.95E+02	1.68E+03	1.39E+03	3.64E+03	5.29E+02	1.39E+03	3.13E+02	3.66E+02	6.75E+02	1.12E+03
Salem 2	1.81E+03	1.15E+03	8.56E+02	1.06E+03	1.18E+03	7.30E+01	1.49E+02	1.92E+02	2.68E+02	3.42E+02
San Onofre 1	8.62E+01	3.83E+03	4.11E+02	9.81E+02	2.99E+03	9.05E+02	1.80E+03	2.49E+03	4.12E+03	4.20E+02
San Onofre 2-3	4.00E+04	2.53E+04	8.25E+03	2.18E+04	5.12E+03	2.46E+03	1.16E+03	1.30E+03	1.41E+03	1.54E+03
Seabrook 1						N/D	1.07E+02	2.92E+01	9.13E-01	1.09E-01
Sequoyah 1&2	6.68E+03	4.57E+03	1.21E+00	N/D	2.25E+02	3.85E+03	6.07E+03	1.42E+03	2.07E+02	7.71E+01
South Texas 1					8.64E+02	4.45E+02	1.72E+02	8.55E+01	2.89E+02	2.42E+01
South Texas 2						1.16E+02	1.09E+02	4.67E+01	6.23E+02	1.79E+01
St. Lucie 1	3.53E+04	5.08E+04	3.33E+04	6.21E+03	1.42E+03	4.53E+03	6.19E+02	2.05E+03	3.30E+02	2.61E+02
St. Lucie 2	7.68E+03	9.55E+03	9.98E+03	8.60E+03	9.16E+03	2.22E+03	5.34E+02	4.90E+02	6.59E+02	8.62E+01
Summer 1	1.64E+01	1.40E+02	1.39E+01	6.34E+02	3.32E+02	1.82E+03	7.51E+02	4.34E+02	3.38E+02	2.43E+02
Surry 1&2	6.95E+03	2.07E+03	1.99E+03	3.08E+02	3.66E+02	1.37E+02	4.51E+02	3.54E+01	1.61E+01	4.15E+01
Three Mile Island 1	3.62E-01	1.08E+02	3.80E+03	7.89E+02	1.87E+03	2.10E+03	6.66E+02	1.22E+02	5.73E+02	2.40E+03
Three Mile Island 2	2.07E+02	N/D	2.80E-01	N/D	4.40E-01	N/D	N/D	4.18E-05	5.81E-05	4.41E-02
TMI 2/Epicor	3.99E+01	*+	*+	*+	*+	*+	*+	*+	*+	*+
* Trojan	8.98E+02	1.10E+03	9.42E+02	2.55E+02	4.25E+02	5.94E+02	2.06E+02	1.66E+02	2.07E+02	5.34E+01

\* Changes to the entries for Trojan for 1976-1987 are corrections which were reported and explained in the Trojan July-December 1990 Effluent and Waste Disposal Report.

\*\* Changes to the entries for Maine Yankee for 1977 - 1988 are corrections which were reported and explained in the Main Yankee report "Revised Semiannual Effluent and Release Reports for 770131 - 901231" Docket Date 92/01/08.

\*+ Included with Three Mile Island 2 total

N/D = Not Detectable

Table 2

## Airborne Effluents Comparison By Year

## Fission and Activation Gases (Total Curies)

Pressurized Water Reactors

Facility	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Turkey Point 3&4	1.16E+04									
Turkey Point 3		1.32E+03	3.64E+03	9.38E+02	1.25E+03	1.70E+03	6.88E+02	8.95E+00	6.15E+01	2.31E+02
Turkey Point 4		1.80E+03	1.01E+03	7.86E+02	1.31E+03	1.71E+03	5.92E+02	9.49E+00	6.22E+01	2.22E+02
Vogtle 1&2				1.07E+02	1.15E+02	5.46E+02	1.88E+02	3.58E+02	1.13E+02	2.34E+02
Waterford 3		8.21E+03	1.12E+04	5.63E+03	5.30E+03	5.59E+02	5.73E+03	2.15E+03	6.93E+02	9.13E+02
Wolf Creek 1		1.72E+02	3.15E+01	1.73E+02	7.92E+02	6.40E+02	9.99E+02	3.00E+03	3.08E+02	5.20E+02
Yankee Rowe 1	1.74E+03	1.47E+03	5.11E+02	3.84E+02	2.06E+02	1.21E+02	1.13E+02	2.15E+02	N/D	N/D
Zion 1&2	3.61E+03	3.88E+03	3.18E+03	1.18E+02	1.39E+03	1.12E+03	1.10E+02	2.76E+02	3.35E+02	2.61E+03
<b>Total</b>	< 2.10E+05	< 2.05E+05	< 1.57E+05	< 1.11E+05	< 1.03E+05	8.11E+04	6.21E+04	6.22E+04	4.16E+04	2.79E+04

Table 3

## Airborne Effluents Comparison By Year

## I-131 and Particulates (Curies)

(Half-Life Equal To or Greater Than 8 Days)

## Boiling Water Reactors

Facility	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Big Rock Point 1	1.60E-01	1.20E-01	5.00E-02	1.00E-02	8.91E-03	1.90E-03	2.94E-02	6.10E-03	4.71E-03	3.35E-03
Browns Ferry 1,2.& 3	1.20E-01	2.70E-01	< 7.00E-02	1.04E-01	2.27E-01	5.03E-02	1.05E-01	N/D	1.89E-01	2.83E-01
Brunswick 1&2		< 1.00E-02	4.60E-01	9.32E-01	4.07E-01	9.52E-01	2.12E+00	8.89E-01	1.99E+00	6.25E+00
Clinton 1										
Cooper	2.40E-01	5.00E-02	< 4.00E-02	< 1.91E-02	5.41E-03	< 1.79E-01	< 1.52E-01	< 1.09E-02	< 1.55E-01	< 2.30E-02
Dresden 1	6.80E-01	9.60E-01	8.40E-01	4.93E+00	2.28E+00	2.38E-02	1.46E-02	9.94E-03	3.36E-04	7.56E-04
Dresden 2-3	6.50E+00	4.31E+00	5.49E+00	6.86E+00	3.13E+00	6.97E+00	1.10E+01	9.87E+00	9.50E-01	6.32E-01
Duane Arnold		1.10E-03	8.18E-02	2.29E-02	3.65E-02	3.35E-02	8.50E-02	3.25E-02	1.03E-02	1.50E-02
Fermi 2										
James A. Fitzpatrick		< 4.00E-02	6.80E-01	1.73E-01	2.79E-01	1.42E-02	1.25E-01	2.80E-01	7.71E-01	3.80E-01
Grand Gulf 1										4.50E-05
Edwin 1. Hatch 1		< 1.00E-02	< 1.00E-02	5.67E-03	4.13E-03	2.59E-02	4.29E-01	2.12E-01	1.84E-01	6.96E-02
Edwin 1. Hatch 2							1.33E-02	9.42E-03	6.83E-02	1.95E-02
Hope Creek 1										
Humboldt Bay 3	8.40E-01	1.06E+00	8.36E-02	4.04E-03	7.26E-04	1.07E-04	5.11E-04	< 3.82E-04	1.09E-04	2.68E-04
LaCrosse	4.00E-02	1.00E-01	< 7.06E-02	1.67E-01	2.79E-02	2.53E-02	1.32E-02	1.69E-02	8.35E-03	1.08E-02
LaSalle 1&2									4.16E-03	1.80E-02
Limerick 1&2										
Millstone 1	3.26E+00	9.98E+00	2.33E+00	4.86E+00	4.55E+00	5.90E-01	3.32E-01	1.48E-01	2.09E-01	6.25E-02
Monticello	5.70E+00	3.71E+00	1.71E-01	8.51E-02	5.49E-02	3.39E-02	2.83E-02	3.45E-02	8.85E-02	4.10E-02
Nine Mile Point 1	8.90E-01	2.78E+00	2.20E+00	1.99E-01	1.35E-01	4.71E-02	2.55E-02	1.49E-02	2.71E-02	1.07E-02
Nine Mile Point 2										
Oyster Creek 1	3.51E+00	5.64E+00	6.39E+00	9.05E+00	1.81E+01	9.32E+00	1.25E+00	2.24E+00	1.04E+00	1.90E-02
Peach Bottom 2&3	1.00E-02	4.00E-02	9.75E-01	2.73E-01	9.62E-02	2.58E-01	2.94E-02	< 4.19E-02	3.90E-02	4.60E-02
Perry 1										
Pilgrim 1	1.45E+00	2.58E+00	6.74E-01	6.90E-01	1.81E-01	1.45E-01	1.04E-01	< 6.87E-02	< 4.44E-02	< 4.69E-02
Quad-Cities 1&2	8.88E+00	1.31E+00	1.33E+00	1.69E+00	2.15E+00	1.57E+00	5.90E-01	1.27E+00	4.12E-01	4.36E-01
River Bend 1										
Shoreham 1										
Susquehanna 1&2									< 8.70E-04	9.43E-04
Vermont Yankee 1	3.60E-01	1.00E-02	< 1.00E-02	1.44E-02	2.18E-01	4.43E-01	1.70E-02	4.53E-03	1.45E-03	4.14E-03
WNP-2										
<b>Total</b>	3.26E+01	< 3.30E+01	< 2.20E+01	< 3.01E+01	3.19E+01	< 2.07E+01	< 1.65E+01	< 1.52E+01	< 6.20E+00	< 8.37E+00
* Fort St. Vrain						6.89E-07	1.25E-06	1.40E-06	2.61E-01	7.40E-07

\* High temperature gas cooled reactor  
N/D = Not Detectable



Table 3

## Airborne Effluents Comparison By Year

## I-131 and Particulates (Curies)

(Half-Life Equal To or Greater Than 8 Days)

## Boiling Water Reactors

Facility	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Big Rock Point 1	1.32E-01	8.25E-02	7.56E-02	2.94E-02	5.07E-02	4.87E-03	5.71E-03	3.07E-03	4.99E-03	3.81E-03
Browns Ferry 1,2,& 3	< 1.72E-01	< 2.49E-02	< 2.73E-03	1.78E-03	1.76E-03	1.86E-04	1.88E-04	2.84E-02	4.66E-02	2.56E-02
Brunswick 1&2	3.49E-01	6.32E-02	4.69E-02	1.82E-01	1.77E-01	4.84E-02	4.83E-02	1.91E-02	7.43E-03	7.90E-03
Clinton 1				2.58E-04	5.94E-02	9.52E-03	8.71E-03	9.10E-03	2.52E-03	1.85E-02
Cooper	< 1.15E-02	< 2.29E-02	< 1.16E-02	2.67E-02	2.04E-02	5.26E-03	3.53E-04	5.64E-04	9.09E-05	1.76E-04
Dresden 1	1.69E-03	9.23E-05	+	+	+	1.07E-04	2.59E-04	4.19E-03	3.32E-05	1.24E-04
Dresden 2-3	1.30E-01	1.56E-01	7.11E-02	1.45E-01	2.35E-01	1.15E+00	1.51E-01	3.69E-02	2.57E-02	3.82E-02
Duane Arnold	1.53E-02	8.89E-03	7.32E-02	1.37E-01	1.55E-02	3.16E-03	4.45E-03	2.64E-03	2.98E-03	2.17E-03
Fermi 2			2.68E-07	8.56E-03	2.78E-03	1.67E-02	1.54E-02	5.66E-03	6.89E-03	9.01E-03
James A. Fitzpatrick	2.10E-01	1.67E-01	8.66E-02	1.36E-01	7.00E-02	7.12E-02	1.91E-02	2.50E-02	4.23E-04	2.31E-03
Grand Gulf 1	1.86E-04	7.53E-04	4.85E-04	4.28E-03	4.90E-04	1.08E-03	9.98E-04	4.29E-03	8.77E-03	5.56E-04
Edwin I. Hatch 1	6.57E-02	3.98E-02	1.50E-02	2.54E-01	**	**	**	**	**	**
Edwin I. Hatch 2	1.15E-02	3.47E-02	1.79E-02	1.16E-01	4.29E-02	5.73E-03	7.64E-03	5.57E-03	4.06E-02	2.98E-01
Hope Creek 1			N/D	N/D	N/D	N/D	5.47E-03	4.44E-04	2.67E-03	1.94E-03
Humboldt Bay 3	2.68E-04	7.62E-05	1.64E-04	6.78E-05	1.49E-04	3.67E-05	3.85E-05	6.68E-05	2.70E-05	6.16E-05
LaCrosse	6.90E-03	9.62E-03	5.91E-03	2.31E-03	1.11E-05	1.29E-05	1.80E-04	3.64E-06	3.69E-05	1.04E-04
LaSalle 1&2	1.06E-02	2.32E-02	7.09E-02	4.97E-02	1.34E-02	8.23E-03	3.44E-03	6.84E-03	2.70E-03	8.45E-03
Limerick 1&2	N/D	N/D	7.45E-03	1.17E-03	6.67E-03	7.60E-03	7.64E-04	1.13E-04	1.48E-03	2.85E-02
Millstone 1	6.24E-02	5.20E-02	4.71E-02	2.50E-02	7.60E-03	9.35E-03	2.60E-03	2.64E-03	1.49E-03	5.08E-03
Monticello	2.93E-02	9.95E-02	6.86E-02	1.73E-01	7.90E-02	1.14E-01	4.34E-02	3.62E-02	4.01E-02	2.94E-02
Nine Mile Point 1	1.75E-02	3.46E-02	1.75E-02	1.61E-02	1.89E-03	3.02E-03	2.72E-03	7.19E-03	4.42E-03	5.59E-03
Nine Mile Point 2				5.17E+00	6.90E-04	5.04E-03	4.95E-03	1.38E-02	6.70E-03	8.90E-03
Oyster Creek 1	4.37E-01	3.04E+00	7.00E-01	1.04E-01	6.35E-02	5.08E-02	3.14E-02	3.25E-02	5.71E-02	1.23E-02
Peach Bottom 2&3	1.02E-01	6.88E-02	5.20E-02	2.00E-02	1.50E-03	3.45E-03	1.82E-02	4.26E-02	3.19E-02	5.59E-02
Perry 1			1.13E-06	4.87E-05	4.62E-02	8.54E-03	1.11E-02	1.42E-02	1.52E-01	4.20E-02
Pilgrim 1	< 5.17E-03	< 5.68E-02	< 1.24E-02	< 8.43E-04	3.82E-04	5.62E-03	1.02E-02	4.71E-02	4.61E-02	4.33E-02
Quad-Cities 1&2	8.86E-02	6.06E-01	1.11E-01	9.40E-02	2.46E-02	4.06E-02	3.34E-02	1.19E-02	3.07E-02	2.06E-02
River Bend 1			4.62E-05	4.03E-04	9.66E-04	4.13E-04	5.17E-02	4.44E-02	9.34E-03	2.33E-02
Shoreham 1			N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Susquehanna 1&2	1.48E-02	2.66E-02	3.39E-03	6.08E-03	1.82E-03	1.11E-03	8.63E-04	2.43E-04	4.71E-03	1.29E-03
Vermont Yankee 1	6.87E-03	< 5.87E-03	< 1.29E-02	1.27E-02	6.58E-03	8.92E-03	7.24E-02	8.26E-02	6.41E-02	2.00E-02
WNP-2	2.49E-01	1.89E-01	6.35E-02	6.87E-02	4.48E-01	1.14E-01	1.50E-01	6.27E-02	4.33E-02	3.62E-02
<b>Total</b>	< 2.13E+00	< 4.81E+00	< 1.57E+00	< 6.79E+00	1.38E+00	1.70E+00	7.05E-01	5.50E-01	6.44E-01	7.49E-01
* Fort St. Vrain	2.78E-06	6.31E-07	N/D	N/D	< 1.79E-05	N/D	N/D	N/D	N/D	6.76E-06

+ Included with Dresden 2-3 total

\* High temperature gas cooled reactor

\*\* Included with Edwin I. Hatch 2 total

N/D = Not Detectable

Table 4

## Airborne Effluents Comparison By Year

I-131 and Particulates (Curies)  
(Half-Life Equal To or Greater Than 8 Days)

## Pressurized Water Reactors

Facility	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Arkansas One 1	5.00E-02	7.40E-01	5.73E-02	9.04E-03	3.19E-03	4.47E-03	1.66E-01	5.58E-03	9.07E-04	1.15E-03
Arkansas One 2						4.65E-03	6.90E-03	1.41E-03	4.92E-03	5.78E-03
Beaver Valley 1&2			* < 1.00E-02	1.52E-04	7.21E-02	4.07E-04	1.91E-03	6.85E-03	4.56E-03	5.25E-02
Braidwood 1										
Braidwood 2										
Byron 1&2										
Callaway 1										
Calvert Cliffs 1&2		7.00E-02	1.38E-01	3.07E-01	1.35E-01	2.05E+00	7.44E-02	4.69E-02	1.84E-01	1.02E-01
Catawba 1										
Catawba 2										
Comanche Peak 1										
Donald C. Cook 1&2		< 1.00E-02	< 1.00E-02	7.45E-02	1.10E-01	7.36E-02	6.88E-02	3.55E-01	1.28E-01	5.75E-02
Crystal River 3				2.53E-03	1.05E-03	1.88E-02	6.77E-03	1.78E-02	3.22E-03	1.58E-03
Davis-Besse 1				2.57E-04	4.30E-04	5.69E-03	2.01E-03	5.79E-02	5.28E-03	7.37E-03
Diablo Canyon 1&2										
Joseph M. Farley 1					4.11E-02	2.20E-02	2.37E-03	6.24E-01	9.09E-02	4.60E-02
Joseph M. Farley 2								3.22E-03	6.51E-05	5.06E-05
Fort Calhoun 1	< 1.00E-02	< 1.00E-02	< 2.04E-02	1.34E-02	8.30E-03	1.58E-03	2.42E-03	3.63E-03	1.59E-03	9.32E-04
R. E. Ginna	< 1.00E-02	2.00E-02	3.17E-02	2.55E-02	1.04E-02	1.86E-02	9.00E-03	5.88E-03	1.36E-02	1.53E-02
Haddam Neck	< 1.00E-02	< 1.00E-02	< 1.00E-02	1.74E-03	5.21E-03	4.77E-02	8.01E-03	< 1.28E-02	< 5.41E-04	< 1.02E-02
Harris 1										
Indian Point 1&2	4.30E-01	1.62E+00	2.42E-01	5.59E-02	2.05E-01	4.50E-01	6.42E-02	4.42E-02	4.17E-02	2.06E-02
Indian Point 3			Shown With	Other Unit	1.29E-02	3.89E-03	2.53E-02	3.63E-03	< 4.28E-03	< 1.53E-04
Kewaunee	2.00E-02	6.60E-01	< 1.00E-02	2.40E-02	5.48E-03	6.18E-04	2.61E-04	1.21E-04	5.97E-05	< 2.16E-04
** Maine Yankee	5.00E-02	< 1.00E-02	< 1.00E-02	1.07E-02	4.39E-03	1.16E-01	3.67E-03	1.21E-03	2.55E-04	1.48E-04
McGuire 1								1.21E-11	9.51E-04	1.89E-03
McGuire 2										1.89E-03
Millstone 2		1.00E-02	1.25E-02	4.47E-03	2.97E-03	9.79E-03	1.94E-02	1.06E-01	3.19E-01	5.73E-02
Millstone 3										
North Anna 1&2					3.19E-02	5.71E-02	1.26E-02	4.81E-01	3.49E-02	3.28E-01
Oconee 1,2,& 3	3.00E-02	1.00E-02	2.72E-01	5.35E-01	2.22E-01	2.28E-01	1.33E-01	3.24E-01	2.55E-01	1.13E-01
Palisades	1.00E-02	3.80E-01	4.16E-02	1.63E-02	2.07E-02	2.46E-02	2.76E-02	4.15E-02	2.30E-02	3.44E-02
Palo Verde 1										
Palo Verde 2										
Palo Verde 3										
Point Beach 1&2	1.60E-01	7.00E-02	1.85E-02	5.02E-03	2.88E-02	1.35E-02	1.28E-03	2.03E-01	8.46E-03	1.82E-02
Prarie Island 1&2	< 1.00E-02	2.12E-02	1.14E-02	7.56E-03	8.96E-04	3.86E-03	1.83E-03	4.49E-04	3.74E-03	1.40E-02
Rancho Seco 1		< 1.00E-02	< 1.00E-02	5.02E-03	3.21E-02	5.75E-03	9.96E-03	4.85E-03	2.62E-02	2.26E-03
H. B. Robinson 2	5.00E-02	2.00E-02	9.96E-02	3.88E-03	9.26E-04	4.10E-04	1.13E-03	3.32E-04	5.70E-04	1.31E-02
Salem 1			N/D	2.34E-07	4.01E-02	7.68E-03	2.17E-01	4.84E-01	7.85E-03	6.25E-02
Salem 2							5.44E-05	6.31E-03	4.54E-03	3.53E-02
San Onofre 1	< 1.00E-02	4.00E-02	< 1.00E-02	1.86E-04	2.71E-03	1.43E-04	8.41E-01	1.18E-02	4.66E-07	5.44E-06
San Onofre 2-3									3.35E-05	1.56E-01
Seabrook 1										
Sequoyah 1&2							2.57E-03	1.30E-02	1.23E-01	2.22E-03
South Texas 1										
South Texas 2										
St. Lucie 1			< 1.00E-02	1.48E-01	5.17E-01	2.02E-01	6.20E-02	7.69E-02	4.15E-01	2.13E-01
St. Lucie 2										1.27E-02
Summer 1									N/D	4.74E-05
Surry 1&2	1.40E-01	5.00E-02	3.46E-01	1.20E-01	6.49E-02	7.61E-03	1.85E-02	6.53E-02	5.96E-02	8.34E-02
Three Mile Island 1	< 1.00E-02	< 1.00E-02	1.07E-02	3.39E-02	1.35E-01	1.24E-02	2.93E-04	5.05E-04	1.65E-04	6.55E-05
Three Mile Island 2					2.30E-03	1.42E+01	5.67E-04	3.69E-05	6.46E-05	2.79E-05
TMI 2/Epicor							6.83E-06	2.63E-06	3.71E-06	1.80E-06
* Trojan			2.84E-02	3.56E-02	8.28E-03	2.48E-02	1.84E-02	4.97E-02	1.09E-02	5.57E-03

\* Changes to the entries for Trojan for 1976-1987 are corrections which were reported and explained in the Trojan July-December 1990 Effluent and Waste Disposal Report.

# I-131 not included

\*\* Changes to the entries for Maine Yankee for 1977 - 1988 are corrections which were reported and explained in the Maine Yankee report "Revised Semiannual Effluent Release Reports for 770131 - 901231" Docket Date 92/01/08.

N/D = Not Detectable

Table 4

## Airborne Effluents Comparison By Year

I-131 and Particulates (Curies)  
(Half-Life Equal To or Greater Than 8 Days)

## Pressurized Water Reactors

Facility	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Turkey Point 3&4	3.63E+00	4.30E-01	4.22E-01	1.04E+00	4.59E-01	7.91E-02	7.05E-02	2.94E-02	2.20E-01	1.44E-01
Turkey Point 3										
Turkey Point 4										
Vogtle 1&2										
Waterford 3										
Wolf Creek 1										
Yankee Rowe 1	5.30E-01	1.00E-02	< 1.00E-02	8.70E-05	2.25E-04	2.49E-04	9.56E-05	2.13E-04	< 5.75E-04	3.11E-03
Zion 1&2	1.00E-02	1.40E-01	9.00E-02	5.38E-02	8.91E-02	6.74E-02	3.00E-03	1.25E-02	8.57E-02	2.28E-02
<b>Total</b>	< 5.17E+00	< 4.35E+00	< 1.93E+00	2.53E+00	2.27E+00	1.78E+01	1.88E+00	< 3.11E+00	< 2.08E+00	< 1.85E+00

Table 4

## Airborne Effluents Comparison By Year

I-131 and Particulates (Curies)  
(Half-Life Equal To or Greater Than 8 Days)

Pressurized Water Reactors

Facility	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Arkansas One 1	1.14E-03	3.50E-03	4.01E-03	3.05E-04	1.03E-03	8.17E-04	8.94E-04	2.51E-03	4.99E-02	7.30E-06
Arkansas One 2	2.54E-04	3.27E-03	2.36E-04	5.12E-05	4.21E-04	5.87E-04	2.03E-04	4.27E-02	7.89E-04	4.87E-06
Beaver Valley 1&2	6.21E-03	1.58E-03	7.83E-03	1.36E-02	3.54E-03	1.11E-02	3.20E-04	1.02E-02	1.27E-03	2.20E-02
Braidwood 1				1.34E-05	2.44E-02	2.54E-04	1.56E-03	6.01E-03	2.91E-05	3.19E-04
Braidwood 2					9.52E-05	2.86E-04	5.61E-04	5.07E-03	7.55E-06	2.87E-03
Byron 1&2		2.18E-03	5.45E-02	9.45E-03	1.28E-02	7.93E-04	4.08E-03	1.81E-04	4.36E-04	4.38E-04
Callaway 1	9.41E-07	3.23E-04	1.18E-03	4.46E-04	3.36E-04	1.66E-04	1.46E-04	9.16E-06	4.87E-04	6.28E-04
Calvert Cliffs 1&2	6.02E-02	5.36E-02	8.73E-02	9.18E-02	1.36E-01	4.81E-02	1.69E-03	1.32E-02	1.68E-02	2.16E-02
Catawba 1		5.71E-04	6.69E-03	7.42E-03	4.05E-03	7.46E-04	8.60E-04	1.39E-03	7.71E-04	4.58E-04
Catawba 2			6.69E-03	7.42E-03	4.05E-03	7.46E-04	8.60E-04	1.39E-03	7.71E-04	4.58E-04
Comanche Peak 1							N/D	1.85E-05	8.31E-04	7.56E-05
Donald C. Cook 1&2	2.09E-02	1.78E-01	2.29E-02	6.44E-02	8.92E-03	3.44E-02	7.35E-02	2.41E-03	9.38E-03	5.01E-04
Crystal River 3	2.07E-04	7.31E-04	1.02E-03	3.49E-03	1.25E-03	2.02E-03	7.68E-04	4.57E-04	5.59E-04	2.64E-05
Davis-Besse 1	1.66E-03	5.13E-04	N/D	1.24E-03	4.76E-04	3.06E-03	2.38E-03	8.70E-03	9.57E-04	7.79E-03
Diablo Canyon 1&2	1.20E-05	2.40E-04	1.44E-03	2.36E-03	1.29E-03	9.75E-04	5.94E-05	5.90E-04	2.57E-04	5.06E-05
Joseph M. Farley 1	5.87E-03	5.60E-03	7.96E-04	3.81E-04	1.60E-03	3.64E-05	N/D	1.60E-03	3.80E-04	N/D
Joseph M. Farley 2	1.54E-03	2.97E-04	1.35E-03	1.49E-04	2.51E-06	7.89E-07	3.15E-06	1.43E-05	4.66E-05	1.26E-07
Fort Calhoun 1	1.25E-02	7.29E-03	1.48E-03	5.11E-03	3.10E-04	1.27E-04	1.81E-03	3.22E-04	5.66E-04	2.27E-05
R. E. Ginna	1.62E-03	9.74E-04	4.04E-04	8.71E-03	5.69E-05	8.38E-04	5.14E-03	1.65E-03	1.40E-03	7.46E-04
Haddam Neck	5.72E-02	1.13E-03	9.36E-03	1.35E-03	3.69E-02	1.50E-02	4.71E-03	2.60E-02	5.39E-03	1.25E-02
Harris 1				4.43E-06	4.59E-05	1.79E-06	7.72E-05	4.71E-05	8.16E-04	1.81E-04
Indian Point 1&2	< 1.51E-01	1.44E+00	4.59E-01	1.57E-02	9.18E-03	3.88E-03	5.36E-03	2.10E-03	1.32E-02	5.76E-03
Indian Point 3	2.04E-02	1.90E-03	4.01E-03	2.07E-03	3.42E-03	1.36E-03	1.81E-04	2.44E-05	8.26E-05	1.55E-04
Kewaunee	< 4.05E-03	2.77E-04	< 5.58E-03	< 1.23E-02	< 1.05E-02	1.75E-02	3.24E-03	1.93E-03	1.79E-06	2.02E-05
** Maine Yankee	7.14E-03	8.17E-04	4.60E-03	5.05E-03	5.10E-04	2.39E-04	1.81E-02	7.22E-03	5.24E-03	5.61E-03
McGuire 1	1.25E-02	1.29E-02	3.03E-02	6.08E-02	6.14E-03	3.76E-03	1.02E-03	9.78E-04	1.16E-03	8.66E-04
McGuire 2	1.25E-02	1.29E-02	3.03E-02	6.08E-02	6.14E-03	3.76E-03	1.02E-03	9.78E-04	1.16E-03	8.66E-04
Millstone 2	3.71E-02	6.48E-03	5.37E-03	6.51E-03	5.13E-02	3.78E-02	2.08E-02	1.27E-02	7.87E-03	1.06E-03
Millstone 3			< 3.69E-04	5.09E-03	9.89E-03	1.28E-02	2.46E-03	4.60E-03	9.71E-04	1.05E-03
North Anna 1&2	8.65E-02	8.57E-02	2.27E-02	1.73E-02	2.30E-03	4.33E-03	7.05E-03	2.70E-03	1.36E-02	2.90E-03
Oconee 1,2&3	1.07E-01	4.92E-03	4.34E-02	1.46E-01	1.63E-01	3.56E-02	9.02E-03	2.90E-02	1.41E-02	3.32E-03
Palisades	9.92E-04	4.92E-02	3.03E-03	2.77E-02	2.65E-02	1.73E-02	2.13E-03	3.02E-04	9.52E-04	1.12E-03
Palo Verde 1		1.43E-03	7.78E-03	5.81E-02	1.82E-03	7.58E-04	2.69E-03	1.15E-02	1.20E-02	1.00E-02
Palo Verde 2			3.49E-03	1.34E-02	4.67E-02	3.03E-03	2.66E-03	2.08E-02	1.77E-05	7.34E-03
Palo Verde 3				N/D	1.24E-04	6.45E-03	6.34E-04	3.32E-03	1.91E-03	1.72E-03
Point Beach 1&2	1.25E-03	9.05E-03	1.69E-03	3.08E-03	2.23E-03	3.27E-03	3.02E-04	3.46E-03	6.75E-03	1.48E-02
Prairie Island 1&2	1.44E-03	7.35E-03	2.22E-03	2.33E-04	7.74E-05	2.10E-05	1.50E-03	4.87E-04	2.53E-04	7.40E-04
Rancho Seco 1	2.37E-02	7.84E-03	1.49E-03	1.54E-06	4.74E-04	2.76E-04	N/D	N/D	N/D	N/D
H. B. Robinson 2	2.47E-04	1.37E-02	9.92E-03	2.08E-02	1.10E-03	1.41E-04	1.34E-04	1.73E-04	1.39E-04	1.56E-03
Salem 1	5.16E-04	4.45E-02	1.17E-03	1.66E-03	2.13E-03	3.62E-03	1.20E-03	1.66E-03	3.79E-04	5.11E-03
Salem 2	5.41E-03	8.95E-02	3.23E-03	1.52E-03	9.91E-04	8.70E-04	2.06E-04	7.13E-04	7.10E-05	1.13E-03
San Onofre 1	9.49E-06	1.17E-03	2.09E-04	4.17E-04	1.08E-02	2.22E-03	7.25E-03	1.94E-03	1.57E-02	3.01E-04
San Onofre 2-3	4.12E-01	4.47E-01	1.62E-01	4.20E-01	7.75E-02	4.73E-01	7.05E-03	1.14E-02	2.32E-02	4.99E-02
Seabrook 1						N/D	N/D	1.08E-03	1.11E-03	6.60E-07
Sequoyah 1&2	2.12E-02	3.17E-03	1.56E-03	5.04E-04	1.90E-04	4.22E-04	2.65E-04	5.66E-04	9.23E-05	1.41E-05
South Texas 1					8.26E-04	4.02E-03	1.15E-03	1.85E-03	2.52E-03	4.84E-05
South Texas 2						1.42E-03	5.75E-04	2.72E-04	4.63E-05	4.85E-04
St. Lucie 1	2.60E-01	7.91E-01	2.69E-01	3.95E-02	6.40E-03	5.75E-03	8.36E-03	2.69E-03	1.03E-03	2.08E-03
St. Lucie 2	2.84E-01	1.92E-01	4.20E-02	5.51E-02	2.86E-02	8.27E-03	5.79E-03	4.86E-03	4.88E-03	5.06E-04
Summer 1	9.00E-06	2.55E-05	2.99E-05	7.04E-04	2.33E-03	1.61E-03	5.57E-04	2.84E-04	2.14E-04	4.39E-03
Surry 1&2	5.87E-02	2.67E-02	2.09E-02	2.09E-02	2.02E-02	2.37E-03	2.93E-03	1.10E-03	8.04E-04	7.86E-04
Three Mile Island 1	1.27E-09	2.86E-05	3.97E-04	1.28E-04	1.26E-03	8.22E-03	1.53E-03	9.89E-04	4.05E-03	7.38E-03
Three Mile Island 2	1.61E-05	4.59E-05	1.67E-04	7.27E-05	6.78E-05	3.50E-06	3.74E-06	7.80E-05	5.49E-06	5.91E-02
TMI 2/Epicor	7.93E-07	**	**	**	**	**	**	**	**	**
* Trojan	4.65E-03	5.75E-03	8.62E-03	2.61E-03	3.97E-03	4.30E-03	1.64E-03	5.81E-04	2.44E-04	N/D

\* Changes to the entries for Trojan for 1976-1987 are corrections which were reported and explained in the Trojan July-December 1990 Effluent and Waste Disposal Report.

\*\* Changes to the entries for Maine Yankee for 1977 - 1988 are corrections which are reported and explained in the Maine Yankee report "Revised Semiannual Effluent Release Reports for 770131 - 901231" Docket Date 92/01/08.

\*\*+ Included with Three Mile Island 2 total

N/D = Not Detectable

Table 4

## Airborne Effluents Comparison By Year

I 131 and Particulates (Curies)  
 (Half-Life Equal To or Greater Than 8 Days)

Pressurized Water Reactors

Facility	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Turkey Point 3&4	2.77E-02									
Turkey Point 3		7.98E-03	1.93E-02	1.24E-02	4.83E-03	3.10E-03	4.60E-03	6.53E-04	1.15E-04	1.13E-03
Turkey Point 4		7.88E-03	2.45E-03	1.38E-02	4.78E-03	2.99E-04	1.87E-03	6.52E-04	1.15E-04	1.13E-03
Vogtle 1&2				1.99E-05	1.75E-05	1.25E-03	8.49E-05	2.08E-03	5.87E-03	5.21E-04
Waterford 3		3.48E-03	5.30E-03	1.02E-03	1.24E-03	7.62E-04	5.99E-04	2.56E-03	2.75E-05	1.08E-06
Wolf Creek 1		1.67E-06	2.11E-04	2.14E-04	8.36E-05	2.31E-05	1.71E-04	2.40E-03	1.81E-05	6.92E-04
Yankee Rowe 1	< 6.49E-03	< 7.61E-04	2.02E-04	4.10E-05	5.89E-05	< 1.82E-04	1.61E-04	2.97E-05	7.71E-06	7.97E-07
Zion 1&2	4.27E-02	2.55E-02	4.48E-02	4.07E-03	1.40E-02	2.39E-03	1.38E-03	7.65E-03	5.11E-02	3.46E-02
<b>Total</b>	< 1.76E+00	< 3.56E+00	< 1.42E+00	< 1.25E+00	< 7.59E-01	< 7.96E-01	2.25E-01	2.73E-01	2.86E-01	2.99E-01

Table 5

## Liquid Effluents Comparison By Year

## Tritium (Curies)

## Boiling Water Reactors

Facility	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Big Rock Point 1	5.10E+00	5.73E+00	2.41E+00	8.83E+00	4.05E+00	5.45E+00	6.18E+00	3.13E+00	2.98E+00	2.22E+01
Browns Ferry 1,2 & 3	2.80E+00	1.04E+01	4.02E+00	2.40E+01	3.08E+01	1.32E+01	2.18E+01	2.42E+01	2.39E+01	3.20E+01
Brunswick 1&2		3.20E+00	5.90E+00	8.93E+00	1.41E+01	3.08E+01	1.28E+01	2.26E+01	4.88E+01	1.04E+02
Clinton 1										
Cooper	1.70E+00	8.25E+00	8.43E+00	9.04E+00	7.51E+00	6.63E+00	8.77E+00	8.37E+00	9.08E+00	7.60E+00
Dresden 1	1.88E+01	2.70E-01	2.00E-02	8.90E-02	1.31E+01	1.50E+00	N/D	N/D	N/D	N/D
Dresden 2-3	2.26E+01	5.40E+01	1.97E+01	5.00E+00	1.92E+01	1.93E+01	6.20E+01	6.05E+00	1.36E+00	1.45E-03
Duane Arnold		3.30E-01	3.40E-01	2.13E-01	1.19E+02	2.90E-01	N/D	N/D	2.25E-05	N/D
Fermi 2										
James A. Fitzpatrick		5.03E+00	4.20E+00	3.35E+00	1.90E+00	1.52E+00	2.81E+00	4.11E+00	6.55E-01	2.72E+00
Grand Gulf 1										3.89E-03
Edwin I. Hatch 1		6.12E+00	8.98E+00	1.20E+01	9.00E+00	1.23E+01	1.42E+01	1.16E+01	1.03E+02	9.47E+01
Edwin I. Hatch 2							1.07E+01	9.28E+00	3.68E+01	3.40E+01
Hope Creek 1										
Humboldt Bay 3	3.17E+01	2.01E+01	1.30E+01	5.26E-01	3.63E-02	3.91E-02	9.70E-02	1.62E-01	5.99E-02	5.38E-02
LaCrosse	1.15E+02	1.27E+02	4.10E+01	4.86E+01	4.72E+01	3.54E+01	7.20E+01	7.74E+01	5.92E+01	1.24E+02
LaSalle 1&2									9.26E-01	4.25E+00
Limerick 1&2										
Millstone 1	2.41E+01	8.03E+01	2.01E+01	4.41E+00	3.20E+00	7.92E+00	2.73E+01	2.62E+00	6.21E+00	8.38E+00
Monticello	N/D	N/D	N/D	N/D	N/D	N/D	N/D	4.17E-03	2.70E-05	N/D
Nine Mile Point 1	1.87E+01	2.81E+01	2.46E+00	2.49E+00	N/D	6.78E+00	N/D	5.05E+00	5.82E+00	7.89E+00
Nine Mile Point 2										
Oyster Creek 1	1.41E+01	1.79E+01	3.86E+01	1.88E+01	1.96E+01	1.40E+00	1.54E+02	2.67E+01	4.95E+00	8.76E+00
Peach Bottom 2&3	1.00E+01	3.08E+01	7.37E+01	7.09E+01	3.24E+01	4.28E+01	3.73E+01	3.68E+01	2.37E+01	2.02E+01
Perry 1										
Pilgrim 1	1.06E+01	1.82E+01	4.67E+01	3.27E+01	2.98E+00	1.34E+01	4.00E+01	3.41E+01	5.91E+00	1.56E+01
Quad-Cities 1&2	3.40E+01	5.37E+01	4.98E+01	2.64E+01	1.72E+01	1.76E+01	1.03E+01	1.19E+01	7.80E+00	3.88E+00
River Bend 1										
Shoreham 1										
Susquehanna 1&2									< 8.55E-01	8.98E+00
Vermont Yankee 1	N/D	N/D	1.60E+00	8.44E-01	N/D	4.04E+00	N/D	3.70E-01	N/D	N/D
WNP-2										
<b>Total</b>	3.09E+02	4.69E+02	3.41E+02	2.77E+02	3.41E+02	2.20E+02	4.80E+02	2.84E+02	3.42E+02	4.99E+02
* Fort St. Vrain						1.23E+02	2.06E+02	2.19E+02	2.62E+02	3.69E+02

\* High temperature gas cooled reactor  
N/D = Not Detectable

Table 5

## Liquid Effluents Comparison By Year

## Tritium (Curies)

Boiling Water Reactors										
Facility	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Big Rock Point 1	1.11E+00	1.27E+00	3.51E-01	5.85E-01	3.47E-01	6.39E-01	5.89E-01	2.51E-01	1.08E+00	1.58E-01
Browns Ferry 1,2 & 3	3.18E+01	3.31E+01	7.93E+00	2.03E+00	1.46E+00	7.01E-01	2.07E-01	5.96E+00	2.85E+01	1.24E+01
Brunswick 1&2	3.37E+01	9.88E+00	5.78E+00	1.93E+01	3.10E+01	1.79E+01	4.95E+01	7.99E+01	4.24E+01	4.72E+01
Clinton 1				1.87E+00	2.90E+00	1.49E+00	2.60E+00	4.45E+00	2.36E+00	N/D
Cooper	< 7.20E+00	< 5.05E+00	< 5.56E+00	5.02E+00	4.17E+00	5.45E+00	5.07E+00	9.05E+00	1.46E+01	1.08E+01
Dresden 1	N/D	N/D	N/D	N/D	**	**	**	**	**	**
Dresden 2-3	3.93E+01	7.45E+00	1.27E+01	2.23E+01	1.72E+01	1.83E+01	2.04E+01	1.28E+01	4.26E+00	2.33E+01
Duane Arnold	1.41E-06	3.57E-02	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Fermi 2			3.00E-01	1.05E+00	9.33E-01	1.30E+00	7.47E-01	2.02E+00	3.52E-01	3.73E-01
James A. Fitzpatrick	4.77E+00	4.20E+00	4.99E+00	2.48E+00	8.87E+00	7.32E-01	3.08E+00	7.61E+00	2.85E+00	1.44E+00
Grand Gulf 1	7.27E-01	5.17E+00	1.47E+01	1.83E+01	1.34E+01	1.32E+01	1.89E+01	2.16E+01	2.30E+01	6.29E+01
Edwin I. Hatch 1	8.02E+01	3.93E+01	1.85E+01	2.01E+01	+	+	+	+	+	+
Edwin I. Hatch 2	2.13E+01	1.81E+01	1.01E+01	8.10E+00	4.40E+01	4.57E+01	2.26E+01	2.91E+01	4.46E+01	5.08E+01
Hope Creek 1			6.91E-03	9.53E+00	9.36E+00	2.35E+01	1.18E+01	2.45E+01	1.25E+02	6.17E+01
Humboldt Bay 3	2.93E-02	1.08E+00	6.67E-02	6.98E-04	9.44E-04	1.14E-03	3.48E-03	2.29E-03	1.62E-03	8.17E-04
LaCrosse	1.25E+02	1.28E+02	5.75E+01	4.66E+01	4.60E+00	2.79E+00	7.74E-01	5.36E-01	1.83E-01	5.24E-02
LaSalle 1&2	1.10E+00	3.89E-01	1.37E-01	1.10E+00	1.76E+00	1.07E+00	3.74E-01	N/D	2.96E-05	N/D
Limerick 1&2	N/D	1.15E+00	2.06E+00	6.02E+00	N/D	2.70E+01	3.02E+01	1.37E+01	1.05E+01	2.57E+01
Millstone 1	8.58E+00	1.79E+01	5.33E+00	1.78E+01	3.78E+01	4.58E+01	2.02E+01	8.40E+00	7.34E+00	2.45E+01
Monticello	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D	1.88E-05
Nine Mile Point 1	N/D	N/D	2.19E+00	N/D	N/D	N/D	1.41E+00	N/D	N/D	N/D
Nine Mile Point 2				4.63E-01	7.92E+00	8.10E+00	4.78E+00	7.78E+00	8.95E+00	2.37E+01
Oyster Creek 1	1.03E+01	N/D	1.07E+00	1.96E+00	1.62E+01	3.96E+00	N/D	6.03E-01	N/D	N/D
Peach Bottom 2&3	3.58E+01	5.04E+01	4.46E+01	4.64E+01	9.69E+00	2.00E+01	2.35E+01	1.46E+01	1.77E+01	7.21E+00
Perry 1			2.67E-03	3.49E+00	7.34E+00	6.96E+00	8.79E+00	1.06E+01	9.27E+00	9.35E+00
Pilgrim 1	1.47E+01	7.81E+00	1.00E+01	3.21E+00	5.73E-01	2.37E+00	3.68E+00	1.02E+01	1.46E-02	3.75E+00
Quad-Cities 1&2	5.42E+00	3.41E+00	6.43E+00	6.92E+00	7.28E+00	2.91E+01	2.61E+01	4.43E+00	1.25E+01	3.67E+01
River Bend 1			4.56E+00	6.92E+00	9.65E+00	1.60E+01	8.35E+01	3.06E+01	2.34E+01	3.02E+01
Shoreham 1			3.80E-03	6.04E-03	N/D	N/D	N/D	N/D	N/D	N/D
Susquehanna 1&2	1.12E+01	9.14E+00	1.54E+01	1.87E+01	1.45E+01	2.74E+01	5.80E+01	4.62E+01	7.70E+01	6.79E+01
Vermont Yankee 1	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D	4.02E-05	N/D
WNP-2	5.40E-01	1.50E+00	3.29E+00	1.21E+00	1.38E+00	2.03E+00	7.54E-01	1.81E+00	1.08E+01	3.40E+01
<b>Total</b>	< 4.33E+02	< 3.44E+02	< 2.34E+02	2.71E+02	2.52E+02	3.21E+02	3.98E+02	3.47E+02	4.67E+02	5.34E+02
* Fort St. Vrain	1.24E+02	1.53E+01	1.27E+02	5.61E+01	1.61E+02	1.12E+02	3.22E+00	1.11E+01	1.92E-01	2.49E-01

\* High temperature gas cooled reactor

\*\* Included with Dresden 2-3 total

+ Included with Edwin I. Hatch 2 total

N/D = Not Detectable

Table 6

## Liquid Effluents Comparison By Year

Facility	Tritium (Curies)									
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Pressurized Water Reactors										
Arkansas One 1	2.56E+01	4.60E+02	2.12E+02	2.45E+02	2.94E+02	1.68E+02	2.12E+02	4.42E+02	2.06E+02	1.09E+02
Arkansas One 2						5.27E+01	2.89E+02	2.44E+02	1.39E+02	2.38E+02
Beaver Valley 1&2			8.60E+00	1.08E+02	3.49E+02	9.59E+01	3.98E+01	1.40E+02	1.84E+02	4.60E+02
Braidwood 1										
Braidwood 2										
Byron 1&2										
Callaway 1										
Calvert Cliffs 1&2		2.63E+02	2.74E+02	5.75E+02	4.56E+02	5.14E+02	4.91E+02	1.00E+03	4.35E+02	7.56E+02
Catawba 1										
Catawba 2										
Comanche Peak 1										
Donald C. Cook 1&2		5.64E+01	1.92E+02	2.86E+02	6.24E+02	1.22E+03	7.82E+02	9.15E+02	1.23E+03	8.85E+02
Crystal River 3				1.66E+02	1.54E+02	1.66E+02	1.95E+02	2.71E+02	1.82E+02	1.99E+02
Davis-Besse 1				9.01E+00	2.15E+02	2.45E+02	1.08E+02	1.57E+02	5.68E+01	1.14E+02
Diablo Canyon 1&2										
Joseph M. Farley 1					5.91E+01	9.40E+01	5.70E+02	1.65E+02	3.37E+02	4.12E+02
Joseph M. Farley 2								6.34E+02	3.59E+02	3.17E+02
Fort Calhoun 1	1.24E+02	1.11E+02	1.22E+02	1.57E+02	1.50E+02	2.58E+02	5.44E+01	2.42E+02	3.08E+02	1.53E+02
R. E. Ginna	1.95E+02	2.60E+02	2.42E+02	1.19E+02	2.42E+02	2.40E+02	1.60E+02	2.40E+02	3.08E+02	3.50E+02
Haddam Neck	2.24E+03	5.67E+03	4.85E+03	6.67E+03	3.94E+03	3.55E+03	3.29E+03	5.29E+03	4.05E+03	3.90E+03
Harris 1										
Indian Point 1&2	4.79E+01	7.94E+01	3.32E+02	3.71E+02	5.12E+02	3.75E+02	2.76E+02	2.41E+02	1.72E+02	3.43E+02
Indian Point 3			Shown With	Other Unit	2.56E+02	1.15E+02	4.27E+02	6.42E+02	1.94E+02	3.19E+01
Kewaunee	9.24E+01	2.77E+02	1.80E+02	2.95E+02	2.96E+02	2.49E+02	2.33E+02	2.51E+02	3.18E+02	2.92E+02
Maine Yankee	2.19E+02	1.77E+02	3.67E+02	1.53E+02	3.15E+02	2.02E+02	2.18E+02	2.16E+02	1.85E+02	2.87E+02
McGuire 1								6.25E+00	1.60E+02	1.49E+02
McGuire 2										1.49E+02
Millstone 2		7.60E+00	2.77E+02	2.11E+02	2.01E+02	2.54E+02	2.68E+02	3.71E+02	2.91E+02	1.21E+02
Millstone 3										
North Anna 1&2					2.82E+02	3.13E+02	4.03E+02	1.28E+03	5.71E+02	1.61E+03
Oconee 1,2& 3	3.50E+02	3.55E+03	2.19E+03	1.92E+03	1.17E+03	8.94E+02	7.12E+02	5.07E+02	3.54E+02	1.28E+03
Palsades	8.10E+00	4.16E+01	9.63E+00	5.58E+01	1.01E+02	1.26E+02	7.47E+01	2.78E+02	1.79E+02	2.35E+02
Palo Verde 1										
Palo Verde 2										
Palo Verde 3										
Point Beach 1&2	8.33E+02	8.85E+02	6.94E+02	9.99E+02	1.29E+03	8.92E+02	7.61E+02	6.52E+02	5.03E+02	5.39E+02
Prairie Island 1&2	1.42E+02	4.54E-01	1.00E-01	1.35E+03	5.51E+02	6.25E+02	5.43E+02	5.62E+02	6.00E+02	5.20E+02
Rancho Seco 1		1.32E+02	N/D	8.55E-02	N/D	N/D	1.47E-02	8.35E+01	6.46E+01	7.43E+01
H. B. Robinson 2	4.49E+02	6.24E+02	9.80E+02	6.85E+02	4.73E+02	4.29E+02	1.89E+02	1.86E+02	9.51E+01	2.40E+02
Salem 1			4.00E-02	2.96E+02	4.46E+02	7.26E+02	N/D	4.93E+02	7.22E+02	2.08E+02
Salem 2							N/R	8.42E+02	5.25E+02	2.23E+02
San Onofre 1	3.81E+03	4.00E+03	3.39E+03	1.79E+03	2.50E+03	2.32E+03	1.03E+03	2.97E+02	5.45E+02	1.57E+01
San Onofre 2-3									8.92E+00	2.38E+02
Seabrook 1										
Sequoyah 1&2							3.23E-01	7.65E+01	9.34E+02	7.35E+02
South Texas 1										
South Texas 2										
St. Lucie 1			1.33E+01	2.42E+02	1.28E+02	1.28E+02	2.72E+02	3.25E+02	3.21E+02	3.46E+02
St. Lucie 2										3.77E+01
Summer 1									3.19E-01	2.27E+02
Surry 1&2	2.45E+02	4.42E+02	7.82E+02	4.08E+02	7.47E+02	3.57E+02	3.85E+02	5.31E+02	9.10E+02	7.17E+02
Three Mile Island 1	1.30E+02	4.63E+02	1.89E+02	1.92E+02	1.55E+02	5.59E+01	3.26E+01	7.11E+00	3.91E+00	3.09E+00
Three Mile Island 2					3.83E+01	7.81E+01	6.10E-04	5.06E-02	7.20E-02	3.75E-04
TMI 2/Epicor							N/D	N/D	N/D	N/D
Trojan			3.60E+01	3.11E+02	1.59E+02	6.80E+01	1.24E+02	1.03E+02	2.00E+02	2.34E+02

N/R = Not Reported

N/D = Not Detectable



Table 6

## Liquid Effluents Comparison By Year

## Tritium (Curies)

## Pressurized Water Reactors

Facility	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Turkey Point 3&4	5.80E+02	7.97E+02	7.71E+02	9.24E+02	1.17E+03	9.40E+02	7.49E+02	1.95E+02	6.27E+02	7.12E+02
Turkey Point 3										
Turkey Point 4										
Vogtle 1&2										
Waterford 3										
Wolf Creek 1										
Yankee Rowe 1	3.14E+02	2.47E+02	1.56E+02	1.39E+02	1.96E+02	1.75E+02	5.84E+01	1.03E+02	1.86E+02	1.68E+02
Zion 1	2.74E+02	1.03E+03	7.47E+02	7.24E+02	7.25E+02	6.01E+02	7.45E+02	6.04E+02	6.76E+02	1.74E+02
Zion 2								2.66E+02	3.77E+02	2.56E+02
<b>Total</b>	1.01E+04	1.96E+04	1.70E+04	1.94E+04	1.82E+04	1.65E+04	1.37E+04	1.89E+04	1.75E+04	1.81E+04

Table 6

## Liquid Effluents Comparison By Year

Facility	Tritium (Curies)									
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Pressurized Water Reactors										
Arkansas One 1	3.05E+02	3.27E+02	2.12E+02	1.50E+02	2.50E+02	3.81E+02	2.67E+02	5.18E+02	5.06E+02	4.51E+02
Arkansas One 2	3.09E+02	2.41E+02	2.30E+02	3.52E+02	2.44E+02	4.40E+02	5.33E+02	9.40E+02	2.98E+02	3.08E+02
Beaver Valley 1&2	4.12E+02	1.50E+02	2.06E+02	5.72E+02	4.09E+02	6.21E+02	4.91E+02	4.85E+02	4.65E+02	5.53E+02
Braidwood 1				4.12E+01	2.74E+02	5.58E+02	6.50E+02	3.43E+02	9.58E+02	8.05E+02
Braidwood 2					2.44E+02	5.58E+02	6.50E+02	3.43E+02	9.58E+02	8.05E+02
Byron 1&2		2.61E+02	6.70E+01	4.10E+02	1.01E+03	1.29E+03	9.98E+02	1.43E+03	1.58E+03	2.06E+03
Callaway 1	2.90E+01	5.88E+02	4.35E+02	4.48E+02	8.93E+02	6.09E+02	1.02E+03	1.23E+03	5.92E+02	1.41E+03
Calvert Cliffs 1&2	7.87E+02	4.83E+02	7.35E+02	7.38E+02	6.24E+02	2.36E+02	7.29E+01	1.02E+03	1.77E+03	6.36E+02
Catawba 1		1.75E+02	1.18E+02	3.64E+02	3.53E+02	4.45E+02	2.97E+02	3.23E+02	3.86E+02	4.13E+02
Catawba 2			1.18E+02	3.64E+02	3.53E+02	4.45E+02	2.97E+02	3.23E+02	3.86E+02	4.13E+02
Comanche Peak 1							1.87E+02	4.60E+02	6.11E+02	5.04E+02
Donald C. Cook 1&2	1.37E+03	1.14E+03	6.95E+02	1.97E+03	1.10E+03	8.74E+02	1.56E+03	1.55E+03	4.33E+02	6.01E+02
Crystal River 3	4.20E+02	1.76E+02	1.73E+02	3.56E+02	5.11E+02	3.44E+02	5.10E+02	4.49E+02	3.64E+02	5.89E+02
Davis-Besse 1	1.22E+02	6.74E+01	2.09E+01	2.46E+02	3.50E+01	2.39E+02	1.27E+02	3.26E+02	3.80E+02	1.81E+02
Diablo Canyon 1&2	1.07E+00	4.28E+02	6.98E+02	6.91E+02	4.29E+02	9.35E+02	9.68E+02	1.05E+03	1.22E+03	1.03E+03
Joseph M. Farley 1	4.23E+02	6.03E+02	7.14E+02	6.37E+02	5.16E+02	6.99E+02	7.35E+02	4.71E+02	8.18E+02	9.35E+02
Joseph M. Farley 2	3.56E+02	5.02E+02	6.22E+02	5.05E+02	7.53E+02	6.08E+02	6.72E+02	3.53E+02	7.90E+02	8.85E+02
Fort Calhoun 1	2.35E+02	1.67E+02	1.84E+02	2.28E+02	2.32E+02	2.28E+02	1.74E+02	1.77E+02	1.06E+02	2.39E+02
R. E. Ginna	4.59E+02	5.01E+02	3.57E+02	5.64E+02	3.47E+02	5.92E+02	3.21E+02	3.76E+02	2.13E+02	1.77E+02
Haddam Neck	3.66E+03	5.76E+03	2.58E+03	3.17E+03	1.18E+03	4.81E+03	9.89E+02	4.63E+03	8.63E+02	4.00E+03
Harris 1				2.48E+02	4.01E+02	4.58E+02	7.26E+02	2.92E+02	9.02E+02	5.55E+02
Indian Point 1&2	2.22E+02	3.51E+02	3.36E+02	5.63E+02	4.39E+02	5.60E+02	6.44E+02	5.45E+02	6.95E+02	2.89E+02
Indian Point 3	5.87E+02	3.40E+02	5.67E+02	3.40E+02	5.73E+02	3.51E+02	3.33E+02	5.38E+02	4.50E+02	2.95E+02
Kewaunee	4.40E+02	3.79E+02	2.94E+02	3.51E+02	3.32E+02	3.41E+02	3.79E+02	4.34E+02	2.90E+02	2.36E+02
Maine Yankee	1.72E+02	1.84E+02	3.50E+02	1.18E+02	2.91E+02	4.22E+02	2.43E+02	3.89E+02	2.17E+02	2.72E+02
McGuire 1	3.23E+02	4.02E+02	4.58E+02	4.92E+02	5.29E+02	4.23E+02	4.58E+02	4.39E+02	4.33E+02	3.88E+02
McGuire 2	3.23E+02	4.02E+02	4.58E+02	4.92E+02	5.29E+02	4.23E+02	4.58E+02	4.39E+02	4.33E+02	3.88E+02
Millstone 2	3.97E+02	1.66E+02	2.80E+02	2.86E+02	2.59E+02	3.66E+02	5.28E+02	2.66E+02	1.06E+02	3.29E+02
Millstone 3			5.41E+02	5.90E+02	5.47E+02	6.97E+02	7.74E+02	3.04E+02	5.96E+02	5.16E+02
North Anna 1&2	6.20E+02	1.48E+03	1.56E+03	8.36E+02	1.94E+03	1.40E+03	1.67E+03	1.16E+03	9.29E+02	6.93E+02
Oconee 1,2 & 3	1.28E+03	1.24E+03	1.34E+03	9.49E+02	7.10E+02	1.02E+03	9.92E+02	1.13E+03	9.98E+02	1.10E+03
Palisades	6.95E+01	4.29E+02	6.32E+01	1.19E+02	2.83E+02	8.06E+01	1.49E+02	5.52E+01	8.09E+01	2.10E+02
Palo Verde 1		N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Palo Verde 2			N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Palo Verde 3				N/D	N/D	N/D	N/D	N/D	N/D	N/D
Point Beach 1&2	2.10E+03	8.05E+02	8.11E+02	7.09E+02	3.57E+02	5.59E+02	8.72E+02	7.87E+02	4.16E+02	4.64E+02
Prairie Island 1&2	6.41E+02	6.96E+02	6.70E+02	4.49E+02	4.05E+02	4.64E+02	3.98E+02	5.58E+02	4.72E+02	4.80E+02
Rancho Seco 1	2.97E+02	9.00E+01	6.50E+01	1.83E+01	1.01E+02	7.29E+01	1.37E+01	9.84E+01	2.42E+01	7.44E+00
H. B. Robinson 2	1.34E+01	3.09E+02	3.42E+02	2.74E+02	5.36E+02	1.64E+02	3.53E+02	1.88E+02	3.94E+02	8.45E+02
Salem 1	3.30E+02	9.23E+02	4.10E+02	3.79E+02	6.35E+02	6.09E+02	3.53E+02	6.06E+02	2.45E+02	3.93E+02
Salem 2	3.08E+02	5.77E+02	4.38E+02	6.61E+02	3.68E+02	5.11E+02	3.03E+02	4.42E+02	2.25E+02	5.08E+02
San Onofre 1	3.39E+01	2.38E+03	4.53E+02	2.27E+03	1.53E+03	9.62E+02	1.42E+03	1.25E+03	3.00E+03	4.45E+02
San Onofre 2-3	4.55E+02	4.75E+02	7.41E+02	8.20E+02	6.43E+02	1.30E+03	9.27E+02	1.08E+03	9.69E+02	9.78E+02
Seabrook 1						1.33E+03	1.13E+02	3.86E+02	5.01E+02	5.63E+02
Sequoyah 1&2	1.82E+03	6.33E+02	2.46E+02	1.19E+02	2.01E+02	1.15E+03	8.53E+02	1.65E+03	1.44E+03	5.60E+02
South Texas 1					1.99E+02	3.17E+02	3.45E+02	6.21E+02	6.19E+02	1.13E+02
South Texas 2						2.72E+02	4.70E+02	4.69E+02	7.42E+02	1.13E+02
St. Lucie 1	2.21E+02	2.86E+02	2.78E+02	3.38E+02	2.75E+02	4.05E+02	2.57E+02	4.06E+02	4.00E+02	2.58E+02
St. Lucie 2	2.21E+02	3.64E+02	2.78E+02	3.38E+02	2.75E+02	4.05E+02	2.84E+02	4.06E+02	4.00E+02	2.51E+02
Summer 1	2.25E+02	3.11E+02	3.75E+02	7.36E+02	7.55E+02	6.85E+02	4.22E+02	8.13E+02	6.08E+02	4.79E+02
Surry 1&2	8.12E+02	7.50E+02	8.73E+02	8.15E+02	4.94E+02	4.29E+02	1.11E+03	9.13E+02	9.74E+02	1.32E+03
Three Mile Island 1	1.72E+00	9.06E+00	1.69E+02	1.97E+02	3.02E+02	3.73E+02	2.10E+02	3.59E+02	5.61E+02	3.76E+02
Three Mile Island 2	1.56E-04	2.22E-03	1.60E-03	1.48E-03	5.49E-03	9.76E-04	8.80E-04	6.19E-03	3.53E-03	1.59E-02
TMI 2/Epicor	N/D	**	**	**	**	**	**	**	**	**
Trojan	1.87E+02	2.65E+02	2.43E+02	1.75E+02	3.75E+02	3.18E+02	2.19E+02	1.69E+02	1.96E+02	1.22E+03

\*\* Included with Three Mile Island 2 total

N/D = Not Detectable

Table 6

## Liquid Effluents Comparison By Year

Facility	Tritium (Curies)										
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	
Pressurized Water Reactors											
Turkey Point 3&4	8.91E+02										
Turkey Point 3		4.33E+02	3.64E+02	2.69E+02	2.99E+02	2.29E+02	3.22E+02	1.02E+02	2.21E+02	2.57E+02	
Turkey Point 4		4.33E+02	3.64E+02	2.69E+02	2.99E+02	2.29E+02	3.22E+02	1.32E+02	2.21E+02	2.57E+02	
Vogtle 1&2				3.21E+02	3.90E+02	9.18E+02	1.17E+03	1.09E+03	1.48E+03	7.61E+02	
Waterford 3		2.54E+01	4.31E+02	5.25E+02	5.03E+02	3.58E+02	7.12E+02	3.44E+02	4.95E+02	4.90E+02	
Wolf Creek 1		1.83E+02	3.77E+02	3.17E+02	4.06E+02	5.88E+02	5.90E+02	7.17E+02	4.51E+02	9.99E+02	
Yankee Rowe 1	1.64E+02	2.28E+02	1.76E+02	2.19E+02	1.96E+02	1.68E+02	1.92E+02	2.03E+02	6.31E+01	5.01E-01	
Zion 1	1.74E+02	1.35E+02	2.67E+02	2.16E+02	4.11E+02	1.81E+02	2.90E+02	**	**	**	
Zion 2	5.11E+02	5.21E+02	4.46E+02	4.40E+02	5.58E+02	8.66E+02	3.91E+02	9.30E+02	5.22E+02	1.24E+03	
<b>Total</b>	<b>2.27E+04</b>	<b>2.78E+04</b>	<b>2.32E+04</b>	<b>2.81E+04</b>	<b>2.71E+04</b>	<b>3.40E+04</b>	<b>3.18E+04</b>	<b>3.74E+04</b>	<b>3.55E+04</b>	<b>3.56E+04</b>	

\*\* Included with Zion 2 total

Table 7

## Liquid Effluents Comparison By Year

## Mixed Fission and Activation Products (Curies)

## Boiling Water Reactors

Facility	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Big Rock Point 1	1.10E+00	2.02E+00	7.70E-01	3.92E-01	2.74E-01	9.03E-01	7.82E-01	3.91E-01	2.60E-01	7.82E-02
Browns Ferry 1,2 & 3	8.00E-01	2.70E+00	3.95E+00	1.19E+00	1.32E+01	1.02E+01	9.38E+00	2.24E+00	5.36E+01	1.28E+01
Brunswick 1&2		1.89E+00	3.29E+00	6.22E+00	3.48E+00	5.10E+00	1.26E+00	2.20E+00	2.32E+00	1.08E+00
Clinton 1										
Cooper	1.40E+00	1.74E+00	7.00E-02	7.50E-01	3.05E+00	< 2.48E+00	< 1.10E+01	< 3.61E+00	< 5.44E+00	< 1.23E+01
Dresden 1	6.90E+00	8.40E-01	3.60E-01	6.00E-01	3.26E-01	2.65E-02	N/D	N/D	N/D	N/D
Dresden 2-3	3.31E+01	8.10E-01	1.21E+00	4.40E-01	3.99E-01	2.65E-01	7.16E-01	6.12E-02	1.91E-02	1.24E-02
Duane Arnold		< 1.00E-02	< 1.00E-02	2.32E-03	2.73E-01	5.10E-04	N/D	N/D	4.16E-06	N/D
Fermi 2										
James A. Fitzpatrick		5.32E+00	6.01E+00	8.85E-01	1.58E+00	6.46E-01	1.51E+00	2.51E+00	6.50E-01	7.71E-01
Grand Gulf 1										4.42E-03
Edwin I. Hatch 1		6.00E-02	4.00E-02	2.50E+01	4.03E-02	4.82E-02	6.83E-02	3.73E-01	7.00E-01	9.09E-01
Edwin I. Hatch 2							4.57E-02	1.63E-01	1.83E-01	3.29E-01
Hope Creek 1										
Humboldt Bay 3	4.40E+00	3.79E+00	9.90E-01	9.17E-01	1.95E-01	9.55E-02	1.39E-01	1.55E-01	3.46E-01	9.89E-02
LaCrosse	1.31E+01	1.42E+01	< 5.78E+00	2.13E+01	8.86E+00	1.67E+00	2.13E+00	2.26E-01	5.83E+00	3.75E+00
LaSalle 1&2									9.82E-01	8.60E+00
Limerick 1&2										
Millstone 1	1.98E+02	1.99E+02	9.65E+00	5.27E-01	1.75E-01	2.10E-01	7.24E-01	3.94E-01	1.15E+00	8.08E-01
Monticello	N/D	N/D	N/D	N/D	N/D	N/D	N/D	3.11E-06	5.80E-07	N/D
Nine Mile Point 1	2.56E+01	2.10E+01	2.14E+00	3.03E-01	N/D	1.89E+00	N/D	5.35E+00	2.51E-03	1.11E-02
Nine Mile Point 2										
Oyster Creek 1	7.00E-01	4.10E-01	2.20E-01	9.81E-02	1.53E-02	6.59E-03	5.06E-01	2.48E-01	8.10E-02	3.63E-03
Peach Bottom 2&3	9.00E-01	9.30E-01	3.38E+00	2.23E+00	5.11E+00	1.95E+01	1.90E+00	1.97E+00	9.33E+00	2.24E+00
Perry 1										
Pilgrim 1	4.20E+00	8.01E+00	2.33E+00	3.41E+00	1.77E+00	5.12E-01	2.73E+00	1.94E+00	8.72E-01	9.35E-01
Quad-Cities 1&2	3.88E+01	1.71E+01	6.99E+00	1.34E+00	2.24E+00	1.31E+00	1.31E+01	3.27E+00	4.03E-01	1.37E-01
River Bend 1										
Shoreham 1										
Susquehanna 1&2									< 1.99E-01	2.49E+00
Vermont Yankee 1	N/D	< 1.00E-02	< 1.00E-02	1.55E-01	N/D	2.40E-04	N/D	1.02E-02	N/D	N/D
WNP-2										
<b>Total</b>	3.29E+02	< 2.80E+02	< 4.72E+01	6.58E+01	4.10E+01	< 4.49E+01	< 4.60E+01	< 2.51E+01	< 8.24E+01	< 4.74E+01
* Fort St. Vrain						1.89E-04	6.37E-05	3.64E-04	4.34E-04	1.73E-02

\* High temperature gas cooled reactor

N/D = Not Detectable

Table 7

## Liquid Effluents Comparison By Year

## Mixed Fission and Activation Products (Curies)

Boiling Water Reactors

Facility	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Big Rock Point 1	1.48E-01	1.53E-01	7.09E-02	2.73E-01	2.18E-01	2.32E-01	3.64E-02	1.22E-01	1.50E-01	9.71E-02
Browns Ferry 1,2 & 3	6.30E+00	1.34E+00	5.39E-01	3.25E-01	2.42E-01	1.71E-01	3.02E-01	8.39E-01	2.41E+00	4.80E+00
Brunswick 1&2	5.65E-01	1.15E-01	1.26E-01	7.15E-01	8.32E-01	1.56E+00	4.57E-01	4.36E-01	4.94E-02	1.04E-01
Clinton 1				1.54E-02	1.10E-01	1.74E-02	2.53E-02	3.29E-02	1.82E-02	N/D
Cooper	< 6.30E+00	< 1.30E+01	< 7.40E+00	2.25E+00	2.33E+00	2.19E+00	2.04E+00	2.29E+00	3.97E+00	2.31E+00
Dresden 1	N/D	N/D	N/D	N/D	+	+	+	+	+	+
Dresden 2-3	1.15E-01	2.03E+00	2.14E-01	3.78E-01	1.16E-01	6.53E-01	7.12E-01	7.63E-01	2.21E-02	1.62E-01
Duane Arnold	1.90E-09	8.24E-04	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Fermi 2			3.67E-03	2.10E-02	7.41E-02	1.68E-01	2.18E-01	2.15E-01	1.52E-04	1.48E-03
James A. Fitzpatrick	9.79E-02	1.80E-01	1.92E-02	7.84E-02	4.86E-02	5.46E-02	2.74E-02	3.08E-02	1.15E-02	1.89E-03
Grand Gulf 1	3.16E-02	2.13E-01	3.01E-01	3.64E-01	3.96E-01	3.20E-01	6.45E-01	8.76E-01	1.20E-01	1.66E-01
Edwin I. Hatch 1	1.05E+00	4.80E-01	4.88E-01	6.85E-01	**	**	**	**	**	**
Edwin I. Hatch 2	2.67E-01	2.63E-01	3.02E-01	1.30E-01	9.83E-01	2.48E-01	3.01E-01	7.23E-01	7.54E-01	5.55E-01
Hope Creek 1			7.56E-01	1.62E+00	7.24E-01	1.05E+00	1.49E+00	7.88E-01	3.06E-01	3.61E-01
Humboldt Bay 3	1.64E-01	1.25E-01	4.69E-02	1.19E-02	7.60E-03	8.42E-03	5.77E-03	6.88E-03	9.81E-03	9.68E-03
LaCrosse	3.26E+00	1.83E+00	5.00E+00	1.16E+00	4.47E-01	1.69E-01	6.86E-02	1.59E-01	5.23E-02	3.82E-02
LaSalle 1&2	8.48E-02	3.84E+00	1.78E-02	8.89E-01	1.10E+01	4.01E-01	2.46E-02	N/D	2.84E-04	N/D
Limerick 1&2	6.45E-04	2.18E-02	5.74E-03	7.45E-02	N/D	1.12E-01	3.43E-01	3.34E-02	2.95E-02	1.45E-01
Millstone 1	3.78E-02	4.66E-01	7.73E-01	1.14E+00	1.08E+00	9.06E-01	1.39E-01	1.36E+00	4.63E-01	1.28E-01
Monticello	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Nine Mile Point 1	N/D	N/D	< 6.70E-04	N/D	N/D	N/D	1.95E-03	N/D	N/D	N/D
Nine Mile Point 2				1.30E+00	3.08E+00	2.20E-01	6.34E-02	1.68E-01	2.60E-01	1.17E-01
Oyster Creek 1	6.84E-03	N/D	N/D	6.63E-03	2.68E-02	5.01E-02	6.70E-05	1.61E-04	N/D	N/D
Peach Bottom 2&3	6.15E+00	2.16E+00	4.59E-01	3.31E-01	2.02E-01	1.13E-01	1.36E-02	3.73E-02	2.62E-02	5.66E-02
Perry 1			3.67E-03	1.47E-02	2.50E-01	1.16E+00	6.10E-01	1.18E-01	5.98E-02	1.55E-01
Pilgrim 1	4.75E+00	1.06E+00	< 2.11E-01	< 1.47E+00	3.56E-02	2.49E-02	1.56E-02	3.40E-02	3.36E-03	2.28E-02
Quad-Cities 1&2	7.23E-02	1.46E+00	2.36E-01	7.10E-02	5.60E-02	4.84E-01	1.13E-01	7.33E-01	3.92E-02	6.14E-02
River Bend 1			1.06E-01	7.96E-02	5.58E-01	1.11E+00	7.37E-01	3.62E-01	1.66E+00	9.73E-01
Shoreham 1			7.17E-03	3.41E-03	1.98E-05	1.78E-05	N/D	1.74E-04	6.03E-04	2.59E-05
Susquehanna 1&2	1.45E-01	6.35E-01	7.92E-01	3.12E-01	9.48E-02	1.02E-01	1.34E-01	6.21E-02	4.84E-02	4.92E-02
Vermont Yankee 1	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D	2.66E-05	N/D
WNP-2	2.74E-02	1.09E-02	2.32E-02	1.21E-02	6.10E-03	5.04E-02	1.53E-02	3.45E-02	9.49E-02	2.06E-01
<b>Total</b>	< 2.96E+01	< 2.94E+01	< 1.79E+01	< 1.37E+01	2.29E+01	1.16E+01	8.54E+00	1.02E+01	1.06E+01	1.05E+01
* Fort St. Vrain	1.27E-03	1.84E-03	2.30E-05	1.18E-06	1.69E-04	1.22E-05	8.22E-05	1.21E-04	4.35E-05	1.74E-02

\* High temperature gas cooled reactor

\*\* Included with Edwin I. Hatch 2 total

+ Included with Dresden 2-3 total

N/D = Not Detectable

Table 8

## Liquid Effluents Comparison By Year

## Mixed Fission and Activation Products (Curies)

Pressurized Water Reactors

Facility	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Arkansas One 1	6.50E+00	3.11E+00	1.31E+01	4.50E+00	6.05E+00	3.09E+00	3.42E+00	7.50E+00	5.80E+00	4.30E+00
Arkansas One 2						1.30E+00	4.13E+00	2.95E+00	5.90E+00	3.70E+00
Beaver Valley 1&2			1.70E-01	6.52E-01	2.63E-01	1.21E-01	1.04E-01	1.44E-01	1.47E-01	6.09E-02
Braidwood 1										
Braidwood 2										
Byron 1&2										
Callaway 1										
Calvert Cliffs 1&2		1.44E+00	1.18E+00	3.48E+00	6.13E+00	7.80E+00	4.53E+00	2.68E+00	5.26E+00	2.24E+00
Catawba 1										
Catawba 2										
Comanche Peak 1										
Donald C. Cook 1&2		2.60E-01	1.87E+00	1.52E+00	1.48E+00	2.58E+00	1.37E+00	1.86E+00	1.90E+00	6.83E-01
Crystal River 3				1.54E-02	2.96E-02	4.16E-01	1.46E-01	1.29E-01	1.07E-01	1.50E-01
Davis-Besse 1				2.60E-02	9.01E-02	4.28E-02	2.07E-01	7.92E-01	2.19E-01	5.39E-01
Diablo Canyon 1&2										
Joseph M. Farley 1					1.03E-01	5.86E-02	6.18E-02	1.31E-01	5.94E-02	5.75E-02
Joseph M. Farley 2								2.69E-02	2.90E-02	2.04E-02
Fort Calhoun 1	2.30E+00	3.60E-01	5.50E-01	3.63E-01	5.95E-01	2.45E-01	5.33E-01	1.75E-01	2.03E-01	1.44E-01
R. E. Ginna	1.00E-01	4.20E-01	6.90E-01	6.47E-02	6.07E-02	8.63E-02	1.96E-02	3.85E-02	6.17E-01	1.93E-01
Haddam Neck	2.20E+00	1.20E+00	1.30E-01	1.71E+00	9.50E-01	8.67E-01	2.76E-01	7.12E-01	6.9E-02	4.80E-01
Harris 1										
Indian Point 1&2	4.20E+00	4.93E+00	< 4.98E+00	3.02E+00	1.99E+00	1.94E+00	1.26E+00	5.67E+00	2.41E+00	4.02E+00
Indian Point 3			Shown With	Other Unit	1.03E+00	4.02E-01	2.90E+00	2.62E+00	5.46E-01	5.44E-01
Kewaunee	4.00E-01	7.20E-01	2.83E+00	1.26E+00	6.99E-01	8.94E-01	6.17E-01	8.15E-01	1.52E+00	5.43E-01
Maine Yankee	4.00E+00	3.21E+00	< 2.84E+00	4.42E-01	1.04E-01	4.63E-01	2.97E-01	4.36E-01	7.03E-01	1.99E-01
McGuire 1								3.94E-01	1.75E+00	1.87E+00
McGuire 2										1.87E+00
Millstone 2		2.00E-02	2.60E-01	1.56E+00	2.79E+00	4.87E+00	2.81E+00	4.18E+00	1.39E+01	7.81E+00
Millstone 3										
North Anna 1&2					2.68E-01	5.89E-01	1.05E+00	6.76E-01	1.32E+00	5.88E+00
Oconee 1,2&3	1.90E+00	5.05E+00	7.93E+00	3.62E+01	6.51E+00	9.24E-01	1.54E+00	1.75E+00	1.04E+00	1.43E+00
Palisades	5.90E+00	3.45E+00	4.40E-01	9.29E-02	9.65E-02	1.28E-01	8.73E-03	3.31E-02	1.27E-01	7.48E-02
Palo Verde 1										
Palo Verde 2										
Palo Verde 3										
Point Beach 1&2	2.00E-01	2.34E+00	3.24E+00	1.50E+00	6.86E-01	7.25E-01	6.29E-01	1.01E+00	2.95E+00	1.27E+00
Prairie Island 1&2	< 1.00E-01	4.50E-01	1.00E-01	1.33E-02	4.94E-03	9.00E-03	1.32E-02	9.12E-03	2.23E-03	3.16E-02
Rancho Seco 1		< 1.00E-02	N/D	N/D	N/D	N/D	3.78E-03	5.92E-01	2.16E-01	2.81E-01
H. B. Robinson 2	2.50E+00	4.50E-01	3.80E-01	3.29E-01	1.78E-01	2.99E-01	3.58E-01	1.84E+00	1.20E+00	8.23E-01
Salem 1			< 1.00E-02	2.88E+00	4.02E+00	3.98E+00	2.65E+00	2.80E+00	3.22E+00	2.97E+00
Salem 2							3.89E-01	1.51E+00	3.21E+00	2.85E+00
San Onofre 1	5.00E+00	1.22E+00	7.43E+00	9.84E+00	1.18E+01	1.10E+01	1.12E+01	3.64E+00	2.15E+00	1.22E+00
San Onofre 2-3									6.32E-01	2.79E+00
Seabrook 1										
Sequoyah 1&2							N/R	2.76E+00	9.82E+00	4.61E+00
South Texas 1										
South Texas 2										
St. Lucie 1			8.00E-02	5.80E+00	2.80E+00	2.67E+00	2.36E+00	2.46E+00	3.07E+00	2.99E+00
St. Lucie 2										4.37E-01
Summer 1									1.24E-04	1.47E+00
Surry 1&2	3.80E+00	9.27E+00	3.37E+01	6.55E+01	2.41E+00	2.53E+00	3.85E+00	6.11E+00	6.68E+00	1.45E+01
Three Mile Island 1	1.30E+00	7.00E-02	1.00E-01	1.94E-01	6.14E-01	4.91E-01	1.83E-01	8.69E-02	5.29E-02	8.12E-02
Three Mile Island 2					3.92E-01	3.31E-01	1.45E-05	2.22E-05	4.25E-05	9.03E-05
TMI 2/Epicor							N/D	N/D	N/D	N/D
Trojan			2.77E+00	4.19E+00	7.07E-01	5.55E-01	7.87E-01	9.94E-01	8.56E-01	3.10E-01

N/R = Not Reported

N/D = Not Detectable

Table 8

## Liquid Effluents Comparison By Year

## Mixed Fission and Activation Products (Curies)

Pressurized Water Reactors

Facility	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Turkey Point 3&4	1.60E+00	3.07E+00	8.65E+00	8.90E+00	3.32E+00	4.10E-01	6.78E-01	3.03E-01	1.68E+00	1.13E+00
Turkey Point 3										
Turkey Point 4										
Vogtle 1&2										
Waterford 3										
Wolf Creek 1										
Yankee Rowe 1	< 1.00E-01	2.00E-02	< 1.00E-02	1.80E-02	8.14E-02	1.17E-02	1.75E-02	1.43E-02	9.53E-03	1.30E-02
Zion 1	< 1.00E-01	< 1.00E-02	1.60E-01	9.50E-01	9.51E-01	7.00E-01	4.74E-01	1.81E+00	7.22E-01	1.50E+00
Zion 2								1.05E+00	1.65E+00	1.15E+00
<b>Total</b>	< 4.22E+01	< 4.11E+01	< 9.36E+01	1.55E+02	5.72E+01	5.05E+01	4.89E+01	6.05E+01	8.17E+01	7.72E+01

Table 8

## Liquid Effluents Comparison By Year

## Mixed Fission and Activation Products (Curies)

Pressurized Water Reactors

Facility	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Arkansas One 1	4.10E+00	3.53E+00	5.09E+00	2.45E+00	3.73E+00	2.04E+00	2.36E+00	1.12E+00	3.59E+00	1.75E+00
Arkansas One 2	2.48E+00	4.36E+00	3.43E+00	1.85E+00	4.46E+00	2.65E+00	2.52E-01	2.73E+00	1.85E+00	4.77E-01
Beaver Valley 1&2	2.03E-01	1.13E-01	1.19E-01	6.69E-01	1.02E-01	5.45E-01	2.55E+00	3.14E-01	3.41E-01	3.96E-01
Braidwood 1				5.00E-02	8.57E+00	2.50E+00	2.13E+00	1.01E+01	5.23E-01	4.77E-01
Braidwood 2					3.04E+00	2.52E+00	2.13E+00	1.01E+01	5.23E-01	4.77E-01
Byron 1&2		1.63E+01	4.05E+00	2.48E+00	1.40E+00	6.35E-01	1.18E+00	6.70E-01	4.10E+00	1.26E+00
Callaway 1	1.07E-03	4.97E-03	3.83E-02	4.92E-01	7.74E-02	1.01E-02	3.86E-02	1.59E-02	4.54E-03	4.01E-02
Calvert Cliffs 1&2	1.64E+00	2.38E+00	1.79E+00	5.19E+00	2.64E+00	2.07E+00	1.42E+00	1.59E+00	1.44E+00	1.55E+00
Catawba 1		1.26E+00	3.82E-01	6.53E-01	5.42E-01	3.42E-01	9.78E-01	3.81E-01	4.65E-01	4.47E-01
Catawba 2			3.82E-01	6.53E-01	5.42E-01	3.42E-01	9.78E-01	3.81E-01	4.65E-01	4.47E-01
Comanche Peak 1							1.19E-02	1.57E-01	3.99E-01	4.18E-01
Donald C. Cook 1&2	1.19E+00	2.26E+00	3.34E-01	2.00E+00	4.44E-01	8.06E-01	1.61E+00	1.03E+00	1.12E+00	5.37E-01
Crystal River 3	2.34E-01	1.51E+00	8.12E-01	9.55E-01	2.31E-01	2.36E-01	6.19E-01	1.80E-01	1.63E+00	5.30E-01
Davis-Besse 1	1.89E-01	1.85E-01	6.15E-02	6.51E-02	1.68E-01	1.84E-01	1.41E-01	1.84E-01	1.10E-01	5.21E-02
Diablo Canyon 1&2	1.16E-02	3.20E+00	1.11E+01	2.86E+00	2.00E+00	1.61E+00	2.80E+00	8.47E-01	7.44E-01	9.85E-01
Joseph M. Farley 1	6.34E-02	5.72E-02	1.02E-01	5.09E-02	7.97E-02	7.31E-02	7.47E-02	2.14E-01	1.77E-01	7.60E-02
Joseph M. Farley 2	8.63E-02	3.77E-02	8.28E-02	4.63E-02	8.53E-02	7.34E-02	8.29E-02	1.90E-01	1.77E-01	1.12E-01
Fort Calhoun 1	2.91E+00	2.88E-01	8.37E-02	2.03E-01	3.08E-01	5.62E-01	8.05E-01*	2.08E+00	5.90E-01	5.19E-01
R. E. Ginna	1.69E-01	5.22E-01	6.47E-02	5.88E-02	3.43E-02	8.12E-02	1.50E-01	1.52E-01	3.42E-01	1.37E-01
Haddam Neck	2.63E-01	8.44E-02	3.10E-01	4.26E-01	6.87E-01	3.90E-01	2.69E+00	7.43E-01	1.73E-01	8.36E-01
Harris 1				9.08E-01	8.04E-02	2.42E-01	7.31E-01	6.62E-01	3.14E-01	7.79E-02
Indian Point 1&2	2.67E+00	1.85E+00	3.61E+00	6.02E+00	2.84E+00	6.38E-01	1.06E+00	1.30E+00	1.53E+00	7.24E-01
Indian Point 3	1.26E+00	4.18E-01	1.95E-01	3.47E-01	3.22E-01	5.92E-01	3.09E-01	2.86E-01	2.13E-01	1.07E-01
Kewaunee	1.01E+00	1.35E+00	5.33E-01	1.29E+00	5.01E-01	1.22E+00	2.06E-01	2.35E-01	6.42E-02	1.20E-01
Maine Yankee	8.62E-02	3.11E-02	2.99E-01	8.81E-01	3.49E-01	1.83E-01	1.87E-01	4.13E-01	2.51E-01	1.62E-01
McGuire 1	1.51E+00	6.21E-01	7.73E-01	1.57E+00	2.57E+00	1.54E+00	2.00E+00	1.04E+00	3.27E-01	2.85E-01
McGuire 2	1.51E+00	6.21E-01	7.73E-01	1.57E+00	2.57E+00	1.54E+00	2.00E+00	1.04E+00	3.27E-01	2.85E-01
Millstone 2	3.55E+00	4.60E+00	4.49E+00	4.07E+00	8.89E+00	1.06E+01	6.76E+00	2.06E+00	2.14E+00	1.18E+00
Millstone 3			3.01E+00	5.40E+00	3.15E+00	5.94E+00	2.47E+00	2.99E+00	2.42E+00	2.24E+00
North Anna 1&2	4.51E+00	5.07E+00	9.41E-01	1.33E+00	4.32E-01	1.16E+00	6.75E-01	3.20E-01	4.98E-01	4.83E-01
Oconee 1,2,& 3	1.58E+00	4.16E+00	3.02E+00	2.90E+00	3.10E+00	3.82E+00	3.11E+00	1.40E+00	2.58E+00	4.70E-01
Palisades	3.68E-02	5.83E-02	1.40E-01	9.23E-02	3.43E-02	3.75E-03	7.75E-03	1.14E-02	3.88E-03	1.40E-02
Palo Verde 1		N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Palo Verde 2			N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Palo Verde 3				N/D	N/D	N/D	N/D	N/D	N/D	N/D
Point Beach 1&2	1.22E+01	1.90E+00	1.60E+01	7.55E-01	9.58E-02	5.58E-02	1.16E-02	5.89E-02	4.29E-01	2.32E-01
Prairie Island 1&2	1.91E-02	2.75E-02	6.01E-01	6.04E-02	2.55E-01	1.73E-01	1.30E-01	1.85E-01	6.66E-01	1.95E-01
Rancho Seco 1	6.33E-01	7.39E-03	1.45E-03	5.78E-04	5.79E-03	2.15E-03	2.08E-04	2.04E-04	4.83E-04	3.92E-04
H. B. Robinson 2	3.90E-01	9.41E-02	2.61E-01	7.36E-01	9.64E-01	2.82E-01	3.60E-01	2.36E-01	2.20E-01	5.47E-02
Salem 1	3.31E+00	2.88E+00	4.35E+00	3.33E+00	3.21E+00	3.11E+00	3.00E+00	3.35E+00	3.27E+00	3.21E+00
Salem 2	2.75E+00	2.80E+00	6.11E+00	4.07E+00	3.23E+00	3.56E+00	3.14E+00	2.31E+00	3.63E+00	3.65E+00
San Onofre 1	2.74E+00	7.79E+00	8.51E-01	8.42E-01	7.11E-01	6.87E-01	4.03E-01	4.22E-01	3.79E-01	1.14E+00
San Onofre 2-3	1.30E+01	1.12E+01	8.20E-01	5.37E-01	1.16E+00	9.19E-01	2.02E-01	9.94E-02	1.03E-01	2.94E-01
Seabrook 1						1.09E-04	2.21E-03	1.22E-01	1.19E-01	9.18E-02
Sequoyah 1&2	3.23E+00	1.45E+00	1.65E-01	4.66E-01	4.48E-01	3.54E-01	1.22E+00	1.48E+00	1.45E+00	1.52E+00
South Texas 1					2.24E-01	3.02E+00	7.09E+00	5.08E+00	2.12E+00	5.73E-01
South Texas 2						1.17E-02	5.72E+00	3.61E+00	1.74E+00	2.94E-01
St. Lucie 1	1.93E+00	2.72E+00	2.53E+00	5.95E-01	2.64E-01	2.56E-01	8.27E-01	3.98E-01	5.12E-01	7.55E-01
St. Lucie 2	1.93E+00	2.75E+00	2.43E+00	5.42E-01	2.59E-01	2.53E-01	7.68E-01	3.09E-01	5.12E-01	6.79E-01
Summer 1	4.54E+00	7.09E-01	3.26E-01	4.88E-01	7.55E-01	1.37E+00	3.56E-01	6.08E-01	2.23E-01	1.93E-01
Surry 1&2	9.73E+00	8.55E+00	8.77E+00	5.17E+00	2.41E+00	3.87E+00	4.60E+00	2.84E+00	8.27E-02	2.08E-02
Three Mile Island 1	3.41E-02	6.30E-03	1.41E-02	4.41E-02	4.68E-02	1.61E-02	2.36E-02	3.50E-02	2.60E-02	8.82E-02
Three Mile Island 2	6.46E-04	1.77E-04	1.87E-04	1.16E-04	1.12E-03	3.15E-04	1.77E-04	8.82E-05	1.22E-04	7.68E-04
TMI 2/Epicor	N/D	**	**	**	**	**	**	**	**	**
Trojan	3.49E-01	4.65E-01	2.64E-01	2.09E-01	2.01E-01	1.61E-01	1.44E-01	5.80E-02	8.95E-02	1.06E-01

\* This number is a correction to that reported in the 1990 report

\*\* Included with Three Mile Island 2 total

N/D = Not Detectable



Table 8

## Liquid Effluents Comparison By Year

## Mixed Fission and Activation Products (Curies)

Pressurized Water Reactors

Facility	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Turkey Point 3&4	2.27E-01									
Turkey Point 3		4.48E-01	2.53E-01	3.74E-01	3.27E-01	1.58E-01	1.41E-01	4.06E-01	2.96E-01	2.38E-01
Turkey Point 4		4.48E-01	2.53E-01	3.74E-01	3.26E-01	1.58E-01	1.40E-01	3.29E-01	2.98E-01	2.39E-01
Vogtle 1&2				5.77E-01	1.66E+00	4.03E-01	1.01E+00	2.76E-01	1.94E-01	1.52E+00
Waterford 3		2.88E-01	4.02E+00	1.28E+00	1.41E+00	1.28E+00	7.30E-01	9.10E-01	1.31E+00	6.04E-01
Wolf Creek 1		6.35E-01	2.26E+00	2.90E-01	3.79E-01	7.23E-01	3.15E-01	2.12E+00	2.91E-01	7.05E-01
Yankee Rowe 1	3.06E-02	1.69E-02	1.36E-02	1.56E-02	7.10E-02	4.88E-03	4.17E-03	1.33E-02	6.23E-03	7.19E-04
Zion 1	6.82E+00	3.24E-01	5.57E-01	7.53E-01	1.61E+00	9.07E-01	2.65E+00	**	**	**
Zion 2	7.06E+00	2.05E+00	1.04E+00	8.20E-01	1.97E+00	2.57E+00	9.26E-01	1.68E+00	1.81E+00	1.13E+00
<b>Total</b>	1.02E+02	1.02E+02	9.79E+01	6.99E+01	7.60E+01	6.95E+01	7.84E+01	7.19E+01	4.92E+01	3.52E+01

\*\* Included with Zion 2 total

Table 9

## Solid Waste Summary 1993

Boiling Water Reactors	Volume	Activity	No. Of
Facility	(Cubic Meters)	(Curies)	Shipments
Big Rock Point 1	0.00E+00	0.00E+00	0 ***
Browns Ferry 1,2,&3	2.89E+02	6.44E+04	86
Brunswick 1&2	3.92E+02	2.10E+03	114
Clinton 1	8.77E+01	5.68E+02	27
Cooper	3.04E+02	1.04E+03	33
Dresden 1,2,&3	2.13E+03	2.06E+04	138
Duane Arnold	4.46E+01	5.13E+04	16
Fermi 2	0.00E+00	0.00E+00	0 ***
James A. Fitzpatrick	4.54E+02	3.45E+04	39
Grand Gulf 1	1.90E+02	3.79E+02	82
Edwin I. Hatch 1&2	2.43E+02	2.19E+05	49
Hope Creek 1	1.86E+02	6.64E+03	57
Humboldt Bay 3	0.00E+00	0.00E+00	0
LaCrosse	5.04E+00	2.43E-01	3
LaSalle 1&2	1.21E+03	1.45E+04	63
Limerick 1&2	3.51E+02	5.74E+02	254
Millstone 1	1.01E+02	1.21E+03	20
Monticello	4.07E+01	8.25E+02	8
Nine Mile Point 1	1.41E+02	6.33E+02	80
Nine Mile Point 2	1.87E+02	3.68E+03	95
Oyster Creek 1	8.04E+02	9.35E+02	52
Peach Bottom 2&3	4.45E+02	6.85E+04	217
Perry 1	1.26E+03	2.90E+03	32
Pilgrim 1	1.66E+02	5.75E+02	72
Quad-Cities 1&2	3.05E+04	2.40E+03	70
River Bend 1	1.62E+02	1.52E+02	75
Shoreham 1	1.52E+02	1.91E+02	25
Susquehanna 1&2	2.73E+02	6.12E+02	61
Vermont Yankee 1	1.30E+02	7.37E+02	93
WNP-2	4.26E+02	1.04E+03	46
<b>Total</b>	<b>4.07E+04</b>	<b>5.00E+05</b>	<b>1907</b>
* Fort St. Vrain	1.10E+03	2.70E+04	120

\* High temperature gas cooled reactor

\*\*\* These plants store waste on-site

Note: If the volume before compaction and the volume after compaction were both given, the volume used for this table is the volume after compaction. If more than one volume was given, both are shown in the individual plant report. If a description of what the volume represents was given, that is also shown in the individual plant report.

Table 10

## Solid Waste Summary 1993

Pressurized Water Reactors			
Facility	Volume (Cubic Meters)	Activity (Cur.es)	No. Of Shipments
Arkansas One 1&2	7.85E+01	1.99E+02	10
Beaver Valley 1&2	1.47E+02	1.37E+03	48
Braidwood 1&2	1.07E+02	1.57E+03	23
Byron 1&2	9.48E+01	4.09E+02	15
Callaway 1	5.18E+01	5.71E+02	19
Calvert Cliffs 1&2	1.39E+03	4.99E+03	31
Catawba 1&2	1.55E+02	1.05E+02	7
Comanche Peak 1	1.04E+02	1.11E+02	26
Donald C. Cook 1&2	0.00E+00	0.00E+00	0 ***
Crystal River 3	4.99E+02	8.89E+02	25
Davis-Besse 1	7.50E+01	7.81E+02	19
Diablo Canyon 1&2	5.53E+01	1.94E+03	42
Joseph M. Farley 1&2	6.67E+01	5.06E+02	64
Fort Calhoun 1	2.42E+01	1.27E+01	33
R.E. Ginna	5.02E+02	5.87E+02	13
Haddam Neck	6.05E+01	3.66E+03	21
Harris 1	6.51E+01	3.75E+02	87
Indian Point 1&2	1.94E+02	4.07E+02	21
Indian Point 3	2.46E+02	3.12E+01	7
Kewaunee	4.38E+00	4.30E+00	1
Maine Yankee	0.00E+00	0.00E+00	0
McGuire 1&2	9.90E+01	3.02E+02	25
Millstone 2	1.07E+02	4.49E+02	18
Millstone 3	5.44E+01	3.70E+01	9
North Anna 1&2	2.77E+02	6.07E+02	68
Oconee 1,2,&3	1.23E+02	2.03E+04	46
Palisades	0.00E+00	0.00E+00	0 ***
Palo Verde 1,2,&3	2.29E+02	6.43E+02	145
Point Beach 1&2	5.32E+01	2.42E+02	42
Prairie Island 1&2	7.70E+00	2.83E+02	2
Rancho Seco 1	0.00E+00	0.00E+00	0
H.B. Robinson 2	4.41E+01	2.57E+01	75
Salem 1&2	5.62E+01	5.04E+01	18
* San Onofre	7.39E+01	4.74E+01	99
San Onofre 1	1.85E+01	6.39E+03	0
Seabrook 1	0.00E+00	0.00E+00	0 ***
Sequoyah 1&2	5.47E+01	8.63E+01	68
South Texas 1&2	5.62E+01	6.30E+03	21
St. Lucie 1&2	8.80E+01	1.24E+04	26
Summer 1	1.08E+02	1.24E+02	62
Surry 1&2	2.13E+02	5.62E+02	41
Three Mile Island 1	6.14E+02	7.59E+00	24
Three Mile Island 2	5.36E+02	3.31E+02	17
TMI 2/Epicor	**	**	**
Trojan	1.33E+02	3.90E+02	22
Turkey Point 3&4	9.05E+01	1.41E+02	28
Vogtle 1&2	6.85E+01	2.23E+02	40
Waterford 3	2.51E+02	1.03E+02	8
Wolf Creek 1	6.88E+01	7.62E+02	6
Yankee Rowe 1	2.98E+02	1.71E+04	73
Zion 1&2	1.22E+02	9.94E+02	24
<b>Total</b>	<b>7.76E+03</b>	<b>8.75E+04</b>	<b>1519</b>

\* Represents solid waste shipped by plant but not broken down into units 1, 2, & 3

\*\* Included with Three Mile Island 2 totals

\*\*\* These plants store waste on-site

Note: If the volume before compaction and the volume after compaction were both given, the volume used for this table is the volume after compaction. If more than one volume was given, both are shown in the individual plant report. If a description of what the volume represents was given, that is also shown in the individual plant report.

Table 11

## Solid Waste Comparison By Year

Boiling Water Reactors	Volume (Cubic Meters) - Activity (Curies)							
	Facility	1978		1979		1980		1981
Big Rock Point 1	3.10E+01	2.56E+01	8.99E+01	2.77E+02	4.20E+01	3.09E+01	1.44E+02	3.17E+02
Browns Ferry 1,2.&3	2.90E+03	1.33E+03	2.29E+03	4.17E+03	2.49E+03	6.46E+03	2.23E+03	4.78E+03
Brunswick 1&2	2.02E+03	2.14E+03	3.09E+03	4.29E+03	6.73E+03	7.55E+03	4.30E+03	7.47E+03
Clinton 1								
Cooper	3.29E+02	3.84E+02	5.65E+02	9.69E+01	4.35E+02	7.05E+02	4.99E+02	4.43E+02
Dresden 1,2 & 3	1.77E+03	1.88E+03	1.04E+03	8.45E+02	1.16E+03	4.46E+03	1.14E+03	4.59E+03
Duane Arnold	1.10E+03	1.86E+03	7.99E+02	8.01E+02	7.35E+02	7.00E+02	6.97E+02	1.07E+03
Fermi 2								
James A. Fitzpatrick	8.70E+02	3.19E+02	8.04E+02	1.06E+03	7.50E+02	8.86E+02	8.61E+02	1.63E+03
Grand Gulf 1								
Edwin I. Hatch 1	7.50E+02	1.09E+04	9.78E+02	2.70E+02	4.64E+02	9.62E+02	1.29E+03	4.46E+03
Edwin I. Hatch 2					2.59E+02	8.27E+01	1.40E+03	3.05E+02
Hope Creek 1								
Humboldt Bay 3	1.78E+02	7.91E-01	9.06E+01	3.35E+03	8.20E+01	6.95E+01	8.43E+01	5.46E-01
LaCrosse	3.80E+01	6.18E+01	5.09E+00	1.25E+02	4.32E+01	2.02E+01	4.82E+00	6.11E+01
LaSalle 1&2								
Limerick 1&2								
Millstone 1	2.00E+03	8.15E+04	2.11E+03	1.16E+03	2.30E+03	2.36E+03	1.96E+03	1.82E+03
Monticello	4.99E+02	6.35E+04	4.74E+02	1.31E+04	7.42E+02	7.57E+02	5.54E+02	4.42E+02
Nine Mile Point 1	3.85E+02	2.24E+04	4.97E+02	1.52E+03	8.14E+02	2.32E+04	5.31E+02	1.72E+03
Nine Mile Point 2								
Oyster Creek 1	1.54E+03	1.15E+03	1.13E+03	1.34E+03	2.03E+03	1.32E+03	1.78E+03	4.21E+02
Peach Bottom 2&3	1.96E+03	4.97E+03	2.40E+03	8.03E+03	2.64E+03	6.69E+03	2.34E+03	5.33E+03
Perry 1								
Pilgrim 1	1.97E+03	4.92E+04	3.03E+03	2.22E+04	2.94E+03	1.60E+03	1.06E+03	9.38E+02
Quad-Cities 1&2	1.34E+03	3.27E+03	7.82E+02	4.26E+03	1.67E+03	4.07E+03	1.72E+03	5.16E+03
River Bend 1								
Shoreham 1								
Susquehanna 1&2								
Vermont Yankee 1	3.99E+02	5.39E+04	2.71E+02	9.99E+02	4.84E+02	9.20E+02	4.39E+02	1.11E+03
WNP-2								
<b>Total</b>	2.01E+04	2.99E+05	2.04E+04	6.79E+04	2.68E+04	6.28E+04	2.30E+04	4.21E+04
* Fort St. Vrain			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

\* High temperature gas cooled reactor

Table 11

## Solid Waste Comparison By Year

Facility	Boiling Water Reactors							
	Volume (Cubic Meters) - Activity (Curies)							
	1982		1983		1984		1985	
Big Rock Point 1	1.09E+02	4.33E+00	1.01E+02	2.74E+02	3.67E+01	2.13E+00	5.22E+01	1.14E+02
Browns Ferry 1,2.& 3	5.91E+03	5.51E+03	3.72E+03	6.90E+03	1.92E+03	2.15E+03	2.30E+03	3.08E+03
Brunswick 1&2	3.53E+03	5.50E+03	3.51E+03	8.36E+03	1.37E+03	3.45E+03	1.32E+03	2.50E+03
Clinton 1								
Cooper	4.45E+02	4.27E+02	5.03E+02	8.53E+02	4.37E+02	4.91E+02	6.35E+02	2.98E+04
Dresden 1,2.& 3	8.99E+02	1.66E+05+	1.42E+03	2.91E+03	1.26E+03	4.37E+03	1.05E+04	6.63E+04
Duane Arnold	4.57E+02	1.27E+03	6.81E+02	1.44E+03	2.88E+02	9.13E+02	7.93E+02	5.24E+02
Fermi 2								
James A. Fitzpatrick	1.64E+03	7.89E+02	7.11E+02	7.03E+02	4.31E+02	1.26E+03	7.77E+02	7.79E+02
Grand Gulf 1			3.12E+02	7.21E+00	4.31E+02	9.09E+00	6.02E+02	2.60E+02
Edwin 1. Hatch 1	9.13E+02	3.10E+03	1.87E+03	2.27E+03	2.50E+03	2.58E+03	2.04E+03	3.83E+04
Edwin 1. Hatch 2	7.79E+02	9.40E+02	**	**	**	**	**	**
Hope Creek 1								
Humboldt Bay 3	7.71E+01	1.34E+00	2.78E+01	1.75E+04	6.56E+01	7.29E+00	8.31E+02	2.60E+02
LaCrosse	3.53E+01	5.26E+01	1.20E+01	1.88E+02	4.22E+01	1.93E+02	6.30E+01	2.35E+02
LaSalle 1&2	0.00E+00	0.00E+00	6.83E+02	3.01E+01	8.40E+02	1.87E+02	1.21E+03	4.87E+02
Limerick 1&2					0.00E+00	0.00E+00	3.06E+02	2.06E+01
Millstone 1	9.77E+02	1.08E+03	6.93E+02	6.81E+02	9.40E+02	1.97E+03	1.17E+03	9.36E+04
Monticello	7.50E+02	3.89E+03	3.57E+02	4.43E+04	1.24E+03	5.73E+02	5.44E+02	4.87E+03
Nine Mile Point 1	5.76E+02	7.07E+03	7.21E+02	5.42E+04	6.29E+02	1.34E+04	5.75E+02	6.80E+03
Nine Mile Point 2								
Oyster Creek 1	9.96E+02	4.67E+03	1.00E+03	5.61E+02	1.39E+03	4.39E+04	4.62E+02	6.30E+02
Peach Bottom 2&3	3.23E+03	4.51E+03	2.68E+03	2.24E+04	2.26E+03	9.22E+04	2.33E+03	1.21E+05
Perry 1								
Pilgrim 1	2.28E+03	9.59E+02	6.65E+02	1.48E+03	3.12E+03	1.54E+03	1.41E+03	7.48E+04
Quad-Cities 1&2	1.46E+03	3.98E+03	1.58E+03	5.85E+03	1.35E+03	4.06E+04	1.33E+03	5.53E+04
River Bend 1								
Shoreham 1								
Susquehanna 1&2	4.51E+01	6.52E+02	1.26E+03	2.84E+02	1.30E+03	9.27E+02	1.13E+03	2.07E+03
Vermont Yankee 1	4.51E+02	2.09E+02	4.15E+02	5.75E+04	3.48E+02	2.85E+02	5.43E+02	1.73E+04
WNP-2					3.87E+02	3.58E+01	4.02E+02	2.96E+02
<b>Total</b>	2.56E+04	2.10E+05	2.29E+04	2.29E+05	2.26E+04	2.11E+05	3.13E+04	5.19E+05
* Fort St. Vrain	0.00E+00	0.00E+00	2.39E+01	1.84E+01	0.00E+00	0.00E+00	1.10E+02	4.19E+02

\* High temperature gas cooled reactor

+ Includes 12 shipments of poison curtains (irradiated components) to Barnwell, SC

\*\* Included with Edwin 1. Hatch 1 totals

Table 11

## Solid Waste Comparison By Year

Boiling Water Reactors

Volume (Cubic Meters) - Activity (Curies)

Facility	1986		1987		1988		1989	
Big Rock Point 1	9.46E+00	2.52E+02	7.40E+01	2.30E+03	4.44E+01	7.28E+02	7.35E+01	3.71E+02
Browns Ferry 1,2 & 3	1.36E+03	1.49E+03	1.32E+03	6.44E+02	7.81E+02	5.72E+02	5.84E+02	2.95E+02
Brunswick 1&2	9.35E+02	9.83E+03	8.43E+02	4.48E+04	6.89E+02	3.07E+03	0.20E+02	6.06E+03
Clinton 1			5.10E+01	1.41E+01	2.87E+02	6.14E+01	3.99E+02	1.89E+03
Cooper	4.49E+02	5.83E+02	3.41E+02	3.60E+02	3.09E+02	1.47E+02	2.92E+02	3.06E+02
Dresden 1,2 & 3	2.14E+03	3.74E+04	1.80E+03	8.26E+02	2.35E+03	1.54E+03	2.24E+03	2.54E+03
Duane Arnold	2.17E+02	2.15E+04	4.94E+02	2.62E+02	2.12E+02	4.06E+02	1.46E+02	1.89E+04
Fermi 2	1.48E+02	2.12E+01	2.36E+02	9.37E+01	2.38E+02	2.81E+02	3.66E+02	7.01E+02
James A. Fitzpatrick	4.62E+02	7.21E+02	5.13E+02	6.44E+02	3.81E+02	1.32E+04	2.50E+02	9.39E+04
Grand Gulf 1	4.39E+02	1.36E+03	3.92E+02	1.65E+03	4.99E+02	7.15E+02	2.72E+02	2.06E+02
Edwin I. Hatch 1	1.36E+03	8.82E+02	7.78E+02	1.82E+03	8.36E+02	2.02E+03	8.53E+02	1.91E+03
Edwin I. Hatch 2	**	**	**	**	**	**	**	**
Hope Creek 1	8.45E+01	5.17E+00	4.21E+02	3.63E+02	2.92E+02	3.23E+03	1.67E+02	5.27E+02
Humboldt Bay 3	5.99E+02	3.70E+02	0.00E+00	0.00E+00	3.99E+01	9.91E+02	0.00E+00	0.00E+00
LaCrosse	4.81E+00	7.78E+01	2.93E+01	2.86E+03	6.52E+00	7.03E+01	6.74E+00	3.21E+01
LaSalle 1&2	8.02E+02	1.20E+03	7.66E+02	2.30E+03	9.25E+02	3.38E+03	8.80E+02	4.36E+03
Limerick 1&2	5.76E+02	7.53E+02	3.81E+02	2.15E+03	8.95E+02	9.70E+02	5.76E+02	3.40E+04
Millstone 1	7.00E+02	7.85E+02	6.66E+02	5.05E+02	2.79E+02	9.54E+04	4.28E+02	1.99E+04
Monticello	2.94E+02	2.81E+04	2.19E+02	5.66E+02	1.48E+02	2.93E+02	2.48E+02	5.97E+04
Nine Mile Point 1	1.08E+03	7.27E+02	5.07E+02	2.30E+02	2.72E+02	3.07E+02	2.37E+02	2.48E+02
Nine Mile Point 2			9.89E+01	1.14E+01	3.78E+02	3.88E+02	4.22E+02	4.89E+02
Oyster Creek 1	5.92E+02	7.96E+02	2.36E+02	3.48E+04	1.81E+02	6.29E+03	4.20E+02	2.33E+05
Peach Bottom 2&3	1.49E+03	1.88E+04	1.58E+03	3.89E+03	8.38E+02	1.19E+03	8.92E+02	1.73E+03
Perry 1	0.00E+00	0.00E+00	4.89E+02	4.52E+01	4.95E+02	5.59E+02	9.68E+02	9.18E+02
Pilgrim 1	6.01E+02	4.38E+02	5.27E+02	3.15E+02	2.72E+02	2.19E+02	2.02E+02	2.76E+02
Quad-Cities 1&2	1.32E+03	2.14E+03	9.19E+02	2.90E+04	9.25E+02	6.26E+02	9.79E+02	1.33E+05
River Bend 1	4.63E+02	7.99E+01	4.07E+02	3.45E+02	3.06E+02	3.50E+02	5.16E+02	8.41E+02
Shoreham 1	4.47E+01	1.47E+01	6.26E+01	9.57E+02	6.26E+01	1.86E+02	1.79E+01	3.51E+02
Susquehanna 1&2	8.68E+02	2.53E+03	7.18E+02	2.11E+03	1.33E+03	2.65E+03	4.28E+02	1.34E+03
Vermont Yankee 1	3.10E+02	3.33E+02	2.23E+02	1.19E+04	1.73E+02	4.25E+02	4.84E+00	2.15E+00
WNP-2	3.02E+02	5.07E+02	3.75E+02	1.09E+03	4.70E+02	1.01E+03	3.64E+02	1.10E+03
<b>Total</b>	1.77E+04	1.32E+05	1.55E+04	1.43E+05	1.49E+04	1.40E+05	1.39E+04	6.17E+05
* Fort St. Vrain	0.00E+00	0.00E+00	3.02E+01	1.03E+02	7.00E+00	3.10E+01	4.57E+00	1.08E+03

\* High temperature gas cooled reactor

\*\* Included with Edwin I. Hatch 1 totals

Table 11

## Solid Waste Comparison By Year

Facility	Volume (Cubic Meters) - Activity (Curies)							
	+1990		+1991		+1992		+1993	
Big Rock Point 1	8.30E+01	1.26E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00 ***
Browns Ferry 1,2,& 3	2.12E+02	1.04E+02	2.60E+02	3.36E+04	3.12E+02	3.54E+04	2.89E+02	6.44E+04
Brunswick 1&2	4.89E+02	1.26E+03	3.33E+02	1.23E+03	4.16E+02	5.45E+04	3.92E+02	2.10E+03
Clinton 1	2.72E+02	5.44E+02	2.48E+02	8.03E+02	2.34E+02	2.13E+03	8.77E+01	5.68E+02
Cooper	3.08E+02	3.69E+02	2.49E+02	6.17E+02	1.43E+02	1.01E+05	3.04E+02	1.04E+03
Dresden 1,2,& 3	2.41E+03	5.09E+02	2.61E+03	9.87E+02	2.46E+03	3.32E+04	2.13E+03	2.06E+04
Duane Arnold	3.34E+02	3.79E+04	1.06E+02	4.57E+02	3.01E+02	4.21E+04	4.46E+01	5.13E+04
Fermi 2	1.23E+03	2.09E+04	2.16E+01	2.02E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00 ***
James A. Fitzpatrick	2.83E+02	2.05E+03	1.07E+03	2.85E+02	2.53E+02	1.67E+03	4.54E+02	3.45E+04
Grand Gulf 1	1.62E+02	1.35E+03	2.15E+02	2.68E+02	3.30E+02	2.64E+03	1.90E+02	3.79E+02
Edwin I. Hatch 1	1.38E+03	2.85E+04	7.90E+02	2.00E+03	4.05E+02	3.79E+04	2.43E+02	2.19E+05
Edwin I. Hatch 2	**	**	**	**	**	**	**	**
Hope Creek 1	3.06E+02	2.30E+03	2.46E+02	4.31E+04	2.03E+02	2.17E+04	1.86E+02	6.64E+03
Humboldt Bay 3	2.93E+01	9.06E-02	6.48E+01	1.42E-01	3.86E+01	6.43E-02	0.00E+00	0.00E+00
LaCrosse	4.59E+00	7.44E-01	2.40E+01	3.23E-01	3.73E+01	4.36E-01	5.04E+00	2.43E-01
LaSalle 1&2	9.04E+02	2.95E+03	8.99E+02	5.53E+03	1.76E+03	5.49E+03	1.21E+03	1.45E+04
Limerick 1&2	6.86E+02	1.24E+03	6.61E+02	5.95E+02	4.70E+02	9.39E+04	3.51E+02	5.74E+02
Millstone 1	2.94E+02	3.41E+04	3.51E+02	2.25E+03	2.78E+02	2.37E+04	1.01E+02	1.21E+03
Monticello	9.40E+01	1.17E+03	2.16E+02	1.45E+03	6.12E+01	5.93E+04	4.07E+01	8.25E+02
Nine Mile Point 1	2.45E+02	4.34E+02	1.77E+02	1.00E+05	1.87E+02	6.43E+04	1.41E+02	6.33E+02
Nine Mile Point 2	3.40E+02	6.73E+02	2.67E+02	1.38E+03	2.19E+02	1.98E+04	1.87E+02	3.68E+03
Oyster Creek 1	3.23E+02	1.13E+03	4.93E+02	1.39E+03	8.35E+02	2.55E+04	8.04E+02	9.35E+02
Peach Bottom 2&3	8.08E+02	3.02E+04	8.68E+02	8.56E+04	1.76E+04	2.45E+04	4.45E+02	6.85E+04
Perry 1	1.36E+03	1.94E+03	9.20E+02	2.68E+03	1.08E+03	2.32E+03	1.26E+03	2.90E+03
Pilgrim 1	3.71E+02	6.62E+02	3.50E+02	7.06E+02	1.78E+02	5.46E+02	1.66E+02	5.75E+02
Quad-Cities 1&2	1.21E+03	1.24E+03	7.56E+02	1.04E+03	4.33E+02	2.66E+03	3.05E+04	2.40E+03
River Bend 1	2.44E+02	4.02E+02	3.30E+01	2.67E+00	4.30E+02	3.15E+02	1.62E+02	1.52E+02
Shoreham 1	5.04E+01	9.17E-01	6.99E+01	2.92E+00	3.35E+03	6.81E+02	1.52E+02	1.91E+02
Susquehanna 1&2	4.07E+02	2.95E+03	4.73E+02	2.61E+05	3.40E+02	9.89E+02	2.73E+02	6.12E+02
Vermont Yankee 1	0.00E+00	0.00E+00	4.70E+02	1.82E+05	4.16E+02	2.06E+04	1.30E+02	7.37E+02
WNP-2	3.34E+02	1.29E+03	3.01E+02	1.42E+03	4.77E+02	1.25E+03	4.26E+02	1.04E+03
<b>Total</b>	1.52E+04	1.76E+05	1.35E+04	7.33E+05	3.32E+04	6.78E+05	4.07E+04	5.00E+05
* Fort St. Vrain	1.01E+02	2.30E+00	6.75E+01	8.10E+03	3.79E+02	3.27E+04	1.10E+03	2.70E+04

\* High temperature gas cooled reactor

\*\* Included with Edwin I. Hatch 1 totals

\*\*\* These plants store waste on-site

+ Note: If the volume before compaction and the volume after compaction were both given, the volume used for this table is the volume after compaction. If more than one volume was given, both are shown in the individual plant report. If a description of what the volume represents was given, that is also shown in the individual plant report.

Table 12

## Solid Waste Comparison By Year

Pressurized Water Reactors

Volume (Cubic Meters) - Activity (Curies)

Facility	1978		1979		1980		1981	
Arkansas One 1&2	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
Beaver Valley 1&2	4.39E+02	2.25E+02	2.44E+02	2.95E+02	2.84E+02	5.34E+02	2.13E+02	9.30E+01
Bradwood 1&2								
Byron 1&2								
Callaway 1								
Calvert Cliffs 1&2	6.03E+02	1.12E+03	4.32E+02	9.71E+02	2.51E+02	1.48E+04	5.00E+02	9.86E+01
Catawba 1&2								
Comanche Peak 1								
Donald C. Cook 1&2	1.28E+03	2.25E+02	1.09E+03	3.37E+02	2.10E+03	1.04E+03	9.63E+02	1.43E+03
Crystal River 3	6.87E+02	2.72E+04	1.24E+03	1.20E+03	9.27E+02	2.05E+03	1.27E+03	1.38E+03
Davis-Besse 1	3.40E+02	3.30E+00	2.60E+02	2.86E+00	3.30E+02	3.00E+01	3.25E+02	3.95E+01
Diablo Canyon 1&2								
Joseph M. Farley 1&2	2.69E+02	5.72E+00	1.11E+03	2.32E+02	4.41E+02	2.26E+02	5.64E+02	7.20E+02
Fort Calhoun 1	5.84E+02	1.06E+02	2.44E+02	2.99E+01	4.06E+02	1.32E+03	2.53E+02	1.01E+02
R. E. Ginna	5.96E+01	6.27E+02	3.08E+02	1.53E+02	4.00E+02	4.60E+02	3.76E+02	6.35E+02
Haddam Neck	2.29E+02	1.44E+02	1.29E+03	3.05E+02	1.26E+03	4.89E+02	4.38E+02	6.61E+02
Harris 1								
Indian Point 1&2	8.43E+03	2.37E+03	1.17E+03	2.16E+03	1.03E+03	3.32E+02	1.58E+03	1.71E+03
Indian Point 3	5.94E+02	6.49E+01	2.25E+02	1.63E+02	3.47E+02	2.02E+02	3.17E+02	6.40E+01
Kewaunee	7.98E+01	1.50E+03	1.70E+02	3.54E+02	1.03E+02	1.37E+03	7.38E+01	1.98E+02
Maine Yankee	5.81E+02	4.14E+03	3.63E+02	2.77E+03	4.57E+02	4.79E+03	4.14E+02	1.67E+03
McGuire 1&2							1.98E+01	1.31E-01
Millstone 2	1.55E+02	1.70E+01	2.46E+02	1.78E+03	7.51E+00	2.28E+02	1.63E+01	3.21E+02
Millstone 3								
North Anna 1&2	2.14E+01	3.59E+00	2.95E+02	5.89E+01	2.64E+02	1.54E+02	3.02E+02	2.62E+03
Oconee 1,2 & 3	1.58E+03	5.93E+03	1.63E+03	2.59E+03	1.32E+03	2.91E+03	2.48E+03	1.12E+04
Palisades	7.17E+02	3.40E+03	6.84E+02	3.92E+02	7.31E+02	1.18E+02	8.54E+02	1.57E+04
Palo Verde 1,2&3								
Point Beach 1&2	1.61E+02	1.51E+03	2.69E+02	1.22E+03	4.49E+02	9.35E+02	1.77E+02	4.87E+02
Prairie Island 1&2	1.95E+02	1.53E+02	1.99E+01	8.83E+01	5.25E+02	1.98E+02	2.97E+02	5.64E+01
Rancho Seco 1	1.29E+02	1.27E+03	1.01E+02	4.03E+00	4.60E+02	1.12E+02	2.31E+02	1.44E+02
H. B. Robinson 2	8.22E+02	2.40E+02	8.34E+02	8.72E+01	3.99E+03	3.08E+02	9.02E+02	1.88E+01
Salem 1&2	2.27E+02	1.94E+02	6.86E+02	1.28E+02	1.01E+03	4.59E+02	9.36E+02	1.14E+03
San Onofre								
San Onofre 1	1.31E+02	7.17E+00	8.35E+01	9.24E+01	7.12E+02	4.35E+02	1.62E+03	1.26E+03
San Onofre 2-3								
Seabrook 1								
Sequoyah 1&2					N/R	N/R	1.61E+02	2.92E+01
South Texas 1&2								
St. Lucie 1&2	3.58E+02	1.26E+04	3.08E+02	1.79E+02	3.12E+02	7.46E+02	2.50E+02	2.96E+02
Summer 1								
Surry 1&2	6.03E+02	5.66E+02	2.74E+03	3.45E+02	2.01E+03	7.06E+02	2.80E+03	1.36E+03
Three Mile Island 1	3.89E+02	2.34E+02	7.51E+02	3.12E+01	4.62E+02	2.30E+02	7.98E+02	2.34E+02
Three Mile Island 2	Shown With	Other Unit	Shown With	Other Unit	7.67E+02	1.26E+02	2.74E+02	5.11E+01
TMI 2/Epicor					0.00E+00	0.00E+00	1.51E+02	3.50E+02
Trojan	2.26E+02	4.48E+02	6.37E+02	3.30E+02	5.14E+02	4.59E+01	3.75E+02	1.04E+03
Turkey Point 3&4	1.75E+03	1.72E+03	9.20E+02	2.48E+02	7.24E+02	1.61E+02	1.25E+03	1.17E+02
Vogtle 1&2								
Waterford 3								
Wolf Creek 1								
Yankee Rowe 1	2.60E+02	9.75E+00	2.36E+02	1.63E+02	2.07E+02	9.57E+01	3.08E+02	6.79E+01
Zion 1&2	1.63E+03	1.86E+03	5.97E+02	2.69E+03	1.64E+03	2.55E+03	1.53E+03	3.44E+03
<b>Total</b>	2.35E+04	6.79E+04	1.92E+04	1.94E+04	2.44E+04	3.82E+04	2.30E+04	4.87E+04

N/R = Not Reported



Table 12

## Solid Waste Comparison By Year

Facility	Volume (Cubic Meters) - Activity (Curies)							
	1982		1983		1984		1985	
Arkansas One 1&2	N/R	N/R	7.05E+02	2.09E+03	8.10E+02	1.46E+03	6.88E+02	1.75E+03
Beaver Valley 1&2	2.94E+02	3.83E+02	2.19E+02	4.75E+02	1.56E+02	7.11E+02	1.56E+02	9.71E+01
Etraidwood 1&2								
Byron 1&2							1.78E+02	1.39E+01
Callaway 1					0.00E+00	0.00E+00	1.39E+02	6.29E+00
Calvert Cliffs 1&2	1.57E+02	9.16E+02	5.06E+02	1.07E+02	5.28E+02	3.77E+04	3.89E+02	1.51E+04
Catawba 1&2							3.48E+01	6.90E-02
Comanche Peak 1								
Donald C. Cook 1&2	7.14E+02	8.45E+02	6.68E+02	2.01E+03	4.94E+02	6.69E+02	8.28E+02	2.00E+03
Crystal River 3	6.62E+02	6.28E+02	5.40E+02	1.55E+03	4.11E+02	1.15E+03	4.98E+02	4.60E+03
Davis-Besse 1	0.00E+00	0.00E+00	1.13E+02	6.37E+02	1.51E+02	4.73E+02	1.97E+02	9.58E+01
Diablo Canyon 1&2					0.00E+00	0.00E+00	3.11E+01	4.40E+01
Joseph M. Farley 1&2	3.46E+02	1.03E+02	4.41E+02	1.05E+03	5.62E+02	2.98E+02	4.95E+02	8.20E+02
Fort Calhoun 1	3.42E+02	3.54E+01	4.65E+02	7.00E+02	3.93E+02	7.17E+01	3.43E+02	2.24E+02
R. E. Ginna	4.89E+02	2.02E+02	3.36E+02	5.21E+02	2.52E+02	3.23E+02	2.23E+02	1.19E+02
Haddam Neck	3.12E+02	2.57E+02	6.52E+02	1.52E+03	4.28E+02	3.75E+02	1.73E+02	5.33E+01
Harris 1								
Indian Point 1&2	1.17E+03	6.46E+03	1.29E+03	2.12E+03	9.81E+02	2.03E+03	6.89E+02	5.75E+02
Indian Point 3	3.79E+02	6.14E+01	3.16E+02	7.32E+02	1.53E+02	4.12E+02	2.39E+02	5.49E+02
Kewaunee	6.73E+01	2.74E+02	5.52E+01	6.85E+02	6.32E+01	1.60E+03	7.77E+01	9.56E+02
Maine Yankee	2.20E+02	3.09E+01	3.37E+02	1.03E+02	3.49E+02	3.59E+02	3.59E+02	1.11E+02
McGuire 1&2	9.91E+01	6.43E+00	2.44E+02	2.82E+01	4.14E+02	1.89E+03	6.60E+02	1.97E+02
Millstone 2	6.85E+00	4.84E+02	4.48E+01	2.58E+02	6.08E+01	1.10E+05	2.87E+01	6.16E+03
Millstone 3								
North Anna 1&2	4.21E+02	3.05E+02	5.39E+02	1.87E+03	9.00E+02	9.53E+02	6.50E+02	2.90E+02
Oconee 1,2 & 3	3.06E+03	1.09E+04	1.16E+03	2.84E+03	9.36E+02	6.17E+03	4.33E+02	1.41E+03
Palisades	7.08E+02	7.98E+01	5.75E+02	2.56E+04	4.48E+02	2.58E+02	4.76E+02	1.83E+02
Palo Verde 1,2 & 3							8.42E+01	6.80E+01
Point Beach 1&2	2.52E+02	9.46E+02	7.11E+02	1.12E+03	7.12E+02	1.64E+03	2.81E+02	1.25E+03
Prairie Island 1&2	9.91E+01	3.64E+02	2.39E+02	1.92E+02	4.19E+01	1.19E+01	1.73E+02	4.02E+02
Rancho Seco 1	2.40E+02	4.66E+02	2.72E+02	2.25E+02	4.25E+02	4.60E+01	9.76E+02	1.57E+03
H. B. Robinson 2	1.38E+03	6.38E+01	1.09E+03	4.62E+01	3.05E+03	1.95E+02	6.42E+02	3.35E+03
Salem 1&2	1.91E+03	3.19E+02	2.07E+03	2.99E+02	1.52E+03	6.23E+02	4.55E+02	2.02E+03
San Onofre							1.56E+01	8.96E-01
San Onofre 1	9.27E+02	7.52E+01	3.33E+02	2.27E+02	2.91E+02	1.54E+01	1.80E+02	6.04E+00
San Onofre 2-3	0.00E+00	0.00E+00	1.89E+02	7.98E+00	2.02E+02	5.49E+02	5.45E+02	1.72E+03
Seabrook 1								
Sequoyah 1&2	3.58E+02	2.28E+02	6.93E+02	2.30E+03	9.67E+02	2.43E+03	7.52E+02	2.45E+03
South Texas 1&2								
St. Lucie 1&2	3.07E+02	7.95E+02	6.20E+02	9.39E+04	1.22E+03	6.36E+04	5.45E+02	1.59E+03
Summer 1	0.00E+00	0.00E+00	9.25E+01	1.37E+01	4.80E+02	1.55E+02	4.46E+02	1.30E+02
Surry 1&2	2.17E+03	9.89E+02	3.08E+03	3.56E+03	9.45E+02	1.16E+03	2.02E+03	1.21E+03
Three Mile Island 1	5.32E+02	8.91E+00	6.05E+02	6.84E+02	4.34E+02	4.18E+02	4.69E+02	1.94E+01
Three Mile Island 2	1.80E+02	1.22E+01	3.16E+02	5.17E+05	2.56E+02	9.89E+03	4.83E+02	6.35E+03
TMI 2/Epicor	0.00E+00	0.00E+00	2.23E+02	4.62E+04	4.53E+00	2.35E-01	**	**
Trojan	2.17E+01	2.87E+02	2.28E+02	1.67E+03	2.30E+02	5.85E+01	3.09E+02	3.52E+03
Turkey Point 3&4	1.01E+03	1.13E+03	1.21E+03	9.26E+02	8.50E+02	1.91E+03	6.08E+02	1.50E+03
Vogtle 1&2								
Waterford 3							2.82E+02	3.39E+01
Wolf Creek 1							0.00E+00	0.00E+00
Yankee Rowe 1	2.09E+02	2.81E+01	1.58E+02	5.12E+00	2.00E+02	1.63E+02	2.00E+02	2.68E+02
Zion 1&2	8.82E+02	2.17E+03	9.21E+02	2.97E+03	6.43E+02	2.62E+03	6.73E+02	2.69E+03
<b>Total</b>	<b>1.99E+04</b>	<b>2.99E+04</b>	<b>2.23E+04</b>	<b>7.16E+05</b>	<b>2.10E+04</b>	<b>2.52E+05</b>	<b>1.81E+04</b>	<b>6.55E+04</b>

N/R = Not Reported

Table 12

## Solid Waste Comparison By Year

Pressurized Water Reactors

Volume (Cubic Meters) - Activity (Curies)

Facility	1986		1987		1988		1989	
Arkansas One 1&2	1.21E+02	2.18E+02	5.23E+02	1.63E+03	1.97E+02	8.22E+02	2.22E+02	2.96E+02
Beaver Valley 1&2	9.49E+01	4.45E+02	7.65E+01	3.22E+01	2.33E+02	4.29E+02	1.96E+03	1.35E+03
Braidwood 1&2			0.00E+00	0.00E+00	8.32E+01	3.51E+00	3.10E+02	3.89E+02
Byron 1&2	3.18E+02	9.90E+01	3.06E+02	8.65E+02	3.09E+02	5.09E+02	3.65E+02	1.28E+03
Callaway 1	1.68E+02	1.91E+01	1.98E+02	3.13E+02	9.58E+01	9.46E+02	2.09E+02	6.00E+02
Calvert Cliffs 1&2	2.12E+02	4.51E+02	2.44E+02	6.41E+02	5.25E+01	1.12E+03	2.07E+02	4.14E+02
Catawba 1&2	1.93E+02	1.33E+01	2.73E+02	2.79E+02	2.56E+02	7.05E+02	2.16E+02	3.17E+02
Comanche Peak 1								
Donald C. Cook 1&2	5.28E+02	1.59E+03	4.63E+02	2.30E+03	2.46E+02	5.58E+02	3.88E+02	1.17E+03
Crystal River 3	3.64E+02	1.35E+03	2.90E+02	6.75E+02	2.26E+02	1.07E+03	3.47E+02	2.40E+03
Davis-Besse 1	1.40E+02	2.19E+00	8.48E+01	3.20E+00	1.72E+02	1.76E+02	1.18E+02	2.08E+02
Diablo Canyon 1&2	9.06E+01	6.97E+00	1.65E+02	1.21E+02	2.10E+02	3.92E+02	1.87E+02	4.29E+02
Joseph M. Farley 1&2	2.45E+02	1.80E+03	5.32E+02	3.34E+02	4.96E+02	1.47E+03	4.85E+02	4.00E+02
Fort Calhoun 1	1.16E+02	2.82E+01	1.26E+02	5.47E+02	4.87E+01	1.75E+01	1.75E+02	8.76E+00
R. E. Ginna	1.12E+02	1.39E+02	1.65E+02	2.16E+02	1.67E+02	3.80E+02	2.33E+02	7.99E+01
Haddam Neck	4.14E+02	5.86E+02	3.20E+02	5.45E+02	1.31E+02	3.37E+02	1.53E+02	6.55E+02
Harris 1			1.05E+02	2.61E+00	1.50E+02	1.05E+01	1.60E+02	2.54E+01
Indian Point 1&2	5.30E+02	2.52E+02	2.30E+02	8.34E+02	2.41E+02	4.67E+02	4.78E+02	3.80E+02
Indian Point 3	8.29E+01	2.58E+01	3.17E+02	3.33E+02	1.82E+02	3.57E+02	5.77E+02	3.50E+02
Kewaunee	5.31E+01	1.33E+02	8.25E+01	4.58E+02	7.49E+01	4.83E+02	7.00E+01	7.74E+02
Maine Yankee	1.96E+02	1.64E+02	7.50E+01	1.90E+02	1.37E+02	4.36E+02	1.95E+02	2.36E+02
McGuire 1&2	7.83E+02	6.73E+02	6.92E+02	3.23E+02	5.16E+02	6.49E+02	4.36E+02	6.32E+02
Millstone 2	8.85E+01	6.17E+03	1.38E+02	2.13E+04	1.59E+02	5.06E+01	2.47E+02	5.55E+02
Millstone 3	5.47E+00	5.17E-01	9.95E+01	5.91E+01	1.63E+02	5.34E+02	1.47E+02	7.37E+02
North Anna 1&2	5.30E+02	7.97E+02	4.89E+02	1.64E+03	2.95E+02	7.71E+02	6.77E+02	1.72E+03
Oconee 1,2 & 3	7.60E+02	8.51E+02	8.53E+02	2.01E+03	7.23E+02	1.42E+04	4.25E+02	1.46E+03
Palisades	2.39E+02	2.65E+02	2.23E+02	1.06E+02	1.87E+02	1.38E+03	2.19E+02	4.23E+02
Palo Verde 1,2 & 3	1.16E+02	4.22E+01	4.63E+02	9.76E+02	7.78E+02	7.78E+02	8.74E+02	6.74E+02
Point Beach 1&2	1.08E+02	1.35E+03	1.55E+02	1.43E+03	1.95E+02	6.61E+02	1.06E+02	2.54E+02
Prairie Island 1&2	1.28E+02	1.55E+02	1.42E+02	4.30E+02	5.68E+01	1.38E+02	1.25E+02	1.03E+02
Rancho Seco 1	1.56E+02	1.00E+03	1.59E+02	3.51E+00	3.46E+02	6.25E+01	2.44E+02	3.27E+02
H. B. Robinson 2	4.53E+02	1.58E+02	1.01E+02	2.59E+02	8.42E+01	3.76E+02	9.69E+01	1.86E+02
Salem 1&2	4.71E+02	4.53E+02	3.29E+02	9.69E+02	3.59E+02	3.80E+02	1.22E+02	5.65E+04
San Onofre	2.33E+00	4.65E-01	4.04E+00	4.32E-01	4.24E-01	1.63E-01	0.00E+00	0.00E+00
San Onofre 1	2.51E+02	3.82E+02	3.69E+01	4.98E+01	3.08E+01	4.06E+00	1.19E+02	1.72E+03
San Onofre 2-3	2.94E+02	1.93E+02	2.45E+02	2.71E+02	2.60E+02	2.55E+03	3.28E+02	2.72E+03
Seabrook 1							0.00E+00	0.00E+00
Sequoyah 1&2	4.27E+02	1.33E+04	4.12E+02	9.78E+02	6.07E+02	2.92E+02	4.65E+02	2.64E+03
South Texas 1&2					0.00E+00	0.00E+00	5.03E+01	7.24E+00
St. Lucie 1&2	4.60E+02	2.13E+03	3.53E+02	1.05E+03	4.67E+02	1.29E+04	3.18E+02	1.69E+02
Summer 1	1.12E+02	1.50E+01	3.80E+02	6.76E+02	1.61E+02	1.22E+02	1.40E+02	3.76E+02
Surry 1&2	6.39E+02	1.16E+03	5.15E+02	2.94E+04	7.30E+02	1.94E+02	5.38E+02	1.31E+03
Three Mile Island 1	2.13E+02	7.70E+00	2.49E+02	2.38E+02	2.37E+02	6.92E+02	3.32E+02	5.05E+01
Three Mile Island 2	3.29E+02	5.81E+01	6.59E+02	3.18E+02	9.17E+02	7.18E+03	1.18E+03	1.39E+04
TMI 2/Epicor	**	**	**	**	**	**	**	**
Trojan	2.49E+02	6.25E+02	3.31E+02	4.09E+02	2.48E+02	4.33E+02	2.59E+02	4.47E+02
Turkey Point 3&4	3.23E+02	8.87E+01	3.07E+02	9.32E+02	1.07E+02	7.05E+02	3.46E+02	2.26E+00
Vogtle 1&2			0.00E+00	0.00E+00	4.72E+01	2.55E+01	1.00E+02	1.51E+01
Waterford 3	1.74E+02	3.75E+01	3.83E+02	1.78E+02	2.81E+02	4.43E+03	7.61E+02	4.07E+02
Wolf Creek 1	1.73E+02	1.48E+02	1.28E+02	1.15E+01	1.24E+02	1.27E+03	1.51E+02	1.26E+03
Yankee Rowe 1	1.12E+02	5.21E+00	1.86E+02	6.83E+00	1.22E+02	8.85E+03	2.98E+02	1.78E+01
Zion 1&2	3.31E+02	6.74E+02	4.11E+02	7.13E+02	3.59E+02	2.50E+03	2.14E+02	3.58E+03
<b>Total</b>	<b>1.19E+04</b>	<b>3.81E+04</b>	<b>1.30E+04</b>	<b>7.51E+04</b>	<b>1.23E+04</b>	<b>7.28E+04</b>	<b>1.64E+04</b>	<b>1.08E+05</b>

\* Represents solid waste shipped by plant but not broken down into units 1, 2, &amp; 3

\*\* Included with Three Mile Island 2 totals

Table 12

## Solid Waste Comparison By Year

Facility	Volume (Cubic Meters) - Activity (Curies)							
	+1990		+1991		+1992		+1993	
Arkansas One 1&2	1.69E+02	1.43E+01	4.18E+02	6.03E+02	1.75E+02	2.61E+03	7.85E+01	1.99E+02
Beaver Valley 1&2	1.57E+02	5.44E+02	1.74E+02	1.08E+03	1.63E+02	4.71E+02	1.47E+02	1.37E+03
Braidwood 1&2	1.48E+02	8.55E+01	4.57E+02	6.52E+01	5.98E+02	8.10E+02	1.07E+02	1.57E+03
Byron 1&2	2.43E+02	4.99E+02	2.81E+02	3.77E+02	1.59E+02	8.78E+02	9.48E+01	4.09E+02
Callaway 1	8.70E+01	3.12E+02	1.36E+02	2.48E+03	8.85E+01	1.03E+03	5.18E+01	5.71E+02
Calvert Cliffs 1&2	1.35E+02	4.12E+03	1.60E+02	4.50E+03	1.04E+03	6.33E+03	1.39E+03	4.99E+03
Catawba 1&2	1.19E+02	2.09E+01	1.16E+02	3.35E+02	2.08E+02	9.88E+02	1.55E+02	1.05E+02
Comanche Peak 1	0.00E+00	0.00E+00	6.99E+01	7.76E-01	1.27E+02	2.33E+02	1.04E+02	1.11E+02
Donald C. Cook 1&2	1.95E+02	1.44E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00 ***
Crystal River 3	9.22E+02	2.20E+02	3.45E+02	2.39E+02	6.42E+02	3.30E+02	4.99E+02	8.89E+02
Davis-Besse 1	3.99E+02	2.26E+03	2.38E+02	5.47E+02	3.71E+01	4.10E+01	7.50E+01	7.81E+02
Diablo Canyon 1&2	8.32E+01	2.91E+02	1.89E+02	1.70E+03	1.77E+01	9.95E+02	5.53E+01	1.94E+03
Joseph M. Farley 1&2	1.51E+02	2.88E+02	1.50E+02	1.03E+03	2.39E+02	2.15E+03	6.67E+01	5.06E+02
Fort Calhoun 1	1.22E+02	7.48E+00	3.78E+01	1.97E+01	6.45E+01	4.41E+02	2.42E+01	1.27E+01
R. E. Ginna	1.98E+02	2.32E+02	5.00E+01	3.19E+00	5.46E+01	5.84E+02	5.02E+02	6.87E+02
Haddam Neck	1.66E+02	2.21E+05	1.34E+02	3.37E+02	1.41E+02	1.48E+03	6.05E+01	3.66E+03
Harris 1	7.73E+01	6.25E+01	7.84E+01	3.03E+02	7.12E+01	2.90E+02	6.51E+01	3.75E+02
Indian Point 1&2	2.60E+02	2.08E+03	4.88E+02	9.62E+01	1.64E+02	6.07E+02	1.94E+02	4.07E+02
Indian Point 3	6.66E+02	1.50E+02	1.29E+02	2.00E+01	1.81E+02	2.23E+02	2.46E+02	3.12E+01
Kewaunee	1.11E+02	3.54E+02	6.90E+01	5.28E+02	2.35E+01	1.93E+02	4.38E+00	4.30E+00
Maine Yankee	1.70E+02	1.85E+02	1.47E+02	3.46E+02	1.83E+02	8.06E+03	0.00E+00	0.00E+00
McGuire 1&2	2.63E+02	9.80E+02	4.52E+01	9.29E+02	1.65E+02	1.19E+03	9.90E+01	3.02E+02
Millstone 2	1.59E+02	9.34E+00	1.37E+02	8.79E+02	7.59E+02	3.67E+03	1.07E+02	4.49E+02
Millstone 3	7.60E+01	1.76E+02	1.16E+02	1.04E+02	4.13E+01	4.81E+02	5.44E+01	3.70E+01
North Anna 1&2	2.13E+02	7.24E+02	2.35E+02	3.01E+02	2.17E+02	3.83E+02	2.77E+02	6.07E+02
Oconee 1,2 & 3	4.39E+02	1.79E+03	1.02E+02	4.04E+02	1.46E+02	4.35E+02	1.23E+02	2.03E+04
Palsades #	2.85E+02	8.74E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00 ***
Palo Verde 1,2 & 3	7.66E+02	2.40E+02	4.83E+02	8.91E+02	4.25E+02	1.54E+03	2.29E+02	6.43E+02
Point Beach 1&2	1.30E+02	2.07E+02	9.64E+01	2.20E+02	1.28E+02	3.71E+02	5.32E+01	2.42E+02
Prairie Island 1&2	5.54E+01	3.23E+02	1.11E+02	1.90E+02	1.12E+01	2.79E+01	7.70E+00	2.83E+02
Rancho Seco 1	2.16E+01	3.69E+02	3.97E+01	2.46E+02	3.47E+01	3.68E+00	0.00E+00	0.00E+00
H. B. Robinson 2	6.99E+01	1.44E+01	6.46E+01	9.54E+01	6.25E+01	4.47E+02	4.41E+01	2.57E+01
Salem 1&2	8.92E+01	1.45E+02	1.03E+02	6.79E+02	9.78E+01	8.32E+02	5.62E+01	5.04E+01
San Onofre	2.12E-01	1.04E+00	0.00E+00	0.00E+00	2.04E+01	4.16E-01	7.39E+01	4.74E+01
San Onofre 1	5.81E+01	1.27E+01	9.29E+01	5.75E+00	9.36E+01	6.84E+02	1.85E+01	6.39E+03
Seabrook 1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00 ***
Sequoyah 1&2	2.59E+02	9.06E+02	1.42E+02	1.82E+03	1.27E+02	1.35E+03	5.47E+01	8.63E+01
South Texas 1&2	5.76E+01	1.38E+01	9.99E+01	9.81E+01	8.27E+01	4.67E+02	5.62E+01	6.30E+03
St. Lucie 1&2	2.26E+02	5.89E+03	1.82E+02	8.26E+02	2.14E+02	3.88E+02	8.80E+01	1.24E+04
Summer 1	1.10E+02	2.22E+02	6.82E+01	1.64E+02	1.14E+02	2.68E+02	1.08E+02	1.24E+02
Surry 1&2	1.48E+02	1.13E+03	1.73E+02	8.18E+02	2.10E+02	4.10E+02	2.13E+02	5.62E+02
Three Mile Island 1	5.83E+02	6.53E+02	6.19E+02	3.85E+02	6.87E+02	2.03E+02	6.14E+02	7.59E+00
Three Mile Island 2	3.40E+02	7.74E+03	3.88E+02	2.21E+02	1.19E+03	1.27E+03	5.36E+02	3.31E+02
TMI 2/Epicor	**	**	**	**	**	**	**	**
Trojan	1.80E+02	5.84E+02	1.09E+02	2.40E+02	1.20E+02	7.10E+02	1.33E+02	3.90E+02
Turkey Point 3&4	2.15E+02	6.94E+02	1.89E+02	1.16E+01	2.14E+03	2.30E+02	9.05E+01	1.41E+02
Vogtle 1&2	9.29E+01	1.64E+02	6.87E+01	5.96E+02	1.09E+02	1.07E+03	6.85E+01	2.23E+02
Waterford 3	5.50E+01	5.91E+02	1.46E+02	7.01E+02	8.25E+02	3.93E+03	2.51E+02	1.03E+02
Wolf Creek 1	8.31E+01	3.17E+01	8.39E+01	4.14E+02	5.24E+01	2.43E+02	6.88E+01	7.62E+02
Yankee Rowe 1	1.82E+02	1.69E+02	1.61E+02	8.49E+01	2.02E+02	3.24E+04	2.98E+02	1.71E+04
Zion 1&2	1.44E+02	2.02E+03	9.59E+01	1.95E+03	2.74E+02	2.19E+04	1.22E+02	9.94E+02
Total	9.88E+03	2.59E+05	8.02E+03	2.79E+04	1.29E+04	1.04E+05	7.76E+03	8.75E+04

\* Represents solid waste shipped by plant but not broken down into units 1, 2, &amp; 3

\*\* Included with Three Mile Island 2 totals

\*\*\* These plants store waste on-site

# This number is a correction to that entered in earlier reports

+ Note: If the volume before compaction and the volume after compaction were both given, the volume used for this table is the volume after compaction. If more than one volume was given, both are shown in the individual plant report. If a description of what the volume represents was given, that is also shown in the individual plant report.

Table 13

## Net Electrical Energy Generation Comparison By Year

Boiling Water Reactors	Megawatt Hours									
	Initial Criticality	Commercial Operation	1979	1980	1981	1982	1983	1984	1985	1986
Big Rock Point 1	09/27/62	03/29/63	1.14E+05	4.05E+05	4.70E+05	3.60E+05	3.49E+05	4.18E+05	3.62E+05	5.06E+05
Browns Ferry 1	08/17/73	08/01/74	2.04E+07	6.06E+06	4.41E+06	7.88E+06	2.18E+06	7.85E+06	1.54E+06	0.00E+00
Browns Ferry 2	07/20/74	03/01/75		5.62E+06	7.47E+06	4.45E+06	6.39E+06	4.04E+06	0.00E+00	0.00E+00
Browns Ferry 3	08/08/76	03/01/77		6.94E+06	6.26E+06	4.89E+06	5.39E+06	2.91E+05	1.47E+06	0.00E+00
Brunswick 1	10/08/76	03/18/77	6.82E+06	3.94E+06	2.56E+06	2.92E+06	1.39E+06	5.03E+06	1.91E+06	5.97E+06
Brunswick 2	03/20/75	11/03/75		1.86E+05	3.28E+06	1.91E+06	3.94E+06	1.39E+06	5.02E+06	2.91E+06
Clinton 1	02/27/87	11/24/87								
Cooper	02/21/74	07/01/74	4.99E+06	3.79E+06	3.85E+06	5.28E+06	3.34E+06	3.47E+06	1.07E+06	4.05E+06
Dresden 1	10/15/59	07/04/60	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.46E+06	0.00E+00	0.00E+00
Dresden 2	01/07/70	06/09/70	8.42E+06	4.58E+06	3.41E+06	5.12E+06	3.40E+06	2.11E+06	3.09E+06	4.65E+06
Dresden 3	01/31/71	11/16/71		4.33E+06	5.18E+06	3.89E+06	4.15E+06	2.11E+06	4.39E+06	1.46E+06
Duane Arnold	03/23/74	02/01/75	2.90E+06	2.80E+06	2.22E+06	2.28E+06	2.32E+06	2.72E+06	1.94E+06	3.01E+06
Fermi 2	06/21/85	01/23/86								0.00E+00
James A. Fitzpatrick	11/17/74	07/28/75	2.96E+06	4.33E+06	4.78E+06	4.96E+06	4.63E+06	4.90E+06	4.17E+06	6.02E+06
Grand Gulf 1	08/18/82	07/01/85					0.00E+00	1.65E+05	2.65E+06	4.10E+06
Edwin I. Hatch 1	09/12/74	12/31/75	5.10E+06	4.79E+06	2.76E+06	2.88E+06	3.96E+06	3.60E+06	4.76E+06	3.65E+06
Edwin I. Hatch 2	07/04/78	09/05/79		3.64E+06	4.48E+06	3.73E+06	3.81E+06	1.88E+06	5.38E+06	3.62E+06
Hope Creek 1	06/28/86	12/20/86								1.03E+06
Humboldt Bay 3	02/16/63	08/ /63	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LaCrosse	07/11/67	11/01/69	2.01E+05	2.15E+06	2.41E+05	1.38E+05	2.01E+05	3.19E+05	3.23E+05	1.57E+05
LaSalle 1	06/21/82	01/01/84				4.61E+05	1.64E+06	5.21E+06	4.81E+06	2.02E+06
LaSalle 2	03/10/84	10/19/84						1.39E+06	3.43E+06	5.72E+06
Limerick 1	12/22/84	02/01/86						0.00E+00	1.14E+06	6.85E+06
Limerick 2	08/12/89	01/08/90								
Millstone 1	10/26/70	03/01/71	4.22E+06	3.40E+06	2.52E+06	4.08E+06	5.35E+06	4.32E+06	4.59E+06	5.25E+06
Monticello	12/10/70	06/30/71	4.40E+06	3.45E+06	3.26E+06	2.42E+06	4.15E+06	2.63E+05	4.29E+06	3.38E+06
Nin. Mile Point 1	09/05/69	12/01/69	3.00E+06	4.54E+06	3.27E+06	1.13E+06	2.80E+06	3.64E+06	4.93E+06	3.15E+06
Nine Mile Point 2	05/23/87	04/05/88								
Oyster Creek 1	05/03/69	12/01/69	4.56E+06	1.96E+06	2.63E+06	2.01E+06	2.05E+05	2.79E+05	3.75E+06	1.30E+06
Peach Bottom 2	09/16/73	07/05/74	1.47E+07	4.34E+06	6.63E+06	4.79E+06	4.45E+06	2.43E+06	2.33E+06	6.90E+06
Peach Bottom 3	08/07/74	12/23/74		7.23E+06	3.13E+06	8.53E+06	2.42E+06	7.45E+06	3.28E+06	4.85E+06
Perry 1	06/06/86	11/18/87								
Pilgrim 1	06/16/72	12/01/72	4.84E+06	3.04E+06	3.44E+06	3.29E+06	4.71E+06	3.52E+03	4.95E+06	1.03E+06
Quad-Cities 1	10/18/71	02/18/73	8.76E+06	3.44E+06	5.73E+06	3.24E+06	5.78E+06	3.35E+06	6.07E+06	4.42E+06
Quad-Cities 2	04/26/72	03/10/73		3.61E+06	3.77E+06	5.06E+06	3.15E+06	4.98E+06	4.56E+06	4.72E+06
River Bend 1	10/31/85	06/16/86								3.00E+06
Shoreham 1	02/15/85									
Susquehanna 1	09/10/82	06/08/83				3.21E+05	3.54E+06	6.09E+06	5.26E+06	5.83E+06
Susquehanna 2	05/08/84	02/12/85						9.32E+05	6.95E+06	5.45E+06
Vermont Yankee 1	03/24/72	11/30/72	3.45E+06	2.98E+06	3.57E+06	4.17E+06	2.87E+06	3.34E+06	3.00E+06	2.06E+06
WNP-2	1/19/84	12/13/84						4.10E+05	5.18E+06	5.18E+06
<b>Total</b>			9.98E+07	9.16E+07	8.93E+07	9.02E+07	8.65E+07	8.88E+07	1.07E+08	1.12E+08
* Fort St. Vrain 1	01/31/74	07/01/79	1.24E+05	6.76E+05	7.55E+05	5.69E+05	7.48E+05	5.67E+04	0.00E+00	5.20E+04

\* High temperature gas cooled reactor

Table 13

**Net Electrical Energy Generation Comparison By Year**  
Megawatt Hours

## Boiling Water Reactors

Facility	Initial	Commercial	1987	1988	1989	1990	1991	1992	1993
	Criticality	Operation							
Big Rock Point 1	09/27/62	03/29/63	3.75E+05	3.84E+05	4.17E+05	4.26E+05	4.92E+05	2.71E+05	4.26E+05
Browns Ferry 1	08/17/73	08/01/74	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Browns Ferry 2	07/20/74	03/01/75	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.76E+06	8.39E+06	5.78E+06
Browns Ferry 3	08/08/76	03/01/77	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Brunswick 1	10/08/76	03/18/77	4.05E+06	4.45E+06	4.18E+06	4.32E+06	4.39E+06	1.82E+06	0.00E+00
Brunswick 2	03/20/75	11/03/75	3.69E+06	3.92E+06	4.19E+06	4.05E+06	3.64E+06	1.26E+06	3.98E+06
Clinton 1	02/27/87	11/24/87	3.34E+05	5.86E+05	2.86E+06	3.60E+06	6.05E+06	4.94E+06	5.88E+06
Cooper	02/21/74	07/01/74	5.32E+06	4.20E+06	4.79E+06	5.11E+06	4.80E+06	6.23E+06	3.71E+06
Dresden 1	10/15/59	07/04/60	0.00E+00						
Dresden 2	01/07/70	06/09/70	3.34E+06	4.32E+06	4.75E+06	4.08E+06	7.97E+06	4.18E+06	3.06E+06
Dresden 3	01/31/71	11/16/71	4.40E+06	4.16E+06	5.12E+06	5.14E+06	2.57E+06	3.06E+06	4.97E+06
Duane Arnold	03/23/74	02/01/75	2.54E+06	3.14E+06	3.14E+06	3.01E+06	4.15E+06	3.43E+06	3.24E+06
Fermi 2	06/21/85	01/23/86	1.39E+06	4.06E+06	5.22E+06	7.10E+06	6.18E+06	5.41E+06	8.28E+06
James A. Fitzpatrick	11/17/74	07/28/75	4.20E+06	4.36E+06	6.16E+06	4.60E+06	3.38E+06	0.00E+00	4.75E+06
Grand Gulf 1	08/18/82	07/01/85	7.73E+06	9.59E+06	7.85E+06	7.40E+06	9.12E+06	8.17E+06	7.90E+06
Edwin I. Hatch 1	09/12/74	12/31/75	5.08E+06	4.11E+06	6.48E+06	4.07E+06	4.70E+06	6.16E+06	4.95E+06
Edwin I. Hatch 2	07/04/78	09/05/79	5.76E+06	4.25E+06	4.14E+06	6.53E+06	4.92E+06	4.69E+06	5.00E+06
Hope Creek 1	06/28/86	12/20/86	7.28E+06	6.99E+06	6.61E+06	4.07E+06	7.39E+06	7.05E+06	8.83E+06
Humboldt Bay 3	02/16/63	08/ /63	0.00E+00						
LaCrosse	07/11/67	11/01/69							
LaSalle 1	06/21/82	01/01/84	4.08E+06	5.44E+06	6.18E+06	8.64E+06	6.83E+06	6.45E+06	7.20E+06
LaSalle 2	03/10/84	10/19/84	4.54E+06	5.66E+06	6.50E+06	6.18E+06	8.71E+06	5.78E+06	5.84E+06
Limerick 1	12/22/84	02/01/86	5.32E+06	6.67E+06	5.21E+06	5.62E+06	8.13E+06	6.23E+06	8.75E+06
Limerick 2	08/12/89	01/08/90			1.06E+06	7.23E+06	7.14E+06	8.49E+06	7.47E+06
Millstone 1	10/26/70	03/01/71	4.38E+06	5.54E+06	4.64E+06	5.09E+06	1.75E+06	3.61E+06	5.27E+06
Monticello	12/10/70	06/30/71	3.53E+06	4.57E+06	2.65E+06	4.51E+06	3.59E+06	4.45E+06	3.86E+06
Nine Mile Point 1	09/05/69	12/01/69	4.62E+06	0.00E+00	0.00E+00	1.28E+06	3.87E+06	2.93E+06	4.35E+06
Nine Mile Point 2	05/23/87	04/05/88	2.61E+05	2.51E+06	4.25E+06	4.14E+06	6.56E+06	4.25E+06	7.19E+06
Oyster Creek 1	05/03/69	12/01/69	3.11E+06	3.54E+06	2.40E+06	4.31E+06	2.95E+06	4.53E+06	4.66E+06
Peach Bottom 2	09/16/73	07/05/74	1.55E+06	0.00E+00	3.86E+06	6.70E+06	5.06E+06	5.67E+06	7.70E+06
Peach Bottom 3	08/07/74	12/23/74	1.46E+06	0.00E+00	1.89E+05	7.53E+06	5.11E+06	7.18E+06	6.31E+06
Perry 1	06/06/86	11/18/87	8.28E+05	7.23E+06	5.32E+06	6.59E+06	8.98E+06	7.17E+06	3.97E+06
Pilgrim 1	06/16/72	12/01/72	0.00E+00	0.00E+00	1.71E+06	4.24E+06	3.42E+06	4.74E+06	4.34E+06
Quad-Cities 1	10/18/71	02/18/73	4.46E+06	5.66E+06	4.28E+06	5.33E+06	3.54E+06	4.17E+06	5.04E+06
Quad-Cities 2	04/26/72	03/10/73	4.95E+06	4.18E+06	5.74E+06	4.35E+06	5.30E+06	3.90E+06	3.11E+06
River Bend 1	10/31/85	06/16/86	4.96E+06	7.25E+06	4.79E+06	5.59E+06	6.69E+06	2.76E+06	5.26E+06
Shoreham 1	02/15/85								
Susquehanna 1	09/10/82	06/08/83	6.13E+06	8.41E+06	6.47E+06	6.44E+06	8.82E+06	6.39E+06	5.20E+06
Susquehanna 2	05/08/84	02/12/85	8.60E+06	5.90E+06	6.77E+06	8.29E+06	7.04E+06	7.18E+06	8.34E+06
Vermont Yankee 1	03/24/72	11/30/72	3.54E+06	4.11E+06	3.61E+06	3.62E+06	4.11E+06	3.73E+06	3.37E+06
WNP-2	01/19/84	12/13/84	5.40E+06	6.00E+06	6.12E+06	5.74E+06	4.23E+06	5.69E+06	7.13E+06
<b>Total</b>			1.30E+08	1.46E+08	1.48E+08	1.75E+08	1.80E+08	1.70E+08	1.85E+08

\* Fort St. Vrain 1 01/31/74 07/01/79 1.81E+05 6.60E+05

\* High temperature gas cooled reactor

Table 14

## Net Electrical Energy Generation Comparison By Year

Facility	Megawatt Hours									
	Initial Criticality	Commercial Operation	1979	1980	1981	1982	1983	1984	1985	1986
Pressurized Water Reactors										
Arkansas One 1	08/06/74	12/19/74	3.32E+06	3.78E+06	4.90E+06	3.72E+06	3.22E+06	4.60E+06	5.19E+06	3.57E+06
Arkansas One 2	12/05/78	03/26/80	8.81E+05	3.65E+06	4.32E+06	3.81E+06	4.43E+06	6.20E+06	4.70E+06	5.31E+06
Beaver Valley 1	05/10/76	10/01/76	1.79E+06	3.01E+05	4.66E+06	2.69E+06	4.68E+06	4.75E+06	5.90E+06	4.78E+06
Beaver Valley 2	08/04/87	11/17/87								
Braidwood 1	05/29/87	07/29/88								
Braidwood 2	03/08/88	10/17/88								
Byron 1	02/02/85	09/16/85							1.01E+06	7.40E+06
Byron 2	01/09/87	08/21/87								
Callaway 1	10/02/84	12/19/84						3.23E+05	8.05E+06	7.20E+06
Calvert Cliffs 1	10/07/74	05/08/75	9.68E+06	4.53E+06	6.11E+06	5.36E+06	5.57E+06	6.22E+06	4.36E+06	5.83E+06
Calvert Cliffs 2	11/30/76	04/01/77		6.41E+06	5.42E+06	5.00E+06	6.11E+06	5.34E+06	5.61E+06	7.01E+06
Catawba 1	01/07/85	06/29/85							3.44E+06	5.18E+06
Catawba 2	05/08/86	08/19/86								1.30E+06
Comanche Peak 1	04/03/90	08/13/90								
Comanche Peak 2	03/24/93	08/03/93								
Donald C. Cook 1	01/18/75	08/27/75	1.16E+07	6.46E+06	6.78E+06	5.35E+06	5.29E+06	7.75E+06	2.12E+06	6.65E+06
Donald C. Cook 2	03/10/78	07/01/78		6.70E+06	6.38E+06	7.00E+06	7.01E+06	5.36E+06	5.68E+06	4.34E+06
Cryetal River 3	01/14/77	03/13/77	3.76E+06	3.35E+06	4.01E+06	4.92E+06	3.77E+06	6.48E+06	2.85E+06	2.65E+06
Davis-Besse 1	08/12/77	07/31/78	3.13E+06	2.09E+06	4.36E+06	3.22E+06	4.88E+06	4.29E+06	1.94E+06	3.49E+03
Diablo Canyon 1	04/29/84	05/07/85						2.04E+05	5.23E+06	5.29E+06
Diablo Canyon 2	09/19/85	03/13/86							5.41E+06	6.55E+06
Joseph M. Farley 1	08/09/77	12/01/77	1.74E+06	4.60E+06	2.62E+06	5.22E+06	5.26E+06	5.43E+06	5.87E+06	5.73E+06
Joseph M. Farley 2	05/05/81	07/30/81			2.92E+06	5.30E+06	5.98E+06	6.62E+06	5.47E+06	5.96E+06
Fort Calhoun 1	08/06/73	06/20/74	3.67E+06	2.01E+06	2.15E+06	3.48E+06	2.75E+06	2.33E+06	3.07E+06	3.61E+06
R. E. Ginna	11/08/69	07/01/70	2.96E+06	3.09E+06	3.32E+06	2.41E+06	3.04E+06	3.16E+06	3.62E+06	3.61E+06
Haddam Neck	07/24/67	01/01/68	4.12E+06	3.56E+06	4.06E+06	4.54E+06	3.78E+06	3.36E+06	4.64E+06	2.13E+06
Harris 1	01/03/87	05/02/87								
Indian Point 1	08/02/62	10/ /62	4.80E+06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indian Point 2	05/22/73	08/01/74		4.26E+06	3.06E+06	4.45E+06	5.90E+06	2.89E+06	6.67E+06	3.81E+06
Indian Point 3	04/06/76	08/30/76	4.79E+06	3.07E+06	3.03E+06	1.44E+06	6.07E+04	6.04E+06	4.73E+06	5.53E+06
Kewaunee	03/07/74	06/16/74	3.44E+06	3.63E+06	3.77E+06	3.82E+06	3.71E+06	3.81E+06	3.70E+06	3.85E+06
Maine Yankee	10/23/72	12/28/72	4.54E+06	4.40E+06	5.21E+06	4.52E+06	0.00E+00	5.13E+06	5.35E+06	6.24E+06
McGuire 1	08/08/81	12/01/81			1.91E+04	4.30E+06	4.63E+06	6.42E+06	6.78E+06	5.16E+06
McGuire 2	05/08/83	03/01/84					0.00E+00	6.58E+06	5.60E+06	6.21E+06
Millstone 2	10/17/75	12/26/75	4.36E+06	4.88E+06	6.09E+06	5.01E+06	2.45E+06	6.61E+06	3.50E+06	5.16E+06
Millstone 3	01/23/86	04/23/86								5.86E+06
North Anna 1	04/05/78	06/06/78	4.19E+06	5.63E+06	4.64E+06	2.40E+06	5.31E+06	3.78E+06	5.80E+06	6.31E+06
North Anna 2	06/12/80	12/14/80		3.50E+05	5.65E+06	4.05E+06	5.80E+06	4.72E+06	6.81E+06	6.02E+06
Oconee 1	04/19/73	07/15/73	1.32E+07	5.12E+06	3.00E+06	5.15E+06	5.67E+06	6.17E+06	7.07E+06	4.78E+06
Oconee 2	11/11/73	09/09/74		3.88E+06	5.19E+06	3.44E+06	5.14E+06	7.30E+06	5.06E+06	5.80E+06
Oconee 3	09/05/74	12/16/74		5.22E+06	5.64E+06	2.12E+06	7.10E+06	5.35E+06	4.86E+06	6.06E+06
Palisades	05/24/71	12/31/71	3.43E+06	2.38E+06	3.46E+06	3.35E+06	3.77E+06	8.12E+05	5.30E+06	8.41E+05
Palo Verde 1	05/25/85	02/13/86							1.13E+06	5.85E+06
Palo Verde 2	04/18/86	09/19/86								2.65E+06
Palo Verde 3	10/25/87	01/08/88								
Point Beach 1	11/02/70	12/21/70	6.77E+06	2.48E+06	2.61E+06	2.70E+06	2.38E+06	3.11E+06	3.35E+06	3.77E+06
Point Beach 2	05/30/72	10/01/71		3.59E+06	3.72E+06	3.61E+06	3.02E+06	3.51E+06	3.60E+06	3.42E+06
Prairie Island 1	12/01/73	12/16/73	7.10E+06	3.11E+06	3.84E+06	3.92E+06	3.89E+06	4.16E+06	3.68E+06	3.82E+06
Prairie Island 2	12/17/74	12/21/74		3.47E+06	3.09E+06	3.86E+06	3.72E+06	3.91E+06	3.61E+06	3.86E+06
Rancho Seco 1	09/16/74	04/17/75	5.71E+06	4.42E+06	2.63E+06	3.37E+06	2.85E+06	3.77E+06	1.94E+06	0.00E+00
H. B. Robinson 2	09/20/70	03/07/71	4.00E+06	3.21E+06	3.50E+06	2.25E+06	3.35E+06	1.90E+05	5.24E+06	4.80E+06
Salem 1	12/11/76	06/30/77	2.04E+06	5.63E+06	6.19E+06	4.09E+06	5.38E+06	2.13E+06	9.01E+06	7.08E+06
Salem 2	08/08/80	10/13/81		0.00E+00	1.63E+06	7.94E+06	7.44E+05	3.20E+06	5.92E+06	5.31E+06
San Onofre 1	06/14/67	01/01/68	3.36E+06	8.17E+05	7.79E+05	5.10E+05	0.00E+00	2.62E+05	2.46E+06	8.74E+05
San Onofre 2	07/26/82	08/08/83				1.26E+05	3.76E+06	5.27E+05	5.15E+06	6.36E+06
San Onofre 3	08/29/83	04/01/84					9.97E+05	4.10E+06	3.71E+06	6.76E+06
Seabrook 1	06/13/89	08/19/90								
Sequoyah 1	07/05/80	07/01/81		5.18E+05	2.53E+06	4.91E+06	7.34E+06	6.10E+06	4.06E+06	0.00E+00
Sequoyah 2	11/05/81	06/01/82					6.69E+06	6.40E+06	5.61E+06	0.00E+00
South Texas 1	03/08/88	08/25/88								
South Texas 2	03/12/89	06/19/89								

Table 14

## Net Electrical Energy Generation Comparison By Year

Facility	Initial		Megawatt Hours							
	Criticality	Commercial Operation	1979	1980	1981	1982	1983	1984	1985	1986
Pressurized Water Reactors										
St. Lucie 1	04/22/76	12/21/76	4.88E+06	5.20E+06	4.95E+06	6.78E+06	1.07E+06	4.23E+06	5.87E+06	7.05E+06
St. Lucie 2	06/02/83	08/08/83					2.40E+06	5.56E+06	6.11E+06	6.15E+06
Summer 1	10/22/82	01/01/84				1.91E+05	4.33E+06	4.20E+06	5.23E+06	7.16E+06
Surry 1	07/01/72	12/22/72	2.87E+06	2.47E+06	2.38E+06	5.48E+06	3.52E+06	3.33E+06	5.62E+06	4.49E+06
Surry 2	03/07/73	05/01/73		2.24E+06	5.15E+06	5.49E+06	4.09E+06	5.21E+06	4.07E+06	4.50E+06
Three Mile Island 1	06/05/74	09/02/74	8.48E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.12E+05	4.82E+06
Three Mile Island 2	03/28/78	12/30/78	N/R	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trojan	12/15/75	05/20/76	5.27E+06	6.07E+06	6.42E+06	4.80E+06	4.08E+06	4.74E+06	6.91E+06	7.09E+06
Turkey Point 3	10/20/72	12/14/72	6.71E+06	4.39E+06	9.12E+05	3.77E+06	4.33E+06	4.78E+06	3.41E+06	4.51E+06
Turkey Point 4	06/11/73	09/07/73		3.85E+06	4.50E+06	3.84E+06	2.97E+06	3.08E+06	5.18E+06	1.72E+06
Vogtle 1	03/09/87	05/31/87								
Vogtle 2	03/28/89	05/20/89								
Waterford 3	03/04/85	09/24/85							1.81E+06	7.30E+06
Wolf Creek 1	05/22/85	09/03/85							2.94E+06	6.97E+06
Yankee Rowe 1	08/19/60	07/01/61	1.23E+06	2.92E+05	8.85E+05	8.82E+05	1.34E+06	1.03E+06	1.18E+06	1.39E+06
Zion 1	06/19/73	12/31/73	1.03E+07	6.51E+06	6.19E+06	4.70E+06	4.02E+06	5.69E+06	4.81E+06	4.90E+06
Zion 2	12/24/73	09/17/74		5.28E+06	5.26E+06	5.16E+06	6.18E+06	5.99E+06	5.11E+06	7.33E+06
<b>Total</b>			1.50E+08	1.57E+08	1.78E+08	1.84E+08	1.98E+08	2.32E+08	2.72E+08	2.96E+08

N/R = Not Reported

Table 14

## Net Electrical Energy Generation Comparison By Year

Facility	Megawatt Hours								
	Initial	Commercial	1987	1988	1989	1990	1991	1992	1993
	Criticality	Operation							
Pressurized Water Reactors									
Arkansas One 1	08/06/74	12/19/74	4.76E+06	3.95E+06	3.37E+06	4.12E+06	6.54E+06	5.83E+06	6.13E+06
Arkansas One 2	12/05/78	03/26/80	6.61E+06	4.95E+06	5.47E+06	7.13E+06	6.12E+06	5.50E+06	7.34E+06
Beaver Valley 1	05/10/76	10/01/76	5.62E+06	4.98E+06	3.79E+06	6.17E+06	3.70E+06	6.30E+06	4.35E+06
Beaver Valley 2	08/04/87	11/17/87	7.38E+05	6.48E+06	4.54E+06	4.29E+06	6.76E+06	5.64E+06	5.20E+06
Braidwood 1	05/29/87	07/29/88	1.46E+06	3.42E+06	4.63E+06	8.26E+06	4.98E+06	7.15E+06	8.69E+06
Braidwood 2	03/08/88	10/17/88		1.35E+06	7.14E+06	6.33E+06	6.54E+06	8.75E+06	7.35E+06
Byron 1	02/02/85	09/16/85	5.33E+06	6.29E+06	8.95E+06	6.95E+06	6.31E+06	8.99E+06	7.36E+06
Byron 2	01/09/87	08/21/87	1.97E+06	6.36E+06	6.06E+06	6.01E+06	8.77E+06	6.98E+06	7.62E+06
Callaway 1	10/02/84	12/19/84	6.32E+06	8.94E+06	8.35E+06	8.01E+06	9.98E+06	8.09E+06	8.39E+06
Calvert Cliffs 1	10/07/74	05/08/75	5.27E+06	5.16E+06	1.35E+06	1.34E+06	5.47E+06	4.11E+06	7.33E+06
Calvert Cliffs 2	11/30/76	04/01/77	4.83E+06	6.60E+06	4.53E+06	0.00E+00	3.64E+06	6.59E+06	4.97E+06
Catawba 1	01/07/85	06/29/85	6.38E+06	7.63E+06	7.76E+06	6.87E+06	6.67E+06	7.03E+06	7.58E+06
Catawba 2	05/08/86	08/19/86	7.17E+06	6.17E+06	6.51E+06	6.44E+06	7.27E+06	9.27E+06	8.16E+06
Comanche Peak 1	04/03/90	08/13/90				2.51E+06	5.38E+06	6.95E+06	7.15E+06
Comanche Peak 2	03/24/93	08/03/93							3.43E+06
Donald C. Cook 1	01/18/75	08/27/75	5.03E+06	7.47E+06	5.43E+06	6.30E+06	7.34E+06	4.99E+06	8.76E+06
Donald C. Cook 2	03/10/78	07/01/78	5.03E+06	2.32E+06	6.66E+06	4.81E+06	8.19E+06	1.43E+06	7.55E+06
Crystal River 3	01/14/77	03/13/77	3.62E+06	5.77E+06	2.93E+06	4.14E+06	5.46E+06	5.30E+06	6.08E+06
Davis-Besse 1	08/12/77	07/31/78	5.06E+06	1.16E+06	7.32E+06	4.16E+06	5.84E+06	7.65E+06	6.08E+06
Diablo Canyon 1	04/29/84	05/07/85	8.28E+06	5.26E+06	7.20E+06	8.71E+06	7.36E+06	7.45E+06	9.03E+06
Diablo Canyon 2	09/19/85	03/13/86	5.72E+06	6.23E+06	8.62E+06	7.56E+06	7.71E+06	9.25E+06	7.79E+06
Joseph M. Farley 1	08/09/77	12/01/77	6.44E+06	5.91E+06	6.02E+06	6.91E+06	5.41E+06	5.65E+06	6.87E+06
Joseph M. Farley 2	05/05/81	07/30/81	4.90E+06	7.17E+06	5.62E+06	5.25E+06	6.74E+06	5.41E+06	5.24E+06
Fort Calhoun 1	08/06/73	06/20/74	3.06E+06	2.63E+06	3.30E+06	2.42E+06	3.25E+06	2.54E+06	3.10E+06
R. E. Ginna	11/08/69	07/01/70	3.80E+06	3.53E+06	3.07E+06	3.45E+06	3.48E+06	3.48E+06	3.50E+06
Haddam Neck	07/24/67	01/01/68	2.53E+06	3.31E+06	2.96E+06	1.15E+06	3.70E+06	3.88E+06	3.74E+06
Harris 1	01/03/87	05/02/87	3.38E+06	5.33E+06	5.63E+06	6.34E+06	5.92E+06	5.41E+06	7.53E+06
Indian Point 1	08/02/62	08/02/62	0.00E+00						0.00E+00
Indian Point 2	05/22/73	08/01/74	5.15E+06	6.06E+06	4.47E+06	5.21E+06	3.86E+06	7.88E+06	5.93E+06
Indian Point 3	04/06/76	08/30/76	4.85E+06	6.71E+06	4.97E+06	5.03E+06	7.30E+06	4.76E+06	1.19E+06
Kewaunee	03/07/74	06/16/74	4.01E+06	3.91E+06	3.74E+06	3.90E+06	3.67E+06	3.94E+06	3.82E+06
Maine Yankee	10/23/72	12/28/72	4.04E+06	5.02E+06	6.94E+06	4.86E+06	6.26E+06	5.36E+06	5.74E+06
McGuire 1	08/08/81	12/01/81	7.35E+06	7.39E+06	7.80E+06	4.73E+06	6.84E+06	7.49E+06	5.52E+06
McGuire 2	05/08/83	03/01/84	7.57E+06	8.05E+06	7.41E+06	6.46E+06	9.52E+06	6.78E+06	6.81E+06
Millstone 2	10/17/75	12/26/75	6.89E+06	5.73E+06	4.89E+06	5.30E+06	3.94E+06	2.71E+06	6.30E+06
Millstone 3	01/23/86	04/23/86	6.74E+06	7.67E+06	7.08E+06	8.22E+06	2.84E+06	6.57E+06	6.48E+06
North Anna 1	04/05/78	06/06/78	3.57E+06	6.90E+06	4.30E+06	7.23E+06	5.63E+06	5.36E+06	5.69E+06
North Anna 2	06/12/80	12/14/80	5.65E+06	7.88E+06	5.90E+06	5.98E+06	7.68E+06	6.32E+06	6.23E+06
Oconee 1	04/19/73	07/15/73	5.03E+06	7.19E+06	5.94E+06	6.45E+06	6.01E+06	6.28E+06	6.52E+06
Oconee 2	11/11/73	09/09/74	6.23E+06	5.54E+06	6.01E+06	6.27E+06	7.43E+06	5.94E+06	6.23E+06
Oconee 3	09/05/74	12/16/74	5.08E+06	5.97E+06	6.34E+06	7.43E+06	5.59E+06	5.45E+06	7.39E+06
Palisades	05/24/71	12/31/71	2.63E+06	3.44E+06	3.64E+06	3.01E+06	4.87E+06	4.87E+06	3.55E+06
Palo Verde 1	05/25/85	02/13/86	5.27E+06	6.67E+06	1.80E+06	4.72E+06	9.31E+06	7.12E+06	7.51E+06
Palo Verde 2	04/18/86	09/19/86	8.19E+06	6.75E+06	4.70E+06	6.24E+06	8.27E+06	1.01E+07	5.13E+06
Palo Verde 3	10/25/87	01/08/88	3.20E+05	3.55E+04	1.33E+06	9.64E+06	7.52E+06	8.39E+06	9.39E+06
Point Beach 1	11/02/70	12/21/70	3.57E+06	3.83E+06	3.61E+06	3.53E+06	3.63E+06	3.60E+06	3.80E+06
Point Beach 2	05/30/72	10/01/71	3.61E+06	3.72E+06	3.49E+06	3.79E+06	3.69E+06	3.67E+06	3.84E+06
Prairie Island 1	12/01/73	12/16/73	3.59E+06	3.82E+06	4.39E+06	3.83E+06	3.98E+06	3.50E+06	4.38E+06
Prairie Island 2	12/17/74	12/21/74	4.43E+06	3.89E+06	3.89E+06	3.80E+06	4.48E+06	3.22E+06	3.75E+06
Rancho Seco 1	09/16/74	04/17/75	0.00E+00	2.81E+06	1.41E+06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H. B. Robinson 2	09/20/70	03/07/71	4.23E+06	3.18E+06	2.78E+06	3.31E+06	4.79E+06	4.06E+06	4.19E+06
Salem 1	12/11/76	06/30/77	6.21E+06	7.41E+06	6.21E+06	5.96E+06	6.81E+06	5.30E+06	5.87E+06
Salem 2	08/08/80	10/13/81	6.17E+06	5.97E+06	7.82E+06	5.41E+06	7.66E+06	4.72E+06	5.54E+06
San Onofre 1	06/14/67	01/01/68	2.71E+06	1.37E+06	1.17E+06	1.54E+06	2.03E+06	1.17E+06	0.00E+00
San Onofre 2	07/26/82	08/08/83	6.23E+06	9.00E+06	5.22E+06	8.31E+06	5.76E+06	8.80E+06	7.65E+06
San Onofre 3	08/29/83	04/01/84	7.52E+06	6.13E+06	8.84E+06	6.58E+06	8.69E+06	6.83E+06	7.12E+06
Seabrook 1	06/13/89	08/19/90				4.09E+06	6.81E+06	7.87E+06	9.05E+06
Sequoyah 1	07/05/80	07/01/81	0.00E+00	6.71E+04	9.55E+06	6.82E+06	7.27E+06	8.36E+06	1.24E+06
Sequoyah 2	11/05/81	06/01/82	0.00E+00	3.88E+06	9.55E+06	7.18E+06	9.32E+06	7.27E+06	2.06E+06
South Texas 1	03/08/88	08/25/88		2.79E+06	6.28E+06	6.00E+06	7.20E+06	7.27E+06	6.66E+05
South Texas 2	03/12/89	06/19/89			3.02E+06	6.43E+06	7.26E+06	1.03E+07	6.90E+05



Table 14

## Net Electrical Energy Generation Comparison By Year

Facility	Initial		Megawatt Hours						
	Criticality	Commercial Operation	1987	1988	1989	1990	1991	1992	1993
St. Lucie 1	04/22/76	12/21/76	5.72E+06	6.25E+06	6.95E+06	4.49E+06	5.79E+06	7.14E+06	7.14E+06
St. Lucie 2	06/02/81	08/08/83	5.95E+06	7.41E+06	5.44E+06	5.32E+06	7.43E+06	5.43E+06	5.43E+06
Summer 1	10/22/82	01/01/84	5.15E+06	5.05E+06	5.41E+06	6.11E+06	5.34E+06	7.52E+06	6.10E+06
Surry 1	07/01/72	12/22/72	4.63E+06	2.69E+06	3.17E+06	4.77E+06	6.59E+06	5.22E+06	6.23E+06
Surry 2	03/07/73	05/01/73	4.79E+06	3.57E+06	5.94E+05	5.84E+06	3.99E+06	6.43E+06	4.54E+06
Three Mile Island 1	06/05/74	09/02/74	5.03E+06	5.47E+06	7.22E+06	5.30E+06	5.67E+06	7.22E+06	5.96E+06
Three Mile Island 2	03/28/78	12/30/78	0.00E+00						
Trojan	12/15/75	05/20/76	4.35E+06	6.34E+06	5.53E+06	6.07E+06	1.46E+06	4.57E+06	0.00E+00
Turkey Point 3	10/20/72	12/14/72	8.56E+05	3.45E+06	3.59E+06	3.36E+06	1.31E+06	3.42E+06	3.59E+06
Turkey Point 4	06/11/73	09/07/73	2.64E+06	3.26E+06	2.09E+06	4.38E+06	7.95E+05	4.64E+06	2.09E+06
Vogtle 1	03/09/87	05/31/87	3.92E+06	6.79E+06	8.71E+06	7.34E+06	7.50E+06	9.38E+06	8.60E+06
Vogtle 2	03/28/89	05/20/89			5.55E+06	6.85E+06	8.90E+06	7.77E+06	8.68E+06
Waterford 3	03/04/85	09/24/85	7.43E+06	6.54E+06	7.61E+06	8.60E+06	7.27E+06	7.62E+06	9.14E+06
Wolf Creek 1	05/22/85	09/03/85	6.50E+06	6.66E+06	9.71E+06	7.87E+06	5.86E+06	8.49E+06	7.90E+06
Yankee Rowe 1	08/19/60	07/01/61	1.14E+06	1.12E+06	1.31E+06	8.26E+05	9.92E+05	0.00E+00	0.00E+00
Zion 1	06/19/73	12/31/73	6.06E+06	6.34E+06	5.00E+06	4.45E+06	4.26E+06	4.11E+06	7.02E+06
Zion 2	12/24/73	09/17/74	5.11E+06	6.65E+06	7.69E+06	2.65E+06	5.13E+06	5.37E+06	5.29E+06
<b>Total</b>			3.19E+08	3.65E+08	3.88E+08	3.97E+08	4.33E+08	4.45E+08	4.23E+08

\* High temperature gas cooled reactor

Table 15

## Thermal Energy Generation Comparison By Year

Boiling Water Reactors	Megawatt Hours										
	Initial Facility	Initial Criticality	Commercial Operation	1979	1980	1981	1982	1983	1984	1985	1986
Big Rock Point 1	09/27/62	03/29/63	3.96E+05	1.40E+06	1.63E+06	1.20E+06	1.14E+06	1.37E+06	1.19E+06	1.66E+06	
Browns Ferry 1	08/17/73	08/01/74	6.31E+07	1.92E+07	1.36E+07	2.49E+07	6.78E+06	2.45E+07	4.95E+06	0.00E+00	
Browns Ferry 2	07/20/74	03/01/75		1.74E+07	2.31E+07	1.38E+07	1.97E+07	1.31E+07	0.00E+00	0.00E+00	
Browns Ferry 3	08/08/76	03/01/77		2.13E+07	1.95E+07	1.55E+07	1.70E+07	9.11E+05	4.65E+06	0.00E+00	
Brunswick 1	10/08/76	03/18/77	2.12E+07	1.23E+07	8.29E+06	9.48E+06	4.53E+06	1.56E+07	6.06E+06	1.89E+07	
Brunswick 2	03/20/75	11/03/75		5.38E+06	1.04E+07	6.30E+06	1.23E+07	4.53E+06	1.57E+07	9.43E+06	
Clinton 1	02/27/87	11/24/87									
Cooper	02/21/74	07/01/74	1.58E+07	1.36E+07	1.39E+07	1.64E+07	1.05E+07	1.09E+07	3.42E+06	1.26E+07	
Dresden 1	10/15/59	07/04/60	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.46E+07	0.00E+00	0.00E+00	
Dresden 2	01/07/70	06/09/70	2.77E+07	1.57E+07	1.13E+07	1.69E+07	1.13E+07	7.10E+06	1.03E+07	1.52E+07	
Dresden 3	01/31/71	11/16/71		1.42E+07	1.71E+07	1.27E+07	1.37E+07	7.10E+06	1.47E+07	5.04E+06	
Duane Arnold	03/23/74	02/01/75	9.07E+06	8.87E+06	7.05E+06	7.32E+06	7.38E+06	8.71E+06	6.15E+06	9.48E+06	
Fermi 2	06/21/85	01/23/86									2.23E+05
James A. Fitzpatrick	11/17/74	07/28/75	8.97E+06	1.30E+07	1.42E+07	1.51E+07	1.42E+07	1.52E+07	1.28E+07	1.84E+07	
Grand Gulf 1	08/18/82	07/01/85					0.00E+00	8.80E+05	9.80E+06	1.47E+07	
Edwin I. Hatch 1	09/12/74	12/31/75	1.62E+07	1.54E+07	8.97E+06	9.42E+06	1.29E+07	1.20E+07	1.53E+07	1.18E+07	
Edwin I. Hatch 2	07/04/78	09/05/79		1.16E+07	1.47E+07	1.18E+07	1.19E+07	5.99E+06	1.70E+07	1.19E+07	
Hope Creek 1	06/28/86	12/20/86									3.62E+06
Humboldt Bay 3	02/16/63	08/ / 63	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
LaCrosse	07/11/67	11/01/69	7.48E+05	8.00E+05	9.11E+05	5.27E+05	7.60E+05	1.07E+06	1.11E+06	5.58E+05	
LaSalle 1	06/21/82	01/01/84				2.09E+06	5.86E+06	2.30E+07	1.54E+07	6.54E+06	
LaSalle 2	03/10/84	10/19/84						4.51E+06	1.10E+07	1.80E+07	
Limerick 1	12/22/84	02/01/86						0.00E+00	4.42E+06	2.16E+07	
Limerick 2	08/12/89	01/08/90									
Millstone 1	10/26/70	03/01/71	1.30E+07	1.04E+07	8.60E+06	1.36E+07	1.64E+07	1.34E+07	1.42E+07	1.61E+07	
Monticello	12/10/70	06/30/71	1.35E+07	1.07E+07	1.01E+07	7.68E+06	1.30E+07	8.98E+05	1.31E+07	1.04E+07	
Nine Mile Point 1	09/05/69	12/01/69	9.67E+06	1.41E+07	1.01E+07	3.42E+06	8.72E+06	1.12E+07	1.52E+07	9.76E+06	
Nine Mile Point 2	05/23/87	04/05/88									
Oyster Creek 1	05/03/69	12/01/69	1.38E+07	6.27E+06	8.44E+06	6.79E+06	9.23E+05	1.04E+06	1.16E+07	4.12E+06	
Peach Bottom 2	09/16/73	07/05/74	4.58E+07	1.37E+07	2.08E+07	1.53E+07	1.40E+07	7.87E+06	7.85E+06	2.16E+07	
Peach Bottom 3	08/07/74	12/23/74		2.26E+07	9.85E+06	2.65E+07	7.82E+06	2.32E+07	1.08E+07	1.55E+07	
Perry 1	06/06/86	11/18/87									
Pilgrim 1	06/16/72	12/01/72	1.47E+07	9.20E+06	1.05E+07	9.90E+06	1.42E+07	4.99E+05	1.50E+07	3.09E+06	
Quad-Cities 1	10/18/71	02/18/73	3.00E+07	1.17E+07	1.88E+07	1.12E+07	1.89E+07	1.06E+07	1.92E+07	1.41E+07	
Quad-Cities 2	04/26/72	03/10/73		1.22E+07	1.27E+07	1.67E+07	1.08E+07	1.61E+07	1.46E+07	1.52E+07	
River Bend 1	10/31/85	06/16/86									9.85E+06
Shoreham 1	02/15/85										
Susquehanna 1	09/10/82	06/08/83				1.16E+06	1.12E+07	1.94E+07	1.70E+07	1.87E+07	
Susquehanna 2	05/08/84	02/12/85						3.23E+06	2.20E+07	1.74E+07	
Vermont Yankee 1	03/24/72	11/30/72	1.08E+07	9.38E+06	1.13E+07	1.31E+07	9.12E+06	1.04E+07	9.55E+06	6.57E+06	
WNP-2	01/19/84	12/13/84						1.21E+06	1.64E+07	1.61E+07	
<b>Total</b>			3.14E+08	2.90E+08	2.86E+08	2.89E+08	2.75E+08	2.90E+08	3.40E+08	3.58E+08	
* Fort St. Vrain 1	01/31/74	07/01/79	4.78E+05	2.23E+06	2.23E+06	1.86E+06	2.58E+06	3.40E+05	3.34E+04	3.70E+05	

\* High temperature gas cooled reactor

Table 15

## Thermal Energy Generation Comparison By Year

Facility	Megawatt Hours								
	Initial Criticality	Commercial Operation	1987	1988	1989	1990	1991	1992	1993
Boiling Water Reactors									
Big Rock Point 1	09/27/62	03/29/63	1.23E+06	1.26E+06	1.14E+07	1.40E+06	1.63E+06	8.97E+05	1.41E+06
Browns Ferry 1	08/17/73	08/01/74	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Browns Ferry 2	07/20/74	03/01/75	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E+07	2.57E+07	1.78E+07
Browns Ferry 3	08/08/76	03/01/77	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Brunswick 1	10/08/76	03/18/77	1.29E+07	1.43E+07	1.32E+07	1.37E+07	1.39E+07	5.90E+06	0.00E+00
Brunswick 2	03/20/75	11/03/75	1.83E+07	1.24E+07	1.34E+07	1.30E+07	1.18E+07	4.20E+06	1.28E+07
Clinton 1	02/27/87	11/24/87	2.15E+06	1.86E+07	9.26E+06	1.15E+07	1.92E+07	1.57E+07	1.86E+07
Cooper	02/21/74	07/01/74	1.72E+07	1.31E+07	1.50E+07	1.59E+07	1.50E+07	1.93E+07	1.15E+07
Dresden 1	10/15/59	07/04/60	0.00E+00						0.00E+00
Dresden 2	01/07/70	06/09/70	1.11E+07	1.45E+07	1.56E+07	1.35E+07	1.00E+07	1.41E+07	1.03E+07
Dresden 3	01/31/71	11/16/71	1.46E+07	1.36E+07	1.67E+07	1.67E+07	9.00E+06	1.02E+07	1.62E+07
Duane Arnold	03/23/74	02/01/75	7.96E+06	9.97E+06	1.00E+07	9.64E+06	1.33E+07	1.10E+07	1.04E+07
Fermi 2	06/21/85	01/23/86	5.99E+06	1.30E+07	1.63E+07	2.25E+07	1.96E+07	1.76E+07	2.56E+07
James A. Fitzpatrick	11/17/74	07/28/75	1.31E+07	1.34E+07	1.88E+07	1.42E+07	1.04E+07	0.00E+00	1.48E+07
Grand Gulf 1	08/18/82	07/01/85	2.55E+07	3.05E+07	2.51E+07	2.43E+07	2.98E+07	2.65E+07	2.56E+07
Edwin I. Hatch 1	09/12/74	12/31/75	1.65E+07	1.35E+07	2.09E+07	1.35E+07	1.56E+07	2.02E+07	1.64E+07
Edwin I. Hatch 2	07/04/78	09/05/79	1.83E+07	1.36E+07	1.35E+07	2.08E+07	1.59E+07	1.53E+07	1.60E+07
Hope Creek 1	06/28/86	12/20/86	2.29E+07	2.22E+07	2.10E+07	1.35E+07	2.35E+07	2.22E+07	2.78E+07
Humboldt Bay 3	02/16/63	08/ /63	0.00E+00						
LaCrosse	07/11/67	11/01/69							
LaSalle 1	06/21/82	01/01/84	1.31E+07	1.69E+07	1.91E+07	2.64E+07	2.10E+07	1.99E+07	2.23E+07
LaSalle 2	03/10/84	10/19/84	1.43E+07	1.81E+07	2.04E+07	1.91E+07	2.68E+07	1.78E+07	1.81E+07
Limerick 1	12/22/84	02/01/86	1.73E+07	2.19E+07	1.71E+07	1.82E+07	2.59E+07	1.97E+07	2.77E+07
Limerick 2	08/12/89	01/08/90			3.54E+06	2.29E+07	2.24E+07	2.67E+07	2.33E+07
Millstone 1	10/26/70	03/01/71	1.34E+07	1.70E+07	1.42E+07	1.56E+07	5.52E+06	1.14E+07	1.67E+07
Monticello	12/10/70	06/30/71	1.10E+07	1.43E+07	8.48E+06	1.40E+07	1.12E+07	1.39E+07	1.19E+07
Nine Mile Point 1	09/05/69	12/01/69	1.42E+07	0.00E+00	0.00E+00	4.07E+06	1.19E+07	8.94E+06	1.34E+07
Nine Mile Point 2	05/23/87	04/05/88	1.53E+06	8.32E+06	1.41E+07	1.34E+07	2.05E+07	1.41E+07	2.33E+07
Oyster Creek 1	05/03/69	12/01/69	9.69E+06	1.09E+07	7.75E+06	1.36E+07	9.43E+06	1.41E+07	1.46E+07
Peach Bottom 2	09/16/73	07/05/74	4.98E+06	0.00E+00	1.25E+07	2.11E+07	1.61E+07	1.78E+07	2.41E+07
Peach Bottom 3	08/07/74	12/23/74	4.76E+06	0.00E+00	8.84E+05	2.37E+07	1.82E+07	2.25E+07	2.02E+07
Ferry 1	06/06/86	11/18/87	2.56E+06	1.62E+07	1.62E+07	2.00E+07	2.75E+07	2.19E+07	1.24E+07
Pilgrim 1	06/16/72	12/01/72	0.00E+00	0.00E+00	5.48E+06	1.29E+07	1.04E+07	1.43E+07	1.31E+07
Quad-Cities 1	10/18/71	02/18/73	1.42E+07	1.83E+07	1.40E+07	1.70E+07	1.13E+07	1.35E+07	1.61E+07
Quad-Cities 2	04/26/72	03/10/73	1.60E+07	1.36E+07	1.85E+07	1.38E+07	1.69E+07	1.26E+07	1.01E+07
River Bend 1	10/31/85	06/16/86	1.55E+07	2.25E+07	1.53E+07	1.78E+07	2.11E+07	8.77E+06	1.66E+07
Shoreham 1	02/15/85								
Susquehanna 1	09/10/82	06/08/83	1.98E+07	2.65E+07	2.05E+07	2.05E+07	2.78E+07	2.03E+07	1.67E+07
Susquehanna 2	05/08/84	02/12/85	2.72E+07	1.87E+07	2.14E+07	2.63E+07	2.23E+07	2.26E+07	2.63E+07
Vermont Yankee 1	03/24/72	11/30/72	1.11E+07	1.30E+07	1.13E+07	1.13E+07	1.29E+07	1.18E+07	1.06E+07
WNP-2	01/19/84	12/13/84	1.67E+07	1.87E+07	1.92E+07	1.80E+07	1.33E+07	1.75E+07	2.16E+07
<b>Total</b>			4.15E+08	4.65E+08	4.80E+08	5.54E+08	5.71E+08	5.39E+08	5.84E+08
* Fort St. Vrain 1	01/31/74	07/01/79	6.68E+05	1.95E+06					

\* High temperature gas cooled reactor

Table 16

## Thermal Energy Generation Comparison By Year

Facility	Megawatt Hours									
	Initial Criticality	Commercial Operation	1979	1980	1981	1982	1983	1984	1985	1986
Pressurized Water Reactors										
Arkansas One 1	08/06/74	12/19/74	1.05E+07	1.29E+07	1.54E+07	1.22E+07	1.02E+07	1.44E+07	1.62E+07	1.11E+07
Arkansas One 2	12/05/78	03/26/80	3.45E+06	1.18E+07	1.39E+07	1.25E+07	1.43E+07	1.95E+07	1.50E+07	1.68E+07
Beaver Valley 1	05/10/76	10/01/76	6.11E+06	1.13E+06	1.55E+07	8.88E+06	1.51E+07	1.58E+07	1.96E+07	1.55E+07
Beaver Valley 2	08/04/87	11/17/87								
Braidwood 1	05/29/87	07/29/88								
Braidwood 2	03/08/88	10/17/88								
Byron 1	02/02/85	09/16/85							3.34E+06	2.32E+07
Byron 2	01/09/87	08/21/87								
Callaway 1	10/02/84	12/19/84						1.00E-	2.49E+07	2.26E+07
Calvert Cliffs 1	10/07/74	05/08/75	3.15E+07	1.52E+07	1.96E+07	1.68E+07	1.75E+07	1.96E+07	1.35E+07	1.82E+07
Calvert Cliffs 2	11/30/76	04/01/77		2.05E+07	1.71E+07	1.62E+07	1.96E+07	1.69E+07	1.78E+07	2.18E+07
Catawba 1	01/07/85	06/29/85							1.07E+07	1.59E+07
Catawba 2	05/08/86	08/19/86								4.04E+06
Comanche Peak 1	04/03/90	08/13/90								
Comanche Peak 2	03/24/93	08/03/93								
Donald C. Cook 1	01/18/75	08/27/75	3.68E+07	2.02E+07	2.11E+07	1.69E+07	1.68E+07	2.41E+07	6.83E+06	2.16E+07
Donald C. Cook 2	03/10/78	07/01/78		2.14E+07	2.04E+07	2.22E+07	2.22E+07	1.70E+07	1.82E+07	1.44E+07
Crystal River 3	01/14/77	03/13/77	1.17E+07	1.04E+07	1.27E+07	1.52E+07	1.14E+07	1.97E+07	1.17E+07	8.14E+06
Davis-Besse 1	08/12/77	07/31/78	1.00E+07	6.71E+06	1.40E+07	1.03E+07	1.57E+07	1.39E+07	6.31E+06	1.29E+05
Diablo Canyon 1	04/29/84	05/07/85						9.48E+05	1.66E+07	1.70E+07
Diablo Canyon 2	08/19/85	03/13/86							2.12E+06	2.11E+07
Joseph M. Farley 1	08/09/77	12/01/77	5.77E+06	1.54E+07	8.96E+06	1.75E+07	1.76E+07	1.78E+07	1.90E+07	1.85E+07
Joseph M. Farley 2	05/05/81	07/30/81			9.47E+06	1.75E+07	1.99E+07	2.15E+07	1.74E+07	1.91E+07
Fort Calhoun 1	08/06/73	06/20/74	1.16E+07	6.48E+06	6.98E+06	1.09E+07	9.14E+06	7.43E+06	9.56E+06	1.13E+07
R. E. Ginna	11/08/69	07/01/70	9.35E+06	9.93E+06	1.07E+07	7.68E+06	9.67E+06	1.00E+07	1.14E+07	1.13E+07
Haddam Neck	07/24/67	01/01/68	1.32E+07	1.14E+07	1.31E+07	1.45E+07	1.22E+07	1.08E+07	1.49E+07	7.26E+06
Harris 1	01/03/87	05/02/87								
Indian Point 1	08/02/62	10/ /62	1.61E+07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indian Point 2	05/22/73	08/01/74		1.50E+07	1.05E+07	1.51E+07	1.96E+07	1.17E+07	2.21E+07	1.29E+07
Indian Point 3	04/06/76	08/30/76	1.57E+07	1.15E+07	1.14E+07	5.06E+06	2.82E+05	1.93E+07	1.51E+07	1.77E+07
Kewaunee	03/07/74	06/16/74	1.09E+07	1.15E+07	1.21E+07	1.23E+07	1.19E+07	1.21E+07	1.16E+07	1.21E+07
Maine Yankee	10/23/72	12/28/72	1.41E+07	1.41E+07	1.67E+07	1.47E+07	1.83E+07	1.62E+07	1.67E+07	1.93E+07
McGuire 1	08/08/81	12/01/81			8.50E+04	1.34E+07	1.39E+07	1.94E+07	2.06E+07	1.56E+07
McGuire 2	05/08/83	03/01/84					0.00E+00	1.94E+07	1.68E+07	1.96E+07
Millstone 2	10/17/75	12/26/75	1.38E+07	1.55E+07	1.92E+07	1.60E+07	7.88E+06	2.14E+07	1.12E+07	1.65E+07
Millstone 3	01/23/86	04/23/86								2.17E+07
North Anna 1	04/05/78	06/06/78	1.41E+07	1.89E+07	1.51E+07	7.95E+06	1.68E+07	1.18E+07	1.81E+07	1.98E+07
North Anna 2	06/12/80	12/14/80		1.12E+06	1.77E+07	1.29E+07	1.87E+07	1.51E+07	2.16E+07	1.92E+07
Oconee 1	04/19/73	07/15/73	4.37E+07	1.52E+07	9.00E+06	1.57E+07	1.72E+07	1.86E+07	2.14E+07	1.46E+07
Oconee 2	11/11/73	09/09/74		1.20E+07	1.59E+07	1.06E+07	1.58E+07	2.25E+07	1.56E+07	1.79E+07
Oconee 3	09/05/74	12/16/74		1.59E+07	1.72E+07	6.53E+06	2.14E+07	1.63E+07	1.49E+07	1.88E+07
Palisades	05/24/71	12/31/71	1.20E+07	8.19E+06	1.17E+07	1.12E+07	1.27E+07	2.72E+06	1.75E+07	2.76E+06
Palo Verde 1	05/25/85	02/13/86							4.39E+06	1.82E+07
Palo Verde 2	04/18/86	09/19/86								7.02E+06
Palo Verde 3	10/25/87	01/08/88								
Point Beach 1	11/02/70	12/21/70	2.08E+07	8.09E+06	8.51E+06	8.60E+06	7.59E+06	9.41E+06	1.02E+07	1.15E+07
Point Beach 2	05/30/72	10/01/71		1.11E+07	1.15E+07	1.13E+07	9.38E+06	1.09E+07	1.11E+07	1.06E+07
Prairie Island 1	12/01/73	12/16/73	1.12E+08	1.06E+07	1.25E+07	1.27E+07	1.24E+07	1.33E+07	1.18E+07	1.22E+07
Prairie Island 2	12/17/74	12/21/74		1.14E+07	1.01E+07	1.26E+07	1.19E+07	1.24E+07	1.15E+07	1.23E+07
Rancho Seco 1	09/16/74	04/17/75	1.79E+07	1.39E+07	8.92E+06	1.09E+07	9.16E+06	1.21E+07	6.26E+06	0.00E+00
H. B. Robinson 2	09/20/70	03/07/71	1.30E+07	1.07E+07	1.19E+07	7.67E+06	1.13E+07	7.84E+05	1.86E+07	1.52E+07
Salem 1	12/11/76	06/30/77	6.60E+06	1.84E+07	2.02E+07	1.31E+07	1.67E+07	6.95E+06	2.77E+07	2.24E+07
Salem 2	08/08/80	10/13/81		0.00E+00	5.11E+06	2.54E+07	2.95E+06	1.03E+07	1.60E+07	1.74E+07
San Onofre 1	06/14/67	01/01/68	1.05E+07	2.55E+06	2.59E+06	1.59E+06	0.00E+00	9.24E+05	8.12E+06	3.00E+06
San Onofre 2	07/26/82	08/08/83				9.28E+05	1.23E+07	1.66E+07	1.65E+07	2.01E+07
San Onofre 3	08/29/83	04/01/84					3.55E+06	1.29E+07	1.21E+07	2.13E+07
Seabrook 1	06/13/89	08/19/90								
Sequoyah 1	07/05/80	07/01/81		1.67E+06	8.06E+06	1.52E+07	2.22E+07	1.92E+07	1.24E+07	0.00E+00
Sequoyah 2	11/05/81	06/01/82					2.03E+07	1.96E+07	1.71E+07	0.00E+00
South Texas 1	03/08/88	08/25/88								
South Texas 2	03/12/89	06/19/89								

Table 16

## Thermal Energy Generation Comparison By Year

Pressurized Water Reactors										
Facility	Initial		Megawatt Hours							
	Criticality	Commercial Operation	1979	1980	1981	1982	1983	1984	1985	1986
St. Lucie 1	04/22/76	12/21/76	1.60E+07	1.70E+07	1.61E+07	2.18E+07	3.53E+06	3.35E+07	1.88E+07	2.23E+07
St. Lucie 2	06/02/83	08/08/83					7.66E+06	1.77E+07	1.93E+07	1.94E+07
Summer 1	10/22/82	01/01/84				7.95E+05	1.38E+07	1.33E+07	1.65E+07	2.26E+07
Surry 1	07/01/72	12/22/72	9.32E+06	8.67E+06	7.94E+06	1.83E+07	1.22E+07	1.11E+07	1.79E+07	1.42E+07
Surry 2	03/07/73	05/01/73		7.26E+06	1.68E+07	1.79E+07	1.35E+07	1.73E+07	1.33E+07	1.45E+07
Three Mile Island 1	06/05/74	09/02/74	2.83E+06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.82E+06	1.56E+07
Three Mile Island 2	03/28/78	12/30/78	N/R	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trojan	12/15/75	05/20/76	1.70E+07	1.97E+07	2.10E+07	1.56E+07	1.34E+07	1.54E+07	2.25E+07	2.29E+07
Turkey Point 3	10/20/72	12/14/72	2.28E+07	1.47E+07	3.03E+06	1.22E+07	1.41E+07	1.56E+07	1.11E+07	1.46E+07
Turkey Point 4	06/11/73	09/07/73		1.32E+07	1.48E+07	1.27E+07	9.83E+06	1.04E+07	1.69E+07	5.73E+06
Vogtle 1	03/09/87	05/31/87								
Vogtle 2	03/28/89	05/20/89								
Waterford 3	03/04/85	09/24/85							5.64E+06	2.27E+07
Wolf Creek 1	05/22/85	09/03/85							8.87E+06	2.09E+07
Yankee Rowe 1	08/19/60	07/01/61	4.17E+06	1.13E+06	3.63E+06	3.69E+06	4.69E+06	3.61E+06	4.19E+06	4.90E+06
Zion 1	06/19/73	12/31/73	3.31E+07	2.22E+07	1.98E+07	1.52E+07	1.34E+07	1.83E+07	1.85E+07	1.58E+07
Zion 2	12/24/73	09/17/74		1.75E+07	1.77E+07	1.71E+07	2.00E+07	1.92E+07	2.16E+07	2.30E+07
<b>Total</b>			5.75E+08	5.12E+08	5.76E+08	5.96E+08	6.52E+08	7.37E+08	8.58E+08	9.38E+08

N/R = Not Reported

Table 16

## Thermal Energy Generation Comparison By Year

Facility	Megawatt Hours									
	Initial Criticality	Commercial Operation	1987	1988	1989	1990	1991	1992	1993	
Pressurized Water Reactors										
Arkansas One 1	08/06/74	12/19/74	1.51E+07	1.24E+07	1.07E+07	1.30E+07	2.01E+07	1.80E+07	1.89E+07	
Arkansas One 2	12/05/78	03/26/80	2.10E+07	1.58E+07	1.76E+07	2.26E+07	1.94E+07	1.75E+07	2.32E+07	
Beaver Valley 1	05/10/76	10/01/76	1.84E+07	1.64E+07	1.27E+07	2.02E+07	1.22E+07	2.05E+07	1.44E+07	
Beaver Valley 2	06/04/87	11/17/87	2.39E+06	2.13E+07	1.51E+07	1.43E+07	2.22E+07	1.82E+07	1.67E+07	
Braidwood 1	05/29/87	07/29/88	5.02E+06	1.04E+07	1.44E+07	2.48E+07	1.5E+07	2.19E+07	2.60E+07	
Braidwood 2	03/08/88	10/17/88		4.08E+06	2.18E+07	1.95E+07	2.0E+07	2.67E+07	2.25E+07	
Byron 1	02/02/85	09/16/85	1.71E+07	1.99E+07	2.77E+07	2.16E+07	1.99E+07	2.77E+07	2.26E+07	
Byron 2	01/09/87	08/21/87	6.47E+06	2.04E+07	1.87E+07	1.87E+07	2.72E+07	2.12E+07	2.33E+07	
Callaway 1	10/02/84	12/19/84	1.98E+07	2.76E+07	3.15E+07	2.45E+07	3.04E+07	2.48E+07	2.58E+07	
Calvert Cliffs 1	10/07/74	05/08/75	1.65E+07	1.62E+07	4.23E+06	4.34E+06	1.73E+07	1.29E+07	2.30E+07	
Calvert Cliffs 2	11/30/76	04/01/77	1.50E+07	2.07E+07	1.45E+06	0.00E+00	1.17E+07	2.10E+07	1.57E+06	
Catawba 1	01/07/85	06/29/85	1.95E+07	2.29E+07	2.36E+07	2.08E+07	2.02E+07	2.11E+07	2.27E+07	
Catawba 2	05/08/86	08/19/86	2.17E+07	1.88E+07	1.95E+07	1.93E+07	2.18E+07	2.76E+07	2.42E+07	
Comanche Peak 1	04/03/90	08/13/90				8.16E+06	1.72E+07	2.20E+07	2.35E+07	
Comanche Peak 2	03/24/93	08/03/93							1.06E+07	
Donald C. Cook 1	01/18/75	08/27/75	1.64E+07	2.42E+07	1.74E+07	2.05E+07	2.38E+07	1.63E+07	2.81E+07	
Donald C. Cook 2	03/10/78	07/01/78	1.65E+07	7.41E+06	2.13E+07	1.53E+07	2.65E+07	4.89E+06	2.45E+07	
Crystal River 3	01/14/77	03/13/77	1.11E+07	1.78E+07	9.14E+06	1.28E+07	1.68E+07	1.62E+07	1.86E+07	
Davis-Besse 1	08/12/77	07/31/78	1.65E+07	3.91E+06	2.35E+07	1.32E+07	1.85E+07	2.41E+07	1.92E+07	
Diablo Canyon 1	04/29/84	05/07/85	2.54E+07	1.66E+07	2.25E+07	2.72E+07	2.31E+07	2.34E+07	2.81E+07	
Diablo Canyon 2	08/19/85	03/13/86	1.82E+07	1.98E+07	2.69E+07	2.39E+07	2.45E+07	2.91E+07	2.44E+07	
Joseph M. Farley 1	08/09/77	12/01/77	2.11E+07	1.92E+07	1.96E+07	2.25E+07	1.78E+07	1.86E+07	2.25E+07	
Joseph M. Farley 2	05/05/81	07/30/81	1.60E+07	2.29E+07	1.81E+07	1.69E+07	2.18E+07	1.76E+07	1.70E+07	
Fort Calhoun 1	08/06/73	06/20/74	9.48E+06	8.34E+06	1.07E+07	7.67E+06	1.03E+07	7.94E+06	9.72E+06	
R. E. Ginna	11/08/69	07/01/70	1.19E+07	1.10E+07	9.65E+06	1.07E+07	1.09E+07	1.08E+07	1.09E+07	
Haddam Neck	07/24/67	01/01/68	8.39E+06	1.06E+07	9.47E+06	3.81E+06	1.19E+07	1.24E+07	1.19E+07	
Harris 1	01/03/87	05/02/87	1.12E+07	1.71E+07	1.83E+07	2.05E+07	1.89E+07	1.74E+07	2.39E+07	
Indian Point 1	08/02/62	10/ / 62	0.00E+00						0.00E+00	
Indian Point 2	05/22/73	08/01/74	1.71E+07	1.95E+07	1.45E+07	1.66E+07	1.29E+07	2.57E+07	1.95E+07	
Indian Point 3	04/06/76	08/30/76	1.56E+07	2.14E+07	1.55E+07	1.57E+07	2.25E+07	1.47E+07	3.68E+07	
Kewaunee	03/07/74	06/16/74	1.26E+07	1.22E+07	1.18E+07	1.24E+07	1.16E+07	1.24E+07	1.20E+07	
Maine Yankee	10/23/72	12/28/72	1.31E+07	1.67E+07	2.11E+07	1.50E+07	1.94E+07	1.66E+07	1.77E+07	
McGuire 1	08/08/81	12/01/81	2.21E+07	2.26E+07	2.38E+07	1.48E+07	2.08E+07	2.28E+07	1.70E+07	
McGuire 2	05/08/83	03/01/84	2.25E+07	2.41E+07	2.19E+07	1.93E+07	2.84E+07	2.04E+07	2.05E+07	
Millstone 2	10/17/75	12/26/75	2.18E+07	1.81E+07	1.55E+07	1.69E+07	1.25E+07	8.51E+06	1.96E+07	
Millstone 3	01/23/86	04/23/86	2.05E+07	2.33E+07	2.17E+07	2.52E+07	8.88E+06	2.02E+07	2.01E+07	
North Anna 1	04/05/78	06/06/78	1.14E+07	2.20E+07	1.37E+07	2.31E+07	1.80E+07	1.72E+07	1.83E+07	
North Anna 2	06/12/80	12/14/80	1.80E+07	2.50E+07	1.88E+07	1.91E+07	2.46E+07	2.03E+07	2.01E+07	
Oconee 1	04/19/73	07/15/73	1.56E+07	2.21E+07	1.82E+07	1.96E+07	1.83E+07	1.91E+07	1.98E+07	
Oconee 2	11/11/73	09/09/74	1.93E+07	1.72E+07	1.84E+07	1.90E+07	2.23E+07	1.81E+07	1.88E+07	
Oconee 3	09/05/74	12/16/74	1.55E+07	1.80E+07	1.94E+07	2.23E+07	1.69E+07	1.66E+07	2.21E+07	
Palisades	05/24/71	12/31/71	8.83E+06	1.14E+07	1.21E+07	1.01E+07	1.59E+07	1.56E+07	1.14E+07	
Palo Verde 1	05/25/85	02/13/86	1.61E+07	2.03E+07	5.57E+06	1.45E+07	2.85E+07	2.19E+07	2.33E+07	
Palo Verde 2	04/18/86	09/19/86	2.49E+07	2.07E+07	1.47E+07	1.91E+07	2.52E+07	3.11E+07	1.58E+07	
Palo Verde 3	10/25/87	01/08/88	1.24E+06	3.03E+07	4.10E+06	2.92E+07	2.29E+07	2.55E+07	2.87E+07	
Point Beach 1	11/02/70	12/21/70	1.09E+07	1.17E+07	1.11E+07	1.09E+07	1.12E+07	1.11E+07	1.17E+07	
Point Beach 2	05/30/72	10/01/71	1.11E+07	1.14E+07	1.06E+07	1.16E+07	1.13E+07	1.12E+07	1.17E+07	
Prairie Island 1	12/01/73	12/16/73	1.14E+07	1.23E+07	1.40E+07	1.23E+07	1.26E+07	1.11E+07	1.38E+07	
Prairie Island 2	12/17/74	12/21/74	1.41E+07	1.26E+07	1.25E+07	1.22E+07	1.43E+07	1.03E+07	1.18E+07	
Rancho Seco 1	09/16/74	04/17/75	0.00E+00	9.47E+06	4.62E+06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
H. B. Robinson 2	09/20/70	03/07/71	1.35E+07	1.06E+07	8.86E+06	1.08E+07	1.53E+07	1.29E+07	1.35E+07	
Salem 1	12/11/76	06/30/77	1.96E+07	2.32E+07	1.97E+07	1.90E+07	2.14E+07	1.67E+07	1.86E+07	
Salem 2	08/08/80	10/13/81	1.96E+07	1.90E+07	2.44E+07	1.69E+07	2.41E+07	1.50E+07	1.74E+07	
San Onofre 1	06/14/67	01/01/68	8.82E+06	4.52E+06	3.92E+06	5.04E+06	6.74E+06	3.92E+06	0.00E+00	
San Onofre 2	07/26/82	08/08/83	1.93E+07	2.75E+07	1.63E+07	2.55E+07	1.80E+07	2.73E+07	2.38E+07	
San Onofre 3	08/29/83	04/01/84	2.32E+07	1.89E+07	2.73E+07	2.04E+07	2.70E+07	2.13E+07	2.20E+07	
Seabrook 1	06/13/89	08/19/90				1.26E+07	2.05E+07	2.35E+07	2.69E+07	
Sequoyah 1	07/05/80	07/01/81	0.00E+00	5.16E+05	2.88E+07	2.10E+07	2.23E+07	2.54E+07	3.92E+06	
Sequoyah 2	11/05/81	06/01/82	0.00E+00	1.26E+07	2.88E+07	2.19E+07	2.87E+07	2.23E+07	6.58E+06	
South Texas 1	03/08/88	08/25/88		8.81E+06	1.99E+07	1.90E+07	2.25E+07	2.24E+07	2.08E+06	
South Texas 2	03/12/89	06/19/89			9.52E+06	2.02E+07	2.27E+07	3.18E+07	2.23E+06	

Table 16

## Thermal Energy Generation Comparison By Year

		Megawatt Hours							
Pressurized Water Reactors		Initial	Commercial						
Facility	Criticality	Operation	1987	1988	1989	1990	1991	1992	1993
St. Lucie 1	04/22/76	12/21/76	1.81E+07	1.97E+07	2.19E+07	1.43E+07	1.85E+07	2.26E+07	2.26E+07
St. Lucie 2	06/02/83	08/08/83	1.90E+07	2.35E+07	1.73E+07	1.70E+07	2.33E+07	1.73E+07	1.73E+07
Summer 1	10/22/82	01/01/84	1.64E+07	1.61E+07	1.76E+07	1.93E+07	1.69E+07	2.35E+07	1.92E+07
Surry 1	07/01/72	12/22/72	1.47E+07	8.45E+06	9.95E+06	1.51E+07	2.09E+07	1.65E+07	1.95E+07
Surry 2	03/07/73	05/01/73	1.54E+07	1.16E+07	2.87E+06	1.85E+07	1.27E+07	2.05E+07	1.43E+07
Three Mile Island 1	06/05/74	09/02/74	1.56E+07	1.69E+07	2.22E+07	1.69E+07	1.74E+07	2.22E+07	1.18E+07
Three Mile Island 2	03/28/78	12/30/78	0.00E+00						
Trojan	12/15/75	05/20/76	1.39E+07	1.98E+07	1.73E+07	1.90E+07	4.72E+06	1.46E+07	0.00E+00
Turkey Point 3	10/20/72	12/14/72	2.96E+06	1.14E+07	1.18E+07	1.12E+07	4.34E+07	1.13E+07	1.18E+07
Turkey Point 4	06/11/73	09/07/73	8.69E+06	1.06E+07	7.14E+06	1.44E+07	2.68E+07	1.53E+07	7.14E+06
Vogtle 1	03/09/87	05/31/87	1.27E+07	2.18E+07	2.76E+07	2.32E+07	2.33E+07	2.88E+07	2.64E+07
Vogtle 2	03/28/89	05/20/89			1.72E+07	2.17E+07	2.75E+07	2.40E+07	2.66E+07
Waterford 3	03/04/85	09/24/85	2.31E+07	2.06E+07	2.37E+07	2.69E+07	2.29E+07	2.41E+07	2.94E+07
Wolf Creek 1	05/22/85	09/03/85	1.97E+07	2.01E+07	2.88E+07	2.36E+07	1.80E+07	2.54E+07	2.27E+07
Yankee Rowe 1	08/19/60	07/01/61	4.03E+06	4.03E+06	4.66E+06	2.94E+06	3.53E+06	0.00E+00	0.00E+00
Zion 1	06/19/73	12/31/73	1.88E+07	1.97E+07	1.56E+07	1.41E+07	1.34E+07	1.27E+07	2.18E+07
Zion 2	12/24/73	09/17/74	1.61E+07	2.08E+07	2.40E+07	8.42E+06	1.61E+07	1.67E+07	1.64E+07
<b>Total</b>			1.01E+09	1.18E+09	1.21E+09	1.24E+09	1.42E+09	1.39E+09	1.33E+09

APPENDIX A



Installation: Arkansas One  
Unit No.: 1

Location: 6 Mi WNW Russellville, AR

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-313  
Thermal Power (MWH): 1.89E+07  
Commercial Operation: 12/19/74  
Cooling Water Source: Dardanelle Reservoir

Licensee: Arkansas Power & Light  
Licensed Power (MWT): 2.57E+03  
Net Electrical Power (MWH): 6.13E+06  
Initial Criticality: 08/06/74

Airborne Effluents

Nuclide Released	Activity (Ci)
CO-58	3.65E-07
KR-85	1.05E-03
SR-89	7.55E-07
I-131	6.17E-06
XE-131M	2.22E-03
I-132	8.38E-06
I-133	2.12E-06
XE-133	2.92E+00
XE-133M	1.49E+01
XE-135	6.72E-02
CS-137	9.05E-09

Liquid Effluents

Nuclide Released	Activity (Ci)
BE-7	3.36E-04
NA-24	1.43E-04
AR-41	2.42E-04
CR-51	3.45E-02
MN-54	8.63E-03
FE-55	8.29E-02
CO-57	3.86E-03
CO-58	8.58E-01
FE-59	4.14E-04
CO-60	8.29E-02
SE-75	4.05E-03
KR-85M	2.52E-05
KR-87	2.29E-05
SR-89	1.07E-03
MO-90	4.00E-05
SR-90	8.05E-04
Y-90	3.81E-02
Y-91M	3.85E-04
SR-92	5.42E-04
NB-95	1.21E-02
ZR-95	7.94E-03
NB-97	4.57E-04
ZR-97	1.64E-05
MO-99	4.12E-03
TC-99M	3.46E-03
RU-103	1.66E-04
AG-110M	8.56E-02
SN-113	5.66E-04
SB-122	8.21E-03
SB-124	5.54E-02

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
SB-125	3.64E-01
SB-126	2.88E-03
SB-127	9.88E-04
I-131	1.49E-02
XE-131M	3.66E-03
I-132	5.75E-03
TE-132	1.86E-03
I-133	1.10E-03
XE-133	9.10E-01
XE-133M	1.02E-02
CS-134	1.56E-02
XE-135	3.79E-03
XE-135M	2.61E-04
CS-137	4.24E-02
BA-140	1.39E-04
LA-140	1.13E-03
Unidentified	2.94E-05

Total Airborne Tritium Released	1.01E+01 Ci
Total Liquid Tritium Released	4.51E+02 Ci
Volume of Waste Released (Prior to Dilution)	2.66E+07 liters
Volume of Dilution Water Used During Period	1.82E+11 liters

Installation: Arkansas One  
Unit No.: 2

Location: 6 Mi WNW Russellville, AR

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-368  
Thermal Power (MWH): 2.32E+07  
Commercial Operation: 03/26/80  
Cooling Water Source: Dardanelle Reservoir

Licensee: Arkansas Power & Light  
Licensed Power (MWT): 2.82E+03  
Net Electrical Power (MWH): 7.34E+06  
Initial Criticality: 12/05/78

Airborne Effluents

Nuclide Released	Activity (Ci)
CO-57	5.36E-07
CO-58	3.62E-06
KR-85	1.38E+01
SR-89	2.00E-07
I-131	1.43E-07
XE-131M	8.13E-04
I-132	8.47E-06
BA-133	3.48E-07
I-133	2.07E-06
XE-133	3.81E+01
XE-133M	2.89E-04
XE-135	1.49E-01
CS-137	2.61E-08

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	4.33E-04
CR-51	8.12E-03
MN-54	2.53E-02
FE-55	1.78E-02
CO-57	3.55E-04
CO-58	1.21E-01
FE-59	1.65E-04
CO-60	1.44E-02
SE-75	1.14E-04
KR-85	1.65E-01
SR-89	1.74E-03
SR-90	3.65E-04
SR-92	4.33E-05
NB-95	1.88E-03
ZR-95	1.12E-03
NB-97	1.73E-04
ZR-97	8.16E-06
MO-99	2.36E-04
TC-99M	2.49E-04
AG-110M	1.27E-02
SN-113	1.68E-04
SB-122	1.00E-03
SB-124	1.74E-02
SB-125	1.03E-01
SB-126	5.92E-04
SB-127	2.47E-05
I-131	9.32E-03
I-132	2.01E-02

Installation: Arkansas One  
Unit No.: 2

Location: 6 Mi WNW Russellville, AR

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
TE-132	1.26E-02
I-133	2.25E-03
XE-133	1.52E-01
XE-133M	8.17E-04
CS-134	3.81E-02
I-134	8.83E-06
I-135	1.76E-04
XE-135	4.13E-04
CS-137	6.69E-02
LA-140	2.37E-04
CE-143	8.63E-06
W-187	1.71E-04

Total Airborne Tritium Released	7.30E+00 Ci
Total Liquid Tritium Released	3.08E+02 Ci
Volume of Waste Released (Prior to Dilution)	1.61E+07 liters
Volume of Dilution Water Used During Period	1.91E+11 liters

Installation: Arkansas One  
Unit No.: 1&2

Location: 6 Mi WNW Russellville, AR

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-313  
Thermal Power(MWH): 1.89E+07  
Commercial Operation: 12/19/74  
Cooling Water Source: Dardanelle Reservoir

Licensee: Arkansas Power & Light  
Licensed Power(MWT): 2.57E+03  
Net Electrical Power(MWH): 6.13E+06  
Initial Criticality: 08/06/74

Unit Number: 2      Type: PWR  
Docket Number: 50-368  
Thermal Power(MWH): 2.32E+07  
Commercial Operation: 03/26/80  
Cooling Water Source: Dardanelle Reservoir

Licensee: Arkansas Power & Light  
Licensed Power(MWT): 2.82E+03  
Net Electrical Power(MWH): 7.34E+06  
Initial Criticality: 12/05/78

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
2	Cask Shipment	Barnwell, SC
8	Unshielded Van/Truck	Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June      Jul-Dec

	Jan-June	Jul-Dec
A		
AG-110M		5.00E-01
CO-58	1.58E+01	8.30E+00
CO-60	5.70E+00	4.60E+00
CS-134		1.50E+01
CS-137	1.60E+00	2.30E+01
FE-55	1.27E+01	1.53E+01
MN-54		2.30E+00
NE-95	4.30E+00	
NI-63	5.06E+01	1.59E+01
SB-125	5.20E+00	1.24E+01
SR-89	1.20E+00	
TE-125M	6.00E-01	2.80E+00
ZR-95	2.20E+00	
B		
C-14	1.10E+00	3.00E-01
CO-58	1.84E+01	
CO-60	7.60E+00	2.10E+00
CS-134	1.93E+01	4.70E+00
CS-137	3.12E+01	8.70E+01
FE-55	9.40E+00	2.70E+00
H-3		1.00E-02
I-129		6.00E-02
NI-63	1.10E+01	3.10E+00
SB-125	1.70E+00	
SR-89	1.00E-01	
TC-99		8.00E-02
TE-125M	1.00E-01	

Installation: Arkansas One  
Unit No.: 1&2

Location: 6 Mi WNW Russellville, AR

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 7.87E+00 Ci 1.94E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 7.06E+01 Ci 5.66E+00	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Beaver Valley  
Unit No.: 1

Location: Shippingport, PA

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-334  
Thermal Power(MWH): 1.44E+07  
Commercial Operation: 10/01/76  
Cooling Water Source: Ohio River

Licensee: Duquesne Light  
Licensed Power(MWT): 2.65E+03  
Net Electrical Power(MWH): 4.35E+06  
Initial Criticality: 05/10/76

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	2.18E+00
CR-51	5.45E-04
MN-54	5.09E-05
CO-57	1.68E-05
CO-58	1.24E-02
CO-60	2.77E-04
KR-85	7.49E+00
KR-85M	1.49E-01
ZR/NB-95	1.40E-04
I-131	5.08E-03
XE-131M	9.68E+00
I-133	4.06E-05
XE-133	3.78E+02
XE-133M	6.89E+00
XE-135	5.29E+00

Installation: Beaver Valley  
Unit No.: 2

Location: Shippingport, PA

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-412  
Thermal Power(MWH): 1.67E+07  
Commercial Operation: 11/17/87  
Cooling Water Source: Ohio River

Licensee: Duquesne Light  
Licensed Power(MWT): 2.65E+03  
Net Electrical Power(MWH): 5.20E+06  
Initial Criticality: 08/04/87

Airborne Effluents

Nuclide Released	Activity (Ci)
CO-58	9.27E-04
CO-60	5.81E-06
KR-85	3.02E+00
TC-99M	2.16E-08
I-131	1.10E-03
XE-131M	1.92E+00
I-133	2.51E-05
XE-133	5.78E+01
XE-133M	6.29E-02
XE-135	6.95E+00
CE-141	5.95E-07
CE-144	1.59E-07



Installation: Beaver Valley  
Unit No.: 1&2

Location: Shippingport, PA

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: PWR  
Docket Number: 50-334  
Thermal Power(MWH): 1.44E+07  
Commercial Operation: 10/01/76  
Cooling Water Source: Ohio River  
Unit Number: 2      Type: PWR  
Docket Number: 50-412  
Thermal Power(MWH): 1.67E+07  
Commercial Operation: 11/17/87  
Cooling Water Source: Ohio River

Licensee: Duquesne Light  
Licensed Power(MWT): 2.65E+03  
Net Electrical Power(MWH): 4.35E+06  
Initial Criticality: 05/10/76

Licensee: Duquesne Light  
Licensed Power(MWT): 2.65E+03  
Net Electrical Power(MWH): 5.20E+06  
Initial Criticality: 08/04/87

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	4.21E-05
CO-58	8.41E-04
KR-85	7.67E+00
I-131	5.75E-04
XE-131M	1.02E+00
I-133	1.03E-05
XE-133	6.71E+01
XE-133M	3.82E-01
XE-135	1.02E-01

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	1.06E-04
CR-51	1.27E-02
MN-54	9.71E-04
FE-55	1.74E-01
CO-57	5.92E-04
CO-58	1.16E-01
FE-59	4.20E-03
CO-60	3.35E-02
KR-85	1.76E-03
SR-89	8.23E-05
ZR/NB-95	2.30E-03
NB-97	8.97E-03
MO-99	3.62E-05
TC-99M	3.94E-05
RU-103	2.22E-05
AG-110M	1.07E-02
SB-124	9.47E-03
SB-125	1.73E-02
I-131	1.54E-03
I-133	8.22E-05
XE-133	2.47E-02
CS-134	1.21E-03
XE-135	1.51E-04
CS-137	2.34E-03

Installation: Beaver Valley  
Unit No.: 1&2

Location: Shippingport, PA

Effluent and Waste Disposal Annual Report for 1993

Total Airborne Tritium Released	3.46E+02 Ci
Total Liquid Tritium Released	5.53E+02 Ci
Volume of Waste Released (Prior to Dilution)	6.08E+06 liters
Volume of Dilution Water Used During Period	3.91E+09 liters

Installation: Beaver Valley  
 Unit No.: 1&2

Location: Shippingport, PA

Effluent and Waste Disposal Annual Report for 1993  
 Solid Effluents

Unit Number: 1      Type: PWR  
 Docket Number: 50-334  
 Thermal Power(MWH): 1.44E+07  
 Commercial Operation: 10/01/76  
 Cooling Water Source: Ohio River

Licensee: Duquesne Light  
 Licensed Power(MWT): 2.65E+03  
 Net Electrical Power(MWH): 4.35E+06  
 Initial Criticality: 05/10/76

Unit Number: 2      Type: PWR  
 Docket Number: 50-412  
 Thermal Power(MWH): 1.67E+07  
 Commercial Operation: 11/17/87  
 Cooling Water Source: Ohio River

Licensee: Duquesne Light  
 Licensed Power(MWT): 2.65E+03  
 Net Electrical Power(MWH): 5.20E+06  
 Initial Criticality: 08/04/87

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
11	Truck	Barnwell, SC
35	Truck	Oak Ridge, TN
2	Truck	Wampum, PA

Estimate of Major Nuclide Composition (%)  
 (by type of waste)

Jan-June      Jul-Dec

A

BE-7		1.00E-01
C-14	8.00E-02	4.00E-02
CO-57	2.00E-02	2.30E-01
CO-58	4.00E+00	5.77E+01
CO-60	1.89E+01	6.95E+00
CR-51		1.90E-01
CS-134	1.76E+00	4.35E+00
CS-137	2.87E+00	4.63E+00
FE-55	3.61E+01	5.12E+00
FE-59		2.00E-02
H-3	3.70E-01	1.83E+00
I-131	7.00E-02	2.00E-02
MN-54	2.00E-02	5.30E-01
NB-95		1.00E-02
NI-59	2.42E+01	6.80E-01
NI-63	1.13E+01	1.69E+01
P-32		2.00E-02
PU-241	1.40E-01	3.00E-02
RU-106		2.60E-01
SB-124		3.30E-01
SB-125	8.00E-02	2.00E-02
SR-89		5.00E-02

B

AG-110M	2.30E-01	6.00E-02
C-14	1.10E-01	5.00E-02
CM-242	2.00E-02	
CO-57	5.00E-02	2.00E-02
CO-58	8.70E-01	4.69E+01
CO-60	2.31E+01	1.39E+01

Effluent and Waste Disposal Annual Report for 1993  
 Solid Effluents

Estimate of Major Nuclide Composition ( %) (continued) Jan-June July-Dec  
 (by type of waste)

B

CS-134	6.31E+00	3.66E+00
CS-137	1.54E+01	6.17E+00
FE-55	2.88E+01	1.77E+01
H-3	2.12E+00	7.50E-01
I-129	2.70E-01	7.00E-02
I-131	1.41E+00	1.08E+00
MN-54	5.50E-01	1.08E+00
NB-95	3.00E-02	4.00E-02
NI-59	3.68E+00	1.03E+00
NI-63	1.50E+01	6.98E+00
PU-241	6.40E-01	1.80E-01
SB-124	1.32E+00	3.10E-01
SB-125	6.00E-02	
TC-99	8.00E-02	2.00E-02
ZR-95	4.00E-02	1.00E-02

C

AG-108M	4.00E-02	
CO-60	4.23E+01	
CR-51	1.00E-02	
CS-137	1.00E-02	
FE-55	4.29E+01	
NI-59	1.60E-01	
NI-63	1.44E+01	
SB-125	2.10E-01	

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.14E+02	Volume Shipped
	m3 8.28E+01	Volume Buried
	Ci 1.18E+03	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 1.47E+03	Volume Shipped
	m3 6.21E+01	Volume Buried
	Ci 1.85E+01	
C. Irradiated Components, Control Rods, etc.	m3 1.60E+00	Volume Buried
	Ci 1.70E+02	
D. Other (describe)	m3	
	Ci	

Installation: Big Rock Point  
Unit No.: 1

Location: 4 Mi NE Charlevoix, MI

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-155  
Thermal Power(MWH): 1.41E+06  
Commercial Operation: 03/29/63  
Cooling Water Source: Lake Michigan

Licensee: Consumers Power  
Licensed Power(MWT): 2.40E+02  
Net Electrical Power(MWH): 4.26E+05  
Initial Criticality: 09/27/62

Airborne Effluents

Nuclide Released	Activity (Ci)
NA-24	1.82E-04
CR-51	1.45E-04
MN-54	9.25E-05
CO-58	5.02E-07
CO-60	1.98E-04
ZN-65	6.67E-06
AS-76	3.89E-05
BR-82	1.15E-03
KR-85M	1.61E+02
KR-87	5.34E+02
KR-88	4.36E+02
SR-89	2.09E-04
SR-90	6.09E-06
SR-91	2.73E-03
NB-95	3.27E-07
MO-99	5.64E-05
AG-110M	1.52E-05
SN-113	4.01E-07
SB-124	3.19E-06
I-131	2.57E-03
I-133	1.05E-02
XE-133	2.23E+02
CS-134	1.07E-05
I-135	4.73E-04
XE-135	6.52E+02
XE-135M	7.21E+02
CS-137	1.54E-04
XE-138	2.42E+03
BA-140	3.99E-04
LA-140	8.56E-04
NP-239	1.85E-06

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	9.28E-04
MN-54	3.89E-02
CO-58	4.78E-04
FE-59	4.68E-03
CO-60	3.66E-02
ZN-65	8.11E-04
SR-89	2.03E-05
SR-90	1.71E-04
NB-95	2.04E-04
AG-110M	3.96E-04

Installation: Big Rock Point  
Unit No.: 1

Location: 4 Mi NE Charlevoix, MI

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
SN-113	1.06E-04
SE-124	7.62E-05
I-131	1.61E-04
CS-134	9.54E-04
CS-137	1.19E-02
TA-182	2.19E-04
Unidentified	4.52E-04

Total Airborne Tritium Released	2.29E+00 Ci
Total Liquid Tritium Released	1.58E-01 Ci
Volume of Waste Released (Prior to Dilution)	1.79E+05 liters
Volume of Dilution Water Used During Period	7.32E+10 liters

Installation: Braidwood  
Unit No.: 1

Location: 24 Mi SSW of Joliet, IL

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-456  
Thermal Power(MWH): 2.60E+07  
Commercial Operation: 07/29/88  
Cooling Water Source: Kankakee River

Licensee: Commonwealth Edison  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 8.69E+06  
Initial Criticality: 05/29/87

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	1.90E-01
KR-85	4.03E-01
KR-85M	2.38E-01
KR-87	5.58E-03
KR-88	1.41E-01
I-131	3.19E-04
XE-131M	1.45E+00
I-133	1.49E-04
XF-133	3.38E+02
XE-133M	1.55E+00
XE-135	7.17E+00

Liquid Effluents

Nuclide Released	Activity (Ci)
AR-41	4.90E-06
CR-51	3.27E-02
MN-54	3.96E-03
FE-55	4.34E-02
CO-57	3.17E-04
CO-58	2.37E-01
FE-59	3.97E-03
CO-60	1.98E-02
ZN-65	4.63E-05
KR-85	7.20E-03
SR-89	1.84E-03
SR-90	7.92E-02
SR-92	8.41E-06
NB-95	3.34E-03
ZR-95	2.05E-03
ZR-97	5.00E-06
TC-99M	6.75E-05
RU-105	2.79E-05
AG-110M	4.34E-06
SN-113	1.57E-04
SN-117M	1.57E-05
SB-124	1.89E-03
SB-125	3.01E-02
SB-126	9.19E-06
I-131	1.39E-02
I-132	9.69E-05
I-133	5.44E-04
XE-133	4.09E-02
CS-134	6.53E-04
I-135	3.80E-05

Installation: Braidwood  
Unit No.: 1

Location: 24 Mi SSW of Joliet, IL

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
XE-135	8.08E-04
CS-137	1.69E-03
CE-114	2.33E-04
HF-181	1.13E-04

Total Airborne Tritium Released	1.07E+01 Ci
Total Liquid Tritium Released	8.05E+02 Ci
Volume of Waste Released (Prior to Dilution)	1.69E+07 liters
Volume of Dilution Water Used During Period	9.38E+09 liters



Installation: Braidwood  
Unit No.: 2

Location: 24 Mi SSW of Joliet, IL

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-457  
Thermal Power(MWH): 2.25E+07  
Commercial Operation: 10/17/88  
Cooling Water Source: Kankakee River

Licensee: Commonwealth Edison  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 7.35E+06  
Initial Criticality: 03/08/88

Airborne Effluents

Nuclide Released	Activity (Ci)
LR-41	3.47E-01
KR-85	1.24E+00
KR-85M	4.97E+01
KR-87	5.58E-03
KR-88	4.14E-01
I-131	2.87E-03
XE-131M	7.34E+00
I-132	5.09E-05
I-133	4.82E-04
XE-133	2.28E+03
XE-133M	7.52E+00
XE-135	5.24E+01

Liquid Effluents

Nuclide Released	Activity (Ci)
AR-41	4.90E-06
CR-51	3.27E-02
MN-54	3.96E-03
FE-55	4.34E-02
CO-57	3.17E-04
CO-58	2.37E-01
FE-59	3.97E-03
CO-60	1.98E-02
ZN-65	4.63E-05
KR-85	7.20E-03
SR-89	1.84E-03
SR-90	7.92E-02
SR-92	8.41E-06
NB-95	3.34E-03
ZR-95	2.05E-03
ZR-97	5.00E-06
TC-99M	6.75E-05
RU-105	2.79E-05
AG-110M	4.34E-06
SN-113	1.57E-04
SN-117M	1.57E-05
SB-124	1.89E-03
SB-125	3.01E-02
SB-126	9.19E-06
I-131	1.39E-02
I-132	9.69E-05
I-133	5.44E-04
XE-133	4.09E-02
CS-134	6.53E-04

Installation: Braidwood  
Unit No.: 2

Location: 24 Mi SSW of Joliet, IL

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
I-135	3.80E-05
XE-135	6.08E-04
CS-137	1.69E-03
CE-144	2.33E-04
HP-181	1.13E-04

Total Airborne Tritium Released	2.81E+01 Ci
Total Liquid Tritium Released	8.05E+02 Ci
Volume of Waste Released (Prior to Dilution)	1.69E+07 liters
Volume of Dilution Water Used During Period	9.38E+09 liters

Installation: Braidwood  
 Unit No.: 1&2

Location: 24 Mi SSW of Joliet, IL

Effluent and Waste Disposal Annual Report for 1993  
 Solid Effluents

Unit Number: 1      Type: PWR  
 Docket Number: 50-456  
 Thermal Power(MWH): 2.60E+07  
 Commercial Operation: 07/29/88  
 Cooling Water Source: Kankakee River

Licensee: Commonwealth Edison  
 Licensed Power(MWT): 3.41E+03  
 Net Electrical Power(MWH): 8.69E+06  
 Initial Criticality: 05/29/87

Unit Number: 2      Type: PWR  
 Docket Number: 50-457  
 Thermal Power(MWH): 2.25E+07  
 Commercial Operation: 10/17/88  
 Cooling Water Source: Kankakee River

Licensee: Commonwealth Edison  
 Licensed Power(MWT): 3.41E+03  
 Net Electrical Power(MWH): 7.35E+06  
 Initial Criticality: 03/08/88

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
23	Exclusive Use Vehicle	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
 (by type of waste)

Jan-June      Jul-Dec

A

C-14	2.30E-01	4.00E-01
CD-144		2.00E-01
CO-57	2.46E-01	3.00E-01
CO-58	5.89E+01	3.06E+01
CO-60	5.26E+00	9.30E+00
CR-51	1.92E+00	1.00E+00
CS-134	5.00E-01	2.00E-01
CS-137	4.26E-01	5.00E-01
FE-55	2.44E+01	4.34E+01
FE-59	2.00E-01	2.00E-01
H-3	4.03E-01	
MN-54	2.78E+00	4.20E+00
NB-95	5.44E-01	1.80E+00
NI-63	3.31E+00	5.90E+00
SB-125	4.65E-01	1.20E+00
ZR-95	2.96E-01	9.00E-01

B

C-14	1.07E-01	1.00E-01
CM-242	1.18E-03	
CM-244	2.60E-04	
CO-58	1.77E+00	1.70E+00
CO-60	3.81E+01	3.82E+01
FE-55	5.25E+01	5.25E+01
FE-59	2.06E+00	2.00E+00
I-129	2.07E-04	
MN-54	3.69E+00	3.70E+00
NI-59	4.92E-02	
NI-63	1.72E+00	1.70E+00
PU-238	1.66E-04	
PU-241	9.34E-03	
SR-90	2.42E-02	
TC-99	3.79E-03	

Installation: Braidwood  
Unit No.: 1&2

Location: 24 Mi SSW of Joliet, IL

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 8.69E+01 Ci 1.56E+03	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 3.75E+02 m3 1.99E+01 Ci 6.38E+00	Before Compaction After Compaction
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Browns Ferry  
Unit No.: 1&2&3

Location: 10 Mi NW Decatur, AL

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: BWR  
Docket Number: 50-259  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 08/01/74  
Cooling Water Source: Tennessee River  
Unit Number: 2      Type: BWR  
Docket Number: 50-260  
Thermal Power(MWH): 1.78E+07  
Commercial Operation: 03/01/75  
Cooling Water Source: Tennessee River  
Unit Number: 3      Type: BWR  
Docket Number: 50-296  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 03/01/77  
Cooling Water Source: Tennessee River

Licensee: Tennessee Valley Authority  
Licensed Power(MWT): 3.29E+03  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 08/17/73

Licensee: Tennessee Valley Authority  
Licensed Power(MWT): 3.29E+03  
Net Electrical Power(MWH): 5.78E+06  
Initial Criticality: 07/20/74

Licensee: Tennessee Valley Authority  
Licensed Power(MWT): 3.29E+03  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 08/08/76

Airborne Effluents

Nuclide Released	Activity (Ci)
NA-24	8.36E-02
AR-41	2.86E+01
CR-51	9.51E-03
MN-54	1.22E-03
CO-58	6.60E-04
FE-59	8.33E-05
CO-60	3.29E-03
ZN-65	2.24E-03
KR-85M	6.90E+02
KR-87	3.57E+02
KR-88	1.16E+03
SR-89	1.87E-04
Y-91M	3.47E-02
NB-95	3.15E-04
MO/TC-99M	1.98E-03
AG-110M	1.44E-03
I-131	5.03E-03
I-132	1.80E-03
I-133	3.32E-02
XE-133	1.55E+03
XE-133M	5.56E+01
CS-134	3.51E-04
I-135	1.47E-03
XE-135	1.31E+02
XE-135M	2.40E+00
CS-137	8.96E-04
XE-137	5.29E+00
CS-138	3.17E-03
XE-138	3.17E+01
BA-139	4.96E-01
BA-140	4.24E-04
LA-140	1.26E-04

Installation: Browns Ferry  
Unit No.: 1&2&3

Location: 10 Mi NW Decatur, AL

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	5.47E-01
AR-41	5.68E-06
CR-51	4.32E-01
MN-54	5.52E-01
FE-55	2.54E-01
CO-57	7.31E-04
CO-58	2.64E-01
FE-59	1.48E-02
CO-60	1.84E+00
ZN-65	4.75E-01
Zr-69M	3.26E-05
FB-88	2.93E-08
SR-89	4.11E-02
SR-90	2.05E-03
Y-91M	2.48E-04
SR-92	4.03E-04
NB-97	4.17E-04
MO/TC-99M	6.83E-02
RU-103	3.04E-03
TC-104	3.04E-09
AG-110M	6.26E-03
SB-124	4.53E-03
SB-125	5.01E-05
I-131	4.07E-02
I-132	4.42E-04
I-133	3.21E-02
XE-133	1.36E-01
XE-133M	3.01E-03
CS-134	3.33E-02
I-134	1.13E-05
I-135	6.54E-03
XE-135	3.70E-02
XE-135M	1.51E-07
CS-136	4.38E-04
CS-137	1.84E-01
BA-140	4.94E-04

Total Airborne Tritium Released	9.35E+00 Ci
Total Liquid Tritium Released	1.24E+01 Ci
Volume of Waste Released (Prior to Dilution)	3.37E+07 liters
Volume of Dilution Water Used During Period	1.55E+11 liters

Installation: Browns Ferry  
 Unit No.: 1&2&3

Location: 10 Mi NW Decatur, AL

Effluent and Waste Disposal Annual Report for 1993  
 Solid Effluents

Unit Number: 1      Type: BWR  
 Docket Number: 50-259  
 Thermal Power(MWH): 0.00E+00  
 Commercial Operation: 08/01/74  
 Cooling Water Source: Tennessee River

Licensee: Tennessee Valley Authority  
 Licensed Power(MWT): 3.29E+03  
 Net Electrical Power(MWH): 0.00E+00  
 Initial Criticality: 08/17/73

Unit Number: 2      Type: BWR  
 Docket Number: 50-260  
 Thermal Power(MWH): 1.78E+07  
 Commercial Operation: 03/01/75  
 Cooling Water Source: Tennessee River

Licensee: Tennessee Valley Authority  
 Licensed Power(MWT): 3.29E+03  
 Net Electrical Power(MWH): 5.78E+06  
 Initial Criticality: 07/20/74

Unit Number: 3      Type: BWR  
 Docket Number: 50-296  
 Thermal Power(MWH): 0.00E+00  
 Commercial Operation: 03/01/77  
 Cooling Water Source: Tennessee River

Licensee: Tennessee Valley Authority  
 Licensed Power(MWT): 3.29E+03  
 Net Electrical Power(MWH): 0.00E+00  
 Initial Criticality: 08/08/76

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
1	Sole Use Truck	Alaron, Wampum, PA
42	Sole Use Truck	Barnwell, SC
19	Sole Use Truck	Quadrex, Oak Ridge, TN
24	Sole Use Truck	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
 (by type of waste)

	Jan-June	Jul-Dec
<b>A</b>		
AG-110M	5.26E+00	5.45E+00
CO-58	2.36E+00	
CO-60	3.49E+01	3.02E+01
CR-51	4.83E+00	
CS-134	1.12E+00	4.97E+00
CS-137	4.07E+00	2.13E+01
FE-55	1.43E+01	7.61E+00
MN-54	1.08E+01	5.49E+00
NI-63	4.30E+00	1.40E+01
ZN-65	1.74E+01	9.24E+00
<b>B</b>		
AG-110M		6.70E+00
CO-58		3.20E+00
CO-60	4.82E+01	2.63E+01
CR-51		2.13E+01
CS-137	1.00E+01	
FE-55	3.79E+01	1.34E+01
MN-54		1.00E+01
NI-63	2.86E+00	
ZN-65		1.90E+01
<b>C</b>		
CO-58	6.90E+00	

Installation: Browns Ferry  
Unit No.: 1&2&3

Location: 10 Mi NW Decatur, AL

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued) Jan-June July-Dec  
(by type of waste)

C

CO-60	3.10E+01	3.82E+01
CR-51	7.70E+00	1.00E+00
FE-55	4.29E+01	4.87E+01
FE-59	9.00E-01	
MN-54	4.80E+00	8.50E+00
NI-63	3.70E+00	2.00E+00
SB-124		2.00E+00
ZN-65	1.20E+00	

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.78E+02 Ci 1.27E+03	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 8.37E+01 Ci 2.71E+01	
C. Irradiated Components, Control Rods, etc.	m3 2.81E+01 Ci 6.31E+04	
D. Other (describe)	m3 Ci	



Installation: Brunswick  
Unit No.: 1&2

Location: 20 Mi S Wilmington, NC

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: BWR  
Docket Number: 50-325  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 03/18/77  
Cooling Water Source: Cape Fear River  
Unit Number: 2      Type: BWR  
Docket Number: 50-324  
Thermal Power(MWH): 1.28E+07  
Commercial Operation: 11/03/75  
Cooling Water Source: Cape Fear River

Licensee: Carolina Power & Light  
Licensed Power(MWT): 2.44E+03  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 10/08/76

Licensee: Carolina Power & Light  
Licensed Power(MWT): 2.44E+03  
Net Electrical Power(MWH): 3.98E+06  
Initial Criticality: 03/20/75

Airborne Effluents

Nuclide Released	Activity (Ci)
CR-51	9.76E-04
MN-54	2.52E-04
CO-58	6.12E-05
CO-60	5.37E-03
KR-85M	1.67E+01
KR-87	5.03E+01
KR-88	4.45E+01
SR-89	9.86E-05
SR-90	2.67E-06
I-131	3.28E-04
I-133	1.92E-03
XE-133	5.01E+00
XE-135	1.34E+02
XE-135M	3.74E+01
CS-137	6.98E-04
XE-138	5.29E+01
BA-140	9.83E-05
LA-140	5.98E-05
AM-241	1.14E-05

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	5.80E-06
CR-51	2.01E-02
MN-54	2.11E-03
FE-55	3.65E-03
MN-56	7.99E-04
CO-58	1.32E-03
CO-60	7.22E-02
AS-76	1.67E-04
KR-85M	4.23E-06
SR-92	6.22E-06
NB-95	6.49E-06
TC-99M	6.97E-04
AG-110M	2.83E-05
SB-125	1.77E-04
I-131	1.18E-06
I-133	3.54E-07
XE-133	1.26E-03

Installation: Brunswick  
Unit No.: 1&2

Location: 20 Mi S Wilmington, NC

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
CS-134	2.93E-04
XE-135	5.74E-03
XE-135M	1.36E-05
CS-137	1.72E-03
BA-140	4.28E-06
CE-144	2.20E-05
W-187	1.06E-03

Total Airborne Tritium Released	2.00E+01 Ci
Total Liquid Tritium Released	4.72E+01 Ci
Volume of Waste Released (Prior to Dilution)	2.80E+07 liters
Volume of Dilution Water Used During Period	1.01E+11 liters

Installation: Brunswick  
Unit No.: 1&2

Location: 20 Mi S Wilmington, NC

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: BWR  
Docket Number: 50-325  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 03/18/77  
Cooling Water Source: Cape Fear River

Licensee: Carolina Power & Light  
Licensed Power(MWT): 2.44E+03  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 10/08/76

Unit Number: 2      Type: BWR  
Docket Number: 50-324  
Thermal Power(MWH): 1.28E+07  
Commercial Operation: 11/03/75  
Cooling Water Source: Cape Fear River

Licensee: Carolina Power & Light  
Licensed Power(MWT): 2.44E+03  
Net Electrical Power(MWH): 3.98E+06  
Initial Criticality: 03/20/75

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
104	Sole use	CNSI, Barnwell, SC

Irradiated Fuel Shipments (Disposition)

Number of Shipments	Mode of Transportation	Destination
10	Railcar	CP&L/SHNPP

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

	Jan-June	Jul-Dec
A		
CO-58	1.11E+00	
CO-60	3.73E+01	2.37E+01
CR-51	2.46E+00	
CS-137	2.49E+00	1.15E+00
FE-55	4.60E+01	6.46E+01
MN-54	6.72E+00	
NI-63	1.19E+00	1.08E+00
B		
CO-58	3.17E+00	
CO-60	2.19E+01	4.36E+01
FE-55	6.57E+01	4.91E+01
MN-54	6.12E+00	
NI-63	1.69E+00	2.25E+00
C		
CO-60		6.57E+01
FE-55		3.15E+01
NI-63		2.83E+00

Installation: Brunswick  
Unit No.: 1&2

Location: 20 Mi S Wilmington, NC

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.14E+02 Ci 1.05E+03	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 2.47E+02 Ci 1.57E+01	
C. Irradiated Components, Control Rods, etc.	m3 3.11E+01 Ci 1.03E+03	
D. Other (describe)	m3 Ci	

Installation: Byron  
Unit No.: 1

Location: 3 Mi SW Byron, IL

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-454  
Thermal Power(MWH): 2.26E+07  
Commercial Operation: 09/16/85  
Cooling Water Source: Rock River

Licensee: Commonwealth Edison Co.  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 7.36E+06  
Initial Criticality: 02/02/85

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	3.03E-02
CO-58	5.75E-06
KR-85	9.47E-01
KR-85M	1.21E-03
KR-88	6.75E+00
I-131	2.78E-04
XE-131M	3.30E+01
I-133	3.51E-05
XE-133	4.41E+01
XE-133M	1.86E-01
XE-135	9.05E-02

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	2.98E-02
MN-54	2.87E-03
FE-55	6.58E-02
CO-57	1.06E-04
CO-58	8.04E-02
FE-59	6.19E-03
CO-60	3.18E-02
ZN-65	2.43E-04
BR-82	1.04E-05
KR-85	2.14E-03
KR-88	2.63E-03
SR-89	7.62E-02
SR-92	2.78E-04
NB-95	3.87E-03
ZR-95	2.22E-03
MO-99	3.89E-05
RU-103	1.07E-05
RU-105	2.14E-04
AG-110M	1.13E-03
SN-113	1.87E-04
SN-117M	2.03E-04
SB-122	2.46E-04
SB-124	9.91E-03
SB-125	1.94E-01
TE-125M	1.09E-01
SB-126	1.02E-02
I-131	9.60E-04
XE-131M	1.25E-03
XE-133	1.82E-01
XE-133M	9.25E-04

Installation: Byron  
Unit No.: 1

Location: 3 Mi SW Byron, IL

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
CS-134	5.63E-04
XE-135	1.76E-04
CS-137	1.46E-03
W-187	8.72E-05

Total Airborne Tritium Released	5.94E-01 Ci
Total Liquid Tritium Released	1.03E+03 Ci
Volume of Waste Released (Prior to Dilution)	1.66E+07 liters
Volume of Dilution Water Used During Period	1.01E+10 liters

Installation: Byron  
Unit No.: 2

Location: 3 Mi SW Byron, IL

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-455  
Thermal Power(MWH): 2.33E+07  
Commercial Operation: 08/21/87  
Cooling Water Source: Rock River

Licensee: Commonwealth Edison Co.  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 7.62E+06  
Initial Criticality: 01/09/87

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	6.28E-02
KR-85	9.47E-01
KR-85M	3.74E-04
KR-88	3.66E+00
I-131	1.54E-04
KE-131M	2.29E-01
XE-133	3.27E+01
XE-133M	7.71E-02
XE-135	1.97E-02

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	2.98E-02
MN-54	2.87E-03
FE-55	6.58E-02
CO-57	1.06E-04
CO-58	8.04E-02
FE-59	6.19E-03
CO-60	3.18E-02
ZN-65	2.43E-04
BR-82	1.04E-05
KR-85	2.14E-03
KR-88	2.63E-03
SR-89	7.62E-02
SR-92	2.78E-04
NB-95	3.87E-03
ZR-95	2.22E-03
MO-99	3.89E-05
RU-103	1.07E-05
RU-105	2.14E-04
AG-110M	1.13E-03
SN-113	1.87E-04
SN-117M	2.03E-04
SB-122	2.46E-04
SB-124	9.91E-03
SB-125	1.94E-01
TE-125M	1.09E-01
SB-126	1.02E-02
I-131	9.60E-04
KE-131M	1.25E-03
XE-133	1.82E-01
XE-133M	9.25E-04
CS-134	5.63E-04
XE-135	1.76E-04

Installation: Byron  
Unit No.: 2

Location: 3 Mi SW Byron, IL

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
CS-137	1.46E-03
W-187	8.72E-05

Total Airborne Tritium Released	3.38E-01 Ci
Total Liquid Tritium Released	1.03E+03 Ci
Volume of Waste Released (Prior to Dilution)	1.66E+07 liters
Volume of Dilution Water Used During Period	1.01E+10 liters



Installation: Byron  
Unit No.: 1&2

Location: 3 Mi SW Byron, IL

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-454  
Thermal Power(MWH): 2.26E+07  
Commercial Operation: 09/16/85  
Cooling Water Source: Rock River

Licensee: Commonwealth Edison Co.  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 7.36E+06  
Initial Criticality: 02/02/85

Unit Number: 2      Type: PWR  
Docket Number: 50-455  
Thermal Power(MWH): 2.33E+07  
Commercial Operation: 08/21/87  
Cooling Water Source: Rock River

Licensee: Commonwealth Edison Co.  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 7.62E+06  
Initial Criticality: 01/09/87

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
15	Exclusive Use	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June      Jul-Dec

A

C-14	1.83E+00	4.70E-01
CO-57	5.60E-01	6.20E-01
CO-58	9.64E+00	1.14E+01
CO-60	2.54E+01	1.54E+01
CS-134	1.90E-01	1.48E+01
CS-137	3.20E-01	1.65E+01
FE-55	3.81E+01	2.61E+01
H-3	1.80E-01	
MN-54	8.12E+00	5.82E+00
NI-63	1.47E+01	7.69E+00
PU-241	6.00E-02	3.00E-02
SB-124		1.00E-02
SB-125	8.60E-01	1.17E+00
SR-90	7.00E-02	3.00E-02

B

C-14	1.40E-01	3.70E-01
CO-58	1.40E+01	2.03E+01
CO-60	2.27E+00	1.41E+01
CR-51	3.23E+01	1.28E+01
CS-134	1.10E-01	4.60E-01
CS-137	4.10E-01	1.76E+00
FE-55	3.85E+00	2.39E+01
FE-59	7.70E-01	2.10E-01
H-3	4.80E-01	2.96E+00
MN-54	8.20E-01	1.63E+00
NB-95	3.47E+01	1.11E+01
NI-63	1.13E+00	7.04E+00
SN-113		9.00E-02
SN-133	3.10E-01	
ZR-95	8.68E+00	3.26E+00

Installation: Byron  
Unit No.: 1&2

Location: 3 Mi SW Byron, IL

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 5.26E+01 Ci 4.06E+02	Non-compacted, Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 1.13E+02 m3 4.22E+01 Ci 3.47E+00	Compacted, Burial Volume
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Callaway  
Unit No.: 1

Location: 10 Mi SE Fulton, MO

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-483  
Thermal Power(MWH): 2.58E+07  
Commercial Operation: 12/19/84  
Cooling Water Source: Missouri River

Licensee: Union Electric Company  
Licensed Power(MWT): 3.57E+03  
Net Electrical Power(MWH): 8.39E+06  
Initial Criticality: 10/02/84

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	7.77E-01
CR-51	6.23E-07
CO-58	3.15E-06
CO-60	1.59E-07
BR-82	2.27E-08
KR-85	4.71E+00
KR-85M	2.60E+00
KR-88	1.51E+00
RB-88	8.39E-04
SR-89	3.86E-06
NB-95	1.36E-07
I-131	6.20E-04
XE-131M	7.89E+00
I-132	2.26E-04
I-133	4.32E-04
XE-133	7.36E+02
XE-133M	4.99E+00
I-135	5.44E-05
XE-135	4.88E+01
XE-135M	3.89E-01
CS-138	2.14E-04

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	1.59E-05
MN-54	2.12E-04
FE-55	1.53E-02
CO-57	2.78E-06
CO-58	1.01E-03
FE-59	1.44E-05
CO-60	2.94E-03
ZN-65	4.61E-05
SR-89	1.76E-02
SR-90	1.12E-03
NB-95	1.98E-04
ZR-95	1.35E-04
TC-99M	2.13E-06
SB-124	6.97E-06
SB-125	1.96E-05
XE-127	4.54E-06
I-131	6.25E-05
XE-131M	6.36E-03
BA-133M	9.12E-08
XE-133	9.65E-01

Installation: Callaway  
Unit No.: 1

Location: 10 Mi SE Fulton, MO

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
XE-133M	1.10E-02
CS-134	5.32E-04
XE-135	4.08E-03
CS-137	7.81E-04
CE-141	7.81E-06
CE-144	8.01E-05

Total Airborne Tritium Released	9.12E+01 Ci
Total Liquid Tritium Released	1.41E+03 Ci
Volume of Waste Released (Prior to Dilution)	8.81E+07 liters
Volume of Dilution Water Used During Period	2.50E+09 liters

Installation: Callaway  
Unit No.: 1

Location: 10 Mi SE Fulton, MO

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR  
Docket Number: 50-483  
Thermal Power (MWH): 2.58E+07  
Commercial Operation: 12/19/84  
Cooling Water Source: Missouri River

Licensee: Union Electric Company  
Licensed Power (MWT): 3.57E+03  
Net Electrical Power (MWH): 8.39E+06  
Initial Criticality: 10/02/84

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
8	Cask	Barnwell, SC
1	Truck	Quadrex, Oak Ridge, TN
10	Truck	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June Jul-Dec

A

CO-58		1.01E+01
CO-60		2.51E+01
CS-134		8.22E+00
CS-137		1.13E+01
FE-55		2.55E+01
MN-54		2.74E+00
NI-63		1.16E+01
SB-125		1.13E+00

B

CO-58	1.48E+00	1.45E+00
CO-60	5.52E+01	5.41E+01
FE-55	2.26E+00	2.22E+00
MN-54	1.24E+01	1.22E+01
NI-63	2.65E+01	2.60E+01
SB-125	2.09E+00	2.04E+00

C

CO-58		1.79E+01
CO-60		2.47E+01
CS-134		7.21E+00
CS-137		8.42E+00
FE-55		2.05E+01
MN-54		2.31E+00
NB-95		1.34E+00
NI-63		1.35E+01

Installation: Callaway  
Unit No.: 1

Location: 10 Mi SE Fulton, MO

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 2.19E+01 Ci 4.29E+02	Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 2.17E+01 Ci 1.84E-01	Burial Volume
C. Irradiated Components, Control Rods, etc.	m3 8.27E+00 Ci 1.42E+02	Burial Volume
D. Other (describe)	m3 Ci	

Installation: Calvert Cliffs  
Unit No.: 1&2

Location: 45 Mi SE Washington, DC

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: PWR  
Docket Number: 50-317  
Thermal Power(MWH): 2.30E+07  
Commercial Operation: 05/08/75  
Cooling Water Source: Chesapeake Bay  
Unit Number: 2      Type: PWR  
Docket Number: 50-318  
Thermal Power(MWH): 1.57E+06  
Commercial Operation: 04/01/77  
Cooling Water Source: Chesapeake Bay

Licensee: Baltimore Gas & Electric  
Licensed Power(MWT): 2.70E+03  
Net Electrical Power(MWH): 7.33E+06  
Initial Criticality: 10/07/74

Licensee: Baltimore Gas & Electric  
Licensed Power(MWT): 2.70E+03  
Net Electrical Power(MWH): 4.97E+06  
Initial Criticality: 11/30/76

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	1.78E-02
CO-60	1.33E-05
KR-85	9.90E+00
KR-85M	6.59E-01
I-131	1.39E-02
XE-131M	1.73E+00
I-133	2.47E-02
XE-133	1.78E+02
XE-133M	6.09E-01
CS-134	3.40E-03
XE-135	2.28E+01
CS-137	4.20E-03

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	3.44E-04
CR-51	2.40E-02
MN-54	3.77E-03
FE-55	2.00E-01
CO-57	6.93E-04
CO-58	5.76E-01
FE-59	1.43E-02
CO-60	1.67E-02
ZN-65	1.82E-03
SR-89	8.28E-04
SR-90	3.66E-04
NB-95	7.78E-03
ZR-95	3.65E-03
TC-99M	2.76E-04
RU-103	2.39E-03
AG-110M	1.54E-01
SN-113	1.58E-03
SB-122	1.26E-04
SB-124	1.75E-02
SB-125	1.06E-01
TE-129	7.19E-03
I-131	3.78E-02
XE-131M	3.11E-04
I-133	6.11E-03

Installation: Calvert Cliffs  
Unit No.: 1&2

Location: 45 Mi SE Washington, DC

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
XE-133	8.85E-02
CS-134	1.43E-01
XE-135	2.32E-03
CS-136	2.50E-03
CS-137	2.12E-01
BA-140	7.93E-06
LA-140	3.40E-03
CE-141	1.45E-04
CE-144	1.14E-04

Total Airborne Tritium Released	2.46E+01 Ci
Total Liquid Tritium Released	6.36E+02 Ci
Volume of Waste Released (Prior to Dilution)	3.74E+08 liters
Volume of Dilution Water Used During Period	2.39E+12 liters



Installation: Calvert Cliffs  
Unit No.: 1&2

Location: 45 Mi SE Washington, DC

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-317  
Thermal Power(MWH): 2.30E+07  
Commercial Operation: 05/08/75  
Cooling Water Source: Chesapeake Bay

Licensee: Baltimore Gas & Electric  
Licensed Power(MWT): 2.70E+03  
Net Electrical Power(MWH): 7.33E+06  
Initial Criticality: 10/07/74

Unit Number: 2      Type: PWR  
Docket Number: 50-318  
Thermal Power(MWH): 1.57E+06  
Commercial Operation: 04/01/77  
Cooling Water Source: Chesapeake Bay

Licensee: Baltimore Gas & Electric  
Licensed Power(MWT): 2.70E+03  
Net Electrical Power(MWH): 4.97E+06  
Initial Criticality: 11/30/76

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
8	Motor Surface Transit	CNSI, Barnwell, SC
23	Motor Surface Transit	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June    Jul-Dec

A

CO-58		1.20E+01
CO-60	5.58E+00	2.49E+00
CS-134	8.98E+00	3.33E+01
CS-137	4.32E+01	4.12E+01
FE-55	5.96E+00	2.34E+00
NI-63	3.62E+01	7.12E+00

B

AG-110M	1.37E+00	
C-14	1.99E+00	1.56E+00
CE-144	1.97E+00	1.17E+00
CO-58	1.48E+00	1.37E+01
CO-60	9.82E+00	2.34E+00
CR-51	9.36E+00	7.90E+00
CS-134	2.63E+00	1.34E+01
CS-137	1.04E+01	3.04E+01
FE-55	3.45E+01	2.32E+01
H-3		1.61E+00
NB-95	1.01E+00	1.59E+00
NI-63	1.27E+01	1.61E+01
RU-106	2.45E+00	
SB-125	4.62E+00	
ZR-95		1.29E+00

C

CO-58		1.88E+00
CO-60		3.17E+01
FE-55		5.77E+01
MN-54		5.55E+00
NI-63		2.75E+00

Installation: Calvert Cliffs  
Unit No.: 1&2

Location: 45 Mi SE Washington, DC

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued) Jan-June July-Dec  
(by type of waste)

D

AG-110M	2.49E+00
C-14	2.46E+00
CE-144	2.33E+00
CO-58	1.14E+01
CO-60	1.07E+01
CR-51	7.05E+00
FE-55	2.37E+01
NB-95	1.16E+01
NI-63	8.30E+00
RU-106	2.49E+00
SB-125	2.15E+00
SN-113	1.50E+00
ZR-95	7.13E+00

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.70E+01 Ci 3.35E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 1.37E+03 Ci 3.22E+01	
C. Irradiated Components, Control Rods, etc.	m3 1.63E+00 Ci 4.61E+03	
D. Other (describe) Cartridge Filters	m3 3.41E+00 Ci 1.11E+01	

Installation: Catawba  
Unit No.: 1

Location: 6 Mi NNW of Rock Hill, SC

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-413  
Thermal Power (MWH): 2.27E+07  
Commercial Operation: 06/29/85  
Cooling Water Source: Lake Wylie

Licensee: Duke Power Co  
Licensed Power (MWT): 3.41E+03  
Net Electrical Power (MWH): 7.58E+06  
Initial Criticality: 01/07/85

Airborne Effluents

Nuclide Released	Activity (Ci)
F-18	2.31E-06
NA-24	3.31E-08
AR-41	5.10E+01
MN-54	4.71E-06
CO-58	9.32E-05
CO-60	9.59E-09
BR-80M	1.14E-08
BR-82	7.46E-08
KR-85	2.72E-01
KR-85M	6.23E-01
KR-87	1.60E-02
KR-88	3.66E-01
RB-88	1.91E-06
SB-124	1.73E-09
I-131	3.60E-04
XE-131M	2.81E+00
I-132	4.77E-05
I-133	1.38E-04
XE-133	5.67E+02
XE-133M	5.98E+00
XE-135	1.99E+01
XE-135M	1.94E-02
CS-138	1.21E-07

Liquid Effluents

Nuclide Released	Activity (Ci)
F-18	3.78E-03
NA-24	7.27E-05
AR-41	9.06E-07
CR-51	1.95E-02
MN-54	6.75E-03
FE-55	8.33E-02
MN-56	8.19E-07
CO-57	8.56E-04
CO-58	1.99E-01
FE-59	2.97E-03
CO-60	3.35E-02
NI-65	1.80E-05
ZN-65	5.35E-05
SE-75	8.15E-06
BR-82	5.88E-06
KR-85	3.13E-03
KR-85M	1.03E-06
RB-86	9.54E-06

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
KR-87	2.56E-06
KR-88	2.40E-06
RB-88	2.05E-05
RB-89	1.61E-07
SR-92	2.07E-04
NB-95	1.76E-03
ZR-95	8.54E-04
NB-97	2.23E-03
ZR-97	7.63E-05
RU-103	3.54E-05
AG-110M	3.72E-03
SN-113	1.39E-04
SB-122	1.47E-04
SB-124	1.63E-02
SB-125	6.18E-02
I-131	3.32E-03
I-132	2.25E-05
I-133	1.22E-04
XE-133	8.16E-03
CS-134	1.60E-03
XE-135	2.39E-05
CS-136	5.51E-05
CS-137	3.92E-03
CS-138	3.16E-04
BA-139	1.59E-05
BA-140	2.32E-06
LA-140	6.99E-05
CE-141	2.81E-06
W-187	6.25E-05

Total Airborne Tritium Released	5.72E+01 Ci
Total Liquid Tritium Released	4.13E+02 Ci
Volume of Waste Released (Prior to Dilution)	3.17E+08 liters
Volume of Dilution Water Used During Period	8.83E+10 liters

Installation: Catawba  
Unit No.: 2

Location: 6 Mi NNW of Rock Hill, SC

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-414  
Thermal Power(MWH): 2.42E+07  
Commercial Operation: 08/19/86  
Cooling Water Source: Lake Wylie

Licensee: Duke Power Co  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 8.16E+06  
Initial Criticality: 05/08/86

Airborne Effluents

Nuclide Released	Activity (Ci)
F-18	2.31E-06
NA-24	3.31E-08
AR-41	5.10E+01
MN-54	4.71E-06
CO-58	9.32E-05
CO-60	9.59E-09
BR-80M	1.14E-08
BR-82	7.46E-08
KR-85	2.72E-01
KR-85M	6.23E-01
KR-87	1.60E-02
KR-88	3.66E-01
RB-88	1.91E-06
SB-124	1.73E-09
I-131	3.60E-04
XE-131M	2.81E+00
I-132	4.77E-05
I-133	1.38E-04
XE-133	5.67E+02
XE-133M	5.98E+00
XE-135	1.99E+01
XE-135M	1.94E-02
CS-138	1.21E-07

Liquid Effluents

Nuclide Released	Activity (Ci)
F-18	3.78E-03
NA-24	7.27E-05
AR-41	9.06E-07
CR-51	1.95E-02
MN-54	6.75E-03
FE-55	8.33E-02
MN-56	8.19E-07
CO-57	8.56E-04
CO-58	1.99E-01
FE-59	2.97E-03
CO-60	3.35E-02
NI-65	1.80E-05
ZN-65	5.35E-05
SE-75	8.15E-06
BR-82	5.88E-06
KR-85	3.13E-03
KR-85M	1.03E-06
RB-86	9.54E-06

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
KR-87	2.56E-06
KR-88	2.40E-06
RB-88	2.05E-05
RB-89	1.61E-07
SR-92	2.07E-04
NB-95	1.76E-03
ZR-95	8.54E-04
NB-97	2.23E-03
ZR-97	7.63E-05
RU-103	3.54E-05
AG-110M	3.72E-03
SN-113	1.39E-04
SB-122	1.47E-04
SB-124	1.63E-02
SB-125	6.18E-02
I-131	3.32E-03
I-132	2.25E-05
I-133	1.22E-04
XE-133	8.18E-03
CS-134	1.60E-03
XE-135	2.39E-05
CS-136	5.51E-05
CS-137	3.92E-03
CS-138	3.16E-04
BA-139	1.59E-05
BA-140	2.32E-06
LA-140	6.99E-05
CE-141	2.81E-06
W-187	6.25E-05

Total Airborne Tritium Released	5.72E+01 Ci
Total Liquid Tritium Released	4.13E+02 Ci
Volume of Waste Released (Prior to Dilution)	3.17E+08 liters
Volume of Dilution Water Used During Period	8.83E+10 liters

Installation: Catawba  
Unit No.: 1&2

Location: 6 Mi NNW of Rock Hill, SC

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-413  
Thermal Power(MWH): 2.27E+07  
Commercial Operation: 06/29/85  
Cooling Water Source: Lake Wylie

Licensee: Duke Power Co  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 7.58E+06  
Initial Criticality: 01/07/85

Unit Number: 2      Type: PWR  
Docket Number: 50-414  
Thermal Power(MWH): 2.42E+07  
Commercial Operation: 08/19/86  
Cooling Water Source: Lake Wylie

Licensee: Duke Power Co  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 8.16E+06  
Initial Criticality: 05/08/86

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
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7

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June      Jul-Dec

A

CE-144		2.08E-01
CO-58	8.61E+01	1.36E+01
CO-60	1.71E+00	6.63E+00
CS-134	3.26E-03	7.63E+00
CS-137	1.11E+00	1.44E+01
FE-55	8.44E+00	3.22E+01
H-3		6.12E+00
MN-54	1.21E+00	2.07E+00
NI-63	1.31E+00	1.70E+01
SB-125	1.95E-04	

B

C-14	1.50E+00	1.30E+00
CO-58	9.50E+00	1.39E+01
CO-60	1.40E+01	1.33E+01
CS-134	1.40E+00	1.30E+00
CS-137	1.99E+00	1.80E+00
FE-55	6.26E+01	5.94E+01
MN-54	3.11E+00	3.10E+00
NI-63	6.21E+00	5.90E+00

D

CO-58	1.84E+01	1.85E+01
CO-60	1.11E+01	1.10E+01
FE-55	5.55E+01	5.53E+01
MN-54	3.70E+00	3.70E+00
NB-95	1.50E+00	1.50E+00
NI-63	9.80E+00	9.80E+00

Installation: Catawba  
Unit No.: 1&2

Location: 6 Mi NNW of Rock Hill, SC

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.01E+02 Ci 4.49E+01	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 4.99E+01 Ci 1.24E+01	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe) Dewatered Filters	m3 4.44E+00 Ci 4.78E+01	



Installation: Clinton  
Unit No.: 1

Location: 6 Mi E Clinton, IL

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-461  
Thermal Power(MWH): 1.86E+07  
Commercial Operation: 11/24/87  
Cooling Water Source: Salt Creek

Licensee: Illinois Power  
Licensed Power(MWT): 2.89E+03  
Net Electrical Power(MWH): 5.88E+06  
Initial Criticality: 02/27/87

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	3.78E+00
CR-51	1.77E-02
MN-54	1.86E-04
CO-58	1.11E-04
CO-60	3.38E-04
KR-85	2.47E+00
KR-85M	1.82E-01
KR-87	1.06E-02
SR-89	6.16E-05
I-131	1.27E-04
XE-131M	1.46E-03
I-133	2.18E-04
XE-133	1.46E-01
XE-133M	1.47E-04
XE-135	7.57E-01
XE-135M	1.00E+00

Total Airborne Tritium Released

1.14E+01 Ci

Installation: Clinton  
Unit No.: 1

Location: 6 Mi E Clinton, IL

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR  
Docket Number: 50-461  
Thermal Power (MWH): 1.86E+07  
Commercial Operation: 11/24/87  
Cooling Water Source: Salt Creek

Licensee: Illinois Power  
Licensed Power (MWT): 2.89E+03  
Net Electrical Power (MWH): 5.88E+06  
Initial Criticality: 02/27/87

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
11	Truck	Barnwell, SC
16	Truck	Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

	Annual
A	
CO-58	1.71E+00
CO-60	3.02E+01
CR-51	5.84E+00
FE-55	4.72E+01
FE-59	2.04E+00
MN-54	1.20E+01
Unidentified	1.04E+00
B	
CO-58	1.83E+00
CO-60	3.29E+01
FE-55	4.93E+01
MN-54	1.43E+01
Unidentified	1.62E+00
C	
CO-60	3.57E+01
FE-55	6.29E+01
NI-63	1.30E+00

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 4.48E+01 Ci 5.35E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 3.80E+01 Ci 2.76E+01	
C. Irradiated Components, Control Rods, etc.	m3 4.90E+00 Ci 5.17E+00	
D. Other (describe)	m3 Ci	

Installation: Comanche Peak  
Unit No.: 1&2

Location: 4.5 Mi N of Glen Rose, TX

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1	Type: PWR	Licensee: TU Electric Company
Docket Number: 50-445		Licensed Power(MWT): 3.41E+03
Thermal Power(MWH): 2.25E+07		Net Electrical Power(MWH): 7.15E+06
Commercial Operation: 08/13/90		Initial Criticality: 04/03/90
Cooling Water Source: Squaw Creek Reservoir		
Unit Number: 2	Type: PWR	Licensee: TU Electric Company
Docket Number: 50-446		Licensed Power(MWT): 3.41E+03
Thermal Power(MWH): 1.06E+07		Net Electrical Power(MWH): 3.43E+06
Commercial Operation: 08/03/93		Initial Criticality: 03/24/93
Cooling Water Source: Squaw Creek Reservoir		

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	4.89E-01
CO-58	3.68E-06
BR-82	1.63E-06
KR-85	7.90E-01
I-131	7.19E-05
XE-131M	6.85E-03
I-133	2.82E-05
XE-133	1.88E+02
XE-133M	4.69E-05
XE-135	2.86E+00

Liquid Effluents

Nuclide Released	Activity (Ci)
BE-7	8.64E-05
NA-24	3.99E-04
CR-51	1.70E-02
MN-54	2.74E-03
FE-55	1.22E-01
CO-57	3.82E-04
CO-58	1.48E-01
FE-59	9.08E-03
CO-60	3.63E-02
ZN-65	2.14E-04
SE-75	1.06E-04
BR-82	1.42E-04
KR-85	1.18E-02
SR-92	2.90E-05
NB-95	1.73E-03
ZR-95	6.96E-04
ZR-97	1.01E-05
MO-99	8.39E-04
TC-99M	3.18E-04
RU-103	7.75E-05
RU-105	3.97E-05
RU-106	5.26E-05
AG-110M	7.76E-04
IN-113M	1.99E-05
SN-113	2.19E-04
SB-122	5.67E-04

Installation: Comanche Peak  
Unit No.: 1&2

Location: 4.5 Mi N of Glen Rose, TX

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
SB-124	7.54E-03
SB-125	3.56E-02
I-131	1.45E-02
XE-131M	1.46E-02
TE-132	6.92E-06
I-133	1.73E-05
XE-133	1.11E+00
XE-133M	7.14E-03
CS-134	8.74E-03
XE-135	1.20E-04
CS-136	2.59E-05
CS-137	8.75E-03
LA-140	1.38E-04
CE-141	1.84E-04
CE-144	2.39E-04

Total Airborne Tritium Released	6.00E+00 Ci
Total Liquid Tritium Released	5.04E+02 Ci
Volume of Waste Released (Prior to Dilution)	2.07E+07 liters
Volume of Dilution Water Used During Period	2.86E+11 liters

Installation: Comanche Peak  
Unit No.: 1&2

Location: 4.5 Mi N of Glen Rose, TX

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR      Licensee: TU Electric Company  
Docket Number: 50-445      Licensed Power(MWT): 3.41E+03  
Thermal Power(MWH): 2.25E+07      Net Electrical Power(MWH): 7.15E+06  
Commercial Operation: 08/13/90      Initial Criticality: 04/03/90  
Cooling Water Source: Squaw Creek Reservoir

Unit Number: 2      Type: PWR      Licensee: TU Electric Company  
Docket Number: 50-446      Licensed Power(MWT): 3.41E+03  
Thermal Power(MWH): 1.06E+07      Net Electrical Power(MWH): 3.43E+06  
Commercial Operation: 08/03/93      Initial Criticality: 03/24/93  
Cooling Water Source: Squaw Creek Reservoir

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
3	Truck	Alaron, Wampum, PA
10	Truck	CNSI, Barnwell, SC
8	Truck	Quadrex, Oak Ridge, TN
5	Truck	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June      Jul-Dec

A

C-14	1.00E-01	5.00E-01
CO-58	2.82E+01	1.09E+01
CO-60	1.86E+01	2.43E+01
CR-51, FE-59, ZN-65, NB-95, CE-144, PU-241, PU-242	3.00E+00	
CS-134	1.50E+01	1.10E+01
CS-137	1.50E+01	1.57E+01
FE-55	1.70E+00	2.23E+01
H-3	5.00E-01	1.00E-01
I-131	5.90E+00	
MN-54	3.80E+00	3.70E+00
NI-63	6.00E+00	9.50E+00
TC-99, ZN-65, SR-90, ZR-95, CE-144, PU-241, PU-242		2.00E+00
ZR-95	2.20E+00	

B

CO-58	2.84E+01	7.10E+01
CO-60	1.64E+01	1.18E+01
CR-51	4.60E+00	6.00E+00
FE-55	3.12E+01	4.00E+00
FE-59	2.40E+00	
H-3	4.00E-01	
H-3, C-14, SB-125, CS-134, CS-137		5.00E-01
I-131	2.00E+00	
MN-54	4.50E+00	1.00E+00
NB-95	5.50E+00	
NI-63	1.10E+00	5.70E+00
SB-125, CS-137, CS-134, CE-144, CS-136, SR-89, C-14	3.00E+00	
ZR-95	3.20E+00	

Installation: Comanche Peak  
Unit No.: 1&2

Location: 4.5 Mi N of Glen Rose, TX

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.84E+01	Shipped
	m3 1.30E+01	Buried
	Ci 9.94E+01	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 8.85E+02	Shipped
	m3 7.29E+01	Buried
	Ci 1.11E+01	
C. Irradiated Components, Control Rods, etc.	m3	
	Ci	
D. Other (describe)	m3	
	Ci	

Installation: Donald C. Cook  
Unit No.: 1&2

Location: 11 Mi SSW St. Joseph, MI

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: PWR  
Docket Number: 50-315  
Thermal Power(MWH): 2.81E+07  
Commercial Operation: 08/27/75  
Cooling Water Source: Lake Michigan  
Unit Number: 2      Type: PWR  
Docket Number: 50-316  
Thermal Power(MWH): 2.45E+07  
Commercial Operation: 07/01/78  
Cooling Water Source: Lake Michigan

Licensee: Indiana Michigan Power Co.  
Licensed Power(MWT): 3.25E+03  
Net Electrical Power(MWH): 8.76E+06  
Initial Criticality: 01/18/75  
Licensee: Indiana Michigan Power Co.  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 7.55E+06  
Initial Criticality: 03/10/78

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	4.19E+01
CR-51	2.84E-06
MN-54	1.10E-06
CO-57	2.14E-08
CO-58	3.08E-07
CO-60	6.48E-05
ZN-65	3.43E-07
KR-85	1.19E+03
KR-85M	1.29E+00
KR-87	2.78E-02
KR-88	1.38E+00
RB-88	7.20E-06
SR-89	7.96E-05
SR-90	4.83E-07
ZR-95	2.05E-07
AG-110M	2.16E-06
SN-113	4.62E-08
SB-125	2.62E-07
I-131	7.69E-05
XE-131M	3.53E+00
I-132	1.63E-05
I-133	8.60E-05
XE-133	7.85E+02
XE-133M	1.21E+00
CS-134	3.34E-05
I-134	1.91E-05
I-135	6.99E-06
XE-135	3.09E+01
XE-135M	2.33E-02
CS-137	2.39E-04
CS-138	4.42E-06
XE-138	2.13E-03

Liquid Effluents

Nuclide Released	Activity (Ci)
BE-7	5.48E-04
NA-24	6.66E-04
CR-51	4.18E-02
MN-54	1.14E-02

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
FE-55	1.00E-01
CO-57	5.54E-04
CO-58	6.13E-02
FE-59	6.08E-04
CO-60	9.60E-02
ZN-65	3.34E-03
RB-88	1.63E-04
SR-90	2.90E-05
ZR/NB-95	1.05E-02
RU-103	1.71E-05
AG-110M	4.24E-02
SN-113	6.91E-04
SB-124	9.90E-03
SB-125	4.48E-02
I-131	2.47E-03
XE-131M	5.57E-05
I-132	1.85E-03
I-133	5.99E-03
XE-133	6.02E-03
XE-133M	1.21E-05
CS-134	3.55E-02
I-134	8.19E-04
I-135	1.60E-03
XE-135	5.36E-05
XE-135M	3.98E-04
CS-137	6.42E-02
CS-138	8.11E-06
XE-138	4.09E-05
LA-140	8.76E-06
HF-181	1.38E-05

Total Airborne Tritium Released	2.58E+01 Ci
Total Liquid Tritium Released	6.01E+02 Ci
Volume of Waste Released (Prior to Dilution)	5.59E+08 liters
Volume of Dilution Water Used During Period	3.30E+12 liters



Installation: Cooper  
Unit No.: 1

Location: 70 Mi S Omaha, NE

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-298  
Thermal Power (MWH): 1.15E+07  
Commercial Operation: 07/01/74  
Cooling Water Source: Missouri River

Licensee: Nebraska Public Power District  
Licensed Power (MWT): 2.38E+03  
Net Electrical Power (MWH): 3.71E+06  
Initial Criticality: 02/21/74

Airborne Effluents

Nuclide Released	Activity (Ci)
CO-60	1.48E-04
KR-83M	5.40E-02
KR-85	3.10E-01
KR-85M	9.80E-02
KR-87	3.20E-01
KR-88	3.20E-01
RB-88	6.02E-04
KR-89	1.51E+00
RB-89	4.76E-05
I-131	2.77E-05
TE-132	1.59E-05
XE-133	2.25E-01
XE-133M	4.50E-03
I-134	1.47E-05
I-135	6.22E-05
XE-135	4.00E-01
XE-135M	1.08E-01
XE-137	1.75E+00
CS-138	2.38E-03
XE-138	1.32E+00
BA-139	2.22E-04

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	4.12E-05
CR-51	6.43E-03
MN-54	4.71E-01
FE-55	2.46E-01
CO-58	4.13E-02
FE-59	7.98E-03
CO-60	1.43E+00
ZN-65	3.85E-04
SR-89	4.69E-03
SR-90	1.58E-02
SR-91	8.18E-05
NB-95	2.29E-04
AG-110M	2.65E-02
CS-134	9.34E-03
CS-137	5.15E-02
LA-140	1.07E-04

Total Liquid Tritium Released	1.08E+01 Ci
Volume of Waste Released (Prior to Dilution)	7.53E+06 liters
Volume of Dilution Water Used During Period	3.69E+10 liters

Installation: Cooper  
Unit No.: 1

Location: 70 Mi S Omaha, NE

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR  
Docket Number: 50-298  
Thermal Power(MWH): 1.15E+07  
Commercial Operation: 07/01/74  
Cooling Water Source: Missouri River

Licensee: Nebraska Public Power District  
Licensed Power(MWT): 2.38E+03  
Net Electrical Power(MWH): 3.71E+06  
Initial Criticality: 02/21/74

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
33	Exclusive use vehicle	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

A

	Jan-June	Jul-Dec
AG-110M	1.51E+00	1.41E+00
C-14	2.63E-01	1.31E+00
CM-242	6.59E-06	1.89E-05
CO-58	3.84E+00	5.45E-01
CO-60	4.08E+01	3.80E+01
CR-51	6.42E+00	
CS-134	1.09E-01	
CS-137	5.30E-01	6.30E-01
FE-55	2.48E+01	3.80E+01
H-3	5.56E-03	2.46E-02
I-131		7.03E-03
MN-54	1.83E+01	9.89E+00
NI-59	2.39E-02	7.58E-02
NI-63	2.07E+00	7.58E+00
PU-241	1.12E-04	2.52E-04
SR-89	7.94E-01	2.52E+00
SR-90	1.01E-02	3.15E-02
TC-99	6.65E-06	
TRU	2.21E-05	6.30E-05
ZN-65	6.06E-01	

B

AG-110M	8.16E-01	
AM-241	6.24E-02	
BA-133	3.47E-06	
C-14	2.78E-02	3.77E-01
CD-109	1.42E-08	
CE-144	8.22E-01	
CL-36	1.22E-05	
CM-242	7.43E-05	8.44E-04
CM-243/244	8.53E-06	
CO-57	5.48E-12	
CO-58	3.59E+00	7.13E-01
CO-60	4.51E+01	2.39E+01
CS-134	1.61E+00	2.21E+00
CS-137	3.59E+00	1.13E+01
FE-55	2.51E+01	5.19E+01
FE-59	1.01E-01	1.45E+00
H-3	9.02E-04	

Installation: Cooper  
 Unit No.: 1

Location: 70 Mi S Omaha, NE

Effluent and Waste Disposal Annual Report for 1993  
 Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued) Jan-June July-Dec  
 (by type of waste)

	Jan-June	July-Dec
B		
KR-85	1.82E+00	
MN-54	1.58E+01	7.17E+00
NA-22	9.59E-08	
NI-59	1.20E-02	
NI-63	6.55E-01	9.37E-01
PO-210	2.61E-06	
PU-238	8.16E-06	
PU-239/240	3.35E-06	
PU-241	2.76E-04	
SR-89	9.59E-04	1.35E-02
SR-90	2.04E-03	1.69E-03
TC-99	5.73E-05	
TRU	6.52E-05	
U-235	2.39E-08	
U-238	1.31E-03	
ZN-65	9.26E-01	
C		
AM-241	9.23E-12	
C-14	5.67E-03	
CM-242	1.41E-11	
CM-243/244	3.05E-11	
CO-60	3.78E+01	
CR-51	1.38E-03	
FE-55	5.67E+01	
H-3	1.61E-04	
MN-54	2.11E+00	
NB-94	5.26E-05	
NI-59	1.70E-02	
NI-63	3.39E+00	
PU-238	2.99E-11	
PU-239/240	1.22E-11	
PU-241	9.86E-10	
TC-99	2.53E-05	

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 8.76E+01	
	Ci 7.36E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 2.13E+02	
	m3 3.41E+00	Compacted and Incinerated
	Ci 3.29E+01	
C. Irradiated Components, Control Rods, etc.	m3 4.81E-02	Non-compacted
	Ci 2.70E+02	
D. Other (describe)	m3	
	Ci	

Installation: Crystal River  
Unit No.: 3

Location: 70 Mi N Tampa, FL

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-302  
Thermal Power(MWH): 1.86E+07  
Commercial Operation: 03/13/77  
Cooling Water Source: Gulf of Mexico

Licensee: Florida Power  
Licensed Power(MWT): 2.54E+03  
Net Electrical Power(MWH): 6.08E+06  
Initial Criticality: 01/14/77

Airborne Effluents

Nuclide Released	Activity (Ci)
CO-57	1.99E-10
CO-58	2.94E-07
CO-60	1.65E-08
KR-85	4.82E-01
KR-85M	5.60E-03
RB-88	1.42E-06
SR-89	1.02E-06
SR-90	1.15E-06
Y-93	3.27E-06
I-131	1.96E-05
XE-131M	2.84E-02
TE-132	1.35E-07
I-133	2.54E-04
XE-133	2.84E+01
XE-133M	7.89E-03
I-135	1.27E-07
XE-135	9.25E+00
CS-137	3.11E-06
CE-141	3.93E-08
CE-143	1.91E-07
CE-144	1.26E-06
RE-188	8.74E-07

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	1.61E-03
AR-41	1.20E-07
CR-51	1.74E-03
MN-54	1.69E-02
FE-55	3.72E-02
CO-57	9.49E-04
CO-58	1.80E-01
FE-59	3.76E-04
CO-60	1.07E-01
ZN-69	3.36E-05
ZN-72	1.32E-05
KR-85	9.53E-03
KR-85M	3.69E-05
SR-85	2.85E-05
KR-87	4.69E-07
SR-89	3.03E-03
SR-90	1.02E-02
Y-91M	3.06E-06
SR-92	3.57E-03

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
Y-92	2.80E-05
Y-93	2.04E-04
NB-95	2.44E-02
ZR-95	1.36E-03
NB-97	6.25E-03
ZR-97	2.68E-04
MO-99	4.78E-05
TC-99M	1.01E-03
TC-101	1.70E-06
RU-103	9.46E-05
RU-106	6.03E-03
AG-110M	7.06E-03
SB-122	8.39E-04
SB-124	5.78E-02
SB-125	3.41E-02
TE-129	3.63E-05
I-131	2.17E-03
XE-131M	3.57E-03
I-132	5.71E-05
TE-132	3.71E-04
BA-133M	4.82E-05
I-133	2.31E-04
XE-133	7.64E-01
XE-133M	7.20E-03
CS-134	2.71E-03
I-135	2.75E-06
XE-135	5.14E-02
XE-135M	1.40E-05
CS-137	9.29E-03
BA-139	4.84E-05
BA-140	1.67E-04
LA-140	1.79E-03
CE-141	4.72E-05
LA-142	7.94E-07
CE-143	1.29E-05
CE-144	4.49E-03
PA-144	6.08E-03
ND-147	2.39E-05
NP-239	2.18E-05

Total Airborne Tritium Released	1.32E+01 Ci
Total Liquid Tritium Released	5.89E+02 Ci
Volume of Waste Released (Prior to Dilution)	3.54E+07 liters
Volume of Dilution Water Used During Period	2.12E+12 liters

Installation: Crystal River  
Unit No.: 3

Location: 70 Mi N Tampa, FL

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR  
Docket Number: 50-302  
Thermal Power(MWH): 1.86E+07  
Commercial Operation: 03/13/77  
Cooling Water Source: Gulf of Mexico

Licensee: Florida Power  
Licensed Power(MWT): 2.54E+03  
Net Electrical Power(MWH): 6.08E+06  
Initial Criticality: 01/14/77

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
9	Exclusive Use Vehicle	CNSI, Barnwell, SC
3	Exclusive Use Vehicle	Quadrex, Oak Ridge, TN
13	Exclusive Use Vehicle	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

	Jan-June	Jul-Dec
A		
CO-60	5.90E+00	5.90E+00
CS-134	2.16E+01	1.71E+01
CS-137	6.12E+01	6.68E+01
FE-55	3.40E+00	2.90E+00
NI-63	6.20E+00	7.00E+00
B		
C-14	1.04E+01	1.14E+01
CO-58		1.40E+00
CO-60	1.42E+01	1.57E+01
CS-134	3.40E+00	3.80E+00
CS-137	1.03E+01	1.15E+01
FE-55	4.40E+01	4.57E+01
NI-63	1.02E+01	1.13E+01
D		
CO-58		1.90E+00
CO-60		1.75E+01
FE-55		4.51E+01
d-3		2.03E+01
NI-63		1.36E+01

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.34E+02 Ci 8.79E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 3.60E+02 Ci 4.49E+00	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe) Tank Sediment	m3 5.07E+00 Ci 5.68E+00	

Installation: Davis-Besse  
Unit No.: 1

Location: 21 Mi E Toledo, OH

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-346  
Thermal Power(MWH): 1.92E+07  
Commercial Operation: 07/31/78  
Cooling Water Source: Lake Erie

Licensee: Toledo Edison Co.  
Licensed Power(MWT): 2.77E+03  
Net Electrical Power(MWH): 6.08E+06  
Initial Criticality: 08/12/77

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	1.42E-01
MN-54	2.51E-06
CO-58	8.03E-05
CO-60	6.64E-06
KR-85	2.69E+02
KR-85M	2.67E-01
KR-87	9.67E-02
KR-88	3.07E-01
RU-103	2.26E-06
I-131	7.36E-03
XE-131M	9.13E+00
I-132	4.84E-05
I-133	1.39E-03
XE-133	6.41E+01
XE-133M	2.47E+00
CS-134	1.33E-04
I-135	4.91E-05
XE-135	2.55E+00
XE-135M	3.51E-02
CS-137	1.94E-04
BA-140	1.24E-05
CE-144	9.87E-07

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	1.46E-05
CR-51	2.34E-04
MN-54	8.40E-05
FE-55	6.43E-03
CO-57	7.56E-05
CO-58	1.97E-02
FE-59	3.74E-05
CO-60	3.70E-03
SE-75	9.08E-05
KR-85	2.81E-02
NB-95	5.55E-04
ZR-95	3.18E-04
NB-97	3.10E-05
ZR-97	1.75E-04
TC-99M	1.70E-06
RU-103	2.05E-04
RU-106	9.08E-05
AG-110M	3.70E-03
SN-113	8.23E-04

Installation: Davis-Besse  
Unit No.: 1

Location: 21 Mi E Toledo, OH

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
SB-124	7.66E-04
SB-125	5.05E-03
I-131	1.31E-04
XE-131M	2.36E-03
I-132	5.21E-04
TE-132	5.23E-04
I-133	2.47E-06
XE-133	2.25E-01
XE-133M	1.01E-03
CS-134	3.42E-03
XE-135	9.19E-05
CS-137	5.33E-03
CE-144	5.24E-05
NP-239	7.94E-05

Total Airborne Tritium Released	2.24E+01 Ci
Total Liquid Tritium Released	1.81E+02 Ci
Volume of Waste Released (Prior to Dilution)	2.71E+08 liters
Volume of Dilution Water Used During Period	3.37E+10 liters



Installation: Davis-Besse  
Unit No.: 1

Location: 21 Mi E Toledo, OH

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR  
Docket Number: 50-346  
Thermal Power(MWH): 1.92E+07  
Commercial Operation: 07/31/78  
Cooling Water Source: Lake Erie

Licensee: Toledo Edison Co.  
Licensed Power(MWT): 2.77E+03  
Net Electrical Power(MWH): 6.08E+06  
Initial Criticality: 08/12/77

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
1	Truck	Amer. Ecology, Oak Ridge, TN
6	Truck	Barnwell, SC
2	Truck	Quadrex, Oak Ridge, TN
10	Truck	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June Jul-Dec

A

AG-110M	1.60E+00	
CO-58	6.67E+01	1.46E+00
CO-60	7.10E+00	9.19E+00
CS-134	4.90E+00	2.10E+01
CS-137	8.00E+00	4.71E+01
FE-55	6.40E+00	4.30E+00
NI-63	3.30E+00	1.70E+01

B

BA/LA-140		6.64E+01
CO-58	7.00E+01	6.90E-01
CO-60	2.30E+01	4.13E+00
CS-134		6.84E+00
CS-137		1.29E+01
FE-55	7.00E+00	3.92E+00
NI-63		1.44E+00
SN-113		3.12E+00

D

BA/LA-140		1.45E+01
CO-58		7.01E+01
CO-60		1.36E+00
CR-51		2.70E+00
FE-55		2.27E+00
MN-54		1.34E+00
NB-95		1.46E+00
NI-63		1.60E+00
ZR-95		1.20E+00

Installation: Davis-Besse  
Unit No.: 1

Location: 21 Mi E Toledo, OH

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 4.20E+01 Ci 7.68E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 3.82E+01 m3 2.23E+01 Ci 2.64E+00	After Volume Reduction
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe) Cartridge Filters	m3 1.74E+00 Ci 9.79E+00	

Installation: Diablo Canyon  
Unit No.: 1&2

Location: 12 Mi WSW of San Luis Obispo, CA

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: PWR  
Docket Number: 50-275  
Thermal Power(MWH): 2.81E+07  
Commercial Operation: 05/07/85  
Cooling Water Source: Pacific Ocean  
Unit Number: 2      Type: PWR  
Docket Number: 50-323  
Thermal Power(MWH): 2.44E+07  
Commercial Operation: 03/13/86  
Cooling Water Source: Pacific Ocean

Licensee: Pacific Gas & Electric Co  
Licensed Power(MWT): 3.34E+03  
Net Electrical Power(MWH): 9.03E+06  
Initial Criticality: 04/29/84

Licensee: Pacific Gas & Electric Co  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 7.79E+06  
Initial Criticality: 08/19/85

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	6.16E-01
CO-58	4.19E-05
CO-60	3.42E-06
KR-85	2.72E-01
I-131	5.27E-06
XE-131M	2.75E-04
XE-133	9.95E-01
XE-135	2.55E-01

Liquid Effluents

Nuclide Released	Activity (Ci)
BE-7	6.57E-04
NA-24	5.50E-04
CR-51	1.73E-02
MN-54	2.44E-02
FE-55	2.23E-01
CO-57	2.65E-03
CO-58	2.88E-01
FE-59	4.68E-04
CO-60	2.60E-01
ZN-65	2.03E-04
AS-76	5.12E-05
KR-88	1.10E-05
SR-89	1.58E-04
SR-90	5.68E-05
SR-91	1.42E-05
SR-92	2.54E-06
ZR-95	1.58E-02
MO-99	5.16E-04
RU-103	5.86E-05
AG-110M	5.47E-04
SN-113	1.00E-03
SN-117M	1.15E-04
SB-122	3.46E-03
SB-124	1.78E-02
SB-125	1.15E-01
TE-129	2.37E-07
I-131	1.98E-03
TE-131	5.94E-31

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
I-132	1.33E-04
TE-132	1.50E-03
I-133	9.29E-04
XE-133	2.37E-03
CS-134	1.45E-03
I-135	5.88E-05
XE-135	2.46E-04
CS-137	6.16E-03
CS-138	4.19E-08
BA-139	9.86E-08
CE-139	1.04E-05
BA-140	2.76E-05
LA-140	7.22E-07
CE-143	2.89E-05
CE-144	9.59E-07

Total Airborne Tritium Released	1.56E+02 Ci
Total Liquid Tritium Released	1.03E+03 Ci
Volume of Waste Released (Prior to Dilution)	1.88E+08 liters
Volume of Dilution Water Used During Period	5.24E+11 liters

Installation: Diablo Canyon  
Unit No.: 1&2

Location: 12 Mi WSW of San Luis Obispo, CA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-275  
Thermal Power(MWH): 2.81E+07  
Commercial Operation: 05/07/85  
Cooling Water Source: Pacific Ocean

Licensee: Pacific Gas & Electric Co  
Licensed Power(MWT): 3.34E+03  
Net Electrical Power(MWH): 9.03E+06  
Initial Criticality: 04/29/84

Unit Number: 2      Type: PWR  
Docket Number: 50-323  
Thermal Power(MWH): 2.44E+07  
Commercial Operation: 03/13/86  
Cooling Water Source: Pacific Ocean

Licensee: Pacific Gas & Electric Co  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 7.79E+06  
Initial Criticality: 08/19/85

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
42	Truck	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Annual

	Annual
A	
CO-60	1.09E+01
CS-137	1.11E+00
FE-55	7.29E+01
NI-63	1.25E+01
B	
C-14	1.11E+00
CO-58	2.69E+01
CO-60	1.32E+01
CR-51	1.59E+00
FE-55	3.42E+01
MN-54	1.46E+00
NB-95	7.41E+00
NI-63	5.90E+00
ZR-95	5.93E+00

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 2.96E+01 Ci 1.94E+03	Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 2.57E+01 Ci 2.81E+00	Burial Volume
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Dresden  
Unit No.: 1

Location: 14 Mi SW Joliet, IL

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-10  
Thermal Power (MWH): 0.00E+00  
Commercial Operation: 07/04/60  
Cooling Water Source: Kankakee River

Licensee: Commonwealth Edison  
Licensed Power (MWT): 7.00E+02  
Net Electrical Power (MWH): 0.00E+00  
Initial Criticality: 10/15/59

Airborne Effluents

Nuclide Released	Activity (Ci)
MN-54	8.55E-07
FE-55	3.53E-05
CO-60	1.06E-05
SR-89	1.21E-06
SR-90	6.92E-07
I-131	1.38E-07
CS-137	7.47E-05

Installation: Dresden  
Unit No.: 2&3

Location: 14 Mi SW Joliet, IL

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 2      Type: BWR  
Docket Number: 50-237  
Thermal Power(MWH): 1.03E+07  
Commercial Operation: 06/09/70  
Cooling Water Source: Kankakee River  
Unit Number: 3      Type: BWR  
Docket Number: 50-249  
Thermal Power(MWH): 1.62E+07  
Commercial Operation: 11/16/71  
Cooling Water Source: Kankakee River

Licensee: Commonwealth Edison  
Licensed Power(MWT): 2.53E+03  
Net Electrical Power(MWH): 3.06E+06  
Initial Criticality: 01/07/70

Licensee: Commonwealth Edison  
Licensed Power(MWT): 2.53E+03  
Net Electrical Power(MWH): 4.97E+06  
Initial Criticality: 01/31/71

Airborne Effluents

Nuclide Released	Activity (Ci)
CR-51	1.60E-03
MN-54	2.69E-03
FE-55	2.32E-02
CO-58	3.02E-04
FE-59	3.55E-04
CO-60	8.07E-03
KR-85	2.24E-03
KR-87	1.34E+00
SR-89	6.68E-04
SR-90	2.84E-06
I-131	1.01E-03
BA-133	7.68E-05
I-133	6.17E-03
XE-133	2.84E+01
I-135	1.20E-03
XE-135	1.86E+01
CS-137	1.15E-04
BA-140	5.33E-05
LA-140	5.33E-05

Liquid Effluents

Nuclide Released	Activity (Ci)
FE-55	1.82E-06
CO-60	2.62E-05
CS-134	1.16E-06
CS-137	5.25E-04

Installation: Dresden  
Unit No.: 1&2&3

Location: 14 Mi SW Joliet, IL

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: BWR  
Docket Number: 50-10  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 07/04/60  
Cooling Water Source: Kankakee River  
Unit Number: 2      Type: BWR  
Docket Number: 50-237  
Thermal Power(MWH): 1.03E+07  
Commercial Operation: 06/09/70  
Cooling Water Source: Kankakee River  
Unit Number: 3      Type: BWR  
Docket Number: 50-249  
Thermal Power(MWH): 1.62E+07  
Commercial Operation: 11/16/71  
Cooling Water Source: Kankakee River

Licensee: Commonwealth Edison  
Licensed Power(MWT): 7.00E+02  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 10/15/59

Licensee: Commonwealth Edison  
Licensed Power(MWT): 2.53E+03  
Net Electrical Power(MWH): 3.06E+06  
Initial Criticality: 01/07/70

Licensee: Commonwealth Edison  
Licensed Power(MWT): 2.53E+03  
Net Electrical Power(MWH): 4.97E+06  
Initial Criticality: 01/31/71

Liquid Effluents

Nuclide Released	Activity (Ci)
MN-54	1.88E-02
FE-55	4.53E-02
FE-59	9.04E-05
CO-60	6.07E-02
SR-89	5.59E-05
SR-90	8.48E-05
RU-103	4.88E-06
CS-137	2.46E-02
BI-214	1.09E-02

Total Airborne Tritium Released	7.05E+00 Ci
Total Liquid Tritium Released	2.33E+01 Ci
Volume of Waste Released (Prior to Dilution)	7.63E+08 liters
Volume of Dilution Water Used During Period	5.91E+10 liters



Installation: Dresden  
Unit No.: 1&2&3

Location: 14 Mi SW Joliet, IL

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: BWR  
Docket Number: 50-10  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 07/04/60  
Cooling Water Source: Kankakee River

Licensee: Commonwealth Edison  
Licensed Power(MWT): 7.00E+02  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 10/15/59

Unit Number: 2      Type: BWR  
Docket Number: 50-237  
Thermal Power(MWH): 1.03E+07  
Commercial Operation: 06/09/70  
Cooling Water Source: Kankakee River

Licensee: Commonwealth Edison  
Licensed Power(MWT): 2.53E+03  
Net Electrical Power(MWH): 3.06E+06  
Initial Criticality: 01/07/70

Unit Number: 3      Type: BWR  
Docket Number: 50-249  
Thermal Power(MWH): 1.62E+07  
Commercial Operation: 11/16/71  
Cooling Water Source: Kankakee River

Licensee: Commonwealth Edison  
Licensed Power(MWT): 2.53E+03  
Net Electrical Power(MWH): 4.97E+06  
Initial Criticality: 01/31/71

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
109	Motor freight (exclusive use only)	CNSI, Barnwell, SC
6	Motor freight (exclusive use only)	CNSI, Channahon, IL
12	Motor freight (exclusive use only)	Quadrex, Oak Ridge, TN
11	Motor freight (exclusive use only)	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

	Jan-June	Jul-Dec
A		
CO-60	2.92E+01	6.60E+01
CS-137	3.98E+00	1.16E+01
FE-55	5.87E+01	5.71E+00
MN-54	6.40E+00	1.32E+01
NI-63		1.67E+00
B		
CO-60	2.08E+01	2.52E+01
CS-137	2.96E+00	2.62E+00
FE-55	6.32E+01	5.88E+01
MN-54	1.02E+01	9.35E+00
NI-59	1.30E+00	2.23E+00
NI-63	1.01E+00	
C		
CO-60	3.23E+01	2.85E+01
FE-55	5.82E+01	4.70E+00
MN-54	2.58E+00	
NI-63	6.51E+00	6.58E+01

Installation: Dresden  
Unit No.: 1&2&3

Location: 14 Mi SW Joliet, IL

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued) Jan-June July-Dec  
(by type of waste)

D		
CO-60		5.68E+01
FE-55		2.68E+00
MN-54		3.21E+00
NI-59		9.11E+00
ZN-65		1.87E+00

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 4.52E+02 Ci 1.17E+03	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 1.66E+03 Ci 2.20E+01	
C. Irradiated Components, Control Rods, etc.	m3 8.19E+00 Ci 1.94E+04	
D. Other (describe)		
Sewage Treatment Plant Dirt	m3 1.09E+01 Ci 1.00E-01	

Installation: Duane Arnold  
Unit No.: 1

Location: 8 Mi NW Cedar Rapids, IA

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-331  
Thermal Power(MWH): 1.04E+07  
Commercial Operation: 02/01/75  
Cooling Water Source: Cedar Rapids River

Licensee: IES Utilities Inc.  
Licensed Power(MWT): 1.66E+03  
Net Electrical Power(MWH): 3.24E+06  
Initial Criticality: 03/23/74

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	1.57E+00
CR-51	6.44E-05
MN-54	5.80E-04
CO-58	2.37E-05
FE-59	1.68E-05
CO-60	1.38E-03
KR-85M	3.11E+00
SR-89	1.78E-05
SR-90	8.63E-07
I-131	9.11E-05
I-132	1.31E-06
I-133	1.13E-04
XE-133	2.53E+01
I-134	7.74E-07
I-135	1.87E-05
XE-135	1.86E+01
XE-135M	8.38E+00
CS-137	1.39E-06

Total Airborne Tritium Released

3.69E+01 Ci

Installation: Duane Arnold  
Unit No.: 1

Location: 8 Mi NW Cedar Rapids, IA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR  
Docket Number: 50-331  
Thermal Power(MWH): 1.04E+07  
Commercial Operation: 02/01/75  
Cooling Water Source: Cedar Rapids River

Licensee: IES Utilities Inc.  
Licensed Power(MWT): 1.66E+03  
Net Electrical Power(MWH): 3.24E+06  
Initial Criticality: 03/23/74

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
11	Exclusive-Use Vehicle	Barnwell, SC
4	Exclusive-Use Vehicle	SEG, Oak Ridge, TN

Irradiated Fuel Shipments (Disposition)

Number of Shipments	Mode of Transportation	Destination
1	Exclusive-Use Vehicle	Pleasanton, CA

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June Jul-Dec

A

C-14	4.20E-01	1.20E-01
CE-144	2.00E-02	
CO-58	4.40E-01	2.76E+00
CO-60	3.60E+01	2.52E+01
CR-51		2.08E+00
CS-134	2.90E-01	
CS-137	1.10E+00	4.60E-01
FE-55	5.28E+01	4.79E+01
FE-59		6.00E-02
H-3	4.00E-02	2.00E-02
MN-54	8.14E+00	2.09E+01
NI-59		1.00E-02
NI-63	7.90E-01	5.10E-01

B

C-14		1.09E-02
CO-58		1.10E-01
CO-60		2.91E+01
CR-51		5.70E-01
CS-137		1.00E-02
FE-55		6.65E+01
FE-59		1.00E-01
MN-54		1.58E+00
NI-63		1.96E+00

C

CO-60		3.28E+01
CR-51		4.82E+00
FE-55		5.63E+01
MN-54		3.70E+00
NI-63		2.35E+00

Installation: Duane Arnold  
Unit No.: 1

Location: 8 Mi NW Cedar Rapids, IA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.66E+01 m3 1.78E+01 Ci 4.70E+02	Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 1.18E+02 m3 7.20E+00 Ci 4.69E-01	Volume after Incineration
C. Irradiated Components, Control Rods, etc.	m3 3.00E+00 Ci 5.08E+04	
D. Other (describe)	m3 Ci	

Installation: Joseph M. Farley  
Unit No.: 1

Location: Dothan, AL

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-348  
Thermal Power(MWH): 2.25E+07  
Commercial Operation: 12/01/77  
Cooling Water Source: Chatahoochee River

Licensee: Southern Nuclear  
Licensed Power(MWT): 2.65E+03  
Net Electrical Power(MWH): 6.87E+06  
Initial Criticality: 08/09/77

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	2.29E+01
KR-85	6.25E-01
XE-131M	4.01E-01
I-133	2.73E-06
XE-133	1.70E+02
XE-133M	1.06E-01
XE-135	4.45E-02

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	4.00E-03
MN-54	1.70E-03
FE-55	7.17E-03
CO-57	8.27E-05
CO-58	3.16E-02
FE-59	4.15E-04
CO-60	1.65E-02
AS-76	1.94E-06
SR-90	2.81E-05
SR-92	6.37E-05
NB-95	1.15E-03
ZR-95	4.82E-04
NB-97	1.05E-04
TC-99M	4.47E-05
RU-103	3.59E-06
RU-105	1.48E-05
AG-110M	3.63E-03
SB-124	7.81E-04
SB-125	3.68E-03
I-131	1.59E-04
XE-131M	5.58E-04
I-133	1.04E-04
XE-133	7.95E-02
XE-133M	1.11E-04
CS-134	1.39E-03
XE-135	1.42E-04
CS-137	2.94E-03

Total Airborne Tritium Released	2.63E+01 Ci
Total Liquid Tritium Released	9.35E+02 Ci
Volume of Waste Released (Prior to Dilution)	3.11E+08 liters
Volume of Dilution Water Used During Period	5.53E+10 liters

Installation: Joseph M. Farley  
Unit No.: 2

Location: Dothan, AL

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-364  
Thermal Power(MWH): 1.70E+07  
Commercial Operation: 07/30/81  
Cooling Water Source: Chatahoochee River

Licensee: Southern Nuclear  
Licensed Power(MWT): 2.65E+03  
Net Electrical Power(MWH): 5.24E+06  
Initial Criticality: 05/08/81

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	2.56E+01
CO-58	1.26E-07
KR-85M	5.00E-04
I-133	1.88E-08
XE-133	5.05E-01
XE-135	7.92E-03

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	2.02E-04
CR-51	1.14E-02
MN-54	2.77E-03
FE-55	6.88E-03
CO-57	5.51E-05
CO-58	4.89E-02
FE-59	7.66E-04
CO-60	2.38E-02
ZN-65	7.63E-06
AS-76	2.52E-06
KR-88	2.01E-06
RB-88	4.46E-05
SR-92	4.12E-05
NB-95	7.90E-03
ZR-95	4.09E-03
NB-97	2.43E-04
TC-99M	5.94E-05
RU-105	4.60E-05
AG-110M	1.81E-03
SB-124	2.76E-04
SB-125	1.65E-03
I-131	3.30E-05
XE-131M	4.15E-04
TE-132	5.47E-07
I-133	8.06E-05
XE-133	9.12E-02
XE-133M	2.63E-04
CS-134	1.00E-04
I-135	2.61E-05
XE-135	1.30E-04
CS-137	6.47E-04
BA-140	2.97E-06
CE-144	2.57E-06

Installation: Joseph M. Farley  
Unit No.: 2

Location: Dothan, AL

Effluent and Waste Disposal Annual Report for 1993

Total Airborne Tritium Released	4.60E+01 Ci
Total Liquid Tritium Released	8.85E+02 Ci
Volume of Waste Released (Prior to Dilution)	3.28E+08 liters
Volume of Dilution Water Used During Period	5.85E+10 liters



Installation: Joseph M. Farley  
Unit No.: 1&2

Location: Dothan, AL

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR      Licensee: Southern Nuclear  
Docket Number: 50-348      Licensed Power(MWT): 2.65E+03  
Thermal Power(MWH): 2.25E+07      Net Electrical Power(MWH): 6.87E+06  
Commercial Operation: 12/01/77      Initial Criticality: 08/09/77  
Cooling Water Source: Chatahoochee River

Unit Number: 2      Type: PWR      Licensee: Southern Nuclear  
Docket Number: 50-364      Licensed Power(MWT): 2.65E+03  
Thermal Power(MWH): 1.70E+07      Net Electrical Power(MWH): 5.24E+06  
Commercial Operation: 07/30/81      Initial Criticality: 05/08/81  
Cooling Water Source: Chatahoochee River

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
64	Highway	CNSI, Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

	Jan-June	Jul-Dec
A		
CC-58	3.52E+01	1.36E+01
CO-60	1.00E+01	1.87E+01
CR-51	1.20E+00	
CS-134		7.80E+00
CS-137		6.10E+00
FE-55	3.97E+01	2.57E+01
MN-54	1.00E+00	5.00E+00
NB-95	1.10E+00	
NI-63	7.30E+00	2.04E+01
SB-125		1.00E+00
B		
BE-7		1.00E+00
CO-58	1.77E+01	1.49E+01
CO-60	9.70E+00	1.21E+01
CR-51	8.50E+00	1.10E+00
FE-55	3.94E+01	4.83E+01
MN-54	1.60E+00	5.60E+00
NB-95	5.90E+00	2.00E+00
NI-63	8.40E+00	8.20E+00
PU-241	2.10E+00	2.00E+00
ZR-95	4.00E+00	1.60E+00

Installation: Joseph M. Farley  
Unit No.: 1&2

Location: Dothan, AL

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 3.00E+01 Ci 5.00E+02	Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 3.67E+01 Ci 5.74E+00	Burial Volume
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Permi  
Unit No.: 2

Location: Laguna Beach, MI

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-341  
Thermal Power(MWH): 2.56E+07  
Commercial Operation: 01/23/88  
Cooling Water Source: Lake Erie

Licensee: Detroit Edison Company  
Licensed Power(MWT): 3.29E+03  
Net Electrical Power(MWH): 8.28E+06  
Initial Criticality: 06/21/85

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	1.62E+00
CR-51	1.45E-03
MN-54	4.97E-04
CO-58	1.41E-05
CO-60	3.48E-04
ZN-65	8.94E-05
SE-75	5.49E-06
AS-76	2.82E-04
BR-82	7.39E-05
KR-85	1.49E-01
KR-85M	1.49E+00
KR-87	3.40E+00
KR-88	2.12E+00
RB-88	1.55E-01
KR-89	3.63E+00
RB-89	3.72E-01
SR-89	1.40E-04
SR-90	2.51E-06
SR-91	3.99E-03
Y-91M	6.84E-02
TC-99M	2.68E-03
AG-110M	2.47E-06
I-131	6.17E-03
XE-131M	1.25E-02
I-132	2.87E-02
I-133	2.22E-02
XE-133	7.59E+00
XE-133M	8.68E-02
I-134	6.69E-03
I-135	2.12E-02
XE-135	5.89E+00
XE-135M	1.94E+01
XE-137	7.19E+01
CS-138	7.13E-01
XE-138	3.80E+01
BA-139	5.06E-01
BA-140	2.94E-04
LA-140	6.24E-04

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	1.56E-04
MN-54	3.51E-04
CO-58	6.13E-05

Installation: Fermi  
Unit No.: 2

Location: Laguna Beach, MI

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
CO-60	5.52E-04
ZN-65	1.40E-04
SR-89	1.89E-04
SB-125	1.87E-05
XE-133	9.17E-06
CS-137	8.29E-06

Total Airborne Tritium Released	2.36E+00 Ci
Total Liquid Tritium Released	3.73E-01 Ci
Volume of Waste Released (Prior to Dilution)	3.94E+05 liters
Volume of Dilution Water Used During Period	3.86E+10 liters

Installation: James A. Fitzpatrick  
Unit No.: 1

Location: 36 Mi N Syracuse, NY

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-333  
Thermal Power(MWH): 1.48E+07  
Commercial Operation: 07/28/75  
Cooling Water Source: Lake Ontario

Licensee: Power Authority of the State of NY  
Licensed Power(MWT): 2.44E+03  
Net Electrical Power(MWH): 4.75E+06  
Initial Criticality: 11/17/74

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	1.61E+01
CR-51	5.61E-04
MN-54	7.76E-05
CO-58	2.12E-05
FE-59	3.92E-06
CO-60	4.17E-04
ZN-65	6.35E-04
AS-76	3.97E-04
KR-85M	1.31E+01
KR-87	8.44E+00
KR-88	1.75E+01
SR-89	4.54E-05
SR-90	7.29E-10
NB-95M	1.23E-05
I-131	4.94E-04
I-133	4.15E-03
XE-133	2.66E+02
XE-133M	8.26E+00
I-135	9.29E-04
XE-135	4.65E+01
XE-135M	5.53E+00
CS-137	6.60E-06
XE-137	1.23E+00
XE-138	3.20E+01
BA/LA-140	1.65E-05
CE-144	3.06E-05

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	1.23E-04
MN-54	1.56E-04
CO-58	2.08E-06
CO-60	8.51E-04
ZN-65	2.57E-04
AS-76	1.30E-06
SR-89	4.35E-04
TC-99M	1.81E-06
AG-110M	9.74E-06
CS-134	1.74E-05
XE-135	4.28E-05
CS-137	4.06E-05

Installation: James A. Fitzpatrick  
Unit No.: 1

Location: 36 Mi N Syracuse, NY

Effluent and Waste Disposal Annual Report for 1993

Total Airborne Tritium Released	7.93E+00 Ci
Total Liquid Tritium Released	1.44E+00 Ci
Volume of Waste Released (Prior to Dilution)	1.20E+06 liters
Volume of Dilution Water Used During Period	6.08E+11 liters

Installation: James A. Fitzpatrick  
Unit No.: 1

Location: 36 Mi N Syracuse, NY

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR  
Docket Number: 50-333  
Thermal Power(MWH): 1.48E+07  
Commercial Operation: 07/28/75  
Cooling Water Source: Lake Ontario

Licensee: Power Authority of the State of NY  
Licensed Power(MWT): 2.44E+03  
Net Electrical Power(MWH): 4.75E+06  
Initial Criticality: 11/17/74

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
10	Truck	Alaron, Wampum, PA
27	Truck	Barnwell, SC
1	Truck	Quadrex, Oak Ridge, TN
1	Truck	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June Jul-Dec

A			
	CO-58	2.11E+00	3.36E+00
	CO-60	3.34E+01	3.22E+01
	CR-51	6.40E-01	3.64E+00
	CS-134	1.08E+00	9.77E-01
	CS-137	2.63E+00	2.50E+00
	FE-55	2.59E+01	2.17E+01
	MN-54	7.52E+00	1.06E+01
	ZN-65	2.57E+01	2.35E+01
B			
	C-14	1.02E-01	
	CO-60	1.96E+01	4.62E+01
	CS-134	4.48E+00	3.48E-01
	CS-137	7.49E+00	5.82E-01
	FE-55	1.30E+01	2.87E+01
	H-3		1.68E+01
	MN-54	4.87E+00	3.79E-01
	NI-63		3.05E+00
	ZN-65	5.04E+01	3.92E+00
C			
	C-14		8.15E-03
	CO-60		4.76E+01
	FE-55		4.69E+01
	H-3		1.73E-04
	MN-54		5.20E-01
	NB-94		7.94E-05
	NI-59		2.72E-02
	NI-63		4.96E+00
D			
	C-14		1.80E-01
	CO-60		5.34E+01
	CS-137		1.16E+00
	FE-55		2.30E+01
	H-3		9.00E-02
	MN-54		7.56E+00

Installation: James A. Fitzpatrick  
Unit No.: 1

Location: 36 Mi N Syracuse, NY

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued) Jan-June July-Dec  
(by type of waste)

D

NI-63  
ZN-65

7.40E-01  
1.39E+01

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.14E+02 Ci 3.95E+02	Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 3.20E+02 Ci 3.90E+00	Burial Volume
C. Irradiated Components, Control Rods, etc.	m3 8.74E+00 Ci 3.41E+04	Burial Volume
D. Other (describe) Water & Water/Oil Mixtures	m3 1.08E+01 Ci 2.76E-04	Burial Volume



Installation: Fort Calhoun  
Unit No.: 1

Location: 19 Mi N Omaha, NE

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-285  
Thermal Power(MWH): 9.72E+06  
Commercial Operation: 06/20/74  
Cooling Water Source: Missouri River

Licensee: Omaha Public Power  
Licensed Power(MWT): 1.50E+03  
Net Electrical Power(MWH): 3.10E+06  
Initial Criticality: 08/06/73

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	5.79E-01
KR-85	2.19E-07
KR-85M	1.60E-03
SR-90	7.26E-07
Y-90	7.26E-07
I-131	2.12E-05
XE-131M	3.41E-03
XE-133	8.56E+00
XE-133M	1.51E-02
XE-135	9.56E-02
CS-137	7.34E-07

Liquid Effluents

Nuclide Released	Activity (Ci)
BE-7	7.94E-05
C-14	1.53E-03
P-32	1.19E-05
AR-41	4.65E-06
CR-51	1.45E-02
MN-54	8.45E-04
FE-	2.38E-01
CO-1	1.73E-04
CO-58	1.21E-01
FE-59	2.36E-04
CO-60	6.00E-03
NI-63	4.71E-04
ZN-65	4.07E-05
SE-75	1.01E-03
KR-85M	5.38E-06
KR-87	5.16E-06
KR-88	8.43E-06
SR-89	6.05E-04
SR-90	7.69E-04
Y-90	7.69E-04
NB-95	6.03E-03
ZR-95	3.93E-03
MO-99	3.26E-05
TC-99M	3.26E-05
RH-103M	2.77E-04
RU-103	2.77E-04
RH-106	1.06E-04
RU-106	1.06E-04
AG-110M	4.46E-03
SN-113	2.08E-04

Installation: Fort Calhoun  
Unit No.: 1

Location: 19 Mi N Omaha, NE

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
SB-122	2.95E-04
SB-124	1.88E-02
SB-125	8.06E-02
SB-126	4.65E-04
I-129	8.18E-05
I-131	7.90E-03
XE-131M	3.77E-05
I-132	2.06E-05
TE-132	2.11E-05
I-133	2.38E-04
XE-133	1.04E-01
XE-133M	6.97E-04
CS-134	1.29E-03
XE-135	6.98E-04
XE-135M	7.48E-06
CS-137	6.32E-03
BA-140	1.63E-04
LA-140	8.88E-04
CE-141	1.10E-04
LA-141	4.52E-05
CE-144	1.86E-04
PR-144	1.86E-04
HF-181	4.82E-05

Total Airborne Tritium Released	1.19E+00 Ci
Total Liquid Tritium Released	2.39E+02 Ci
Volume of Waste Released (Prior to Dilution)	1.35E+08 liters
Volume of Dilution Water Used During Period	1.22E+12 liters

Installation: Fort Calhoun  
Unit No.: 1

Location: 19 Mi N Omaha, NE

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: FWR  
Docket Number: 50-285  
Thermal Power(MWH): 9.72E+06  
Commercial Operation: 06/20/74  
Cooling Water Source: Missouri River

Licensee: Omaha Public Power  
Licensed Power(MWT): 1.50E+03  
Net Electrical Power(MWH): 3.10E+06  
Initial Criticality: 08/06/73

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
33		Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Annual

	Annual
A	
CS-134	3.16E+01
CS-137	5.80E+01
FE-55	4.80E+00
MN-54	2.20E+00
NI-63	1.60E+00
B	
CO-58	5.90E+00
CO-60	2.37E+01
CS-137	1.49E+01
FE-55	3.63E+01
MN-54	1.00E+00
NI-63	6.00E+00
SE-125	1.10E+00
TC-99	2.50E+00

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 5.52E+00 Ci 1.18E+01	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 1.87E+01 Ci 8.81E-01	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Fort St. Vrain  
Unit No.: 1

Location: 35 Mi N Denver, CO

Effluent and Waste Disposal Annual Report for 1993

Type: HTG  
Docket Number: 50-267  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 07/01/79  
Cooling Water Source: South Platte River

Licensee: Public Service Co of Colorado  
Licensed Power(MWT): 8.42E+02  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 01/31/74

Airborne Effluents

Nuclide Released	Activity (Ci)
CO-60	5.05E-06
CS-137	1.70E-06

Liquid Effluents

Nuclide Released	Activity (Ci)
MN-54	3.68E-05
CO-60	2.39E-03
BA-133	1.61E-05
CS-134	1.30E-03
CS-137	1.23E-02
EU-152	5.08E-04
EU-154	3.71E-04
EU-155	2.27E-04

Total Airborne Tritium Released	1.17E+00 Ci
Total Liquid Tritium Released	2.49E-01 Ci
Volume of Waste Released (Prior to Dilution)	2.55E+08 liters
Volume of Dilution Water Used During Period	2.09E+08 liters

Installation: Fort St. Vrain  
Unit No.: 1

Location: 35 Mi N Denver, CO

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: HTG  
Docket Number: 50-267  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 07/01/79  
Cooling Water Source: South Platte River

Licensee: Public Service Co of Colorado  
Licensed Power(MWT): 8.42E+02  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 01/31/74

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
120	Public Highway	US Ecology, Richland, WA

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Annual

A		
	CS-134	7.90E+00
	CS-137	8.21E+01
	FE-55	1.10E+00
	SR-90	8.90E+00
B		
	CO-60	7.70E+00
	FE-55	8.58E+01
	H-3	5.60E+00
C		
	CO-60	3.55E+01
	EU-152	5.10E+00
	EU-154	3.50E+00
	FE-55	4.04E+01
	H-3	1.05E+01
	NI-63	4.70E+00
D		
	CO-60	1.00E+00
	EU-152	5.40E+00
	FE-55	2.51E+01
	H-3	6.79E+01

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 5.07E+00 Ci 4.39E+00	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 3.11E+01 Ci 2.44E-01	
C. Irradiated Components, Control Rods, etc.	m3 3.98E+02 Ci 2.63E+04	
D. Other (describe) Irradiated Concrete	m3 6.63E+02 Ci 6.58E+02	

Installation: R. E. Ginna  
Unit No.: 1

Location: 16 Mi NE Rochester, NY

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-244  
Thermal Power(MWH): 1.09E+07  
Commercial Operation: 07/01/70  
Cooling Water Source: Lake Ontario

Licensee: Rochester Gas&Electric  
Licensed Power(MWI): 1.52E+03  
Net Electrical Power(MWH): 3.50E+06  
Initial Criticality: 11/08/69

Airborne Effluents

Nuclide Released	Activity (Ci)
C-14	3.16E+00
AR-41	1.98E+00
CO-58	1.28E-06
KR-85	1.77E+00
KR-85M	2.82E-01
KR-87	2.70E-01
KR-88	3.96E-01
I-131	7.31E-04
XE-131M	7.26E-01
I-133	1.12E-04
XE-133	1.11E+02
XE-133M	6.04E-01
XE-135	1.59E+01
XE-135M	2.61E+00
CS-137	5.17E-06
XE-138	9.65E-01
Unidentified	8.69E-06

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	3.15E-04
MN-54	2.17E-05
FE-55	2.62E-03
CO-58	2.12E-03
FE-59	2.85E-06
CO-60	1.14E-03
SR-89	2.99E-04
SR-90	8.95E-05
ZR/NB-95	3.51E-04
MO-99	6.07E-05
RU-106	1.17E-04
AG-110M	1.27E-03
SB-124	2.85E-03
SB-125	6.53E-03
I-131	1.13E-02
I-133	1.53E-02
XE-133	7.78E-02
CS-134	4.19E-02
I-135	1.00E-02
XE-135	2.83E-02
CS-136	2.25E-04
CS-137	4.07E-02
BA/LA-140	9.88E-05

Installation: R. E. Ginna  
Unit No.: 1

Location: 16 Mi NE Rochester, NY

Effluent and Waste Disposal Annual Report for 1993

Total Airborne Tritium Released	5.15E+01 Ci
Total Liquid Tritium Released	1.77E+02 Ci
Volume of Waste Released (Prior to Dilution)	1.14E+08 liters
Volume of Dilution Water Used During Period	6.02E+11 liters

Installation: R. E. Ginna  
Unit No.: 1

Location: 16 Mi NE Rochester, NY

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR  
Docket Number: 50-244  
Thermal Power(MWH): 1.09E+07  
Commercial Operation: 07/01/70  
Cooling Water Source: Lake Ontario

Licensee: Rochester Gas&Electric  
Licensed Power(MWT): 1.52E+03  
Net Electrical Power(MWH): 3.50E+06  
Initial Criticality: 11/08/69

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
7	Sole Use Truck	Barnwell, SC
2	Sole Use Truck	Oak Ridge, TN
1	Sole Use Truck	Quadrex
3	Sole Use Truck	SEG

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June Jul-Dec

	Jan-June	Jul-Dec
A		
C-14		5.00E+00
CO-58	2.95E+01	
CO-60	2.05E+01	3.00E+01
CS-134	1.03E+01	
CS-137	1.56E+01	7.00E+00
FE-55	6.20E+00	3.10E+01
H-3		2.00E+00
MN-54	1.60E+00	
NI-63	1.21E+01	1.90E+01
SB-124	2.40E+00	
SB-125		2.00E+00
B		
C-14	1.40E+00	
CE-144		5.00E+00
CO-58		7.00E+00
CO-60	8.20E+00	1.00E+01
CR-51		6.00E+00
CS-134	1.04E+01	2.00E+00
CS-137	2.24E+01	9.00E+00
FE-55	4.80E+01	3.80E+01
MN-54	1.90E+00	1.00E+00
NE-95		1.00E+01
NI-63	5.00E+00	4.00E+00
ZR-95		7.00E+00



Installation: R. E. Ginna  
Unit No.: 1

Location: 16 Mi NE Rochester, NY

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 7.12E+00 Ci 6.86E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 4.95E+02 Ci 8.53E-01	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Grand Gulf  
Unit No.: 1

Location: 25 Mi Vicksburg, MS

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-416  
Thermal Power(MWH): 2.56E+07  
Commercial Operation: 07/01/85  
Cooling Water Source: Wells

Licensee: Entergy Operations, Inc.  
Licensed Power(MWT): 3.83E+03  
Net Electrical Power(MWH): 7.90E+06  
Initial Criticality: 08/18/82

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	6.06E-01
CR-51	1.17E-05
MN-54	2.28E-05
CO-58	1.64E-06
CO-60	4.00E-05
KR-85M	4.82E+00
KR-88	2.64E+00
SR-89	2.70E-06
SR-90	1.48E-06
I-131	4.71E-04
XE-131M	2.25E+00
I-133	1.70E-04
XE-133	4.61E+01
CS-134	2.12E-06
XE-135	3.57E+01
XE-135M	1.92E+00
CS-137	2.33E-06
XE-138	4.04E-01
EA-140	4.53E-08

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	2.10E-03
CR-51	2.94E-02
MN-54	2.46E-02
FE-55	7.01E-02
MN-56	1.03E-05
CO-58	2.20E-03
FE-59	6.20E-03
CO-60	2.84E-02
CU-64	7.13E-04
ZN-65	3.55E-05
AS-76	7.21E-05
SR-89	3.23E-04
SR-90	2.93E-04
ZR/NB-95	3.26E-05
TC-99M	7.55E-05
SB-124	1.04E-04
SB-125	1.79E-05
I-131	2.96E-06
I-133	1.05E-05
XE-133	3.14E-04
CS-134	3.52E-04
XE-135	2.62E-04

Installation: Grand Gulf  
Unit No.: 1

Location: 25 Mi Vicksburg, MS

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
CS-137	5.98E-04
CE-144	1.79E-05
W-187	1.38E-05

Total Airborne Tritium Released	2.29E+01 Ci
Total Liquid Tritium Released	6.29E+01 Ci
Volume of Waste Released (Prior to Dilution)	2.68E+07 liters
Volume of Dilution Water Used During Period	2.07E+09 liters

Installation: Grand Gulf  
Unit No.: 1

Location: 25 Mi Vicksburg, MS

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR  
Docket Number: 50-416  
Thermal Power (MWH): 2.56E+07  
Commercial Operation: 07/01/85  
Cooling Water Source: Wells

Licensee: Entergy Operations, Inc.  
Licensed Power (MWT): 3.83E+03  
Net Electrical Power (MWH): 7.90E+06  
Initial Criticality: 08/18/82

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
82	Truck	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June Jul-Dec

A

CO-58	2.00E+00	
CO-60	2.30E+01	9.10E+00
CR-51	2.10E+01	1.20E+00
CS-134	2.00E+00	
CS-137	2.00E+00	
FE-55	3.50E+01	7.51E+01
FE-59		1.20E+00
MN-54	1.30E+01	7.80E+00
NI-63		1.40E+00
Unidentified	2.00E+00	2.70E+00
ZN-65		1.50E+00

B

C-14	2.00E+00	1.20E+00
CO-60	7.00E+00	1.85E+01
FE-55	7.80E+01	6.51E+01
FE-59	6.00E+00	2.90E+00
MN-54	7.00E+00	1.23E+01

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.63E+02 Ci 3.76E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 2.68E+01 Ci 3.16E+00	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Haddam Neck  
Unit No.: 1

Location: 9.5 Mi SE Middletown, CT

Effluent and Waste Disposal Annual Report for 1993

Type: PWR

Licensee: Connecticut Yankee Atomic  
Power

Docket Number: 50-213

Licensed Power(MWT): 1.82E+03

Thermal Power(MWH): 1.19E+07

Net Electrical Power(MWH): 3.74E+06

Commercial Operation: 01/01/68

Initial Criticality: 07/24/67

Cooling Water Source: Connecticut River

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	7.04E-02
MN-54	1.51E-05
CO-60	2.16E-04
KR-85	1.58E+02
KR-85M	6.43E-02
KR-87	3.43E-02
KR-88	3.01E-02
SR-89	1.61E-07
SR-90	2.19E-07
I-131	2.66E-03
XE-131M	1.98E+01
I-133	2.48E-04
XE-133	1.88E+03
XE-133M	1.36E+01
CS-134	8.02E-04
XE-135	1.18E+01
XE-135M	2.52E-02
CS-137	8.76E-03
XE-137	8.92E-02
XE-138	7.41E-02

Liquid Effluents

Nuclide Released	Activity (Ci)
MN-54	4.82E-04
FE-55	7.73E-01
CO-58	9.63E-03
FE-59	2.25E-04
CO-60	1.06E-02
KR-85	1.78E-02
SR-89	7.61E-05
SR-90	1.52E-03
I-131	4.34E-03
XE-131M	4.78E-02
I-133	2.64E-05
XE-133	1.37E+00
XE-133M	7.41E-03
CS-134	1.31E-02
XE-135	8.18E-04
CS-137	2.32E-02

Total Airborne Tritium Released	6.43E+01 Ci
Total Liquid Tritium Released	4.00E+03 Ci
Volume of Waste Released (Prior to Dilution)	1.39E+08 liters
Volume of Dilution Water Used During Period	7.01E+11 liters

Installation: Haddam Neck  
Unit No.: 1

Location: 9.5 Mi SE Middletown, CT

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR

Licensee: Connecticut Yankee Atomic  
Power

Docket Number: 50-213

Licensed Power(MWT): 1.82E+03

Thermal Power(MWH): 1.19E+07

Net Electrical Power(MWH): 3.74E+06

Commercial Operation: 01/01/68

Initial Criticality: 07/24/67

Cooling Water Source: Connecticut River

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
13	Truck	Barnwell, SC
4	Truck	Quadrex, Oak Ridge, TN
4	Truck	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Annual

A

AM-241	3.36E-03
C-14	3.00E-02
CM-242	1.94E-03
CM-243	1.34E-03
CM-244	1.34E-03
CO-58	2.00E+01
CO-60	7.40E+00
CS-134	2.16E+01
CS-137	3.13E+01
FE-55	1.27E+01
H-3	1.95E-03
I-129	8.07E-04
MN-54	4.30E+00
NI-63	2.22E+00
PU-238	5.46E-03
PU-239	7.59E-04
PU-240	7.59E-04
PU-241	1.63E-01
SR-90	2.03E-01
TC-99	2.15E-04

B

AM-241	2.11E-02
C-14	1.61E-01
CM-242	1.40E-02
CM-243	1.76E-03
CM-244	1.76E-03
CO-58	2.31E+00
CO-60	1.39E+01
CS-134	6.25E+00
CS-137	1.29E+01
FE-55	5.36E+01
H-3	3.95E+00
I-129	1.30E-02
MN-54	2.55E-01
NI-63	6.21E+00

Installation: Haddam Neck  
Unit No.: 1

Location: 9.5 Mi SE Middletown, CT

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued) Jan-June July-Dec  
(by type of waste)

B

PU-238	8.13E-03
PU-239	1.38E-03
PU-240	1.38E-03
PU-241	3.06E-01
PU-242	6.22E-04
SR-90	8.00E-02
TC-99	1.83E-03

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 4.43E+01	Dewatered Burial Volume
	Ci 3.66E+03	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 1.62E+01	Burial Volume after Compaction
	Ci 2.12E+00	
C. Irradiated Components, Control Rods, etc.	m3	
	Ci	
D. Other (describe)	m3	
	Ci	

Installation: Harris  
Unit No.: 1

Location: 20 Mi SW Raleigh, NC

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-400  
Thermal Power(MWH): 2.39E+07  
Commercial Operation: 05/02/87  
Cooling Water Source: Makeup Reservoir

Licensee: Carolina Power & Light  
Licensed Power(MWT): 2.77E+03  
Net Electrical Power(MWH): 7.53E+06  
Initial Criticality: 01/03/87

Airborne Effluents

Nuclide Released	Activity (Ci)
CO-60	1.73E-04
KR-85	3.27E+01
KR-85M	6.29E+00
KR-87	2.10E+00
KR-88	1.05E+01
I-131	7.35E-06
XE-131M	4.57E-01
I-133	2.41E-06
XE-133	2.64E+02
XE-133M	4.20E+00
XE-135	2.70E+01
XE-138	2.10E+00

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	4.30E-05
MN-54	1.50E-04
FE-55	2.27E-02
CO-57	1.19E-04
CO-58	2.40E-02
CO-60	7.60E-03
Y-93	5.19E-05
NB-95	1.26E-05
SB-125	1.91E-02
I-131	3.35E-03
XE-131M	4.10E-05
I-133	3.66E-05
XE-133	1.33E-02
XE-133M	1.79E-04
CS-134	2.91E-04
XE-135	3.45E-04
CS-137	3.89E-04

Total Airborne Tritium Released	5.08E+01 Ci
Total Liquid Tritium Released	5.55E+02 Ci
Volume of Waste Released (Prior to Dilution)	9.46E+07 liters
Volume of Dilution Water Used During Period	2.74E+10 liters



Installation: Harris  
Unit No.: 1

Location: 20 Mi SW Raleigh, NC

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR  
Docket Number: 50-400  
Thermal Power(MWH): 2.39E+07  
Commercial Operation: 05/02/87  
Cooling Water Source: Makeup Reservoir

Licensee: Carolina Power & Light  
Licensed Power(MWT): 2.77E+03  
Net Electrical Power(MWH): 7.53E+06  
Initial Criticality: 01/03/87

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
87	Truck	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

	Jan-June	Jul-Dec
A		
AM-241	3.36E-05	1.34E-04
C-14	5.12E-02	4.50E-03
CD-109		3.25E+00
CE-144		1.83E-01
CM-242		7.30E-05
CM-243/244	3.31E-05	1.73E-04
CO-58	1.04E+00	5.92E+00
CO-60	2.80E+01	2.15E+01
CS-134	5.11E-01	1.08E+01
CS-137	9.01E-01	1.06E+01
FE-55	2.41E+01	1.86E+01
H-3	1.44E-02	6.34E-02
MN-54	9.61E+00	5.80E+00
NB-94		1.51E-04
NI-59		1.40E-01
NI-63	3.53E+01	2.17E+01
PU-238	5.32E-05	3.03E-04
PU-239/240	5.24E-05	2.09E-04
PU-241	8.68E-03	5.32E-02
SB-125	4.18E-01	1.72E+00
SR-90	7.08E-03	2.13E-02
TC-99		3.00E-04
B		
AM-241		2.64E-01
AM-243		2.80E-11
C-14	2.22E-01	7.21E-02
CE-144	1.40E+00	4.54E-01
CM-242		1.40E-07
CM-243		7.40E-12
CM-244		3.00E-10
CO-58	1.11E+01	4.61E+00
CO-60	2.25E+01	2.22E+01
CS-137	9.45E-01	5.89E-01
FE-55	5.86E+01	6.67E+01
H-3	5.95E-01	1.93E-01
MN-54	1.72E+00	5.61E-01
NI-63	2.94E+00	4.30E+00
NP-237		1.60E-07

Installation: Harris  
Unit No.: 1

Location: 20 Mi SW Raleigh, NC

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued) Jan-June July-Dec  
(by type of waste)

B

PU-238	5.10E-05
PU-239	2.80E-05
PU-240	1.60E-06
PU-241	1.10E-04
PU-242	4.30E-11

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 3.37E+01	After Incineration Burial Volume
	Ci 3.74E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 3.14E+01	After Incineration Burial Volume
	Ci 8.30E-01	
C. Irradiated Components, Control Rods, etc.	m3	
	Ci	
D. Other (describe)	m3	
	Ci	

Installation: Edwin I. Hatch  
Unit No.: 1&2

Location: 11 Mi N Baxley, GA

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: BWR  
Docket Number: 50-321  
Thermal Power(MWH): 1.64E+07  
Commercial Operation: 12/31/75  
Cooling Water Source: Altamaha River  
Unit Number: 2      Type: BWR  
Docket Number: 50-366  
Thermal Power(MWH): 1.60E+07  
Commercial Operation: 09/05/79  
Cooling Water Source: Altamaha River

Licensee: Georgia Power  
Licensed Power(MWT): 2.44E+03  
Net Electrical Power(MWH): 4.95E+06  
Initial Criticality: 09/12/74

Licensee: Georgia Power  
Licensed Power(MWT): 2.44E+03  
Net Electrical Power(MWH): 5.00E+06  
Initial Criticality: 07/04/78

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	1.53E+00
MN-54	5.17E-06
CO-58	4.15E-06
CO-60	3.24E-05
ZN-65	1.36E-03
KR-85M	3.19E+01
KR-87	1.09E+02
KR-88	7.13E+00
SR-89	1.20E-02
SR-90	2.39E-04
NB-95	1.36E-05
I-131	2.60E-01
I-133	1.39E+00
XE-133	2.10E+03
I-135	2.66E+00
XE-135	3.92E+02
XE-135M	3.43E+02
CS-137	6.23E-05
XE-138	8.24E+02
BA-140	1.91E-02
LA-140	5.31E-02
CE-141	1.15E-03
Unidentified	4.41E-03

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	7.92E-03
AR-41	2.75E-05
CR-51	1.01E-02
MN-54	7.58E-03
FE-55	1.48E-01
MN-56	7.69E-05
CO-58	4.03E-03
FE-59	4.85E-04
CO-60	5.91E-02
ZN-65	1.42E-01
ZN-69M	7.61E-05
AS-76	7.06E-03
KR-85	2.08E-03

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
KR-85M	5.57E-07
RB-89	2.90E-04
SR-89	6.29E-03
SR-90	4.25E-04
SR-91	5.20E-03
Y-91M	2.14E-03
SR-92	6.47E-04
Y-92	6.61E-03
NB-95	2.56E-05
NB-97	8.00E-04
MO-99	5.48E-03
TC-99M	1.12E-02
RU-103	1.55E-06
SB-124	1.34E-05
SB-125	2.55E-04
I-131	1.27E-02
XE-131M	5.30E-03
I-132	5.76E-04
I-133	2.43E-02
XE-133	5.69E-02
XE-133M	1.12E-03
CS-134	6.31E-03
I-134	2.12E-05
I-135	1.19E-02
XE-135	2.01E-01
XE-135M	2.56E-02
CS-136	3.76E-04
CS-137	4.37E-02
CS-138	4.56E-04
BA-139	1.45E-04
BA-140	2.82E-03
LA-140	4.93E-03
CE-141	5.82E-04
CE-144	7.56E-05
NP-239	1.92E-02

Total Airborne Tritium Released	6.63E+01 Ci
Total Liquid Tritium Released	5.08E+01 Ci
Volume of Waste Released (Prior to Dilution)	3.52E+07 liters
Volume of Dilution Water Used During Period	7.75E+09 liters

Installation: Edwin I. Hatch  
Unit No.: 1&2

Location: 11 Mi N Baxley, GA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: BWR  
Docket Number: 50-321  
Thermal Power(MWH): 1.64E+07  
Commercial Operation: 12/31/75  
Cooling Water Source: Altamaha River

Licensee: Georgia Power  
Licensed Power(MWT): 2.44E+03  
Net Electrical Power(MWH): 4.95E+06  
Initial Criticality: 09/12/74

Unit Number: 2      Type: BWR  
Docket Number: 50-366  
Thermal Power(MWH): 1.60E+07  
Commercial Operation: 09/05/79  
Cooling Water Source: Altamaha River

Licensee: Georgia Power  
Licensed Power(MWT): 2.44E+03  
Net Electrical Power(MWH): 5.00E+06  
Initial Criticality: 07/04/78

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
49	Tractor Trailer	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June    Jul-Dec

A

CO-60	1.33E+01	1.35E+01
CS-137	3.25E+00	1.11E+00
FE-55	8.14E+00	7.11E+00
Unidentified	1.44E+01	1.01E+01
ZN-65	6.09E+01	6.82E+01

B

CO-60	2.06E+01	1.68E+01
CS-137	2.62E+00	2.39E+00
FE-55	2.19E+01	1.57E+01
Unidentified	9.40E+00	9.61E+00
ZN-65	4.55E+01	5.59E+01

C

CO-60	4.01E+01	3.66E+01
CS-137		1.36E-03
FE-55	5.36E+01	5.58E+01
Unidentified	6.31E+00	7.54E+00

D

CO-60	6.36E+01	
FE-55	2.87E+01	
Unidentified	3.61E+00	
ZN-65	4.15E+00	

Installation: Edwin I. Hatch  
Unit No.: 1&2

Location: 11 Mi N Baxley, GA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.59E+02 Ci 2.81E+03	Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 5.80E+01 Ci 6.69E+00	Burial Volume
C. Irradiated Components, Control Rods, etc.	m3 2.47E+01 Ci 2.16E+05	Burial Volume
D. Other (describe) Control Rod Drive Filters	m3 1.08E+00 Ci 8.35E+00	Burial Volume

Installation: Hope Creek  
Unit No.: 1

Location: 18 Mi SE Wilmington, DE

Effluent and Waste Disposal Annual Report for 1993

Type: BWR

Licensee: Public Serv Elec & Gas Co of  
NJ

Docket Number: 50-354

Licensed Power(MWT): 3.29E+03

Thermal Power(MWH): 2.78E+07

Net Electrical Power(MWH): 8.83E+06

Commercial Operation: 12/20/86

Initial Criticality: 06/28/86

Cooling Water Source: Delaware River

Airborne Effluents

Nuclide Released	Activity (Ci)
CR-51	1.16E-03
MN-54	1.11E-04
CO-60	5.05E-05
ZN-65	6.17E-04
KR-83M	7.34E-01
KR-85M	7.34E-01
KR-87	2.93E+00
KR-88	2.93E+00
KR-89	1.98E+01
XE-133	1.46E+00
XE-135	3.67E+00
XE-135M	4.41E+00
XE-137	2.27E+01
XE-138	1.39E+01

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	1.20E-04
CR-51	1.57E-01
MN-54	6.30E-02
FE-55	4.51E-02
CO-58	1.35E-03
FE-59	8.74E-03
CO-60	1.15E-02
ZN-65	7.01E-02
ZN-69M	2.33E-05
AS-76	1.03E-05
NB-97	4.33E-04
ZR-97	1.45E-05
TC-99M	1.79E-03
AG-110M	2.16E-03
XE-133	7.28E-04
XE-135	7.82E-03
CS-137	4.85E-05

Total Airborne Tritium Released	1.66E+02 Ci
Total Liquid Tritium Released	6.17E+01 Ci
Volume of Waste Released (Prior to Dilution)	1.51E+07 liters
Volume of Dilution Water Used During Period	5.84E+10 liters

Installation: Hope Creek  
Unit No.: 1

Location: 18 Mi SE Wilmington, DE

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR

Licensee: Public Serv Elec & Gas Co of  
NJ

Docket Number: 50-354

Licensed Power(MWT): 3.29E+03

Thermal Power(MWH): 2.78E+07

Net Electrical Power(MWH): 8.83E+06

Commercial Operation: 12/20/86

Initial Criticality: 06/28/86

Cooling Water Source: Delaware River

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
48	Truck	Barnwell, SC
9	Truck	Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June Jul-Dec

A			
	CE-144	2.10E+00	
	CO-60	5.50E+00	1.00E+00
	CS-137	9.00E-01	
	FE-55	4.37E+01	1.35E+01
	MN-54	1.26E+01	2.50E+00
	ZN-65	3.37E+01	8.30E+01
B			
	CO-60	2.40E+00	2.40E+00
	CR-51	1.36E+01	1.33E+01
	FE-55	3.52E+01	3.52E+01
	MN-54	4.00E+00	4.00E+00
	ZN-65	4.30E+01	4.30E+01
D			
	CO-60	2.50E+00	
	FE-55	3.68E+01	
	MN-54	1.38E+01	
	ZN-65	4.53E+01	

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.40E+02 Ci 6.64E+03	Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 1.85E+01 Ci 2.09E+00	Compacted, Buried
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe) Oil	m3 2.68E+01 Ci 9.03E-03	Incinerated



Installation: Humboldt Bay  
Unit No.: 3

Location: 4 Mi SW Eureka, CA

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-133  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 08/01/63  
Cooling Water Source: Humboldt Bay

Licensee: Pacific Gas & Electric  
Licensed Power(MWT): 0.00E+00  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 02/16/63

Airborne Effluents

Nuclide Released	Activity (Ci)
CO-60	2.73E-05
SR-90	1.88E-06
Y-90	1.88E-06
CS-137	3.24E-05

Liquid Effluents

Nuclide Released	Activity (Ci)
CO-60	9.50E-05
SR-90	3.65E-04
Y-90	3.65E-04
CS-134	5.01E-06
CS-137	8.85E-03

Total Liquid Tritium Released	8.17E-04 Ci
Volume of Waste Released (Prior to Dilution)	1.49E+06 liters
Volume of Dilution Water Used During Period	7.35E+10 liters

Installation: Indian Point  
Unit No.: 1&2

Location: 3 Mi SW Peekskill, NY

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: PWR  
Docket Number: 50-3  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 10/01/62  
Cooling Water Source: Hudson River  
Unit Number: 2      Type: PWR  
Docket Number: 50-247  
Thermal Power(MWH): 1.95E+07  
Commercial Operation: 08/01/74  
Cooling Water Source: Hudson River

Licensee: Consolidated Edison  
Licensed Power(MWT): 6.15E+02  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 08/02/62  
Licensee: Consolidated Edison  
Licensed Power(MWT): 3.07E+03  
Net Electrical Power(MWH): 5.93E+06  
Initial Criticality: 05/22/73

Airborne Effluents

Nuclide Released	Activity (Ci)
C-14	6.00E+00
AR-41	6.58E-01
MN-54	6.16E-06
CO-58	4.74E-06
CO-60	3.83E-04
NI-63	2.00E-06
KR-85	2.75E+01
KR-85M	3.96E-01
KR-87	2.14E-01
KR-88	4.28E-01
I-131	4.66E-03
XE-131M	1.04E+00
I-133	4.51E-03
XE-133	1.58E+03
XE-133M	2.96E+01
I-135	3.73E-03
XE-135	4.03E+01
XE-135M	5.88E-01
CS-137	6.98E-04
XE-138	3.00E-01

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	1.61E-03
MN-54	8.87E-05
FE-55	1.08E-02
CO-57	2.87E-05
CO-58	5.98E-02
FE-59	2.01E-05
CO-60	1.82E-02
NI-63	2.03E-02
SR-89	7.70E-05
SR-90	6.60E-06

Installation: Indian Point  
Unit No.: 1&2

Location: 3 Mi SW Peekskill, NY

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
NB-95	2.71E-04
MO-99	5.12E-04
TC-99M	1.33E-04
RU-103	2.95E-05
CD-109	1.39E-03
AG-110M	1.26E-04
SN-113	1.19E-04
SB-122	1.16E-04
TE-123M	3.30E-02
SB-124	2.65E-01
SB-125	2.92E-04
I-131	3.97E-02
XE-131M	1.59E-02
I-132	1.76E-02
TE-132	9.19E-06
I-133	3.59E-02
XE-133	1.28E-01
XE-133M	2.37E-04
CS-134	8.53E-02
I-134	3.02E-03
I-135	2.60E-02
XE-135	3.80E-02
XE-135M	5.04E-02
CS-136	8.17E-04
CS-137	1.03E-01
BA-140	3.83E-04

Total Airborne Tritium Released	1.04E+00 Ci
Total Liquid Tritium Released	2.89E+02 Ci
Volume of Waste Released (Prior to Dilution)	2.36E+08 liters
Volume of Dilution Water Used During Period	7.39E+11 liters

Installation: Indian Point  
Unit No.: 1&2

Location: 3 Mi SW Peekskill, NY

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-3  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 10/01/62  
Cooling Water Source: Hudson River

Licensee: Consolidated Edison  
Licensed Power(MWT): 6.15E+02  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 08/02/62

Unit Number: 2      Type: PWR  
Docket Number: 50-247  
Thermal Power(MWH): 1.95E+07  
Commercial Operation: 08/01/74  
Cooling Water Source: Hudson River

Licensee: Consolidated Edison  
Licensed Power(MWT): 3.07E+03  
Net Electrical Power(MWH): 5.93E+06  
Initial Criticality: 05/22/73

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
21	Truck	Channahan, IL

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

A

	Jan-June	Jul-Dec
CO-58		1.14E+01
CO-60		8.70E+00
CS-134		1.16E+01
CS-137		2.53E+01
FE-55		1.22E+01
H-3		3.10E+00
NI-63		1.55E+01
SB-124		7.70E+00

B

	Jan-June	Jul-Dec
AG-108M	2.42E+00	4.46E+00
C-14	5.20E-01	
CO-58	1.56E+00	1.10E+00
CO-60	1.46E+01	1.96E+01
CS-137	1.86E+00	3.27E+00
FE-55	5.65E+01	5.15E+01
NI-63	1.79E+01	1.65E+01
SB-124	1.53E+00	
SR-89	1.55E+00	2.54E+00
SR-90	1.55E+00	

Installation: Indian Point  
Unit No.: 1&2

Location: 3 Mi SW Peekskill, NY

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 3.90E+01 Ci 3.84E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 1.55E+02 Ci 2.27E+01	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Indian Point  
Unit No.: 3

Location: 3 Mi SW Peekskill, NY

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-286  
Thermal Power(MWH): 3.68E+07  
Commercial Operation: 08/30/76  
Cooling Water Source: Hudson River

Licensee: Power Authority of the State of NY  
Licensed Power(MWT): 3.02E+03  
Net Electrical Power(MWH): 1.19E+06  
Initial Criticality: 04/06/76

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	3.40E-02
KR-85	5.25E-01
I-131	1.53E-04
XE-131M	2.77E-01
XE-133	3.95E+01
XE-133M	5.84E-02
XE-135	1.23E+00
CS-137	1.93E-06

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	8.02E-05
MN-54	7.79E-04
FE-55	2.18E-02
CO-57	5.70E-05
CO-58	6.70E-03
CO-60	2.18E-02
NI-63	4.17E-02
TC-99M	2.11E-06
AG-110M	1.74E-03
SB-124	2.48E-03
SB-125	8.74E-03
I-131	5.64E-05
XE-131M	2.90E-03
XE-133	1.84E-01
XE-133M	1.18E-03
CS-134	2.76E-04
XE-135	6.70E-04
CS-137	5.90E-04

Total Airborne Tritium Released	3.87E+00 Ci
Total Liquid Tritium Released	2.95E+02 Ci
Volume of Waste Released (Prior to Dilution)	2.87E+06 liters
Volume of Dilution Water Used During Period	7.39E+11 liters

Installation: Indian Point  
Unit No.: 3

Location: 3 Mi SW Peekskill, NY

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR  
Docket Number: 50-286  
Thermal Power(MWH): 3.68E+07  
Commercial Operation: 08/30/76  
Cooling Water Source: Hudson River

Licensee: Power Authority of the State of NY  
Licensed Power(MWT): 3.02E+03  
Net Electrical Power(MWH): 1.19E+06  
Initial Criticality: 04/06/76

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
1	Truck/Cask	Barnwell, SC
1	Truck/Van	Quadrex, Oak Ridge, TN
5	Truck/Van	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition (%)  
(by type of waste)

Jan-June Jul-Dec

	Jan-June	Jul-Dec
A		
CO-58	7.00E-01	
CO-60	4.20E+01	
CS-134	1.13E+01	
CS-137	1.86E+01	
FE-55	8.10E+00	
MN-54	1.40E+00	
NI-63	1.64E+01	
B		
CO-58	5.00E+00	
CO-60	2.80E+01	
CS-137	2.00E+00	
FE-55	5.90E+01	
NI-63	5.00E+00	
C		
CO-58	5.00E+00	
CO-60	2.80E+01	
CS-137	2.00E+00	
FE-55	5.90E+01	
NI-63	5.00E+00	

Type of Waste

Unit

Description

A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 4.50E+01	Type A waste is Class C (Jan-Jun)
	m3 1.10E+01	Type A waste is Class A (Jul-Dec)
	Ci 2.90E+01	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 2.00E+01	Type B waste is Class A
	Ci 9.50E-01	
C. Irradiated Components, Control Rods, etc.	m3	
	Ci	
D. Other (describe)		
Dry comp. contaminated equip. vol. red.	m3 1.70E+02	Type D waste is Class A
	Ci 1.25E+00	

Installation: Kewaunee  
Unit No.: 1

Location: 27 Mi ESE Green Bay, WI

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-305  
Thermal Power (MWH): 1.20E+07  
Commercial Operation: 06/16/74  
Cooling Water Source: Lake Michigan

Licensee: Wisconsin Public Service  
Licensed Power (MWT): 1.65E+03  
Net Electrical Power (MWH): 3.82E+06  
Initial Criticality: 03/07/74

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	1.61E-01
CO-58	1.01E-06
CO-60	1.72E-05
KR-85	5.63E-03
KR-85M	4.36E-04
KR-87	1.37E-03
KR-88	7.08E-04
I-133	3.25E-07
XE-133	1.57E-01
XE-133M	2.16E-03
XE-135	2.86E-02
XE-135M	6.38E-03
CS-137	1.95E-06
XE-137	3.93E-04
XE-138	4.24E-03

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	6.42E-03
AR-41	2.23E-03
CR-51	1.79E-03
MN-54	3.71E-04
FE-55	3.34E-02
MN-56	5.94E-04
CO-57	6.60E-07
CO-58	3.05E-02
FE-59	5.08E-04
CO-60	6.48E-03
BR-82	3.30E-04
SR-89	9.23E-04
SR-90	5.11E-05
NB-95	5.91E-04
ZR-95	5.40E-04
ZR-97	1.86E-04
AG-110M	1.01E-02
SN-113	1.43E-04
SB-122	4.18E-05
SB-124	8.03E-04
SB-125	1.26E-03
I-131	3.04E-05
I-132	3.66E-03
I-133	7.77E-03
XE-133	2.33E-04
I-134	2.71E-03



Installation: Kewaunee  
Unit No.: 1

Location: 27 Mi ESE Green Bay, WI

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
I-135	1.03E-02
XE-135	6.45E-04
CS-137	2.65E-06
XE-137	4.97E-06
CS-138	3.67E-04

Total Airborne Tritium Released	9.38E+00 Ci
Total Liquid Tritium Released	2.36E+02 Ci
Volume of Waste Released (Prior to Dilution)	1.54E+08 liters
Volume of Dilution Water Used During Period	5.84E+11 liters

Installation: Kewaunee  
Unit No.: 1

Location: 27 Mi ESE Green Bay, WI

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR  
Docket Number: 50-305  
Thermal Power(MWH): 1.20E+07  
Commercial Operation: 06/16/74  
Cooling Water Source: Lake Michigan

Licensee: Wisconsin Public Service  
Licensed Power(MWT): 1.65E+03  
Net Electrical Power(MWH): 3.82E+06  
Initial Criticality: 03/07/74

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
1	CNSI	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June Jul-Dec

D

AG-110M	1.61E+00
C-14	3.65E+00
CO-57	1.29E-01
CO-58	2.03E+01
CO-60	1.05E+01
CR-51	1.74E+00
FE-55	4.60E+01
FE-59	2.51E-01
MN-54	9.02E-01
NB-95	4.51E+00
SB-125	7.39E-01
SN-113	5.00E-01
ZN-65	9.11E+00
ZR-95	7.58E-02

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 Ci	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 Ci	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)		
Dewatered filter media	m3 4.38E+00 Ci 4.30E+00	

Installation: LaCrosse  
Unit No.: 1

Location: 19 Mi S LaCrosse, WI

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-409  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 11/01/69  
Cooling Water Source: Mississippi River

Licensee: Dairyland Power  
Licensed Power(MWT): 0.00E+00  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 07/11/67

Airborne Effluents

Nuclide Released	Activity (Ci)
MN-54	1.96E-08
CO-60	1.51E-06
SR-90	3.93E-07
CS-137	1.02E-04

Liquid Effluents

Nuclide Released	Activity (Ci)
MN-54	1.88E-05
FE-55	8.50E-03
CO-60	1.90E-02
SR-90	2.79E-04
CS-134	3.24E-04
CS-137	1.01E-02

Total Airborne Tritium Released	1.01E-01 Ci
Total Liquid Tritium Released	5.24E-02 Ci
Volume of Waste Released (Prior to Dilution)	6.57E+05 liters
Volume of Dilution Water Used During Period	9.13E+09 liters

Installation: LaCrosse  
Unit No.: 1

Location: 19 Mi S LaCrosse, WI

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR  
Docket Number: 50-409  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 11/01/69  
Cooling Water Source: Mississippi River

Licensee: Dairyland Power  
Licensed Power(MWT): 0.00E+00  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 07/11/67

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
3	Sole Use	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Annual

	Annual
B	
CO-60	4.44E+01
CS-137	5.51E+00
FE-55	3.49E+01
NI-63	1.32E+01
PU-241	1.70E+00
SR-90	2.90E-01

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 Ci	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 5.04E+00 Ci 2.43E-01	Compacted DAW
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: LaSalle  
Unit No.: 1&2

Location: 11 Mi SE Ottawa, IL

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: BWR  
Docket Number: 50-373  
Thermal Power(MWH): 2.23E+07  
Commercial Operation: 01/01/84  
Cooling Water Source: Reservoir  
Unit Number: 2      Type: BWR  
Docket Number: 50-374  
Thermal Power(MWH): 1.81E+07  
Commercial Operation: 10/19/84  
Cooling Water Source: Reservoir

Licensee: Commonwealth Edison Company  
Licensed Power(MWT): 3.32E+03  
Net Electrical Power(MWH): 7.20E+06  
Initial Criticality: 06/21/82

Licensee: Commonwealth Edison Company  
Licensed Power(MWT): 3.32E+03  
Net Electrical Power(MWH): 5.84E+06  
Initial Criticality: 03/10/84

Airborne Effluents

Nuclide Released	Activity (Ci)
NA-24	2.70E-02
AR-41	2.81E-01
CR-51	1.98E-03
MN-54	1.92E-04
CO-58	6.70E-05
CO-60	3.83E-03
KR-85	2.89E-02
KR-85M	7.34E+00
KR-87	2.05E+01
KR-88	1.01E+03
TC-99M	1.43E-03
I-131	2.38E-03
I-132	3.36E-03
I-133	2.39E-02
XE-133	6.73E-02
XE-135	1.88E+00
CS-138	4.73E-02
BA-139	6.25E-02

Total Airborne Tritium Released

1.30E+02 Ci

Installation: LaSalle  
Unit No.: 1&2

Location: 11 Mi SE Ottawa, IL

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: BWR  
Docket Number: 50-373  
Thermal Power(MWH): 2.23E+07  
Commercial Operation: 01/01/84  
Cooling Water Source: Reservoir

Licensee: Commonwealth Edison Company  
Licensed Power(MWT): 3.32E+03  
Net Electrical Power(MWH): 7.20E+06  
Initial Criticality: 06/21/82

Unit Number: 2      Type: BWR  
Docket Number: 50-374  
Thermal Power(MWH): 1.81E+07  
Commercial Operation: 10/19/84  
Cooling Water Source: Reservoir

Licensee: Commonwealth Edison Company  
Licensed Power(MWT): 3.32E+03  
Net Electrical Power(MWH): 5.84E+06  
Initial Criticality: 03/10/84

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
49	Truck	Barnwell, SC
14	Truck	Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

	Jan-June	Jul-Dec
A		
CO-58	3.00E-01	
CO-60	1.30E+01	1.90E+01
FE-55	7.90E+01	7.20E+01
MN-54	4.00E+00	6.00E+00
NI-63	3.00E+00	4.00E-01
B		
CO-60	2.70E+01	2.70E+01
CR-51	8.00E+00	8.00E+00
FE-55	2.20E+01	2.20E+01
FE-59	1.30E+01	
MN-54	2.80E+01	2.80E+01
D		
CO-60		2.70E+01
CR-51		8.00E+00
FE-55		2.20E+01
FE-59		1.30E+01
MN-54		2.80E+01

Installation: LaSalle  
Unit No.: 1&2

Location: 11 Mi SE Ottawa, IL

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 6.14E+02 Ci 2.94E+03	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 5.92E+02 Ci 1.47E+02	
C. Irradiated Components, Control Rods, etc.	m3 6.38E-01 Ci 1.12E+04	
D. Other (describe)	m3 Ci	

Installation: Limerick  
Unit No.: 1

Location: 21 Mi NW Philadelphia, PA

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-352  
Thermal Power (MWH): 2.77E+07  
Commercial Operation: 02/01/86  
Cooling Water Source: Schuylkill River

Licensee: PECO Energy Company  
Licensed Power (MWT): 3.29E+03  
Net Electrical Power (MWH): 8.75E+06  
Initial Criticality: 12/22/84

Airborne Effluents

Nuclide Released	Activity (Ci)
CR-51	3.43E-04
XE-135	2.61E-01
CE-144	2.19E-05



Installation: Limerick  
Unit No.: 2

Location: 21 Mi NW Philadelphia, PA

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-353  
Thermal Power(MWH): 2.33E+07  
Commercial Operation: 01/08/90  
Cooling Water Source: Schuylkill River

Licensee: PECO Energy Company  
Licensed Power(MWT): 3.29E+03  
Net Electrical Power(MWH): 7.47E+06  
Initial Criticality: 08/12/89

Airborne Effluents

Nuclide Released	Activity (Ci)
MN-54	5.05E-08
CO-60	1.23E-07
KR-85M	3.06E-03
I-131	1.12E-05
I-133	2.01E-04
XE-133	2.10E+00
XE-135	9.12E+01
XE-135M	1.20E-01

Installation: Limerick  
Unit No.: 1&2

Location: 21 Mi NW Philadelphia, PA

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: BWR  
Docket Number: 50-352  
Thermal Power(MWH): 2.77E+07  
Commercial Operation: 02/01/86  
Cooling Water Source: Schuylkill River  
Unit Number: 2      Type: BWR  
Docket Number: 50-353  
Thermal Power(MWH): 2.33E+07  
Commercial Operation: 01/08/90  
Cooling Water Source: Schuylkill River

Licensee: PECO Energy Company  
Licensed Power(MWT): 3.29E+03  
Net Electrical Power(MWH): 8.75E+06  
Initial Criticality: 12/22/84

Licensee: PECO Energy Company  
Licensed Power(MWT): 3.29E+03  
Net Electrical Power(MWH): 7.47E+06  
Initial Criticality: 08/12/89

Airborne Effluents

Nuclide Released	Activity (Ci)
KR-85	1.18E-04
KR-85M	4.04E-05
SR-89	1.64E-02
SR-90	3.14E-04
I-131	1.14E-02
I-133	2.01E-02
XE-133	8.69E-01
XE-133M	9.04E-03
XE-135	6.61E+01
XE-135M	2.86E-01
BA-140	2.83E-06

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	2.20E-04
CR-51	6.57E-02
MN-54	3.56E-03
FE-55	2.07E-03
CO-58	1.51E-03
FE-59	4.76E-04
CO-60	8.71E-03
ZN-65	2.23E-02
AS-76	1.97E-04
SR-89	2.00E-02
SR-90	4.43E-04
Y-91M	5.80E-05
Y-92	2.76E-04
NB-95	5.95E-04
ZR-95	2.43E-04
MO-99	1.80E-04
TC-99M	1.80E-04
RU-103	2.92E-04
I-131	7.69E-04
I-133	2.69E-04
XE-133	7.39E-02
CS-134	2.02E-03
XE-135	5.95E-02
CS-137	6.02E-03
BA-140	5.79E-05

Installation: Limerick  
Unit No.: 1&2

Location: 21 Mi NW Philadelphia, PA

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)	
LA-140	6.92E-03	
CE-141	1.17E-03	
CE-144	8.35E-04	
W-187	3.39E-05	
Total Airborne Tritium Released		8.39E-01 Ci
Total Liquid Tritium Released		2.57E+01 Ci
Volume of Waste Released (Prior to Dilution)		6.46E+06 liters
Volume of Dilution Water Used During Period		5.88E+08 liters

Installation: Limerick  
Unit No.: 1&2

Location: 21 Mi NW Philidelphia, PA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: BWR  
Docket Number: 50-352  
Thermal Power(MWH): 2.77E+07  
Commercial Operation: 02/01/86  
Cooling Water Source: Schuylkill River

Licensee: PECO Energy Company  
Licensed Power(MWT): 3.29E+03  
Net Electrical Power(MWH): 8.75E+06  
Initial Criticality: 12/22/84

Unit Number: 2      Type: BWR  
Docket Number: 50-353  
Thermal Power(MWH): 2.33E+07  
Commercial Operation: 01/08/90  
Cooling Water Source: Schuylkill River

Licensee: PECO Energy Company  
Licensed Power(MWT): 3.29E+03  
Net Electrical Power(MWH): 7.47E+06  
Initial Criticality: 08/12/89

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
19	Truck	Barnwell, SC
18	Truck	Quadrex, to Barnwell, SC
217	Truck	SEG, to Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

	Jan-June	Jul-Dec
A		
BA-140		2.80E-02
BA/LA-140	1.00E-02	
C-14	9.00E-02	7.26E-02
CE-144		4.74E-06
CM-242		2.73E-03
CM-243/244		7.44E-05
CO-58	6.84E+00	3.65E+00
CO-60	1.25E+01	1.30E+01
CR-51	3.89E+01	3.41E+01
CS-134	3.66E+00	4.02E+00
CS-137	4.32E+00	6.29E+00
FE-55	1.00E-01	6.73E-01
H-3	1.00E-02	2.45E-02
I-129		5.09E-05
I-131	1.00E-02	1.79E-01
LA-140		2.80E-02
MN-54	1.11E+01	3.54E+00
NI-63	5.30E-01	4.76E-01
PU-238		3.44E-04
PU-239/240		1.75E-03
PU-241		1.84E-02
SR-89		2.57E+00
SR-90	1.00E-02	1.17E+00
TC-99		2.76E-04
ZN-65	2.19E+01	3.02E+01
B		
BA-140		5.00E-02
C-14		5.00E-02
CO-58	3.98E+00	3.09E+00

Installation: Limerick  
 Unit No.: 1&2

Location: 21 Mi NW Philadelphia, PA

Effluent and Waste Disposal Annual Report for 1993  
 Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued) Jan-June July-Dec  
 (by type of waste)

	Jan-June	July-Dec
B		
CO-60	2.29E+01	2.67E+01
CR-51	2.68E+01	1.62E+01
CS-134		1.13E+00
CS-137	1.64E+00	3.96E+00
FE-55	1.23E+01	1.37E+01
H-3		1.00E-02
I-131		2.10E-01
LA-140		5.00E-02
MN-54	8.64E+00	9.32E+00
NI-63	1.68E+00	2.14E+00
SB-125	1.16E+00	1.31E+00
ZN-65	2.08E+01	2.22E+01
D		
CO-58	4.01E+00	
CO-60	2.30E+01	
CR-51	2.67E+01	
CS-137	1.65E+00	
FE-55	1.21E+01	
MN-54	8.73E+00	
NI-63	1.69E+00	
SB-125	1.19E+00	
ZN-65	2.10E+01	

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 3.13E+02 Ci 4.72E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 3.36E+01 Ci 2.80E+00	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)		
CRD Filter & Trash	m3 4.06E+00 Ci 9.91E+01	

Installation: Maine Yankee  
Unit No.: 1

Location: 3.9 Mi S Wicasset, ME

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-309  
Thermal Power(MWH): 1.77E+07  
Commercial Operation: 12/28/72  
Cooling Water Source: Back River

Licensee: Maine Yankee Atomic Power  
Licensed Power(MWT): 2.70E+03  
Net Electrical Power(MWH): 5.74E+06  
Initial Criticality: 10/23/72

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	5.07E-01
CR-51	7.26E-04
CO-58	4.26E-04
CO-60	4.37E-04
KR-85	5.86E+00
KR-85M	8.24E-03
KR-87	1.38E-02
KR-88	7.05E-03
NB-95	2.95E-06
I-131	3.98E-03
XE-131M	4.23E-01
I-133	1.09E-03
XE-133	3.68E+01
XE-133M	1.51E-01
I-135	4.86E-08
XE-135	1.04E+00
XE-135M	1.12E-01
CS-137	4.20E-05
XE-138	4.62E-02

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	1.50E-02
MN-54	8.99E-05
FE-55	4.45E-02
CO-57	8.17E-06
CO-58	1.63E-02
FE-59	1.27E-03
CO-60	1.06E-02
ZN-65	1.42E-05
KR-87	8.67E-06
SR-89	1.46E-04
ZR/NB-95	9.05E-04
TC-99M	2.12E-05
RU-103	1.49E-04
RH-105	4.44E-05
CD-109	2.57E-05
AG-110M	5.58E-03
SN-113	3.09E-05
SB-122	1.30E-04
SB-124	2.10E-02
SB-125	3.03E-02
I-131	3.96E-03
I-132	3.91E-06

Installation: Maine Yankee  
Unit No.: 1

Location: 3.9 Mi S Wicasset, ME

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
TE-132	3.39E-05
I-133	5.20E-04
XE-133	4.28E-02
XE-133M	5.35E-04
CS-134	1.44E-03
I-135	3.12E-05
XE-135	9.89E-04
CS-137	8.18E-03
CS-138	2.45E-04
BA/LA-140	1.88E-04
CE-141	1.73E-05
LA-141	1.20E-03
CE-144	2.64E-04

Total Airborne Tritium Released	7.31E+00 Ci
Total Liquid Tritium Released	2.72E+02 Ci
Volume of Waste Released (Prior to Dilution)	9.88E+07 liters
Volume of Dilution Water Used During Period	6.84E+11 liters

Installation: McGuire  
Unit No.: 1

Location: 17 Mi N of Charlotte, NC

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-369  
Thermal Power(MWH): 1.70E+07  
Commercial Operation: 12/01/81  
Cooling Water Source: Lake Norman

Licensee: Duke Power Co.  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 5.52E+06  
Initial Criticality: 08/08/81

Airborne Effluents

Nuclide Released	Activity (Ci)
C-11	8.50E-06
F-18	5.09E-07
NA-24	4.76E-08
CL-38	1.58E-07
AR-41	1.21E+01
CR-51	9.68E-09
MN-56	2.68E-08
CO-58	1.44E-05
CO-60	3.65E-06
BR-82	1.83E-07
BR-84	4.80E-08
KR-85	3.46E+00
KR-85M	1.67E+00
KR-87	3.86E-01
KR-88	1.73E+00
RB-88	2.49E-05
RB-89	5.29E-07
AG-110M	6.42E-09
I-130	5.04E-07
I-131	8.38E-04
XE-131M	1.39E+00
I-132	1.40E-04
TE-132	1.30E-09
I-133	1.38E-04
XE-133	4.22E+02
XE-133M	7.05E+00
I-134	3.37E-06
I-135	8.11E-06
XE-135	3.41E+01
XE-135M	3.76E-02
CS-137	1.33E-06
CS-138	2.37E-06
XE-138	1.79E-02
BA-139	1.70E-07
W-187	8.71E-08

Liquid Effluents

Nuclide Released	Activity (Ci)
F-18	1.23E-04
NA-24	2.07E-04
K-40	1.40E-05
CR-51	1.21E-02
MN-54	5.71E-03
FE-55	1.26E-02



Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
MN-56	3.22E-06
CO-57	3.01E-04
CO-58	1.51E-01
FE-59	5.38E-04
CO-60	2.45E-02
ZN-65	1.48E-05
BR-82	2.40E-05
KR-85	1.98E-04
KR-85M	1.30E-04
RB-86	7.91E-05
KR-87	7.80E-04
KR-88	4.04E-05
RB-88	2.06E-04
SR-89	9.76E-05
Y-91M	2.93E-06
SR-92	5.65E-05
NB-95	2.30E-03
ZR-95	1.33E-03
NB-97	7.91E-05
ZR-97	4.37E-06
MO-99	1.32E-04
TC-99M	2.91E-04
RU-103	6.76E-06
RU-106	1.01E-05
AG-110M	1.04E-03
SN-113	9.82E-05
SB-122	9.46E-04
SB-124	1.09E-02
SB-125	3.77E-02
SB-126	4.06E-05
I-131	1.04E-02
XE-131M	7.87E-04
I-132	4.66E-05
TE-132	4.86E-05
I-133	1.42E-03
XE-133	1.58E-01
XE-133M	2.65E-03
CS-134	1.64E-03
I-134	4.83E-06
I-135	2.57E-04
XE-135	8.74E-03
XE-135M	4.31E-05
CS-136	3.86E-06
CS-137	4.56E-03
CS-138	5.97E-05
BA-140	4.28E-05
LA-140	3.70E-03
CE-141	6.81E-06
CE-144	2.10E-05
NP-239	1.12E-04

Installation: McGuire  
Unit No.: 1

Location: 17 Mi N of Charlotte, NC

Effluent and Waste Disposal Annual Report for 1993

Total Airborne Tritium Released	4.13E+01 Ci
Total Liquid Tritium Released	3.88E+02 Ci
Volume of Waste Released (Prior to Dilution)	6.91E+06 liters
Volume of Dilution Water Used During Period	3.33E+12 liters

Installation: McGuire  
Unit No.: 2

Location: 17 Mi N of Charlotte, NC

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-370  
Thermal Power (MWH): 2.05E+07  
Commercial Operation: 03/01/84  
Cooling Water Source: Lake Norman

Licensee: Duke Power Co.  
Licensed Power (MWT): 3.41E+03  
Net Electrical Power (MWH): 6.81E+06  
Initial Criticality: 05/08/83

Airborne Effluents

Nuclide Released	Activity (Ci)
C-11	8.50E-06
F-18	5.09E-07
NA-24	4.76E-08
CL-38	1.58E-07
AR-41	1.21E+01
CR-51	9.68E-09
MN-56	2.68E-08
CO-58	1.44E-05
CO-60	3.65E-06
BR-82	1.83E-07
BR-84	4.80E-08
KR-85	3.46E+00
KR-85M	1.67E+00
KR-87	3.86E-01
KR-88	1.73E+00
RB-88	2.49E-05
RB-89	5.29E-07
AG-110M	6.42E-09
I-130	5.04E-07
I-131	8.38E-04
XE-131M	1.39E+00
I-132	1.40E-04
TE-132	1.30E-09
I-133	1.38E-04
XE-133	4.22E+02
XE-133M	7.05E+00
I-134	3.37E-06
I-135	8.11E-06
XE-135	3.41E+01
XE-135M	3.76E-02
CS-137	1.33E-06
CS-138	2.37E-06
XE-138	1.79E-02
EA-139	1.70E-07
W-187	8.71E-08

Liquid Effluents

Nuclide Released	Activity (Ci)
F-18	1.23E-04
NA-24	2.07E-04
K-40	1.40E-05
CR-51	1.21E-02
MN-54	5.71E-03
FE-55	1.26E-02

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
MN-56	3.22E-06
CO-57	3.01E-04
CO-58	1.51E-01
FE-59	5.38E-04
CO-60	2.45E-02
ZN-65	1.48E-05
BR-82	2.40E-05
KR-85	1.98E-04
KR-85M	1.30E-04
RB-86	7.91E-05
KR-87	7.80E-04
KR-88	4.04E-05
RB-88	2.06E-04
SR-89	9.76E-05
Y-91M	2.93E-06
SR-92	5.65E-05
NB-95	2.30E-03
ZR-95	1.33E-03
NB-97	7.91E-05
ZR-97	4.37E-06
MO-99	1.32E-04
TC-99M	2.91E-04
RU-103	6.76E-06
RU-106	1.01E-05
AG-110M	1.04E-03
SN-113	9.82E-05
SB-122	9.46E-04
SB-124	1.09E-02
SB-125	3.77E-02
SB-126	4.06E-05
I-131	1.04E-02
XE-131M	7.87E-04
I-132	4.66E-05
TE-132	4.86E-05
I-133	1.42E-03
XE-133	1.58E-01
XE-133M	2.65E-03
CS-134	1.64E-03
I-134	4.83E-06
I-135	2.57E-04
XE-135	8.74E-03
XE-135M	4.31E-05
CS-136	3.86E-06
CS-137	4.56E-03
CS-138	5.97E-05
BA-140	4.28E-05
LA-140	3.70E-03
CE-141	6.81E-06
CE-144	2.10E-05
NP-239	1.12E-04

Installation: McGuire  
Unit No.: 2

Location: 17 Mi N of Charlotte, NC

Effluent and Waste Disposal Annual Report for 1993

Total Airborne Tritium Released	4.13E+01 Ci
Total Liquid Tritium Released	3.88E+02 Ci
Volume of Waste Released (Prior to Dilution)	6.91E+06 liters
Volume of Dilution Water Used During Period	3.33E+12 liters

Installation: McGuire  
Unit No.: 1&2

Location: 17 Mi N of Charlotte, NC

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-369  
Thermal Power(MWH): 1.70E+07  
Commercial Operation: 12/01/81  
Cooling Water Source: Lake Norman

Licensee: Duke Power Co.  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 5.52E+06  
Initial Criticality: 08/08/81

Unit Number: 2      Type: PWR  
Docket Number: 50-370  
Thermal Power(MWH): 2.05E+07  
Commercial Operation: 03/01/84  
Cooling Water Source: Lake Norman

Licensee: Duke Power Co.  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 6.81E+06  
Initial Criticality: 05/08/83

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
25		

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Annual

A

C-14	1.00E-01
CE-144	1.00E-01
CO-58	1.24E+01
CO-60	2.25E+01
CS-134	1.04E+01
CS-137	2.26E+01
FE-55	1.21E+01
MN-54	3.80E+00
NI-63	1.34E+01
PU-241	1.00E-01
SB-125	2.40E+00
SR-90	1.00E-01

B

CE-144	1.00E-02
CO-58	2.04E+00
CO-60	1.33E+01
CS-137	1.00E-01
FE-55	7.14E+01
MN-54	1.26E+00
NI-63	1.05E+01
PU-241	1.30E-01
SB-125	3.80E-01
SR-90	1.00E-02

C

CO-58	2.00E-02
CO-60	9.99E+01
CR-51	4.00E-02
FE-59	1.00E-02
MN-54	4.00E-02

D

CO-58	4.43E+00
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Installation: McGuire  
Unit No.: 1&2

Location: 17 Mi N of Charlotte, NC

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued) Jan-June July-Dec  
(by type of waste)

D		
	CO-60	1.43E+01
	CS-137	1.00E-01
	FE-55	6.70E+01
	H-3	1.00E-01
	MN-54	2.75E+00
	NI-63	1.09E+01
	PU-241	4.40E+00

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 3.96E+01 Ci 2.46E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 5.54E+01 Ci 5.21E+00	
C. Irradiated Components, Control Rods, etc.	m3 8.50E-01 Ci 4.56E-01	
D. Other (describe)		
Dewatered Mechanical Filter	m3 3.11E+00 Ci 5.03E+01	

Installation: Millstone  
Unit No.: 1

Location: 3.2 Mi WSW of New London, CT

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-245  
Thermal Power (MWH): 1.67E+07  
Commercial Operation: 03/01/71  
Cooling Water Source: Niantic Bay

Licensee: Northeast Nuclear Energy  
Licensed Power (MWT): 2.01E+03  
Net Electrical Power (MWH): 5.27E+06  
Initial Criticality: 10/26/70

Airborne Effluents

Nuclide Released	Activity (Ci)
BE-7	8.31E-06
AR-41	1.27E+00
CR-51	8.75E-04
MN-54	3.48E-04
CO-58	1.03E-04
FE-59	6.83E-05
CO-60	5.39E-04
ZN-65	1.02E-03
KR-85	1.29E+01
KR-85M	7.92E+00
KR-87	4.20E+01
KR-88	2.75E+01
SR-89	2.14E-04
SR-90	6.21E-07
I-131	1.39E-03
XE-131M	2.22E+00
I-133	1.35E-02
XE-133	1.61E+00
XE-135	4.98E+01
XE-135M	3.82E+01
CS-137	8.92E-05
XE-138	1.45E+02
BA-140	4.24E-04
CE-141	9.49E-07

Liquid Effluents

Nuclide Released	Activity (Ci)
BE-7	7.12E-05
NA-24	1.09E-04
CR-51	5.67E-04
MN-54	1.02E-03
FE-55	3.34E-03
CO-58	3.37E-04
CO-60	7.69E-02
ZN-65	2.95E-02
KR-87	5.34E-06
SR-89	1.39E-04
SR-90	8.22E-05
MO-99	4.71E-04
TC-99M	5.06E-04
SN-113	2.11E-06
I-131	6.63E-05
BA-133	4.49E-06
I-133	9.02E-05



Installation: Millstone  
Unit No.: 1

Location: 3.2 Mi WSW of New London, CT

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
XE-133	1.91E-04
XE-133M	5.68E-05
CS-134	9.38E-06
I-135	2.65E-05
XE-135	2.33E-05
CS-137	1.50E-02
XE-138	3.14E-05
BA-140	2.80E-05
CE-143	1.60E-05
CE-144	1.77E-05
HF-181	4.08E-06
RE-188	1.24E-05

Total Airborne Tritium Released	2.55E+01 Ci
Total Liquid Tritium Released	2.45E+01 Ci
Volume of Waste Released (Prior to Dilution)	9.70E+06 liters
Volume of Dilution Water Used During Period	8.56E+11 liters

Installation: Millstone  
Unit No.: 1

Location: 3.2 Mi WSW of New London, CT

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR  
Docket Number: 50-245  
Thermal Power(MWH): 1.67E+07  
Commercial Operation: 03/01/71  
Cooling Water Source: Niantic Bay

Licensee: Northeast Nuclear Energy  
Licensed Power(MWT): 2.01E+03  
Net Electrical Power(MWH): 5.27E+06  
Initial Criticality: 10/26/70

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
15	Truck	CNSI, Barnwell, SC
1	Truck	Quadrex, Oak Ridge, TN
4	Truck	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Annual

A

AG-110M	3.90E-01
C-14	1.00E-01
CO-58	6.60E-01
CO-60	4.46E+00
CR-51	5.30E+00
CS-134	1.00E-02
CS-137	3.82E+00
FE-55	1.46E+01
FE-59	4.20E-01
H-3	8.00E-02
MN-54	3.22E+00
NI-63	2.60E-01
SR-89	4.00E-02
SR-90	1.00E-02
ZN-65	6.66E+01

B

AG-110M	2.52E-01
AM-241	1.53E-02
BA-140	3.36E-01
C-14	4.10E+00
CE-141	1.30E-01
CM-244	3.06E-02
CO-58	1.68E-01
CO-60	1.22E+01
CR-51	4.76E-01
CS-134	7.64E-02
CS-137	1.60E+00
FE-55	4.09E+01
FE-59	2.52E-01
H-3	4.86E-01
I-131	2.37E-01
LA-140	1.53E-02
MN-54	3.40E+00
NI-63	4.71E-01
PU-241	2.74E-01
SB-125	1.07E-01

Installation: Millstone  
Unit No.: 1

Location: 3.2 Mi WSW of New London, CT

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued) Jan-June July-Dec  
(by type of waste)

B

SR-89	8.39E-02
SR-90	2.29E-02
ZN-65	3.45E+01

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 7.31E+01 Ci 1.21E+03	Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 2.76E+01 Ci 2.03E+00	Burial Volume
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci m3 Ci m3 Ci	

Installation: Millstone  
Unit No.: 2

Location: 3.2 Mi WSW of New London, CT

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-336  
Thermal Power(MWH): 1.96E+07  
Commercial Operation: 12/26/75  
Cooling Water Source: Niantic Bay

Licensee: Northeast Nuclear Energy  
Licensed Power(MWT): 2.70E+03  
Net Electrical Power(MWH): 6.30E+06  
Initial Criticality: 10/17/75

Airborne Effluents

Nuclide Released	Activity (Ci)
BE-7	3.35E-06
CO-58	6.99E-06
CO-60	8.68E-06
KR-85	3.07E+00
KR-85M	8.10E-03
KR-88	3.88E-01
I-131	1.04E-03
XE-131M	2.29E-04
I-133	3.71E-03
XE-133	6.04E+00
XE-135	3.68E+00
CS-137	1.64E-06
CE-144	2.49E-06

Liquid Effluents

Nuclide Released	Activity (Ci)
BE-7	3.58E-04
NA-24	2.25E-01
CR-51	1.87E-02
MN-54	3.93E-03
FE-55	1.72E-01
CO-57	5.38E-04
CO-58	3.02E-01
FE-59	3.75E-03
CO-60	1.68E-01
ZN-69M	1.36E-05
KR-85	3.68E-02
KR-85M	1.81E-04
KR-88	1.10E-05
SR-89	6.02E-04
SR-90	4.96E-05
SR-92	4.76E-04
NB-95	7.43E-03
ZR-95	3.76E-03
NB-97	6.83E-04
ZR-97	4.27E-04
MO-99	5.47E-05
TC-99M	5.88E-05
TC-101	1.83E-05
TC-104	5.94E-05
RU-105	6.78E-04
AG-110M	5.67E-02
SN-113	5.66E-04
SB-122	6.34E-04

Installation: Millstone  
Unit No.: 2

Location: 3.2 Mi WSW of New London, CT

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
SB-124	5.94E-04
SB-125	1.24E-02
I-131	1.19E-03
I-133	1.29E-04
XE-133	3.30E-01
XE-133M	2.97E-03
CS-134	4.18E-02
I-134	1.51E-04
XE-135	2.82E-02
CS-137	1.56E-01
LA-140	3.91E-03
CE-144	6.17E-05

Total Airborne Tritium Released	6.92E+01 Ci
Total Liquid Tritium Released	3.29E+02 Ci
Volume of Waste Released (Prior to Dilution)	1.08E+08 liters
Volume of Dilution Water Used During Period	9.84E+11 liters

Installation: Millstone  
Unit No.: 2

Location: 3.2 Mi WSW of New London, CT

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR  
Docket Number: 50-336  
Thermal Power(MWH): 1.96E+07  
Commercial Operation: 12/26/75  
Cooling Water Source: Niantic Bay

Licensee: Northeast Nuclear Energy  
Licensed Power(MWT): 2.70E+03  
Net Electrical Power(MWH): 6.30E+06  
Initial Criticality: 10/17/75

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
9	Truck	CNSI, Barnwell, SC
8	Truck	Quadrex, Barnwell, SC
1	Truck	SEG, Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Annual

A

C-14	2.40E-01
CO-57	5.00E-02
CO-58	5.40E-01
CO-60	9.65E+00
CS-134	1.80E+01
CS-137	4.58E+01
FE-55	4.15E+00
MN-54	8.90E-01
NI-59	3.67E+00
NI-63	1.66E+01
PU-241	1.00E-02
RU-106	1.00E-02
SB-125	3.10E-01
SR-90	6.00E-02

B

AG-110M	3.69E-02
AM-241	1.48E-02
BA-140	5.17E-02
C-14	3.04E-01
CE-141	4.42E-02
CM-244	2.21E-02
CO-58	5.77E-01
CO-60	1.41E+01
CR-51	1.38E-01
CS-134	1.89E+00
CS-137	6.65E+00
FE-55	4.90E+01
H-3	1.79E+00
I-131	5.17E-02
MN-54	1.94E+00
NI-63	4.80E+00
PU-241	2.96E-02
SB-125	7.35E-04
SR-90	7.38E-03
ZN-65	1.85E+01

Installation: Millstone  
Unit No.: 2

Location: 3.2 Mi WSW of New London, CT

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued) Jan-June July-Dec  
(by type of waste)

C		
CO-58		1.60E-01
CO-60		2.94E+01
FE-55		6.36E+01
MN-54		3.36E+00
NI-59		2.00E-02
NI-63		3.38E+00

m3  
Ci

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.93E+01 Ci 4.44E+02	Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 8.31E+01 Ci 3.86E+00	Burial Volume
C. Irradiated Components, Control Rods, etc.	m3 4.93E+00 Ci 8.56E-01	Burial Volume
D. Other (describe)	m3 Ci m3 Ci	

Installation: Millstone  
Unit No.: 3

Location: 3.2 Mi WSW of New London, CT

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-423  
Thermal Power (MWH): 2.01E+07  
Commercial Operation: 04/23/86  
Cooling Water Source: Niantic Bay

Licensee: Northeast Nuclear Energy  
Licensed Power (MWT): 3.41E+03  
Net Electrical Power (MWH): 6.48E+06  
Initial Criticality: 01/23/86

Airborne Effluents

Nuclide Released	Activity (Ci)
BE-7	1.50E-05
CR-51	1.23E-04
MN-54	3.94E-05
CO-58	4.46E-04
FE-59	2.07E-07
CO-60	7.36E-06
SR-89	1.55E-06
NB-95	1.26E-05
ZR-95	1.86E-07
RU-103	2.70E-06
SN-113	5.61E-06
SN-117M	2.02E-08
SB-125	5.30E-06
I-131	3.61E-04
I-133	5.43E-04
XE-133	1.16E-01
CS-134	6.93E-06
XE-135	2.99E+01
CS-137	1.47E-05
CE-141	4.41E-08
CE-144	9.27E-06

Liquid Effluents

Nuclide Released	Activity (Ci)
BE-7	2.47E-04
NA-24	1.38E-03
AR-41	1.76E-05
CR-51	2.43E-01
MN-54	9.82E-02
FE-55	1.09E-01
CO-57	2.03E-03
CO-58	1.03E+00
FE-59	1.88E-02
CO-60	3.05E-01
ZN-65	3.27E-03
AS-76	1.29E-04
KR-85	3.99E-03
KR-85M	4.72E-05
KR-87	1.63E-04
SR-87M	2.15E-06
KR-88	4.28E-06
SR-89	2.56E-03
SR-90	2.11E-05
SR-92	7.25E-05



Installation: Millstone  
Unit No.: 3

Location: 3.2 Mi WSW of New London, CT

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
NB-95	6.92E-02
NB-95M	2.64E-06
ZR-95	4.02E-02
NB-97	1.31E-02
ZR-97	1.34E-03
MO-99	3.23E-04
TC-99M	3.59E-04
TC-101	1.13E-05
RU-103	1.40E-05
RU-105	9.72E-04
RU-106	4.16E-03
AG-110M	3.73E-02
SN-113	3.69E-03
SN-117M	3.39E-04
SB-122	2.66E-03
SB-124	1.30E-02
SB-125	1.41E-01
SB-126	2.37E-04
I-131	2.19E-03
XE-131M	2.59E-04
I-132	2.64E-03
TE-132	2.21E-03
I-133	1.45E-03
XE-133	1.69E-02
XE-133M	7.55E-06
CS-134	2.39E-02
I-135	4.09E-05
XE-135	1.80E-02
XE-135M	6.25E-05
CS-137	5.31E-02
XE-137	6.43E-05
CS-138	9.87E-05
XE-138	5.32E-05
BA-139	1.12E-05
BA-140	8.10E-05
LA-140	7.85E-05
CE-141	6.62E-05
BA-142	5.02E-05
CE-144	1.85E-03
PR-144	5.69E-03
HF-181	5.91E-04
RE-188	1.73E-04

Total Airborne Tritium Released	4.06E+01 Ci
Total Liquid Tritium Released	5.16E+02 Ci
Volume of Waste Released (Prior to Dilution)	1.59E+07 liters
Volume of Dilution Water Used During Period	1.52E+12 liters

Installation: Millstone  
Unit No.: 3

Location: 3.2 Mi WSW of New London, CT

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR  
Docket Number: 50-423  
Thermal Power(MWH): 2.01E+07  
Commercial Operation: 04/23/86  
Cooling Water Source: Niantic Bay

Licensee: Northeast Nuclear Energy  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 6.48E+06  
Initial Criticality: 01/23/86

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
4	Truck	CNSI, Barnwell, SC
5	Truck	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Annual

A

C-14	1.10E-01
CO-57	2.00E-01
CO-58	3.18E+00
CO-60	3.30E+01
CS-134	4.33E+00
CS-137	9.38E+00
FE-55	1.54E+01
H-3	1.80E-01
MN-54	1.51E+00
NI-63	3.26E+01
PU-241	1.00E-02
SB-125	1.50E-01
SR-90	4.00E-02

B

CO-58	3.83E+00
CO-60	1.43E+01
CR-51	4.91E-03
CS-134	8.48E+00
CS-137	1.82E+01
FE-55	4.06E+01
H-3	1.91E-01
MN-54	1.79E+00
NI-63	1.05E+01
SB-125	2.02E+00
ZN-65	6.93E-03

Installation: Millstone  
Unit No.: 3

Location: 3.2 Mi WSW of New London, CT

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.14E+01 Ci 3.31E+01	Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 4.30E+01 Ci 3.90E+00	Burial Volume
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Monticello  
Unit No.: 1

Location: 23 Mi SE St. Cloud, MN

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-263  
Thermal Power(MWH): 1.19E+07  
Commercial Operation: 06/30/71  
Cooling Water Source: Mississippi River

Licensee: Northern States Power  
Licensed Power(MWT): 1.67E+03  
Net Electrical Power(MWH): 3.86E+06  
Initial Criticality: 12/10/70

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	5.64E-03
CR-51	3.62E-05
MN-54	1.66E-04
FE-55	6.12E-06
CO-58	9.42E-06
FE-59	3.00E-07
CO-60	2.23E-03
ZN-65	1.49E-02
KR-85M	2.31E-02
KR-87	5.44E+00
KR-88	3.38E+00
KR-89	3.14E+00
SR-89	5.86E-04
SR-90	2.78E-06
RU-103	3.88E-06
I-131	9.45E-03
I-133	5.93E-02
XE-133	1.31E+02
XE-133M	1.90E+00
I-135	9.01E-02
XE-135	5.07E+01
XE-135M	7.68E+01
CS-137	4.77E-04
XE-137	2.23E+02
XE-138	1.03E+02
BA-140	1.52E-03

Total Airborne Tritium Released	5.58E+01 Ci
Total Liquid Tritium Released	1.88E-05 Ci
Volume of Waste Released (Prior to Dilution)	3.63E+03 liters
Volume of Dilution Water Used During Period	2.45E+07 liters

Installation: Monticello  
Unit No.: 1

Location: 23 Mi SE St. Cloud, MN

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR  
Docket Number: 50-263  
Thermal Power(MWH): 1.19E+07  
Commercial Operation: 06/30/71  
Cooling Water Source: Mississippi River

Licensee: Northern States Power  
Licensed Power(MWT): 1.67E+03  
Net Electrical Power(MWH): 3.86E+06  
Initial Criticality: 12/10/70

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
8	Truck	CNSI, Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June Jul-Dec

A

AM-241	4.11E-04
C-14	1.03E-02
CE-141	1.93E-02
CE-144	3.46E-05
CM-242	1.38E-03
CM-243	3.67E-04
CO-58	1.34E-01
CO-60	5.38E+00
CS-134	1.60E-02
CS-137	9.17E-01
FE-55	8.15E+00
FE-59	6.64E-02
H-3	2.35E-02
I-129	3.54E-04
I-131	9.17E-03
MN-54	9.81E-01
NI-63	8.27E-02
PU-238	2.86E-04
PU-239	1.33E-04
PU-241	1.52E-02
SR-89	9.02E-02
SR-90	1.01E-02
TC-99	5.92E-05
ZN-65	8.18E+01

B

AM-241	3.06E-03
C-14	4.83E-02
CE-141	3.33E-05
CM-242	3.95E-03
CM-243	2.96E-03
CO-58	2.68E-01
CO-60	1.75E+01
CS-134	2.71E-02
CS-137	5.35E-01
FE-55	4.91E+01
FE-59	6.89E-01
H-3	3.46E-05
I-129	1.46E-04

Installation: Monticello  
Unit No.: 1

Location: 23 Mi SE St. Cloud, MN

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Estimate of Major Nuclide Composition ( %) (continued) Jan-June July-Dec  
(by type of waste)

B	
I-131	3.32E-02
MN-54	8.03E+00
NI-63	1.44E+00
PU-238	8.44E-06
PU-239	4.61E-06
PU-241	6.70E-04
SR-89	3.37E-02
SR-90	5.75E-02
TC-99	9.39E-05
ZN-65	2.22E+01

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 3.10E+01 Ci 8.16E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 9.71E+00 Ci 8.95E+00	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Nine Mile Point  
Unit No.: 1

Location: 8 Mi NE Oswego, NY

Effluent and Waste Disposal Annual Report for 1993

Type: BWR

Docket Number: 50-220

Thermal Power(MWH): 1.34E+07

Commercial Operation: 12/01/69

Cooling Water Source: Lake Ontario

Licensee: Niagara Mohawk Power

Licensed Power(MWT): 1.85E+03

Net Electrical Power(MWH): 4.35E+06

Initial Criticality: 09/05/69

Airborne Effluents

Nuclide Released	Activity (Ci)
FE-55	1.35E-04
CO-60	1.03E-03
KR-85	2.55E-04
KR-85M	6.52E+00
KR-87	9.96E-01
KR-88	2.71E+00
SR-89	1.57E-04
I-131	4.27E-03
I-133	4.10E-03
XE-133	2.38E+02
XE-133M	3.46E-01
I-135	3.18E-02
XE-135	1.62E+01
XE-135M	1.49E-01

Total Airborne Tritium Released

2.42E+01 Ci

Installation: Nine Mile Point  
Unit No.: 2

Location: 8 Mi NE Oswego, NY

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-410  
Thermal Power(MWH): 2.33E+07  
Commercial Operation: 04/05/88  
Cooling Water Source: Lake Ontario

Licensee: Niagara Mohawk Power  
Licensed Power(MWT): 3.32E+03  
Net Electrical Power(MWH): 7.19E+06  
Initial Criticality: 05/23/87

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	7.91E-01
CR-51	1.62E-04
MN-54	2.27E-05
FE-55	1.61E-05
CO-60	1.73E-04
ZN-65	2.55E-03
KR-85	4.47E-04
KR-85M	5.18E-01
KR-87	1.73E+01
KR-88	2.06E+01
SR-89	5.74E-03
SR-90	3.61E-06
MO-99	8.49E-06
I-131	2.08E-04
I-133	3.76E-03
XE-133	9.79E-06
XE-135	6.55E+00
XE-135M	2.41E+01
CS-137	1.91E-05
XE-137	9.02E+01
XE-138	1.15E+02

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	8.81E-03
MN-54	2.14E-02
FE-55	9.90E-04
CO-58	1.05E-03
FE-59	4.92E-03
CO-60	3.39E-02
ZN-65	4.49E-02
SR-89	4.70E-09
AG-110M	1.38E-03

Total Airborne Tritium Released	7.23E+01 Ci
Total Liquid Tritium Released	2.37E+01 Ci
Volume of Waste Released (Prior to Dilution)	3.42E+06 liters
Volume of Dilution Water Used During Period	5.47E+10 liters



Installation: Nine Mile Point  
Unit No.: 1

Location: 8 Mi NE Oswego, NY

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR  
Docket Number: 50-220  
Thermal Power(MWH): 1.34E+07  
Commercial Operation: 12/01/69  
Cooling Water Source: Lake Ontario

Licensee: Niagara Mohawk Power  
Licensed Power(MWT): 1.85E+03  
Net Electrical Power(MWH): 4.35E+06  
Initial Criticality: 09/05/69

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
80	Truck	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

A

	Jan-June	Jul-Dec
CO-58	1.08E+00	
CO-60	6.22E+01	3.55E+01
CS-134		2.89E+00
CS-137	8.24E+00	3.07E+01
FE-55	1.41E+01	2.27E+01
MN-54	1.17E+01	6.54E+00
Unidentified	2.68E+00	1.67E+00

B

CO-58	6.10E+00	
CO-60	5.31E+01	
CS-137	2.47E+01	
FE-55	1.12E+00	
FE-59	1.76E+00	
MN-54	1.14E+01	
Unidentified	1.82E+00	

D

CO-58	5.10E+00	4.20E+00
CO-60	5.98E+01	6.17E+01
CS-137	2.27E+01	2.09E+01
FE-55		1.83E+00
FE-59	1.88E+00	1.58E+00
MN-54	9.54E+00	8.09E+00
Unidentified	9.34E-01	1.65E+00

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 8.67E+01 Ci 6.28E+02	Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 1.14E+01 Ci 4.05E+00	Burial Volume
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe) Commingled Trash	m3 4.25E+01 Ci 8.65E-01	Non-Compacted

Installation: Nine Mile Point  
Unit No.: 2

Location: 8 Mi NE Oswego, NY

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR  
Docket Number: 50-410  
Thermal Power(MWH): 2.33E+07  
Commercial Operation: 04/05/88  
Cooling Water Source: Lake Ontario

Licensee: Niagara Mohawk Power  
Licensed Power(MWT): 3.32E+03  
Net Electrical Power(MWH): 7.19E+06  
Initial Criticality: 05/23/87

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
95	Truck	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

A

	Jan-June	Jul-Dec
CO-60	1.26E+01	6.76E+00
CR-51	7.67E+00	1.40E+01
FE-55	2.51E+00	1.27E+00
MN-54	2.25E+00	2.00E+00
Unidentified	2.77E+00	2.04E+00
N-65	7.22E+01	7.40E+01

D

CO-58	1.13E+00	
CO-60	3.84E+01	2.67E+01
CR-51		7.93E+00
CS-137	6.46E+00	
FE-55	2.72E+00	3.40E+00
FE-59		1.75E+00
MN-54	1.17E+01	9.74E+00
NB-95		1.30E+00
Unidentified	2.29E+00	3.08E+00
ZN-65	3.73E+01	4.61E+01

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.61E+02 Ci 3.68E+03	Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 Ci	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe) Commingled Trash	m3 2.54E+01 Ci 1.19E+00	Non-Compacted

Installation: North Anna  
Unit No.: 1&2

Location: 40 Mi NW Richmond, VA

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: PWR  
Docket Number: 50-338  
Thermal Power(MWH): 1.83E+07  
Commercial Operation: 06/06/78  
Cooling Water Source: Lake Anna  
Unit Number: 2      Type: PWR  
Docket Number: 50-339  
Thermal Power(MWH): 2.01E+07  
Commercial Operation: 12/14/80  
Cooling Water Source: Lake Anna

Licensee: Virginia Electric & Power  
Licensed Power(MWT): 2.89E+03  
Net Electrical Power(MWH): 5.69E+06  
Initial Criticality: 04/05/78  
Licensee: Virginia Electric & Power  
Licensed Power(MWT): 2.89E+03  
Net Electrical Power(MWH): 6.23E+06  
Initial Criticality: 06/12/80

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	7.94E+00
MN-54	1.00E-05
FE-55	2.43E-05
CO-58	1.98E-04
CO-60	1.36E-04
BR-84	4.53E-09
KR-85	8.62E+00
KR-85M	8.06E-02
SR-85	8.17E-09
KR-87	2.09E-02
KR-88	3.12E-02
NB-95	3.55E-06
ZR-95	3.04E-06
SB-122	2.58E-07
I-131	2.44E-03
XE-131M	9.15E-01
I-132	1.15E-06
I-133	7.02E-04
XE-133	2.22E+02
XE-133M	8.82E+00
CS-134	3.44E-06
I-134	1.03E-08
I-135	4.42E-06
XE-135	2.44E+00
XE-135M	1.26E-01
CS-136	4.63E-07
CS-137	8.18E-05
XE-138	8.26E-03
CE-143	3.66E-08

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	7.22E-05
AR-41	4.08E-04
CR-51	3.32E-02
MN-54	4.43E-03
CO-57	9.60E-05
CO-58	1.36E-01
FE-59	6.97E-03

Installation: North Anna  
Unit No.: 1&2

Location: 40 Mi NW Richmond, VA

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
CO-60	9.86E-02
NI-65	1.80E-04
ZN-65	5.47E-07
NB-95	1.56E-02
ZR-95	2.52E-03
TC-99M	9.85E-05
RU-103	2.72E-04
RH-106	1.20E-03
RU-106	1.20E-03
AG-110M	7.41E-02
IN-113M	3.72E-05
SN-113	3.72E-05
SB-122	2.64E-04
SB-124	9.15E-04
SB-125	7.48E-02
TE-129	3.17E-04
TE-129M	3.17E-04
I-131	9.67E-03
I-133	6.28E-03
XE-133	5.79E-02
CS-134	6.20E-03
XE-135	3.25E-04
XE-135M	5.37E-05
CS-136	6.39E-05
CS-137	9.19E-03

Total Airborne Tritium Released	4.66E+01 Ci
Total Liquid Tritium Released	6.93E+02 Ci
Volume of Waste Released (Prior to Dilution)	2.57E+08 liters
Volume of Dilution Water Used During Period	2.41E+12 liters

Installation: North Anna  
Unit No.: 1&2

Location: 40 Mi NW Richmond, VA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-338  
Thermal Power(MWH): 1.83E+07  
Commercial Operation: 06/06/78  
Cooling Water Source: Lake Anna

Licensee: Virginia Electric & Power  
Licensed Power(MWT): 2.89E+03  
Net Electrical Power(MWH): 5.69E+06  
Initial Criticality: 04/05/78

Unit Number: 2      Type: PWR  
Docket Number: 50-339  
Thermal Power(MWH): 2.01E+07  
Commercial Operation: 12/14/80  
Cooling Water Source: Lake Anna

Licensee: Virginia Electric & Power  
Licensed Power(MWT): 2.89E+03  
Net Electrical Power(MWH): 6.23E+06  
Initial Criticality: 06/12/80

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
21	Truck	Barnwell, SC
33	Truck	Quadrex, Oak Ridge, TN
14	Truck	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June      Jul-Dec

A

CD-109	1.80E+00	
CO-58	2.85E+00	2.84E+01
CO-60	3.02E+01	1.55E+01
CS-134	2.47E+00	
CS-137	5.27E+00	1.75E+00
FE-55	1.56E+01	3.61E+01
MN-54		1.06E+00
NI-59	3.05E+00	
NI-63	3.71E+01	1.70E+01

B

CE-144		1.85E+00
CO-58	1.96E+01	1.33E+01
CO-60	1.54E+01	1.15E+01
CR-51	4.29E+00	
CS-137	1.45E+01	1.35E+00
FE-55	2.26E+01	1.86E+01
NB-95	5.70E+00	3.37E+01
NI-63	9.92E+00	2.67E+00
ZR-95	4.10E+00	1.71E+01

D

AG-110M	1.84E+01	
CE-144		4.10E+01
CO-58	4.92E+00	1.02E+00
CO-60	5.57E+00	1.43E+01
CS-134		3.25E+00
CS-137		2.59E+01
FE-55	4.59E+01	1.22E+00
NI-63	2.19E+01	1.20E+00
SR-90		8.83E+00

Installation: North Anna  
Unit No.: 1&2

Location: 40 Mi NW Richmond, VA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.43E+02	Before Volume Reduction
	m3 8.46E+01	Actual Burial Volume
	Ci 5.95E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 2.06E+03	Before Offsite Processing
	m3 1.85E+02	Actual Burial Volume
	Ci 1.22E+01	
C. Irradiated Components, Control Rods, etc.	m3	
	Ci	
D. Other (describe) Waste Oil	m3 1.97E+01	Before Incineration
	m3 6.98E+00	Actual Burial Volume
	Ci 1.39E-02	

Installation: Oconee  
Unit No.: 1&2&3

Location: 30 Mi W Greenville, SC

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: PWR  
Docket Number: 50-269  
Thermal Power(MWH): 1.98E+07  
Commercial Operation: 07/15/73  
Cooling Water Source: Lake Keowee  
Unit Number: 2      Type: PWR  
Docket Number: 50-270  
Thermal Power(MWH): 1.88E+07  
Commercial Operation: 09/09/74  
Cooling Water Source: Lake Keowee  
Unit Number: 3      Type: PWR  
Docket Number: 50-287  
Thermal Power(MWH): 2.21E+07  
Commercial Operation: 12/16/74  
Cooling Water Source: Lake Keowee

Licensee: Duke Power  
Licensed Power(MWT): 2.57E+03  
Net Electrical Power(MWH): 6.52E+06  
Initial Criticality: 04/19/73

Licensee: Duke Power  
Licensed Power(MWT): 2.57E+03  
Net Electrical Power(MWH): 6.23E+06  
Initial Criticality: 11/11/73

Licensee: Duke Power  
Licensed Power(MWT): 2.57E+03  
Net Electrical Power(MWH): 7.39E+06  
Initial Criticality: 09/05/74

Airborne Effluents

Nuclide Released	Activity (Ci)
NA-24	1.12E-06
AR-41	3.45E+00
CO-58	2.49E-05
CO-60	3.19E-07
KR-85	3.78E+00
KR-85M	1.34E+00
KR-87	4.62E-04
KR-88	1.62E-03
RB-88	7.00E-02
MO-99	5.69E-07
TC-99M	5.52E-07
AG-110M	1.07E-04
I-131	2.49E-03
XE-131M	3.80E-01
I-132	8.00E-03
I-133	6.77E-03
XE-133	5.56E+02
XE-133M	2.27E-01
CS-134	3.10E-04
I-134	4.19E-04
I-135	4.33E-03
XE-135	9.28E+01
XE-135M	1.36E-03
CS-137	3.89E-04
CS-138	3.56E-02

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	1.42E-02
MN-54	3.57E-04
FE-55	5.32E-02
CO-57	3.54E-05
CO-58	1.59E-01
FE-59	2.15E-04

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
CO-60	2.78E-02
KR-85	3.45E-02
NB-95	4.07E-03
ZR-95	2.33E-03
MO-99	3.28E-04
TC-99M	3.18E-04
RU-103	2.48E-04
RU-106	1.72E-03
AG-110M	6.40E-02
SN-113	3.07E-05
SB-124	7.71E-04
SB-125	4.28E-02
TE-125M	5.60E-02
I-131	9.67E-03
XE-131M	5.82E-04
I-132	3.44E-04
TE-132	4.40E-04
I-133	8.27E-03
XE-133	4.36E-01
XE-133M	5.51E-03
CS-134	2.69E-03
I-135	3.75E-04
XE-135	5.00E-02
XE-135M	1.36E-06
CS-137	1.01E-02
BA-140	1.44E-04
LA-140	5.94E-03
CE-141	1.94E-05
CE-144	4.27E-03

Total Airborne Tritium Released	4.42E+01 Ci
Total Liquid Tritium Released	1.10E+03 Ci
Volume of Waste Released (Prior to Dilution)	4.68E+09 liters
Volume of Dilution Water Used During Period	1.02E+12 liters



Installation: Oconee  
Unit No.: 1&2&3

Location: 30 Mi W Greenville, SC

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-269  
Thermal Power(MWH): 1.98E+07  
Commercial Operation: 07/15/73  
Cooling Water Source: Lake Keowee

Licensee: Duke Power  
Licensed Power(MWT): 2.57E+03  
Net Electrical Power(MWH): 6.52E+06  
Initial Criticality: 04/19/73

Unit Number: 2      Type: PWR  
Docket Number: 50-270  
Thermal Power(MWH): 1.88E+07  
Commercial Operation: 09/09/74  
Cooling Water Source: Lake Keowee

Licensee: Duke Power  
Licensed Power(MWT): 2.57E+03  
Net Electrical Power(MWH): 6.23E+06  
Initial Criticality: 11/11/73

Unit Number: 3      Type: PWR  
Docket Number: 50-287  
Thermal Power(MWH): 2.21E+07  
Commercial Operation: 12/15/74  
Cooling Water Source: Lake Keowee

Licensee: Duke Power  
Licensed Power(MWT): 2.57E+03  
Net Electrical Power(MWH): 7.39E+06  
Initial Criticality: 09/05/74

Solid Waste Disposition

Number of Shipments      Mode of Transportation  
46

Destination  
Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June      Jul-Dec

A

AG-110M	6.78E-01	7.10E-01
C-14	5.68E-01	3.39E-01
CE-144	8.16E-02	9.71E-02
CO-57	8.25E-02	
CO-58	1.59E+01	1.23E+00
CO-60	3.26E+00	1.75E+00
CR-51	8.22E-04	
CS-134	2.30E+01	6.89E+00
CS-137	2.96E+01	1.32E+01
FE-55	4.18E+00	2.51E+00
FE-59	3.19E-05	
H-3	3.71E-05	1.03E-04
MN-54	8.07E-01	2.99E-02
NB-95	1.62E-01	2.24E-02
NI-63	2.06E+01	1.10E+01
PU-241	8.82E-02	3.05E-02
RU-103	7.88E-05	
RU-106	1.42E-03	
SB-124	7.36E-05	
SB-125	6.87E-01	1.06E-01
SR-90	2.06E-01	9.15E-02
ZR-95	2.31E-02	

B

AG-110M	1.29E+01	1.29E+01
C-14	1.60E-01	1.60E-01

Installation: Oconee  
Unit No.: 1&2&3

Location: 30 Mi W Greenville, SC

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued)	Jan-June	July-Dec
B		
CE-144	1.10E-01	1.10E-01
CM-242	1.00E-02	1.00E-02
CO-57	1.90E-01	1.90E-01
CO-58	3.63E+01	3.63E+01
CO-60	3.40E+00	3.40E+00
CR-51	1.22E+00	1.22E+00
CS-134	7.72E+00	7.72E+00
CS-137	1.48E+01	1.48E+01
FE-55	1.18E+01	1.18E+01
MN-54	5.00E-01	5.00E-01
NB-95	1.65E+00	1.65E+00
NI-63	7.21E+00	7.21E+00
PU-238	1.00E-02	1.00E-02
PU-241	2.90E-01	2.90E-01
RU-106	6.00E-01	6.00E-01
SN-113	2.60E-01	2.60E-01
SR-89	2.00E-02	2.00E-02
SR-90	2.00E-02	2.00E-02
ZR-95	7.90E-01	7.90E-01
C		
AG-110M		5.54E+00
C-14		2.11E-01
CO-58		1.15E+01
CO-60		1.24E+01
CS-134		3.76E+00
CS-137		5.51E+00
FE-55		3.13E+01
H-3		1.10E-02
NB-95		2.60E+00
NI-63		2.44E+01
PU-241		6.22E-01
RU-106		2.13E+00
D		
AG-110M	6.30E+00	2.05E+00
C-14	2.01E-01	
CO-58	1.13E+01	3.10E+00
CO-60	1.39E+01	4.80E+01
CR-51		5.00E-01
CS-137	5.00E-02	
FE-55	3.49E+01	1.83E+01
H-3		3.00E-01
MN-54		4.50E-01
NB-95	2.92E+00	
NI-59		1.50E-01
NI-63	2.72E+01	2.59E+01
PU-241	7.00E-01	
RU-106	2.40E+00	
SB-125		1.30E+00

Installation: Oconee  
Unit No.: 1&2&3

Location: 30 Mi W Greenville, SC

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 9.61E+01 Ci 8.35E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 9.01E+01 m3 4.95E+00 Ci 5.96E+00	compacted non-compacted
C. Irradiated Components, Control Rods, etc.	m3 3.25E+00 Ci 1.94E+04	
D. Other (describe) Dewatered Mechanical Filters	m3 1.88E+01 Ci 4.08E+01	

Installation: Oyster Creek  
Unit No.: 1

Location: 9 Mi S Toms River, NJ

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-219  
Thermal Power(MWH): 1.46E+07  
Commercial Operation: 12/01/69  
Cooling Water Source: Barnegat Bay

Licensee: GPU Nuclear Corporation  
Licensed Power(MWT): 1.93E+03  
Net Electrical Power(MWH): 4.66E+06  
Initial Criticality: 05/03/69

Airborne Effluents

Nuclide Released	Activity (Ci)
CR-51	1.70E-04
MN-54	1.28E-05
CO-60	4.24E-04
KR-85M	3.56E+01
KR-87	4.09E+01
KR-88	2.69E+01
SR-89	1.17E-02
SR-90	1.45E-05
I-131	9.92E-03
I-132	3.10E-02
I-133	7.58E-02
XE-133	1.70E+01
I-135	1.11E-01
XE-135	9.83E+01
CS-137	6.50E-05
BA-140	4.56E-04
CE-144	2.15E-05

Total Airborne Tritium Released

3.68E+00 Ci

Installation: Oyster Creek  
Unit No.: 1

Location: 9 Mi S Toms River, NJ

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR  
Docket Number: 50-219  
Thermal Power(MWH): 1.46E+07  
Commercial Operation: 12/01/69  
Cooling Water Source: Barnegat Bay

Licensee: GPU Nuclear Corporation  
Licensed Power(MWT): 1.93E+03  
Net Electrical Power(MWH): 4.66E+06  
Initial Criticality: 05/03/69

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
36	Truck	Barnwell, SC
13	Truck	Oak Ridge, TN
3	Truck	Wampum, PA

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June Jul-Dec

A			
	C-14		1.63E-01
	CO-60		3.50E+01
	CR-51		1.14E+00
	CS-134		1.08E+00
	CS-137		1.33E+01
	FE-55		4.08E+01
	H-3		2.30E-02
	MN-54		4.55E+00
	NI-59		1.50E-02
	NI-63		1.06E+00
	PU-241		2.32E-01
	SR-90		6.70E-02
	ZN-65		1.11E+00
B			
	CO-60	3.22E-01	3.37E+01
	CR-51	2.20E-02	1.29E+00
	CS-134	1.03E-02	
	CS-137	7.19E-02	7.46E+00
	FE-55	5.21E-01	4.90E+01
	MN-54	3.59E-02	4.33E+00
	NI-59	9.57E-05	1.00E-02
	NI-63	1.72E-03	6.80E-01
	PU-241	2.88E-04	4.00E-02
	SR-90	2.88E-04	6.00E-02
	ZN-65	1.48E-02	1.24E+00
C			
	CO-60	3.23E+01	
	CR-51	2.45E+01	
	FE-55	3.89E+01	
	NI-63	4.30E+00	
D			
	C-14	7.44E-02	
	CM-242	1.65E-04	
	CO-58	2.23E+00	
	CO-60	4.85E+01	
	CR-51	3.14E+00	

Installation: Oyster Creek  
Unit No.: 1

Location: 9 Mi S Toms River, NJ

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued) Jan-June July-Dec  
(by type of waste)

D

CS-134	1.34E+00
CS-137	4.68E+00
FE-55	3.05E+01
H-3	7.11E-04
MN-54	7.62E+00
NI-59	1.22E-02
NI-63	3.94E-01
PU-241	3.11E-02
SR-90	7.90E-02
ZN-65	1.40E+00

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 6.10E+01 Ci 1.87E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 5.79E+02 Ci 1.66E+01	
C. Irradiated Components, Control Rods, etc.	m3 3.35E+00 Ci 8.34E+00	
D. Other (describe) Filters, Filters Sludge & Contam.Metal	m3 1.61E+02 Ci 7.23E+02	

Installation: Palisades  
Unit No.: 1

Location: 5 Mi S South Haven, MI

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-255  
Thermal Power(MWH): 1.14E+07  
Commercial Operation: 12/31/71  
Cooling Water Source: Lake Michigan

Licensee: Consumers Power  
Licensed Power(MWT): 2.53E+03  
Net Electrical Power(MWH): 3.55E+06  
Initial Criticality: 05/24/71

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	2.09E-06
CO-58	1.82E-05
CO-60	1.45E-05
KR-85	5.74E+00
KR-87	2.87E-04
RB-88	1.68E-07
SR-89	1.09E-05
SR-90	4.21E-06
I-131	9.12E-04
XE-131M	2.19E-01
I-132	4.42E-04
I-133	3.40E-04
XE-133	8.60E+01
XE-133M	2.78E-01
XE-135	5.85E-01
XE-135M	1.95E-03
CS-137	1.08E-05
CS-138	5.17E-09
CE-141	7.98E-09
Unidentified	1.45E-04

Liquid Effluents

Nuclide Released	Activity (Ci)
CO-58	7.68E-03
CO-60	1.36E-03
SR-89	2.83E-06
SR-90	1.15E-05
SB-125	7.89E-05
XE-133	4.39E-04
CS-134	2.38E-04
CS-137	4.26E-03
Unidentified	4.14E-04

Total Airborne Tritium Released	8.49E+00 Ci
Total Liquid Tritium Released	2.10E+02 Ci
Volume of Waste Released (Prior to Dilution)	1.29E+06 liters
Volume of Dilution Water Used During Period	8.00E+10 liters

Installation: Palo Verde  
Unit No.: 1

Location: 36 Mi W Phoenix, AZ

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-528  
Thermal Power (MWH): 2.33E+07  
Commercial Operation: 01/28/86  
Cooling Water Source: Sewage Treatment

Licensee: Arizona Public Service Co.  
Licensed Power (MWT): 3.80E+03  
Net Electrical Power (MWH): 7.51E+06  
Initial Criticality: 05/25/85

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	6.49E-01
MN-54	1.17E-05
CO-58	7.78E-05
CO-60	5.00E-06
SE-75	2.43E-05
BR-82	5.42E-04
KR-85	1.87E+01
KR-85M	1.04E+00
KR-87	3.51E-01
KR-88	1.72E-01
RB-88	4.55E-03
SR-89	1.72E-04
SR-90	5.67E-07
NB-95	8.93E-06
ZR-95	2.85E-06
MO-99	1.17E-05
RU-103	4.97E-04
RU-106	2.99E-04
AG-110M	1.06E-06
SB-122	7.69E-06
TE-123M	2.11E-05
SB-124	1.72E-05
I-131	8.47E-03
XE-131M	4.19E-01
I-132	1.04E-02
I-133	1.08E-03
XE-133	5.18E+02
XE-133M	9.53E-02
CS-134	1.35E-04
I-134	1.38E-06
I-135	1.69E-05
XE-135	3.93E+01
CS-137	1.78E-04
CS-138	5.15E-03
CE-141	6.63E-05
OS-191	2.65E-05

Total Airborne Tritium Released

5.07E+02 Ci



Installation: Palo Verde  
Unit No.: 2

Location: 36 Mi W Phoenix, AZ

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-529  
Thermal Power(MWH): 1.58E+07  
Commercial Operation: 09/19/86  
Cooling Water Source: Sewage Treatment

Licensee: Arizona Public Service Co.  
Licensed Power(MWT): 3.80E+03  
Net Electrical Power(MWH): 5.13E+06  
Initial Criticality: 04/18/86

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	1.91E+00
CR-51	2.81E-04
MN-54	5.35E-05
CO-57	1.11E-07
CO-58	8.77E-04
CO-60	2.26E-04
BR-82	3.86E-05
KR-85	2.26E+01
KR-85M	2.66E+00
KR-87	2.32E+00
KR-88	5.33E+00
RB-88	5.35E-02
SR-89	2.87E-06
SR-90	8.93E-08
NB-95	1.27E-04
ZR-95	1.43E-04
RU-103	2.00E-04
AG-110M	2.26E-06
SN-113M	2.87E-07
SB-122	7.66E-05
TE-123M	1.00E-05
SB-124	7.85E-04
SB-125	3.94E-06
I-131	1.24E-03
XE-131M	1.59E-01
I-132	2.76E-05
I-133	1.59E-04
XE-133	1.98E+02
XE-133M	1.38E+00
CS-134	1.91E-03
I-135	7.04E-05
XE-135	2.49E+01
XE-135M	2.93E+00
CS-137	1.48E-03
CS-138	5.94E-02
XE-138	3.12E-01
BA-139	6.57E-05

Total Airborne Tritium Released

3.17E+02 Ci

Installation: Palo Verde  
Unit No.: 3

Location: 36 Mi W Phoenix, AZ

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-530  
Thermal Power(MWH): 2.87E+07  
Commercial Operation: 01/08/88  
Cooling Water Source: Sewage Treatment

Licensee: Arizona Public Service Co.  
Licensed Power(MWT): 3.80E+03  
Net Electrical Power(MWH): 9.39E+06  
Initial Criticality: 10/25/87

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	1.73E+00
CR-51	3.55E-05
MN-54	5.96E-07
CO-58	9.61E-05
CO-60	2.58E-05
SE-75	1.40E-06
BR-82	2.33E-04
KR-85	4.41E+00
KR-85M	2.60E-03
RB-88	6.53E-04
SR-89	1.88E-05
SR-90	2.32E-07
MO-99	3.92E-06
TC-99M	3.80E-06
SB-122	1.53E-05
TE-123M	1.40E-08
SB-124	8.32E-06
I-131	1.53E-03
XE-131M	1.15E+00
I-132	2.69E-03
I-133	6.75E-05
XE-133	1.84E+02
XE-133M	2.75E-01
CS-134	1.40E-08
I-135	3.42E-06
XE-135	5.70E+00
CS-137	1.11E-08
CS-138	3.68E-05

Total Airborne Tritium Released

4.50E+02 Ci

Installation: Palo Verde  
Unit No.: 1&2&3

Location: 36 Mi W Phoenix, AZ

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-528  
Thermal Power(MWH): 2.33E+07  
Commercial Operation: 01/28/86  
Cooling Water Source: Sewage Treatment

Licensee: Arizona Public Service Co.  
Licensed Power(MWT): 3.80E+03  
Net Electrical Power(MWH): 7.51E+06  
Initial Criticality: 05/25/85

Unit Number: 2      Type: PWR  
Docket Number: 50-529  
Thermal Power(MWH): 1.58E+07  
Commercial Operation: 09/19/86  
Cooling Water Source: Sewage Treatment

Licensee: Arizona Public Service Co.  
Licensed Power(MWT): 3.80E+03  
Net Electrical Power(MWH): 5.13E+06  
Initial Criticality: 04/18/86

Unit Number: 3      Type: PWR  
Docket Number: 50-530  
Thermal Power(MWH): 2.87E+07  
Commercial Operation: 01/08/88  
Cooling Water Source: Sewage Treatment

Licensee: Arizona Public Service Co.  
Licensed Power(MWT): 3.80E+03  
Net Electrical Power(MWH): 9.39E+06  
Initial Criticality: 10/25/87

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
106	Truck	Barnwell, SC
39	Truck	SEG, Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June      Jul-Dec

A

AG-110M	1.70E+00	
C-14	1.92E+00	9.01E-01
CE-144	2.86E+00	
CM-242	1.00E-01	1.98E-03
CO-58	8.04E+00	2.42E+00
CO-60	1.09E+01	7.35E+00
CR-51	7.40E-01	
CS-134	6.29E+00	2.64E+01
CS-137	1.72E+01	3.47E+01
FE-55	2.03E+01	2.18E+01
H-3	7.50E+00	1.39E-01
MN-54	6.50E-01	
NB-95	3.00E+00	
NI-63	6.65E+00	5.79E+00
PU-241	1.90E-01	1.30E-01
RU-106	1.38E+00	
SB-124	9.65E+00	9.84E-02
SB-125	1.63E+00	
SR-90	8.00E-02	2.58E-01
ZR-95	1.26E+00	

B

AG-110M	1.05E+00	4.20E+00
C-14	8.80E-01	2.22E+00
CE-144	1.25E+00	1.55E+00

Effluent and Waste Disposal Annual Report for 1993  
 Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued)	Jan-June	July-Dec
(by type of waste)		
B		
CO-58	9.95E+00	9.60E+00
CO-60	1.49E+01	1.24E+01
CR-51	5.50E-01	
CS-134	3.28E+00	2.60E+00
CS-137	1.22E+01	7.04E+00
FE-55	3.75E+01	4.19E+01
FE-59	3.80E-01	
H-3	2.34E+00	1.13E+00
MN-54	1.14E+00	1.70E+00
NB-95	2.36E+00	1.30E+00
NI-63	5.32E+00	6.14E+00
PU-241		2.27E+00
RU-103	1.90E-01	
RU-106		1.55E+00
SB-124	4.62E+00	1.60E+00
SB-125	1.22E+00	1.00E+00
ZR-95	1.09E+00	7.00E-01
D		
AG-110M	4.20E-01	2.10E+00
C-14	4.50E-01	1.51E+01
CE-144	1.27E+00	2.80E+00
CO-58	7.72E+00	6.00E+00
CO-60	2.94E+01	9.70E+00
CR-51	1.53E+00	
CS-134	4.56E+00	1.80E+00
CS-137	1.29E+01	5.50E+00
FE-55	2.56E+01	2.74E+01
FE-59	1.63E+00	
H-3	1.52E+00	1.58E+01
MN-54	4.56E+00	1.10E+00
NB-95	8.40E-01	1.40E+00
NI-63	3.76E+00	4.30E+00
PU-241		7.00E-01
RU-103	8.50E-01	
RU-106		1.40E+00
SB-124	5.41E+00	2.10E+00
SB-125	5.00E-01	6.00E-01
ZR-95	3.40E-01	2.10E+00

Installation: Palo Verde  
Unit No.: 1&2&3

Location: 36 Mi W Phoenix, AZ

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.29E+02 Ci 6.40E+02	Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 9.57E+01 Ci 3.26E+00	Burial Volume
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe) Incinerator Ash	m3 3.82E+00 Ci 4.23E-01	Burial Volume

Installation: Peach Bottom  
Unit No.: 2&3

Location: 17.9 Mi S Lancaster, PA

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 2      Type: BWR  
Docket Number: 50-277  
Thermal Power(MWH): 2.41E+07  
Commercial Operation: 07/05/74  
Cooling Water Source: Susquehanna River  
Unit Number: 3      Type: EWR  
Docket Number: 50-278  
Thermal Power(MWH): 2.02E+07  
Commercial Operation: 12/23/74  
Cooling Water Source: Susquehanna River

Licensee: PECO Energy Co.  
Licensed Power(MWT): 3.44E+03  
Net Electrical Power(MWH): 7.70E+06  
Initial Criticality: 09/16/73  
Licensee: PECO Energy Co.  
Licensed Power(MWT): 3.44E+03  
Net Electrical Power(MWH): 6.31E+06  
Initial Criticality: 08/07/74

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	7.42E+00
CO-58	3.41E-06
CO-60	6.54E-05
ZN-65	4.30E-06
KR-85M	3.55E+02
KR-87	4.81E+02
KR-88	3.35E+02
SR-89	4.90E-03
SR-90	2.12E-05
SR-91	3.76E-03
Y-91M	1.98E-02
MO-99	3.96E-05
TC-99M	6.67E-05
CD-109	1.02E-04
I-131	4.80E-02
TE-132	4.27E-06
I-133	1.81E-01
XE-133	3.40E+03
XE-133M	9.61E+00
CS-134	6.08E-05
I-135	1.95E-01
XE-135	1.70E+03
XE-135M	1.06E+03
CS-137	3.04E-04
CS-138	2.15E-01
XE-138	1.47E+03
BA-139	4.01E-02
BA-140	2.44E-03
LA-140	2.09E-03
CE-144	5.38E-05
Unidentified	2.26E+03

Liquid Effluents

Nuclide Released	Activity (Ci)
P-32	1.04E-03
CR-51	1.35E-03
MN-54	6.98E-03
FE-55	2.66E-03
CO-58	1.90E-03

Installation: Peach Bottom  
Unit No.: 2&3

Location: 17.9 Mi S Lancaster, PA

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
CO-60	2.18E-02
ZN-65	1.87E-02
SR-89	1.94E-04
SR-90	5.55E-05
Y-91M	6.50E-06
AG-110M	1.12E-05
I-131	3.82E-06
XE-133	7.81E-03
XE-133M	2.57E-05
CS-134	5.24E-04
XE-135	1.57E-02
XE-135M	1.25E-04
CS-137	1.36E-03

Total Airborne Tritium Released	2.28E+01 Ci
Total Liquid Tritium Released	7.21E+00 Ci
Volume of Waste Released (Prior to Dilution)	4.38E+06 liters
Volume of Dilution Water Used During Period	8.48E+11 liters

Installation: Peach Bottom  
Unit No.: 2&3

Location: 17.9 Mi S Lancaster, PA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 2      Type: BWR  
Docket Number: 50-277  
Thermal Power(MWH): 2.41E+07  
Commercial Operation: 07/05/74  
Cooling Water Source: Susquehanna River

Licensee: PECO Energy Co.  
Licensed Power(MWT): 3.44E+03  
Net Electrical Power(MWH): 7.70E+06  
Initial Criticality: 09/16/73

Unit Number: 3      Type: BWR  
Docket Number: 50-278  
Thermal Power(MWH): 2.02E+07  
Commercial Operation: 12/23/74  
Cooling Water Source: Susquehanna River

Licensee: PECO Energy Co.  
Licensed Power(MWT): 3.44E+03  
Net Electrical Power(MWH): 6.31E+06  
Initial Criticality: 08/07/74

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
70		
41		Quadrex to Burial
106		SEG to Burial

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 3.39E+02 Ci 2.09E+03	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 9.72E+01 Ci 1.00E+01	
C. Irradiated Components, Control Rods, etc.	m3 8.50E+00 Ci 6.64E+04	
D. Other (describe)	m3 Ci	



Installation: Perry  
Unit No.: 1

Location: 7 Mi NE Painesville, OH

Effluent and Waste Disposal Annual Report for 1993

Type: BWR

Licensee: Cleveland Electric  
Illuminating Company  
Licensed Power(MWT): 3.58E+03  
Net Electrical Power(MWH): 3.97E+06  
Initial Criticality: 06/06/86

Docket Number: 50-440

Thermal Power(MWH): 1.24E+07

Commercial Operation: 11/18/87

Cooling Water Source: Lake Erie

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	8.00E-03
KR-85	6.30E-02
KR-85M	1.37E+01
KR-87	4.84E+00
KR-88	5.01E+00
Y-88	8.94E-05
KR-89	2.21E+00
RB-89	5.08E-04
SR-89	1.80E-03
SR-90	8.91E-06
SR-91	4.87E-03
Y-91M	2.64E-04
SR-92	1.71E-04
TC-99M	2.35E-04
I-131	3.97E-02
XE-131M	1.51E+00
I-132	2.93E-03
I-133	1.09E-01
XE-133	2.63E+02
XE-133M	5.45E+00
I-134	1.51E-02
I-135	4.59E-02
XE-135	2.18E+02
XE-135M	1.00E+02
XE-137	2.40E+01
CS-138	2.44E-02
XE-138	4.63E+01
BA-139	4.81E-02
BA-140	4.55E-04
LA-140	2.00E-04

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	2.10E-02
MN-54	1.87E-03
FE-55	3.67E-03
CO-58	3.60E-04
CO-60	1.71E-02
ZN-65	9.58E-02
SR-89	2.17E-04
SR-90	7.59E-06
MO-99	1.54E-03
TC-99M	2.03E-03

Installation: Perry  
Unit No.: 1

Location: 7 Mi NE Painesville, OH

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
AG-110M	2.26E-04
SB-125	5.43E-05
I-131	5.05E-04
I-133	3.66E-04
XE-133	3.38E-02
XE-133M	5.70E-04
CS-134	8.78E-05
XE-135	7.24E-03
CS-137	1.64E-04
BA-140	6.82E-05
LA-140	9.71E-03
CE-141	5.56E-04
NP-239	1.13E-04

Total Liquid Tritium Released	9.35E+00 Ci
Volume of Waste Released (Prior to Dilution)	1.83E+10 liters
Volume of Dilution Water Used During Period	7.97E+10 liters

Installation: Perry  
Unit No.: 1

Location: 7 Mi NE Painesville, OH

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR

Licensee: Cleveland Electric  
Illuminating Company  
Licensed Power(MWT): 3.58E+03  
Net Electrical Power(MWH): 3.97E+06  
Initial Criticality: 06/06/86

Docket Number: 50-440  
Thermal Power(MWH): 1.24E+07  
Commercial Operation: 11/18/87  
Cooling Water Source: Lake Erie

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
32	Truck	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Annual

	Annual
A	
C-14	7.54E-02
CO-60	1.48E+01
CR-51	1.28E+00
CS-134	1.93E+00
CS-137	2.34E+00
FE-55	2.78E+01
H-3	5.95E-03
MN-54	2.65E+00
NI-63	2.15E-01
PU-241	1.40E-02
SR-90	1.31E-01
ZN-65	4.79E+01
B	
CO-58	2.37E+00
CO-60	1.81E+01
CR-51	5.52E+00
CS-137	3.02E-01
FE-55	6.04E+01
H-3	4.30E-02
MN-54	6.04E+00
ZN-65	6.70E+00

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 7.42E+01 Ci 2.89E+03	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 1.19E+03 Ci 6.09E+00	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Pilgrim  
Unit No.: 1

Location: 25 Mi SE Boston, MA

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-293  
Thermal Power(MWH): 1.31E+07  
Commercial Operation: 12/01/72  
Cooling Water Source: Cape Cod Bay

Licensee: Boston Edison  
Licensed Power(MWT): 2.00E+03  
Net Electrical Power(MWH): 4.34E+06  
Initial Criticality: 06/16/72

Airborne Effluents

Nuclide Released	Activity (Ci)
MN-54	8.40E-06
CO-60	1.58E-04
KR-85M	3.88E+01
KR-87	2.81E+01
KR-88	3.51E+01
SR-89	5.84E-03
SR-90	2.43E-05
I-131	3.07E-02
I-133	1.63E-01
XE-133	8.35E+01
CS-134	2.38E-05
XE-135	3.06E+02
XE-135M	1.00E+02
CS-137	7.33E-05
XE-138	3.49E+02
BA/LA-140	6.46E-03
CE-141	2.52E-05

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	5.72E-05
CR-51	1.70E-04
MN-54	3.16E-03
FE-55	1.14E-03
CO-58	7.07E-04
FE-59	1.84E-04
CO-60	1.15E-02
ZN-65	2.37E-06
AS-76	1.64E-04
SR-89	1.63E-03
SR-90	8.59E-05
Y-91M	6.32E-07
MO/TC-99M	2.48E-05
AG-110M	2.18E-05
I-131	3.04E-05
I-133	6.01E-05
XE-133	6.94E-05
XE-135	1.35E-04
CS-137	9.81E-04
BA/LA-140	2.66E-03
CE-141	2.17E-04

Installation: Pilgrim  
Unit No.: 1

Location: 25 Mi SE Boston, MA

Effluent and Waste Disposal Annual Report for 1993

Total Airborne Tritium Released	1.81E+01 Ci
Total Liquid Tritium Released	3.75E+00 Ci
Volume of Waste Released (Prior to Dilution)	2.18E+06 liters
Volume of Dilution Water Used During Period	6.44E+09 liters

Installation: Pilgrim  
Unit No.: 1

Location: 25 Mi SE Boston, MA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR  
Docket Number: 50-293  
Thermal Power(MWH): 1.31E+07  
Commercial Operation: 12/01/72  
Cooling Water Source: Cape Cod Bay

Licensee: Boston Edison  
Licensed Power(MWT): 2.00E+03  
Net Electrical Power(MWH): 4.34E+06  
Initial Criticality: 06/16/72

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
10	Tractor-Trailer	Alaron, Wampum, PA
30	Tractor-Trailer	CNSI, Barnwell, SC
10	Tractor-Trailer	Quadrex, Oak Ridge, TN
22	Tractor-Trailer	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

	Jan-June	Jul-Dec
A		
AM-241	1.00E-03	
BA-140	2.19E-01	
C-14	2.34E-01	3.00E-02
CE-141		2.40E-02
CE-144	1.77E+00	5.30E-02
CO-58	2.55E+00	1.93E+00
CO-60	4.48E+01	4.50E+01
CR-51	2.02E-01	2.80E-02
CS-137	5.78E+00	7.06E-01
FE-55	2.89E+01	4.44E+01
FE-59	7.29E-01	1.10E-02
H-3	4.20E-02	2.00E-03
I-131		1.40E-02
LA-140	1.00E-01	
MN-54	1.33E+01	7.37E+00
NI-63	1.31E+00	3.72E-01
PU-239/240	1.00E-03	
PU-241		2.00E-02
SR-90	2.30E-02	6.80E-02
B		
AM-241	1.00E-02	1.00E-02
CE-144	1.45E+00	1.78E+00
CM-242	1.00E-02	1.00E-02
CM-243/244	1.00E-02	1.00E-02
CO-58	1.42E+00	1.04E+00
CO-60	2.29E+01	2.32E+01
CR-51	1.48E+00	1.45E+00
CS-134	1.90E-01	1.90E-01
CS-137	4.73E+00	4.40E+00
FE-55	5.71E+01	5.82E+01
FE-59	1.90E+00	1.39E+00
MN-54	5.90E+00	5.78E+00
NB-95	4.70E-01	4.60E-01
NI-59	1.00E-02	1.00E-02
NI-63	1.57E+00	1.44E+00

Installation: Pilgrim  
Unit No.: 1

Location: 25 Mi SE Boston, MA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued) Jan-June July-Dec  
(by type of waste)

	Jan-June	July-Dec
B		
PU-238	1.00E-02	1.00E-02
PU-239/240	1.00E-02	1.00E-02
PU-241	1.70E-01	2.00E-01
RU-103	1.40E-01	1.40E-01
SR-89	3.50E-01	1.30E-01
SR-90	1.00E-01	8.00E-02

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.02E+02 Ci 5.74E+02	Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 6.45E+01 Ci 1.51E+00	Burial Volume
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Point Beach  
Unit No.: 1&2

Location: 15 Mi N Manitowoc, WI

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: PWR  
Docket Number: 50-266  
Thermal Power(MWH): 1.17E+07  
Commercial Operation: 12/21/70  
Cooling Water Source: Lake Michigan  
Unit Number: 2      Type: PWR  
Docket Number: 50-301  
Thermal Power(MWH): 1.17E+07  
Commercial Operation: 10/01/72  
Cooling Water Source: Lake Michigan

Licensee: Wisconsin Electric Power Company  
Licensed Power(MWT): 1.52E+03  
Net Electrical Power(MWH): 3.80E+06  
Initial Criticality: 11/02/70

Licensee: Wisconsin Electric Power Company  
Licensed Power(MWT): 1.52E+03  
Net Electrical Power(MWH): 3.84E+06  
Initial Criticality: 05/30/72

Airborne Effluents

Nuclide Released	Activity (Ci)
F-18	6.50E-05
NA-24	3.23E-06
AR-41	2.82E+00
MN-56	1.03E-06
CO-57	2.47E-07
CO-58	3.76E-04
CO-60	5.93E-04
KR-85	5.53E-01
KR-85M	1.54E-01
KR-87	2.62E-01
KR-88	3.44E-01
RB-88	2.44E-05
SR-90	1.33E-07
I-131	1.21E-04
XE-131M	6.34E-03
I-132	9.95E-06
TE-132	4.20E-09
I-133	4.94E-05
XE-133	3.49E+00
XE-133M	1.96E-02
CS-134	6.87E-03
I-134	6.13E-07
I-135	2.79E-05
XE-135	1.04E+00
XE-135M	4.22E-01
CS-137	6.89E-03
CS-138	9.82E-06
XE-138	1.02E+00

Liquid Effluents

Nuclide Released	Activity (Ci)
F-18	8.12E-02
NA-24	6.69E-04
CR-51	2.26E-03
MN-56	4.98E-04
CO-57	3.84E-05
CO-58	4.07E-04



Installation: Point Beach  
Unit No.: 1&2

Location: 15 Mi N Manitowoc, WI

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
CO-60	1.32E-03
ZN-69M	4.82E-06
SR-89	1.17E-05
SR-90	1.10E-04
SR-92	5.17E-06
NB-97	3.43E-05
ZR-97	1.28E-04
TC-99M	1.88E-04
RU-103	3.47E-06
AG-110M	5.92E-03
SB-125	5.29E-02
I-131	3.39E-03
TE-131M	2.80E-04
I-132	5.41E-03
TE-132	1.25E-04
I-133	2.95E-02
CS-134	1.88E-02
I-134	9.49E-04
I-135	4.30E-03
CS-137	2.26E-02
CS-138	4.94E-05
BA-139	7.65E-04
CE-141	3.51E-05
CE-144	2.00E-04

Total Airborne Tritium Released	1.43E+02 Ci
Total Liquid Tritium Released	4.64E+02 Ci
Volume of Waste Released (Prior to Dilution)	4.25E+08 liters
Volume of Dilution Water Used During Period	5.83E+11 liters

Installation: Point Beach  
Unit No.: 1&2

Location: 15 Mi N Manitowoc, WI

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-266  
Thermal Power(MWH): 1.17E+07  
Commercial Operation: 12/21/70  
Cooling Water Source: Lake Michigan

Licensee: Wisconsin Electric Power Company  
Licensed Power(MWT): 1.52E+03  
Net Electrical Power(MWH): 3.80E+06  
Initial Criticality: 11/02/70

Unit Number: 2      Type: PWR  
Docket Number: 50-301  
Thermal Power(MWH): 1.17E+07  
Commercial Operation: 10/01/72  
Cooling Water Source: Lake Michigan

Licensee: Wisconsin Electric Power Company  
Licensed Power(MWT): 1.52E+03  
Net Electrical Power(MWH): 3.84E+06  
Initial Criticality: 05/30/72

Solid Waste Disposition

Number of Shipments      Mode of Transportation  
42

Destination  
Barnwell, SC

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 7.25E+00 Ci 2.41E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 5.90E+00 Ci 1.16E-01	Compacted, Burial Volume
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe) Dry Active Waste & Scrap Metal	m3 4.01E+01 Ci 7.16E-01	Compacted, Burial Volume

Installation: Prairie Island  
Unit No.: 1&2

Location: 26 Mi SE Minneapolis, MN

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: PWR  
Docket Number: 50-282  
Thermal Power(MWH): 1.38E+07  
Commercial Operation: 12/16/73  
Cooling Water Source: Mississippi River  
Unit Number: 2      Type: PWR  
Docket Number: 50-306  
Thermal Power(MWH): 1.18E+07  
Commercial Operation: 12/21/74  
Cooling Water Source: Mississippi River

Licensee: Northern States Power  
Licensed Power(MWT): 1.65E+03  
Net Electrical Power(MWH): 4.38E+06  
Initial Criticality: 12/01/73

Licensee: Northern States Power  
Licensed Power(MWT): 1.65E+03  
Net Electrical Power(MWH): 3.75E+06  
Initial Criticality: 12/17/74

Airborne Effluents

Nuclide Released	Activity (Ci)
MN-54	4.70E-06
CO-58	1.40E-05
CO-60	1.25E-05
BR-82	1.02E-06
KR-85	1.79E+00
SR-89	6.22E-07
SR-90	3.09E-07
NB-95	4.40E-06
I-131	6.71E-04
XE-131M	2.48E-01
I-133	8.78E-05
XE-133	3.45E+01
XE-133M	1.23E-01
CS-134	1.47E-05
XE-135	1.91E-01
CS-137	1.78E-05

Liquid Effluents

Nuclide Released	Activity (Ci)
BE-7	1.05E-03
NA-24	9.06E-06
SC-47	1.56E-04
CR-51	5.39E-03
MN-54	1.10E-03
FE-55	4.28E-02
CO-57	6.23E-05
CO-58	5.40E-02
FE-59	1.84E-03
CO-60	2.20E-02
ZN-65	1.14E-04
KR-85	3.00E-03
KR-85M	2.56E-06
SR-92	2.89E-05
NB-95	1.28E-03
ZR-95	9.10E-04
NB-97	4.06E-05
ZR-97	1.47E-06
RU-103	1.57E-06
RU-105	1.21E-05

Installation: Prairie Island  
Unit No.: 1&2

Location: 26 Mi SE Minneapolis, MN

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
AG-108M	5.43E-05
AG-110M	2.65E-02
SN-113	1.51E-03
SB-122	9.04E-04
SB-124	1.82E-02
SB-125	1.04E-02
SB-126	1.32E-05
I-131	3.88E-04
XE-131M	7.46E-04
I-133	1.59E-05
XE-133	2.56E-02
XE-133M	7.57E-05
CS-134	2.75E-03
XE-135	4.44E-05
CS-136	6.99E-06
CS-137	3.79E-03
LA-140	4.43E-05
W-187	3.44E-05

Total Airborne Tritium Released	6.30E+01 Ci
Total Liquid Tritium Released	4.80E+02 Ci
Volume of Waste Released (Prior to Dilution)	5.65E+10 liters
Volume of Dilution Water Used During Period	6.30E+11 liters

Installation: Prairie Island  
Unit No.: 1&2

Location: 26 Mi SE Minneapolis, MN

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-282  
Thermal Power(MWH): 1.38E+07  
Commercial Operation: 12/16/73  
Cooling Water Source: Mississippi River

Licensee: Northern States Power  
Licensed Power(MWT): 1.65E+03  
Net Electrical Power(MWH): 4.38E+06  
Initial Criticality: 12/01/73

Unit Number: 2      Type: PWR  
Docket Number: 50-306  
Thermal Power(MWH): 1.18E+07  
Commercial Operation: 12/21/74  
Cooling Water Source: Mississippi River

Licensee: Northern States Power  
Licensed Power(MWT): 1.65E+03  
Net Electrical Power(MWH): 3.75E+06  
Initial Criticality: 12/17/74

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
2	Truck	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

A	Jan-June	Jul-Dec
CO-58	2.90E+00	
CO-60	3.65E+01	
CS-134	3.90E+00	
CS-137	9.50E+00	
FE-55	9.00E+00	
MN-54	2.50E+00	
NI-63	3.51E+01	

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 7.70E+00 Ci 2.83E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 Ci	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Quad-Cities  
Unit No.: 1&2

Location: 20 Mi NE Moline, IL

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: BWR  
Docket Number: 50-254  
Thermal Power(MWH): 1.61E+07  
Commercial Operation: 02/18/73  
Cooling Water Source: Mississippi River  
Unit Number: 2      Type: BWR  
Docket Number: 50-265  
Thermal Power(MWH): 1.01E+07  
Commercial Operation: 03/10/73  
Cooling Water Source: Mississippi River

Licensee: Commonwealth Edison Co.  
Licensed Power(MWT): 2.51E+03  
Net Electrical Power(MWH): 5.04E+06  
Initial Criticality: 10/18/71

Licensee: Commonwealth Edison Co.  
Licensed Power(MWT): 2.51E+03  
Net Electrical Power(MWH): 3.11E+06  
Initial Criticality: 04/26/72

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	2.91E+00
CR-51	4.55E-03
MN-54	2.58E-03
CO-58	6.71E-04
CO-60	1.02E-02
ZN-65	7.37E-05
KR-85M	2.13E+00
KR-87	1.05E+00
KR-88	1.72E+00
SR-89	6.14E-04
SR-90	1.39E-06
ZR-95	6.16E-05
MO-99	3.50E-03
AG-110M	5.21E-05
SB-124	2.23E-05
I-131	1.27E-03
I-133	7.14E-03
XE-133	3.04E+00
I-135	2.34E-03
XE-135	1.43E+00
XE-135M	5.05E+00
CS-137	1.78E-04
XE-138	2.07E+01
BA-140	3.71E-04
LA-140	5.96E-04

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	6.08E-03
MN-54	6.64E-03
FE-55	4.60E-03
CO-58	2.06E-03
FE-59	3.39E-04
CO-60	3.63E-02
ZN-65	1.10E-04
AS-76	6.56E-05
SR-89	5.00E-05
SR-90	1.80E-05
SR-92	1.20E-04

Installation: Quad-Cities  
Unit No.: 1&2

Location: 20 Mi NE Moline, IL

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
NB-95	6.74E-06
MO-99	4.70E-06
TC-99M	5.40E-06
AG-110M	1.19E-03
SB-124	4.62E-05
SB-125	1.53E-04
XE-133	2.75E-04
Y-135	3.94E-04
CS-137	3.62E-03
LA-140	2.16E-05

Total Airborne Tritium Released	4.56E+01 Ci
Total Liquid Tritium Released	3.67E+01 Ci
Volume of Waste Released (Prior to Dilution)	1.02E+07 liters
Volume of Dilution Water Used During Period	1.96E+12 liters

Installation: Quad-Cities  
Unit No.: 1&2

Location: 20 Mi NE Moline, IL

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: BWR  
Docket Number: 50-254  
Thermal Power(MWH): 1.61E+07  
Commercial Operation: 02/18/73  
Cooling Water Source: Mississippi River

Licensee: Commonwealth Edison Co.  
Licensed Power(MWT): 2.51E+03  
Net Electrical Power(MWH): 5.04E+06  
Initial Criticality: 10/18/71

Unit Number: 2      Type: BWR  
Docket Number: 50-265  
Thermal Power(MWH): 1.01E+07  
Commercial Operation: 03/10/73  
Cooling Water Source: Mississippi River

Licensee: Commonwealth Edison Co.  
Licensed Power(MWT): 2.51E+03  
Net Electrical Power(MWH): 3.11E+06  
Initial Criticality: 04/26/72

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
50	CNSI	Barnwell, SC
5	Raytech	Channahan
10	Kindrick	Quadrex
5	Hittman	SEG

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 3.05E+04 Ci 2.40E+03	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 Ci	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	



Installation: Rancho Seco  
Unit No.: 1

Location: 25 Mi SE Sacramento, CA

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-312  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 04/17/75  
Cooling Water Source: Folsom Canal

Licensee: Sacramento Municipal Utility  
Licensed Power(MWT): 0.00E+00  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 09/16/74

Airborne Effluents

Nuclide Released	Activity (Ci)
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Liquid Effluents

Nuclide Released	Activity (Ci)
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CO-60	9.41E-06
SR-90	1.32E-06
CS-134	1.94E-05
CS-137	3.62E-04

Total Airborne Tritium Released	7.53E+00 Ci
Total Liquid Tritium Released	7.44E+00 Ci
Volume of Waste Released (Prior to Dilution)	1.41E+07 liters
Volume of Dilution Water Used During Period	1.68E+10 liters

Installation: River Bend  
Unit No.: 1

Location: 24 Mi NNW Baton Rouge, LA

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-458  
Thermal Power(MWH): 1.66E+07  
Commercial Operation: 06/16/86  
Cooling Water Source: Mississippi River

Licensee: Gulf States Utilities Co  
Licensed Power(MWT): 2.89E+03  
Net Electrical Power(MWH): 5.26E+06  
Initial Criticality: 10/31/85

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	9.22E-03
CR-51	1.74E-04
MN-54	2.92E-06
CO-60	3.50E-04
KR-85M	1.21E+01
KR-87	1.73E+01
KR-88	1.96E+00
SR-89	3.03E-04
SR-90	9.50E-06
RU-106	7.04E-05
I-131	2.19E-02
I-133	9.85E-02
XE-133	2.53E+02
XE-133M	4.14E+00
XE-135	1.95E+02
XE-135M	9.12E+01
XE-137	4.70E+01
XE-138	7.55E+01
BA-140	4.62E-04

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	4.99E-04
CR-51	2.48E-01
MN-54	4.29E-02
FE-55	1.53E-01
CO-57	5.80E-06
CO-58	1.05E-02
FE-59	1.35E-02
CO-60	1.52E-01
CU-64	1.38E-03
ZN-65	1.02E-02
ZN-69M	2.27E-13
AS-76	2.13E-04
KR-88	4.37E-06
SR-89	5.33E-03
SR-90	3.12E-04
Y-91M	8.27E-06
SR-92	3.76E-05
Y-92	1.78E-03
NB-95	2.69E-03
ZR-95	1.24E-03
NB-97	2.03E-04
MO-99	2.61E-03

Installation: River Bend  
Unit No.: 1

Location: 24 Mi NNW Baton Rouge, LA

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
TC-99M	1.86E-03
TC-101	4.76E-03
RU-103	3.09E-03
RH-105	2.20E-03
RU-105	4.69E-02
RU-106	2.41E-04
CD-109	1.86E-05
AG-110M	2.07E-04
SN-113	1.43E-04
SB-122	3.53E-05
SB-124	1.77E-03
I-131	1.25E-02
XE-131M	7.33E-03
TE-132	1.39E-04
I-133	3.38E-03
XE-133	6.14E-01
XE-133M	2.35E-02
CS-134	2.64E-04
I-135	6.23E-05
XE-135	5.41E-01
XE-135M	4.90E-06
CS-137	2.17E-03
XE-137	3.74E-04
BA-140	1.03E-02
LA-140	1.85E-01
CE-141	1.04E-02
CE-144	1.26E-03
NP-239	3.99E-02

Total Airborne Tritium Released	5.40E+00 Ci
Total Liquid Tritium Released	3.02E+01 Ci
Volume of Waste Released (Prior to Dilution)	3.86E+07 liters
Volume of Dilution Water Used During Period	4.43E+09 liters

Installation: River Bend  
Unit No.: 1

Location: 24 Mi NNW Baton Rouge, LA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR  
Docket Number: 50-458  
Thermal Power(MWH): 1.66E+07  
Commercial Operation: 06/16/86  
Cooling Water Source: Mississippi River

Licensee: Gulf States Utilities Co  
Licensed Power(MWT): 2.89E+03  
Net Electrical Power(MWH): 5.26E+06  
Initial Criticality: 10/31/85

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
75	Truck	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Annual

A

BA/LA-140	5.10E-02
C-14	1.28E-01
CE-141	1.00E-03
CE-144	1.92E-01
CO-58	2.60E+00
CO-60	5.45E+01
CR-51	2.33E-01
CS-134	3.51E+00
CS-137	4.74E+00
FE-55	9.08E+00
FE-59	6.10E-02
H-3	2.40E-02
I-131	5.60E-02
MN-54	1.11E+01
NI-63	5.51E-01
PU-238	4.00E-03
SR-89	9.19E+00
SR-90	9.20E-01
ZN-65	3.04E+00

B

CO-58	1.65E+00
CO-60	2.67E+01
CR-51	8.78E+00
CS-134	1.49E-01
CS-137	2.27E+00
FE-55	4.77E+01
FE-59	5.15E-01
MN-54	5.25E+00
SR-89	3.51E+00
SR-90	1.74E-01
ZN-65	3.31E+00

Installation: River Bend  
Unit No.: 1

Location: 24 Mi NNW Baton Rouge, LA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.08E+02 Ci 1.50E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 5.44E+01 Ci 1.62E+00	
C. Irradiated Components Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: H. B. Robinson  
Unit No.: 2

Location: 4.5 Mi WNW Hartsville, SC

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-261  
Thermal Power(MWH): 1.35E+07  
Commercial Operation: 03/07/71  
Cooling Water Source: Robinson Impoundment

Licensee: Carolina Power & Light  
Licensed Power(MWT): 2.30E+03  
Net Electrical Power(MWH): 4.19E+06  
Initial Criticality: 09/20/70

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	3.30E+00
CR-51	1.45E-05
MN-54	7.06E-07
CO-57	3.74E-08
CO-58	1.74E-05
CO-60	3.29E-05
KR-85	2.45E+01
KR-85M	2.72E-01
KR-87	5.05E-03
KR-88	3.92E-02
NB-95	3.51E-06
ZR-95	1.24E-07
RU-103	6.74E-08
I-131	1.47E-03
XE-131M	1.90E+00
I-133	6.58E-05
XE-133	3.51E+02
XE-133M	2.17E+00
CS-134	5.81E-06
XE-135	1.56E+01
CS-137	1.80E-05

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	1.15E-07
CR-51	3.10E-04
MN-54	2.85E-04
FE-55	9.76E-03
CO-57	4.48E-05
CO-58	2.91E-02
FE-59	8.81E-06
CO-60	1.11E-02
KR-85	4.50E-01
KR-85M	7.35E-08
NB-95	7.07E-05
ZR-95	1.14E-05
RU-103	1.54E-06
AG-110M	3.95E-04
SN-113	6.52E-07
SB-124	2.55E-04
SB-125	2.37E-03
I-131	8.92E-05
XE-131M	3.20E-01
I-133	3.46E-08

Installation: H. B. Robinson  
Unit No.: 2

Location: 4.5 Mi WNW Hartsville, SC

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
XE-133	2.36E+01
XE-133M	1.70E-01
CS-134	3.61E-04
XE-135	3.14E-03
CS-137	4.09E-04
BA-139	2.84E-06
CE-139	1.17E-05
CE-141	4.50E-05
CE-144	9.92E-05

Total Airborne Tritium Released	7.95E+00 Ci
Total Liquid Tritium Released	8.45E+02 Ci
Volume of Waste Released (Prior to Dilution)	5.66E+06 liters
Volume of Dilution Water Used During Period	9.09E+11 liters

Installation: H. B. Robinson  
Unit No.: 2

Location: 4.5 Mi WNW Hartsville, SC

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR	Licensee: Carolina Power & Light
Docket Number: 50-261	Licensed Power(MWT): 2.30E+03
Thermal Power(MWH): 1.35E+07	Net Electrical Power(MWH): 4.19E+06
Commercial Operation: 03/07/71	Initial Criticality: 09/20/70
Cooling Water Source: Robinson Impoundment	

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
73	Sole use vehicle	Barnwell, SC

Irradiated Fuel Shipments (Disposition)

Number of Shipments	Mode of Transportation	Destination
2	Sole use rail	C.P. &L.

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June Jul-Dec

	Jan-June	Jul-Dec
A		
AG-110M	4.79E+00	
CO-58	2.67E+00	
CO-60	5.65E+01	
FE-55	2.50E+01	
MN-54	1.10E+00	
NI-63	8.32E+00	
SB-125	5.79E-01	
Unidentified	1.04E+00	
ZN-65	2.50E-01	
B		
CO-60	7.22E+01	7.20E+01
CS-137		5.93E-01
FE-55	2.35E+01	2.33E+01
H-3	1.40E-01	1.38E-01
NI-63	4.11E+00	4.06E+00
C		
CO-58		1.08E+01
CO-60		1.29E+01
CR-51		1.30E+01
FE-55		5.05E+01
FE-59		1.12E+00
MN-54		8.82E+00
NB-95		9.71E-01
NI-63		6.94E-01
Unidentified		1.21E+00



Installation: H. B. Robinson  
Unit No.: 2

Location: 4.5 Mi WNW Hartsville, SC

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 7.00E+00 Ci 2.40E+01	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 3.68E+01 Ci 7.14E-01	
C. Irradiated Components, Control Rods, etc.	m3 2.12E-01 Ci 1.03E+00	
D. Other (describe)	m3 Ci	

Installation: Salem  
Unit No.: 1

Location: 20 Mi S Wilmington, DE

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-272  
Thermal Power(MWH): 1.86E+07  
Commercial Operation: 06/30/77  
Cooling Water Source: Delaware River

Licensee: PSE&G  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 5.87E+06  
Initial Criticality: 12/11/76

Airborne Effluents

Nuclide Released	Activity (Ci)
CO-58	4.07E-06
CO-60	3.30E-06
KR-85	4.02E+00
KR-85M	8.17E-02
KR-88	1.99E-02
NB-95	1.67E-06
I-131	5.10E-03
XE-131M	3.19E+00
XE-133	1.10E+03
XE-133M	5.12E+00
XE-135	1.06E+01
CS-137	7.04E-07
XE-138	1.03E-02

Liquid Effluents

Nuclide Released	Activity (Ci)
BE-7	8.88E-04
NA-24	6.68E-04
CR-51	5.38E-03
MN-54	3.52E-02
FE-55	6.40E-02
CO-57	1.03E-02
CO-58	1.71E+00
FE-59	4.76E-04
CO-60	3.04E-01
ZN-65	6.72E-04
SR-89	1.79E-03
SR-90	3.88E-04
NB-95	5.78E-03
ZR-95	3.29E-03
NB-97	1.27E-03
MO-99	1.76E-04
TC-99M	2.66E-04
RU-105	2.21E-04
AG-110M	1.19E-02
SN-113	7.88E-05
SB-122	1.21E-03
SB-124	2.08E-02
SB-125	9.04E-02
SB-126	1.38E-04
I-131	1.27E-01
XE-131M	6.30E-03
I-133	2.16E-03
XE-133	1.03E+00

Installation: Salem  
Unit No.: 1

Location: 20 Mi S Wilmington, DE

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
XE-133M	4.47E-03
CS-134	3.54E-01
XE-135	4.56E-03
CS-136	3.61E-03
CS-137	4.53E-01
CS-138	4.15E-06
LA-140	2.12E-04
CE-143	2.71E-05

Total Airborne Tritium Released	6.70E+01 Ci
Total Liquid Tritium Released	3.93E+02 Ci
Volume of Waste Released (Prior to Dilution)	7.14E+06 liters
Volume of Dilution Water Used During Period	1.54E+12 liters

Installation: Salem  
Unit No.: 2

Location: 20 Mi S Wilmington, DE

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-311  
Thermal Power(MWH): 1.74E+07  
Commercial Operation: 10/13/81  
Cooling Water Source: Delaware River

Licensee: PSE&G  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 5.54E+06  
Initial Criticality: 08/08/80

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	1.53E-03
CO-58	8.09E-06
KR-85	1.20E+00
KR-85M	3.13E-01
KR-88	7.57E-02
I-131	1.12E-03
XE-131M	3.54E+00
XE-133	3.29E+02
XE-133M	1.62E+00
XE-135	6.40E+00

Liquid Effluents

Nuclide Released	Activity (Ci)
BE-7	1.59E-03
NA-24	1.05E-03
CR-51	4.39E-03
MN-54	3.73E-02
FE-55	6.61E-02
CO-57	1.17E-02
CO-58	1.75E+00
FE-59	4.83E-04
CO-60	3.47E-01
ZN-65	1.59E-04
SR-89	1.95E-03
SR-90	5.88E-04
NB-95	3.97E-03
ZR-95	2.34E-03
NB-97	1.46E-03
TC-99M	3.77E-04
RU-105	4.07E-05
AG-110M	1.03E-02
SN-113	7.45E-05
SB-122	1.20E-03
SB-124	3.77E-02
SB-125	1.35E-01
SB-126	3.51E-04
I-131	1.87E-01
XE-131M	6.19E-03
I-132	8.72E-05
I-133	2.39E-03
XE-133	1.26E+00
XE-133M	3.39E-03
CS-134	4.57E-01
XE-135	9.04E-03

Installation: Salem  
Unit No.: 2

Location: 20 Mi S Wilmington, DE

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
CS-136	4.82E-03
CS-137	5.70E-01
CS-138	1.65E-02
BA-140	1.66E-04
LA-140	2.03E-03

Total Airborne Tritium Released	1.02E+02 Ci
Total Liquid Tritium Released	5.08E+02 Ci
Volume of Waste Released (Prior to Dilution)	7.93E+06 liters
Volume of Dilution Water Used During Period	1.14E+12 liters

Installation: Salem  
Unit No.: 1&2

Location: 20 Mi S Wilmington, DE

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-272  
Thermal Power(MWH): 1.86E+07  
Commercial Operation: 06/30/77  
Cooling Water Source: Delaware River

Licensee: PSE&G  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 5.87E+06  
Initial Criticality: 12/11/76

Unit Number: 2      Type: PWR  
Docket Number: 50-311  
Thermal Power(MWH): 1.74E+07  
Commercial Operation: 10/13/81  
Cooling Water Source: Delaware River

Licensee: PSE&G  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 5.54E+06  
Initial Criticality: 08/08/80

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
4	Truck	Barnwell, SC
14	Truck	Ork Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June      Jul-Dec

A

C-14		1.40E+00
CD-109		3.10E+00
CO-58		1.50E+00
CO-60		1.49E+01
CS-134		2.27E+01
CS-137		2.34E+01
FE-55		1.62E+01
MN-54		2.70E+00
NI-63		1.36E+01

B

CO-58	2.41E+01	3.44E+01
CO-60	1.16E+01	1.55E+01
CS-134	2.30E+00	
CS-137	3.40E+00	
FE-55	4.16E+01	4.51E+01
MN-54	1.00E+00	1.00E+00
NB-95		1.10E+00
NI-63	1.15E+01	2.30E+00
SB-125	1.40E+00	

Installation: Salem  
Unit No.: 1&2

Location: 20 Mi S Wilmington, DE

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.41E+01 Ci 4.60E+01	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 4.21E+01 Ci 4.42E+00	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: San Onofre  
Unit No.: 1

Location: 2.5 Mi S San Clemente, CA

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-206  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 01/01/68  
Cooling Water Source: Pacific Ocean

Licensee: Southern California Edison Co.  
Licensed Power(MWT): 1.35E+03  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 06/14/67

Airborne Effluents

Nuclide Released	Activity (Ci)
CO-57	1.76E-08
CO-58	1.93E-07
CO-60	1.37E-07
KR-85	2.83E+02
NB-95M	6.73E-07
I-131	2.94E-04
XE-131M	2.63E+00
XE-133	1.34E+02
CS-134	2.36E-07
CS-137	6.28E-06

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	6.93E-04
MN-54	1.99E-03
FE-55	4.88E-02
CO-57	9.68E-05
CO-58	2.27E-02
FE-59	8.10E-04
CO-60	5.07E-02
ZN-65	7.19E-05
KR-85	3.66E-05
SR-89	1.36E-04
SR-90	1.91E-04
SR-92	3.88E-04
NB-95	5.97E-04
NB-95M	5.02E-07
ZR-95	2.84E-04
NB-97	1.42E-05
RU-103	3.86E-04
RU-106	3.21E-03
AG-110M	2.87E-03
SN-117M	1.57E-04
SB-124	4.84E-04
SB-125	2.32E-04
I-131	9.55E-05
XE-131M	7.75E-02
CS-134	4.69E-01
CS-137	5.32E-01
CE-141	9.22E-05
CE-144	4.10E-03



Installation: San Onofre  
Unit No.: 1

Location: 2.5 Mi S San Clemente, CA

Effluent and Waste Disposal Annual Report for 1993

Total Airborne Tritium Released	1.19E+01 Ci
Total Liquid Tritium Released	4.45E+02 Ci
Volume of Waste Released (Prior to Dilution)	3.09E+06 liters
Volume of Dilution Water Used During Period	1.42E+11 liters

Installation: San Onofre  
Unit No.: 1

Location: 2.5 Mi S San Clemente, CA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR  
Docket Number: 50-206  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 01/01/68  
Cooling Water Source: Pacific Ocean

Licensee: Southern California Edison Co.  
Licensed Power(MWT): 1.35E+03  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 06/14/67

Estimate of Major Nuclide Composition ( % ) % (by type of waste)	Annual
A	
C-14	5.47E-03
CO-58	5.24E+00
CO-60	5.16E+00
CS-134	4.13E+01
CS-137	4.39E+01
FE-55	2.43E+00
H-3	1.83E-03
I-129	1.24E-05
MN-54	7.61E-02
NI-63	1.87E+00
PU-241	1.96E-02
SR-90	4.74E-02
TC-99	1.20E-05

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.85E+01 Ci 6.39E+03	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 Ci	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: San Onofre  
Unit No.: 2&3

Location: 2.5 Mi S San Clemente, CA

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 2      Type: PWR  
Docket Number: 50-361  
Thermal Power(MWH): 2.38E+07  
Commercial Operation: 08/08/83  
Cooling Water Source: Pacific Ocean  
Unit Number: 3      Type: PWR  
Docket Number: 50-362  
Thermal Power(MWH): 2.20E+07  
Commercial Operation: 04/01/84  
Cooling Water Source: Pacific Ocean

Licensee: Southern California Edison Co.  
Licensed Power(MWT): 3.39E+03  
Net Electrical Power(MWH): 7.65E+06  
Initial Criticality: 07/26/82  
Licensee: Southern California Edison Co.  
Licensed Power(MWT): 3.39E+03  
Net Electrical Power(MWH): 7.12E+06  
Initial Criticality: 08/29/83

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	2.10E+01
CR-51	9.45E-05
MN-54	1.20E-05
CO-57	2.16E-06
CO-58	1.56E-03
FE-59	4.71E-07
CO-60	7.93E-05
ZN-65	4.93E-07
BR-82	1.75E-04
KR-85	1.19E+01
KR-85M	6.29E+00
KR-87	3.73E+00
KR-88	9.47E+00
RB-88	7.46E-01
RB-89	3.75E-02
SR-89	7.45E-06
SR-90	3.80E-09
SR-92	6.92E-07
Y-92	9.12E-05
NB-95	3.57E-05
NB-95M	2.11E-07
ZR-95	6.26E-06
NB-97	1.95E-07
MO-99	6.27E-08
TC-99M	6.40E-08
SN-113	2.24E-07
SB-125	6.36E-06
I-131	4.80E-02
XE-131M	3.43E+00
I-132	6.87E-03
TE-132	2.76E-06
I-133	1.06E-02
XE-133	1.42E+03
XE-133M	4.87E+00
CS-134	2.44E-05
I-134	1.59E-03

Effluent and Waste Disposal Annual Report for 1993

Airborne Effluents (continued)

Nuclide Released	Activity (Ci)
I-135	4.97E-03
XE-135	4.20E+01
XE-135M	1.70E+01
CS-137	3.35E-05
CS-138	2.68E-01
XE-138	4.29E+00
EA-139	3.25E-03
EA-140	1.36E-07
LA-140	8.12E-10
CE-141	1.77E-08
CE-143	1.31E-07
CE-144	5.34E-06

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	2.59E-02
MN-54	4.42E-03
FE-55	2.70E-02
CO-57	3.22E-04
CO-58	7.67E-02
FE-59	1.61E-03
CO-60	2.91E-02
ZN-65	5.82E-05
KR-85	1.05E-01
KR-85M	1.38E-05
KR-88	2.59E-05
SR-89	4.12E-03
SR-90	1.68E-04
SR-92	9.29E-05
NB-95	1.25E-02
ZR-95	6.75E-03
NB-97	3.46E-03
ZR-97	1.63E-04
MO-99	1.05E-04
TC-99M	1.07E-04
RU-103	4.15E-04
RU-106	2.05E-04
AG-110M	4.98E-03
SN-113	8.59E-04
SN-117M	1.80E-05
SB-124	9.22E-04
SB-125	2.02E-02
I-131	8.01E-03
XE-131M	4.05E-02
I-133	2.51E-03
XE-133	1.11E+00
XE-133M	6.11E-03
CS-134	2.17E-02
I-135	6.46E-04
XE-135	5.91E-03
CS-136	4.06E-04

Installation: San Onofre  
Unit No.: 2&3

Location: 2.5 Mi S San Clemente, CA

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
CS-137	3.86E-02
BA-140	1.94E-04
LA-140	2.47E-04
CE-141	1.34E-04
CE-144	6.69E-04
W-187	3.93E-04

Total Airborne Tritium Released	5.01E+01 Ci
Total Liquid Tritium Released	9.78E+02 Ci
Volume of Waste Released (Prior to Dilution)	7.28E+07 liters
Volume of Dilution Water Used During Period	2.66E+12 liters

Installation: San Onofre  
Unit No.: 1&2&3

Location: 2.5 Mi S San Clemente, CA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-206  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 01/01/68  
Cooling Water Source: Pacific Ocean

Licensee: Southern California Edison Co.  
Licensed Power(MWT): 1.35E+03  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 06/14/67

Unit Number: 2      Type: PWR  
Docket Number: 50-361  
Thermal Power(MWH): 2.38E+07  
Commercial Operation: 08/08/83  
Cooling Water Source: Pacific Ocean

Licensee: Southern California Edison Co.  
Licensed Power(MWT): 3.39E+03  
Net Electrical Power(MWH): 7.65E+06  
Initial Criticality: 07/26/82

Unit Number: 3      Type: PWR  
Docket Number: 50-362  
Thermal Power(MWH): 2.20E+07  
Commercial Operation: 04/01/84  
Cooling Water Source: Pacific Ocean

Licensee: Southern California Edison Co.  
Licensed Power(MWT): 3.39E+03  
Net Electrical Power(MWH): 7.12E+06  
Initial Criticality: 08/29/83

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
6	Truck/Cask	Barnwell, SC
93	Truck/Trailer	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

B

C-14	2.01E+00
CO-58	2.58E+00
CO-60	7.06E+00
CS-134	7.78E+00
CS-137	3.01E+01
FE-55	3.90E+01
H-3	1.86E+00
I-129	5.96E-03
MN-54	1.89E-01
NI-63	7.86E+00
PU-241	1.31E+00
SB-125	1.63E-01
SR-90	2.89E-02
TC-99	8.55E-04

D

C-14	4.39E+00
CO-58	2.16E+01
CO-60	9.79E+00
CR-51	2.46E+00
CS-137	3.82E-01
FE-55	4.81E+01
H-3	1.08E-01
I-129	6.65E-04
MN-54	1.81E+00

Installation: San Onofre  
Unit No.: 1&2&3

Location: 2.5 Mi S San Clemente, CA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued) Jan-June July-Dec  
(by type of waste)

D		
	NB-95	1.22E+00
	NI-63	7.10E+00
	PU-241	1.74E-01
	SB-125	1.14E+00
	SR-90	2.57E-02
	TC-99	5.16E-04
	ZR-95	1.83E+00

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 Ci	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 7.18E+01 Ci 8.74E+00	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe) Filters	m3 2.12E+00 Ci 3.87E+01	

Installation: Seabrook  
Unit No.: 1

Location: 13 Mi S Portsmouth, NH

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-443  
Thermal Power(MWH): 2.69E+07  
Commercial Operation: 08/19/90  
Cooling Water Source: Atlantic Ocean

Licensee: North Atlantic  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 9.05E+06  
Initial Criticality: 06/13/89

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	2.23E-02
MN-54	6.03E-08
CO-58	6.00E-07
KR-85M	2.23E-03
KR-87	6.32E-03
KR-88	5.77E-03
XE-133	2.02E-02
XE-133M	1.83E-04
XE-135	1.81E-02
XE-135M	1.55E-02
XE-138	1.87E-02

Liquid Effluents

Nuclide Released	Activity (Ci)
BE-7	1.17E-04
NA-24	2.05E-05
CR-51	1.65E-04
MN-54	1.03E-03
FE-55	6.77E-02
CO-58	9.93E-03
FE-59	7.27E-04
CO-60	2.01E-03
BR-82	1.10E-04
ZR/NB-95	3.75E-05
NB-97	2.23E-05
TC-99M	3.44E-05
SB-124	7.14E-04
SB-125	8.83E-03
I-131	1.41E-04
I-133	1.18E-04
XE-135	1.17E-05
CS-137	3.30E-05

Total Airborne Tritium Released	6.33E-01 Ci
Total Liquid Tritium Released	5.63E+02 Ci
Volume of Waste Released (Prior to Dilution)	1.68E+08 liters
Volume of Dilution Water Used During Period	7.90E+11 liters



Installation: Sequoyah  
Unit No.: 1&2

Location: Daisy, TN

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: PWR  
Docket Number: 50-327  
Thermal Power(MWH): 3.92E+06  
Commercial Operation: 07/01/81  
Cooling Water Source: Chickamauga Lake  
Unit Number: 2      Type: PWR  
Docket Number: 50-328  
Thermal Power(MWH): 6.58E+06  
Commercial Operation: 06/01/82  
Cooling Water Source: Chickamauga Lake

Licensee: Tennessee Valley Authority  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 1.24E+06  
Initial Criticality: 07/05/80  
Licensee: Tennessee Valley Authority  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 2.06E+06  
Initial Criticality: 11/05/81

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	1.78E+00
MN-54	5.98E-08
CO-58	4.40E-06
CO-60	7.76E-06
KR-85	2.02E-01
KR-85M	4.23E-02
KR-87	2.94E-03
KR-88	2.46E-02
I-131	1.93E-06
XE-131M	1.61E-01
I-133	1.15E-06
XE-133	7.26E+01
XE-133M	2.36E-01
XE-135	1.98E+00
XE-135M	1.66E-02

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	2.46E-04
CR-51	1.58E-02
MN-54	1.38E-02
FE-55	1.67E-01
CO-57	3.73E-03
CO-58	4.73E-01
FE-59	2.04E-03
CO-60	1.76E-01
NI-65	1.51E-05
ZN-65	6.01E-02
ZN-69M	3.94E-06
KR-85	3.70E-03
KR-88	1.45E-05
SR-89	3.53E-04
SR-90	2.86E-04
SR-91	2.34E-05
Y-91	7.58E-03
Y-91M	2.07E-05
SR-92	5.39E-04
NB-95	5.65E-03
ZR-95	2.10E-03

Installation: Sequoyah  
Unit No.: 1&2

Location: Daisy, TN

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
NB-97	1.26E-03
MO-99	1.74E-05
TC-99M	1.74E-05
RU-103	2.12E-04
AG-110M	3.23E-03
SB-124	3.70E-02
SB-125	3.14E-01
TE-129M	2.03E-03
I-131	9.68E-04
XE-131M	5.62E-05
TE-132	1.46E-04
I-133	1.45E-05
XE-133	8.37E-02
XE-133M	1.16E-03
CS-134	8.61E-02
XE-135	2.94E-03
CS-136	1.16E-04
CS-137	1.44E-01
CS-138	3.23E-04
BA-140	9.60E-05
LA-140	1.32E-04
CE-144	1.64E-03

Total Airborne Tritium Released	3.96E+01 Ci
Total Liquid Tritium Released	5.60E+02 Ci
Volume of Waste Released (Prior to Dilution)	1.08E+07 liters
Volume of Dilution Water Used During Period	1.88E+09 liters

Installation: Sequoyah  
Unit No.: 1&2

Location: Daisy, TN

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-327  
Thermal Power(MWH): 3.92E+06  
Commercial Operation: 07/01/81  
Cooling Water Source: Chickamauga Lake

Licensee: Tennessee Valley Authority  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 1.24E+06  
Initial Criticality: 07/05/80

Unit Number: 2      Type: PWR  
Docket Number: 50-328  
Thermal Power(MWH): 6.58E+06  
Commercial Operation: 06/01/82  
Cooling Water Source: Chickamauga Lake

Licensee: Tennessee Valley Authority  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 2.06E+06  
Initial Criticality: 11/05/81

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
68	Motor Freight	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Annual

A		
	CO-58	4.12E+00
	CO-60	3.74E+01
	CS-134	2.82E+00
	CS-137	5.11E+00
	FE-55	2.00E+01
	MN-54	1.79E+00
	NI-63	2.57E+01
	SB-125	1.36E+00
B		
	BA/LA-140	1.46E+00
	BE-7	2.07E+00
	CO-58	3.06E+01
	CO-60	1.31E+01
	CR-51	9.71E+00
	CS-134	2.86E+00
	CS-137	3.74E+00
	FE-55	2.25E+01
	MN-54	1.91E+00
	NB-95	4.66E+00
	NI-63	3.71E+00
	ZR-95	2.83E+00
D		
	CO-58	9.74E+00
	CO-60	1.22E+01
	CR-51	1.03E+00
	FE-55	5.86E+01
	MN-54	4.49E+00
	NI-63	1.08E+01

Installation: Sequoyah  
Unit No.: 1&2

Location: Daisy, TN

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.08E+01 Ci 1.70E+01	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 3.80E+01 Ci 6.68E+00	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe) Mechanical Filters Floor Drain Media	m3 5.86E+00 Ci 6.26E+01	

Installation: Shoreham  
Unit No.: 1

Location: Brookhaven, NY

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-322  
Thermal Power(MWH): 0.00E+00  
Commercial Operation:  
Cooling Water Source: Long Island Sound

Licensee: Long Island Power Authority  
Licensed Power(MWT): 2.44E+02  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 02/15/85

Liquid Effluents

Nuclide Released	Activity (Ci)	
FE-55	1.13E-08	
CO-60	1.33E-06	
SR-89	2.46E-05	
Volume of Waste Released (Prior to Dilution)		6.66E+06 liters
Volume of Dilution Water Used During Period		4.92E+08 liters

Installation: Shoreham  
Unit No.: 1

Location: Brookhaven, NY

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR  
Docket Number: 50-322  
Thermal Power(MWH): 0.00E+00  
Commercial Operation:  
Cooling Water Source: Long Island Sound

Licensee: Long Island Power Authority  
Licensed Power(MWT): 2.44E+02  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 02/15/85

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
1	Truck	Barnwell, SC
6	Truck	SEG, Oak Ridge, TN

Irradiated Fuel Shipments (Disposition)

Number of Shipments	Mode of Transportation	Destination
18	Barge/Train	Limerick Generat. Station/PA

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

	Annual
A	
CO-60	5.80E+00
FE-55	5.96E+01
NI-63	3.31E+01
ZN-65	1.50E+00
B	
CO-60	1.87E+01
FE-55	1.40E+01
NI-63	6.51E+01
ZN-65	2.20E+00
C	
CO-60	4.76E+01
FE-55	4.91E+01
NI-63	2.70E+00

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 3.16E+01 Ci 7.68E-01	Non-compacted
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 1.20E+02 Ci 8.51E-02	Non-compacted
C. Irradiated Components, Control Rods, etc.	m3 4.10E-01 Ci 1.90E+02	Burial Volume
D. Other (describe)	m3 Ci	

Installation: South Texas  
Unit No.: 1

Location: 12 Mi SSW Bay City, TX

Effluent and Waste Disposal Annual Report for 1993

Type: PWR

Docket Number: 50-498

Thermal Power(MWH): 2.08E+06

Commercial Operation: 08/24/88

Cooling Water Source: Main Cooling Reservoir

Licensee: Houston Lighting & Power

Licensed Power(MWT): 3.80E+03

Net Electrical Power(MWH): 6.66E+05

Initial Criticality: 03/08/88

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	5.77E-02
CO-60	4.84E-05
XE-133	2.41E+01

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	4.94E-06
CR-51	1.20E-02
MN-54	2.01E-02
FE-55	1.45E-01
CO-57	2.49E-03
CO-58	2.10E-01
FE-59	2.08E-03
CO-60	1.07E-01
ZN-65	3.89E-04
NB-95	1.02E-02
ZR-95	4.50E-03
NB-97	6.92E-05
ZR-97	4.59E-05
MO-99	9.59E-07
TC-99M	9.76E-07
AG-110M	6.67E-03
SN-113	4.24E-04
SB-124	5.03E-03
SB-125	3.16E-02
TE-125M	8.88E-03
TE-129	2.44E-05
I-131	6.21E-06
XE-133	6.57E-03
XE-133M	9.88E-05
CS-134	2.72E-03
XE-135	2.56E-04
CS-137	4.12E-03
Unidentified	1.11E-04

Total Airborne Tritium Released	8.15E+00 Ci
Total Liquid Tritium Released	1.13E+02 Ci
Volume of Waste Released (Prior to Dilution)	1.76E+07 liters
Volume of Dilution Water Used During Period	2.14E+10 liters

Installation: South Texas  
Unit No.: 2

Location: 12 Mi SSW Bay City, TX

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-499  
Thermal Power(MWH): 2.23E+06  
Commercial Operation: 06/19/89  
Cooling Water Source: Main Cooling Reservoir

Licensee: Houston Lighting & Power  
Licensed Power(MWT): 3.80E+03  
Net Electrical Power(MWH): 6.90E+05  
Initial Criticality: 03/12/89

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	4.25E-02
CR-51	8.70E-05
MN-54	1.59E-05
CO-57	1.07E-06
CO-58	1.57E-04
FE-59	1.00E-05
CO-60	1.89E-04
NB-95	1.23E-05
ZR-95	8.66E-06
I-131	5.15E-06
I-133	7.89E-07
XE-133	1.78E+01
XE-133M	1.26E-03
XE-135	4.81E-04

Liquid Effluents

Nuclide Released	Activity (Ci)
AR-41	3.06E-05
CR-51	2.43E-03
MN-54	1.33E-02
FE-55	1.55E-01
CO-57	6.32E-04
CO-58	3.62E-02
FE-59	7.76E-04
CO-60	7.47E-02
ZN-65	1.54E-04
KR-85	8.73E-04
KR-85M	2.19E-04
KR-88	1.22E-05
NB-95	3.28E-04
ZR-95	6.75E-05
NB-97	5.05E-05
AG-110M	3.27E-03
SN-113	2.61E-05
SB-124	6.13E-04
SB-125	4.96E-03
XE-131M	6.57E-03
XE-133	1.07E+00
XE-133M	1.81E-02
CS-134	7.02E-04
XE-135	3.02E-02
CS-137	1.32E-03
Unidentified	1.16E-05



Installation: South Texas  
Unit No.: 2

Location: 12 Mi SSW Bay City, TX

Effluent and Waste Disposal Annual Report for 1993

Total Airborne Tritium Released	6.46E+00 Ci
Total Liquid Tritium Released	1.13E+02 Ci
Volume of Waste Released (Prior to Dilution)	1.62E+07 liters
Volume of Dilution Water Used During Period	1.56E+10 liters

Installation: South Texas  
Unit No.: 1&2

Location: 12 Mi SSW Bay City, TX

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR      Licensee: Houston Lighting & Power  
Docket Number: 50-498      Licensed Power(MWT): 3.80E+03  
Thermal Power(MWH): 2.08E+06      Net Electrical Power(MWH): 6.66E+05  
Commercial Operation: 08/24/88      Initial Criticality: 03/08/88  
Cooling Water Source: Main Cooling Reservoir

Unit Number: 2      Type: PWR      Licensee: Houston Lighting & Power  
Docket Number: 50-499      Licensed Power(MWT): 3.80E+03  
Thermal Power(MWH): 2.23E+06      Net Electrical Power(MWH): 6.90E+05  
Commercial Operation: 06/19/89      Initial Criticality: 03/12/89  
Cooling Water Source: Main Cooling Reservoir

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
7	Truck	CNSI, Barnwell, SC
1	Truck	Quadrex, Oak Ridge, TN
13	Truck	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

	Annual
A	
CO-58	2.06E+00
CO-60	8.30E+00
FE-55	6.87E+01
NI-63	2.01E+01
B	
CO-58	6.80E+00
CO-60	1.15E+01
CR-51	5.17E+00
FE-55	6.45E+01
NI-63	6.24E+00
C	
CO-60	2.08E+01
FE-55	7.13E+01
MN-54	5.17E+00
NI-63	2.77E+00

Installation: South Texas  
Unit No.: 1&2

Location: 12 Mi SSW Bay City, TX

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 2.77E+01 Ci 4.23E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 2.79E+01 Ci 1.53E+00	
C. Irradiated Components, Control Rods, etc.	m3 6.20E-01 Ci 5.88E+03	
D. Other (describe)	m3 Ci	

Installation: St. Lucie  
Unit No.: 1

Location: 8 Mi S Ft. Pierce, FL

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-335  
Thermal Power(MWH): 2.26E+07  
Commercial Operation: 12/21/76  
Cooling Water Source: Atlantic Ocean

Licensee: Florida Power & Light  
Licensed Power(MWT): 2.70E+03  
Net Electrical Power(MWH): 7.14E+06  
Initial Criticality: 04/22/76

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	7.61E-01
CO-60	6.49E-05
KR-85	1.98E+01
KR-85M	5.91E-01
KR-87	1.07E-02
KR-88	2.41E-01
SR-90	1.13E-06
Y-90	1.13E-06
MO-99	5.40E-05
I-131	1.99E-03
XE-131M	5.50E-01
I-132	1.33E-02
I-133	2.84E-03
XE-133	2.07E+02
XE-133M	3.44E+00
CS-134	9.15E-06
XE-135	2.83E+01
XE-135M	1.50E-03
CS-137	1.07E-05

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	8.49E-04
AR-41	4.85E-05
CR-51	7.29E-02
MN-54	6.06E-03
FE-55	2.80E-01
CO-57	1.24E-04
CO-58	8.02E-02
FE-59	3.33E-03
CO-60	5.43E-02
KR-85	7.32E-03
KR-85M	2.72E-05
RB-88	1.94E-04
SR-89	6.36E-04
SR-90	9.16E-04
Y-90	9.16E-04
SR-91	7.27E-05
NB-95	3.04E-02
ZR-95	1.75E-02
NB-97	6.21E-03
TC-99M	3.78E-05
RU-103	3.40E-04
AG-110	5.47E-03

Installation: St. Lucie  
Unit No.: 1

Location: 8 Mi S Ft. Pierce, FL

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
SN-113	1.69E-03
SB-122	2.25E-03
SB-124	3.45E-02
SE-125	7.62E-02
TE-129	1.44E-03
TE-129M	3.07E-04
I-131	1.56E-03
XE-131M	2.00E-03
I-132	1.28E-04
TE-132	9.07E-05
I-133	6.28E-04
XE-133	5.02E-01
XE-133M	7.21E-03
CS-134	2.89E-02
I-135	1.34E-04
XE-135	6.47E-03
XE-135M	5.63E-05
CS-136	1.02E-04
CS-137	4.39E-02
CS-138	2.17E-04
BA-140	3.68E-05
LA-140	1.08E-03
CE-144	4.78E-04
W-187	1.13E-03
NP-239	5.49E-05

Total Airborne Tritium Released	1.60E+01 Ci
Total Liquid Tritium Released	2.58E+02 Ci
Volume of Waste Released (Prior to Dilution)	5.71E+06 liters
Volume of Dilution Water Used During Period	1.73E+12 liters

Installation: St. Lucie  
Unit No.: 2

Location: 8 Mi S Ft. Pierce, FL

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-389  
Thermal Power(MWH): 1.73E+07  
Commercial Operation: 08/08/83  
Cooling Water Source: Atlantic Ocean

Licensee: Florida Power & Light  
Licensed Power(MWT): 2.70E+03  
Net Electrical Power(MWH): 5.43E+06  
Initial Criticality: 06/02/83

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	1.56E+00
CO-60	2.19E-05
KR-85	8.83E-02
KR-85M	2.41E-01
KR-87	8.66E-03
KR-88	9.23E-02
SR-90	4.96E-08
Y-90	4.96E-08
I-131	4.71E-04
XE-131M	1.12E-01
I-132	6.34E-04
I-133	4.08E-03
XE-133	6.38E+01
XE-133M	5.13E-01
I-135	1.40E-03
XE-135	1.96E+01
CS-136	2.57E-06
CS-137	1.01E-05

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	8.49E-04
AR-41	4.85E-05
CR-51	6.37E-02
MN-54	5.71E-03
FE-55	2.42E-01
CO-57	1.24E-04
CO-58	7.43E-02
FE-59	2.82E-03
CO-60	4.99E-02
KR-85	7.32E-03
KR-85M	2.72E-05
RE-88	1.94E-04
SR-89	5.77E-04
SR-90	9.13E-04
Y-90	9.13E-04
SR-91	7.27E-05
ZR-95	1.32E-02
NB-95	2.66E-02
ZR-95	2.31E-03
NB-97	6.21E-03
TC-99M	3.78E-05
RU-103	3.17E-04
AG-110	5.37E-03

Installation: St. Lucie  
Unit No.: 2

Location: 8 Mi S Ft. Pierce, FL

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
SN-113	1.47E-03
SB-122	2.25E-03
SB-124	3.31E-02
SB-125	7.38E-02
TE-129	1.44E-03
TE-129M	3.07E-04
I-131	1.56E-03
XE-131M	2.00E-03
I-132	1.28E-04
TE-132	9.07E-05
I-133	6.28E-04
XE-133	5.02E-01
XE-133M	7.21E-03
CS-134	2.56E-02
I-135	1.34E-04
XE-135	6.47E-03
XE-135M	5.63E-05
CS-136	1.02E-04
CS-137	3.89E-02
CS-138	2.17E-04
BA-140	3.68E-05
LA-140	1.08E-03
CE-144	4.78E-04
W-187	1.13E-03
NP-239	5.49E-05

Total Airborne Tritium Released	8.96E+00 Ci
Total Liquid Tritium Released	2.51E+02 Ci
Volume of Waste Released (Prior to Dilution)	5.50E+06 liters
Volume of Dilution Water Used During Period	1.73E+12 liters

Installation: St. Lucie  
Unit No.: 1&2

Location: 8 Mi S Ft. Pierce, FL

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-335  
Thermal Power(MWH): 2.26E+07  
Commercial Operation: 12/21/76  
Cooling Water Source: Atlantic Ocean

Licensee: Florida Power & Light  
Licensed Power(MWT): 2.70E+03  
Net Electrical Power(MWH): 7.14E+06  
Initial Criticality: 04/22/76

Unit Number: 2      Type: PWR  
Docket Number: 50-389  
Thermal Power(MWH): 1.73E+07  
Commercial Operation: 08/08/83  
Cooling Water Source: Atlantic Ocean

Licensee: Florida Power & Light  
Licensed Power(MWT): 2.70E+03  
Net Electrical Power(MWH): 5.43E+06  
Initial Criticality: 06/02/83

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
12	Truck	Barnwell, SC
5	Truck	Quadrex, Oak Ridge, TN
9	Truck	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June      Jul-Dec

A

BE-7		1.81E+00
CO-58	4.48E+01	4.89E+00
CO-60	3.85E+00	1.75E+01
CR-51		9.90E-01
CS-134	9.43E+00	1.19E+01
CS-137	1.76E+01	1.31E+01
FE-55	1.42E+01	3.49E+01
I-131	1.18E+00	1.42E+00
MN-54	2.58E+00	2.28E+00
NB-95		1.08E+00
NI-63	5.08E+00	7.45E+00
SB-125		7.70E-01
ZR-95		7.70E-01

B

AG-110M		1.66E+00
C-14		1.14E+00
CO-58	1.52E+01	4.39E+00
CO-60	2.52E+01	2.93E+01
CR-51	8.10E-01	
CS-134	3.10E+00	5.74E+00
CS-137	1.20E+01	1.58E+01
FE-55	2.40E+01	2.56E+01
MN-54	1.20E+00	1.66E+00
NB-95	2.47E+00	
NI-63	1.03E+01	1.17E+01
SB-125	1.94E+00	2.14E+00
ZR-95	2.05E+00	



Installation: St. Lucie  
 Unit No.: 1&2

Location: 8 Mi S Ft. Pierce, FL

Effluent and Waste Disposal Annual Report for 1993  
 Solid Effluents

Estimate of Major Nuclide Composition ( %) (continued) Jan-June July-Dec  
 (by type of waste)

	Jan-June	July-Dec
C		
CO-58	1.18E+00	
CO-60	3.53E+01	
FE-55	5.52E+01	
MN-54	5.72E+00	
NI-63	2.50E+00	
D		
C-14		1.13E+00
CE-144	9.70E-01	
CO-58	4.85E+00	7.09E+00
CO-60	6.57E+01	2.96E+01
CS-134		3.01E+00
CS-137	7.50E-01	6.72E+00
FE-55	2.21E+01	4.16E+01
MN-54	8.70E-01	
NB-95		1.84E+00
NI-63	2.81E+00	1.18E+01

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 4.32E+01 Ci 4.77E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 4.11E+01 Ci 1.81E+01	
C. Irradiated Components, Control Rods, etc.	m3 1.64E+00 Ci 1.19E+04	
D. Other (describe)		
Non-Compressible Metal	m3 2.11E+00 Ci 2.45E-01	

Installation: Summer  
Unit No.: 1

Location: 26 Mi NW Columbia, SC

Effluent and Waste Disposal Annual Report for 1993

Type: PWR

Licensee: South Carolina Electric & Gas  
Co.

Docket Number: 50-395

Licensed Power(MWT): 2.77E+03

Thermal Power(MWE): 1.92E+07

Net Electrical Power(MWH): 6.10E+06

Commercial Operation: 01/01/84

Initial Criticality: 10/22/82

Cooling Water Source: Monticello Reservoir

Airborne Effluents

Nuclide Released	Activity (Ci)
NA-24	3.02E-06
AR-41	5.97E-01
CR-51	1.60E-05
MN-54	1.82E-06
CO-58	2.12E-05
CO-60	1.04E-05
BR-82	2.13E-06
KR-85	2.05E+00
KR-85M	1.40E-01
KR-87	2.34E-03
KR-88	9.03E-02
RB-88	5.16E-04
NB-95	4.33E-06
ZR-95	1.43E-05
MO-99	7.10E-06
TC-99M	1.25E-06
I-131	4.26E-03
XE-131M	8.58E-01
I-132	2.87E-04
I-133	1.40E-03
XE-133	2.29E+02
XE-133M	2.62E+00
CS-134	2.19E-05
I-135	1.73E-04
XE-135	7.95E+00
XE-135M	1.81E-03
CS-136	9.07E-06
CS-137	2.87E-05
XE-138	4.14E-03
BA/LA-140	4.16E-06

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	7.83E-03
AR-41	2.14E-06
CR-51	1.98E-02
MN-54	7.83E-03
FE-55	9.59E-03
CO-57	2.05E-04
CO-58	3.25E-02
FE-59	3.09E-03
CO-60	4.07E-02
ZN-65	2.63E-04

Installation: Summer  
Unit No.: 1

Location: 26 Mi NW Columbia, SC

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
KR-85	1.76E-03
KR-85M	6.48E-04
KR-88	4.66E-05
RB-88	1.71E-04
SR-89	7.65E-06
SR-90	2.13E-05
ZR/NB-95	7.75E-03
TC-99M	6.76E-03
RU-103	1.31E-04
RU-106	3.16E-04
AG-110M	6.99E-04
SN-113	2.00E-04
SN-117M	1.18E-05
SB-122	5.69E-06
SB-124	1.25E-03
SB-125	1.51E-02
SB-126	4.27E-06
I-131	7.11E-03
XE-131M	3.01E-02
I-132	9.94E-04
TE-132	2.35E-05
I-133	1.35E-02
XE-133	2.73E+00
XE-133M	2.51E-02
CS-134	1.55E-03
I-134	7.33E-04
I-135	1.01E-02
XE-135	1.89E-02
CS-136	5.64E-05
CS-137	3.33E-03
CS-138	1.01E-03
BA/LA-140	1.07E-04
CE-144	5.87E-05

Total Airborne Tritium Released	2.24E+00 Ci
Total Liquid Tritium Released	4.79E+02 Ci
Volume of Waste Released (Prior to Dilution)	1.14E+08 liters
Volume of Dilution Water Used During Period	1.41E+12 liters

Installation: Summer  
Unit No.: 1

Location: 26 Mi NW Columbia, SC

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR

Licensee: South Carolina Electric & Gas  
Co.

Docket Number: 50-395

Licensed Power(MWT): 2.77E+03

Thermal Power(MWH): 1.92E+07

Net Electrical Power(MWH): 6.10E+06

Commercial Operation: 01/01/84

Initial Criticality: 10/22/82

Cooling Water Source: Monticello Reservoir

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
62	Truck	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June Jul-Dec

A

CO-58	4.80E+00	1.46E+01
CO-60	2.34E+01	1.20E+01
CS-134	7.47E+00	1.42E+01
CS-137	7.69E+00	2.27E+01
FE-55	2.68E+01	1.19E+01
MN-54		6.70E+00
NI-63	2.68E+01	1.42E+01
SB-125		1.39E+00

B

CO-58	2.44E+00	2.30E+00
CO-60	1.53E+01	1.54E+01
CS-134	4.61E+00	4.60E+00
CS-137	1.05E+01	1.06E+01
FE-55	4.99E+01	5.00E+01
MN-54	2.69E+00	2.70E+00
NI-63	1.18E+01	1.19E+01

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 8.24E+01	Non-compacted Burial Volume
	Ci 1.21E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 2.56E+01	Compacted Burial Volume
	Ci 3.39E+00	
C. Irradiated Components, Control Rods, etc.	m3	
	Ci	
D. Other (describe)	m3	
	Ci	

Installation: Surry  
Unit No.: 1&2

Location: 19 Mi NW Newport News, VA

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: PWR  
Docket Number: 50-280  
Thermal Power(MWH): 1.95E+07  
Commercial Operation: 12/22/72  
Cooling Water Source: James River  
Unit Number: 2      Type: PWR  
Docket Number: 50-281  
Thermal Power(MWH): 1.43E+07  
Commercial Operation: 05/01/73  
Cooling Water Source: James River

Licensee: Virginia Electric & Power  
Licensed Power(MWT): 2.44E+03  
Net Electrical Power(MWH): 6.23E+06  
Initial Criticality: 07/01/72

Licensee: Virginia Electric & Power  
Licensed Power(MWT): 2.44E+03  
Net Electrical Power(MWH): 4.54E+06  
Initial Criticality: 03/07/73

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	9.49E-02
CO-57	2.91E-07
CO-58	2.04E-05
CO-60	5.10E-05
SE-75	3.07E-05
KR-85	8.87E-01
KR-85M	3.14E-03
KR-87	6.68E-04
KR-88	4.49E-04
RB-88	1.67E-03
SB-125	2.25E-08
I-131	6.11E-04
XE-131M	7.09E-02
I-132	5.87E-04
TE-132	7.52E-06
I-133	3.80E-04
XE-133	3.66E+01
XE-133M	1.57E-01
XE-135	3.68E+00
XE-135M	1.30E-02
CS-137	7.25E-05
CS-138	7.00E-04
XE-138	1.02E-03
CE-144	4.84E-09

Liquid Effluents

Nuclide Released	Activity (Ci)
CO-58	5.18E-05
CO-60	9.29E-03
NB-95	1.53E-07
ZR-95	1.08E-07
SB-125	4.40E-05
CS-134	7.65E-05
CS-137	1.13E-02

Total Airborne Tritium Released	2.31E+01 Ci
Total Liquid Tritium Released	1.32E+03 Ci
Volume of Waste Released (Prior to Dilution)	1.11E+08 liters
Volume of Dilution Water Used During Period	2.47E+12 liters

Installation: Surry  
Unit No.: 1&2

Location: 19 Mi NW Newport News, VA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-280  
Thermal Power(MWH): 1.95E+07  
Commercial Operation: 12/22/72  
Cooling Water: Source: James River

Licensee: Virginia Electric & Power  
Licensed Power(MWT): 2.44E+03  
Net Electrical Power(MWH): 6.23E+06  
Initial Criticality: 07/01/72

Unit Number: 2      Type: PWR  
Docket Number: 50-281  
Thermal Power(MWH): 1.43E+07  
Commercial Operation: 05/01/73  
Cooling Water Source: James River

Licensee: Virginia Electric & Power  
Licensed Power(MWT): 2.44E+03  
Net Electrical Power(MWH): 4.54E+06  
Initial Criticality: 03/07/73

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
24	Truck	Barnwell, SC
13	Truck	Oak Ridge, TN
4	Truck	Wampum, PA

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June      Jul-Dec

A

CD-109		1.85E+00
CO-58	7.60E+00	2.20E+01
CO-60	5.07E+01	2.80E+01
CS-137		5.26E+00
FE-55	7.33E+00	9.12E+00
MN-54	2.15E+00	
NB-95		3.75E+00
NI-63	3.00E+01	2.24E+01
SB-125		1.36E+00
ZR-95		3.20E+00

B

CO-58	9.22E+00	5.42E+00
CO-60	3.55E+01	4.38E+01
CR-51		3.79E+00
CS-137	8.89E+00	6.55E+00
FE-55	2.22E+01	1.95E+01
FE-59		1.58E+00
H-3	3.22E+00	2.41E+00
NB-95	4.23E+00	2.08E+00
NI-63	1.42E+01	1.22E+01
ZR-95	2.20E+00	1.91E+00

Installation: Surry  
Unit No.: 1&2

Location: 19 Mi NW Newport News, VA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 4.64E+01	Actual Burial Volume
	m3 7.68E+01	Before Volume Reduction
	m3 7.55E+01	Actual Burial Volume
	Ci 5.58E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 8.47E+02	Before Offsite Processing
	m3 9.08E+01	Actual Burial Volume
	Ci 3.92E+00	
C. Irradiated Components, Control Rods, etc.	m3	
	Ci	
D. Other (describe)	m3	
	Ci	

Installation: Susquehanna  
Unit No.: 1&2

Location: 7 Mi NE Berwick, PA

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: BWR  
Docket Number: 50-387  
Thermal Power(MWH): 1.67E+07  
Commercial Operation: 06/08/83  
Cooling Water Source: Susquehanna River  
Unit Number: 2      Type: BWR  
Docket Number: 50-388  
Thermal Power(MWH): 2.63E+07  
Commercial Operation: 02/12/85  
Cooling Water Source: Susquehanna River

Licensee: Pennsylvania Power & Light  
Company  
Licensed Power(MWT): 3.29E+03  
Net Electrical Power(MWH): 5.20E+06  
Initial Criticality: 09/10/82  
Licensee: Pennsylvania Power & Light  
Company  
Licensed Power(MWT): 3.29E+03  
Net Electrical Power(MWH): 8.34E+06  
Initial Criticality: 05/08/84

Airborne Effluents

Nuclide Released	Activity (Ci)
MN-54	5.03E-04
CO-58	6.11E-05
CO-60	4.90E-04
ZN-65	2.32E-04
SR-90	2.60E-07
I-131	8.74E-09
XE-133	1.69E+01

Liquid Effluents

Nuclide Released	Activity (Ci)
F-18	5.65E-07
NA-24	7.44E-07
CR-51	2.70E-07
MN-54	1.24E-04
FE-55	1.38E-02
CO-58	1.00E-03
FE-59	1.27E-03
CO-60	1.62E-02
ZN-65	1.41E-03
AS-76	3.28E-05
KR-88	1.19E-06
SR-89	8.82E-06
SR-92	1.05E-06
MO-99	1.30E-06
TC-99M	4.30E-06
AG-110M	3.30E-04
I-131	5.08E-07
TE-131	4.01E-12
XE-131M	8.19E-05
XE-133	3.52E-04
XE-133M	3.36E-06
CS-134	6.86E-07
XE-135	1.93E-04
CS-137	2.91E-05
CE-141	5.58E-07
ND-147	1.07E-06



Installation: Susquehanna  
Unit No.: 1&2

Location: 7 Mi NE Berwick, PA

Effluent and Waste Disposal Annual Report for 1993

Total Airborne Tritium Released	4.36E+01 Ci
Total Liquid Tritium Released	6.79E+01 Ci
Volume of Waste Released (Prior to Dilution)	1.06E+07 liters
Volume of Dilution Water Used During Period	1.42E+10 liters

Installation: Susquehanna  
Unit No.: 1&2

Location: 7 Mi NE Berwick, PA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: BWR      Licensee: Pennsylvania Power & Light  
Company  
Docket Number: 50-387      Licensed Power(MWT): 3.29E+03  
Thermal Power(MWH): 1.67E+07      Net Electrical Power(MWH): 5.20E+06  
Commercial Operation: 06/08/83      Initial Criticality: 09/10/82  
Cooling Water Source: Susquehanna River

Unit Number: 2      Type: BWR      Licensee: Pennsylvania Power & Light  
Company  
Docket Number: 50-388      Licensed Power(MWT): 3.29E+03  
Thermal Power(MWH): 2.63E+07      Net Electrical Power(MWH): 8.34E+06  
Commercial Operation: 02/12/85      Initial Criticality: 05/08/84  
Cooling Water Source: Susquehanna River

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
41	Truck	Barnwell, SC
20	Truck	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Annual

A	
AG-110M	6.52E-02
AM-241	2.79E-05
C-14	8.83E-02
CE-144	5.19E-04
CM-242	3.25E-06
CM-244	2.05E-05
CO-57	6.40E-04
CO-58	1.44E+00
CO-60	2.94E+01
CR-51	2.66E+00
CS-134	2.08E-04
CS-137	7.31E-03
FE-55	2.43E+01
FE-59	1.77E+00
H-3	9.76E-02
HF-181	7.16E-03
I-131	2.20E-03
LA-140	2.00E-03
MN-54	3.40E+01
NA-24	5.74E-05
NB-95	5.73E-03
NI-63	4.34E-01
NI-65	1.71E-06
PU-238	5.45E-05
PU-239	4.07E-05
PU-241	4.58E-03
SB-124	2.75E-02
SR-89	3.12E-06

Installation: Susquehanna  
Unit No.: 1&2

Location: 7 Mi NE Berwick, PA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued) Jan-June July-Dec  
(by type of waste)

A		
	SR-90	7.08E-05
	TC-99	1.64E-03
	XE-131M	1.57E-05
	ZN-65	5.99E+00
B		
	C-14	1.70E-01
	CO-58	9.40E-01
	CO-60	1.39E+01
	CR-51	7.90E-01
	FE-55	1.53E+01
	FE-59	6.57E+00
	H-3	6.98E+00
	I-129	1.40E-01
	MO-54	5.22E+01
	NI-63	3.20E-01
	PU-241	5.00E-02
	TC-99	5.00E-02
	ZN-65	2.62E+00

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 2.40E+02 Ci 6.11E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 3.25E+01 Ci 6.79E-01	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Three Mile Island  
Unit No.: 1

Location: 10 Mi SE Harrisburg, PA

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-289  
Thermal Power (MWH): 1.18E+07  
Commercial Operation: 09/02/74  
Cooling Water Source: Susquehanna River

Licensee: GPU Nuclear Group  
Licensed Power (MWT): 2.57E+03  
Net Electrical Power (MWH): 5.96E+06  
Initial Criticality: 06/05/74

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	1.95E+00
CO-58	1.89E-07
KR-85	1.13E+02
KR-85M	1.17E+01
KR-87	1.07E+01
KR-88	2.27E+01
I-131	7.37E-03
XE-131M	2.68E+01
I-133	3.84E-03
XE-133	2.08E+03
XE-133M	1.30E+01
CS-134	1.33E-06
XE-135	1.01E+02
XE-135M	8.01E+00
CS-137	2.62E-06
XE-138	6.93E+00

Liquid Effluents

Nuclide Released	Activity (Ci)
FE-55	8.69E-04
CO-58	1.04E-03
CO-60	2.16E-05
KR-85M	4.98E-06
SR-89	3.40E-05
SR-90	1.38E-04
AG-110M	6.96E-05
SB-125	5.81E-05
I-131	2.68E-02
XE-131M	6.76E-03
I-133	2.05E-03
XE-133	4.25E-01
XE-133M	2.66E-03
CS-134	2.55E-02
XE-135	6.49E-02
XE-135M	3.21E-06
CS-136	1.95E-03
CS-137	2.96E-02
LA-140	4.63E-05

Total Airborne Tritium Released	1.52E+01 Ci
Total Liquid Tritium Released	3.76E+02 Ci
Volume of Waste Released (Prior to Dilution)	5.00E+07 liters
Volume of Dilution Water Used During Period	4.47E+10 liters

Installation: Three Mile Island  
Unit No.: 1

Location: 10 Mi SE Harrisburg, PA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR  
Docket Number: 50-289  
Thermal Power (MWH): 1.18E+07  
Commercial Operation: 09/02/74  
Cooling Water Source: Susquehanna River

Licensee: GPU Nuclear Group  
Licensed Power (MWT): 2.57E+03  
Net Electrical Power (MWH): 5.96E+06  
Initial Criticality: 06/05/74

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
4	Tractor	CNSI, Barnwell, SC
1	Tractor	Quadrex, Oak Ridge, TN
19	Tractor	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Annual

A		
	CO-58	4.63E+00
	CS-137	7.99E+00
	H-3	7.76E+01
	NI-63	4.80E+00
B		
	CO-58	3.21E+01
	CO-60	2.89E+00
	CS-137	2.75E+01
	FE-55	2.49E+01
	NI-63	8.83E+00

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 7.04E+01 Ci 5.19E+00	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 5.44E+02 Ci 2.40E+00	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Three Mile Island  
Unit No.: 2

Location: 10 Mi SE Harrisburg, PA

Effluent and Waste Disposal Annual Report for 1993

Type: PWR

Licensee: Metropolitan Edison&Jersey  
Central Power&Light

Docket Number: 50-320

Licensed Power(MWT): 2.77E+03

Thermal Power(MWH): 0.00E+00

Net Electrical Power(MWH): 0.00E+00

Commercial Operation: 12/30/78

Initial Criticality: 03/28/78

Cooling Water Source: Susquehanna River

Airborne Effluents

Nuclide Released	Activity (Ci)
C-14	5.91E-02
CO-58	3.44E-08
KR-85	4.41E-02
SR-90	2.93E-07
CS-134	1.19E-07
CS-137	2.06E-06

Liquid Effluents

Nuclide Released	Activity (Ci)
SR-90	6.90E-04
CS-137	7.77E-05

Total Airborne Tritium Released	1.68E+02 Ci
Total Liquid Tritium Released	1.59E-02 Ci
Volume of Waste Released (Prior to Dilution)	8.76E+05 liters
Volume of Dilution Water Used During Period	6.96E+10 liters

Installation: Three Mile Island  
Unit No.: 2

Location: 10 Mi SE Harrisburg, PA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR

Licensee: Metropolitan Edison&Jersey  
Central Power&Light

Docket Number: 50-320

Licensed Power(MWT): 2.77E+03

Thermal Power(MWH): 0.00E+00

Net Electrical Power(MWH): 0.00E+00

Commercial Operation: 12/30/78

Initial Criticality: 03/28/78

Cooling Water Source: Susquehanna River

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
5	Tractor	CNSI, Barnwell, SC
2	Tractor	Quadrex, Oak Ridge, TN
10	Tractor	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Annual

A		
	CS-137	8.50E+01
	PM-147	1.04E+00
	RU-106	4.70E-01
	SR-90	1.21E+01
B		
	CS-137	1.61E+01
	H-3	2.45E+01
	NI-63	5.40E+00
	PU-241	5.02E+00
	SR-90	4.16E+01

m3  
Ci

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 7.66E+00 Ci 3.24E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 5.28E+02 Ci 7.46E+00	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Trojan  
Unit No.: 1

Location: 43 Mi NW Portland, OR

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-344  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 05/20/76  
Cooling Water Source: Columbia River

Licensee: Portland General Electric  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 12/15/75

Airborne Effluents

Nuclide Released	Activity (Ci)
KR-85	1.72E+01
XE-131M	1.21E-03
XE-133	3.62E+01
XE-133M	4.29E-03

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-22	4.98E-06
CR-51	2.60E-03
MN-54	2.06E-03
FE-55	2.82E-02
CO-57	1.55E-04
CO-58	9.23E-03
FE-59	6.41E-05
CO-60	3.01E-02
SR-89	2.42E-04
SR-90	2.90E-05
NB-95	1.58E-03
ZR-95	4.97E-04
RU-103	3.91E-04
RU-106	9.64E-03
AG-110M	2.13E-03
SN-113	1.76E-04
SB-124	1.76E-05
SB-125	1.11E-02
CS-134	9.96E-04
CS-137	3.96E-03
CE-144	2.77E-03
Unidentified	1.35E-04

Total Airborne Tritium Released	4.33E+01 Ci
Total Liquid Tritium Released	1.22E+03 Ci
Volume of Waste Released (Prior to Dilution)	1.81E+07 liters
Volume of Dilution Water Used During Period	7.02E+10 liters



Installation: Trojan  
Unit No.: 1

Location: 43 Mi NW Portland, OR

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR  
Docket Number: 50-344  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 05/20/76  
Cooling Water Source: Columbia River

Licensee: Portland General Electric  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 12/15/75

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
5	Exclusive Use Truck	SEG, Oak Ridge, TN
17	Exclusive Use Truck	U.S. Ecology, Richland, WA

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June Jul-Dec

A

AG-110M	1.00E-01	
C-14	5.00E-01	1.00E-01
CE-144	3.00E-01	
CO-58	5.50E+00	1.30E+01
CO-60	1.48E+01	2.84E+01
CR-51	9.00E-01	
CS-134	2.00E-01	3.30E+00
CS-137	1.30E+00	7.10E+00
FE-55	4.41E+01	8.40E+00
H-3	4.30E+00	6.00E-01
MN-54	2.50E+00	1.90E+00
NB-95	3.00E-01	
NI-63	2.23E+01	3.65E+01
PU-241	1.00E+00	5.00E-01
RU-106	1.20E+00	
SB-125	5.00E-01	
SR-90	1.00E-01	2.00E-01
ZR-95	3.00E-01	

B

C-14	5.00E-01	1.10E+00
CE-144	1.10E+00	5.00E-01
CO-58	1.37E+01	1.40E+00
CO-60	9.80E+00	7.50E+00
CR-51	5.00E+00	
CS-137	1.00E-01	3.00E-01
FE-55	4.81E+01	2.74E+01
H-3	9.00E-01	4.89E+01
MN-54	3.20E+00	1.50E+00
NB-95	1.80E+00	
NI-63	1.11E+01	8.30E+00
PU-241	4.00E-01	4.00E-01
RU-106	1.50E+00	7.00E-01
SB-125	4.00E-01	5.00E-01
SR-89		1.20E+00
SR-90		2.00E-01
ZR-95	2.50E+00	

Installation: Trojan  
Unit No.: 1

Location: 43 Mi NW Portland, OR

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 2.99E+01 Ci 3.89E+02	Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 1.03E+02 Ci 1.04E+00	Burial Volume
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Turkey Point  
Unit No.: 3

Location: 10 Mi E Florida City, FL

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-250  
Thermal Power (MWH): 1.18E+07  
Commercial Operation: 12/14/72  
Cooling Water Source: Closed Cycle Canal

Licensee: Florida Power & Light  
Licensed Power (MWT): 2.20E+03  
Net Electrical Power (MWH): 3.59E+06  
Initial Criticality: 10/20/72

Airborne Effluents

Nuclide Released	Activity (Ci)
CO-58	8.50E-07
BR-82	1.48E-05
KR-85M	1.11E-03
I-131	1.13E-03
XE-131M	2.88E+00
I-133	2.66E-04
XE-133	2.21E+02
XE-133M	1.60E-01
XE-135	6.63E+00
CS-137	9.35E-07

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	4.13E-04
MN-54	1.72E-02
FE-55	1.09E-01
CO-57	6.70E-05
CO-58	4.98E-02
FE-59	3.57E-05
CO-60	2.56E-02
KR-85	3.14E-03
SR-89	1.27E-02
SR-90	3.55E-03
NB-95	6.00E-04
ZR-97	1.08E-04
MO-99	3.11E-05
AG-110	6.53E-03
SB-124	3.08E-04
SB-125	4.27E-03
I-131	1.69E-03
I-133	5.63E-05
XE-133	1.90E-02
CS-134	9.36E-04
CS-137	5.49E-03
LA-140	1.55E-04
CE-141	3.60E-07
W-187	4.21E-04

Total Airborne Tritium Released	5.28E+00 Ci
Total Liquid Tritium Released	2.57E+02 Ci
Volume of Waste Released (Prior to Dilution)	4.57E+06 liters
Volume of Dilution Water Used During Period	1.12E+11 liters

Installation: Turkey Point  
Unit No.: 4

Location: 10 Mi E Florida City, FL

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-251  
Thermal Power(MWH): 7.14E+06  
Commercial Operation: 09/07/73  
Cooling Water Source: Closed Cycle Canal

Licensee: Florida Power & Light  
Licensed Power(MWT): 2.20E+03  
Net Electrical Power(MWH): 2.09E+06  
Initial Criticality: 06/11/73

Airborne Effluents

Nuclide Released	Activity (Ci)
CO-58	8.50E-07
BR-82	1.48E-05
KR-85M	5.11E-03
I-131	1.13E-03
XE-131M	2.99E+00
I-133	2.66E-04
XE-133	2.12E+02
XE-133M	2.02E-01
XE-135	6.61E+00
CS-137	9.34E-07

Liquid Effluents

Nuclide Released	Activity (Ci)
CR-51	4.13E-04
MN-54	1.72E-02
FE-55	1.09E-01
CO-57	6.70E-05
CO-58	4.98E-02
FE-59	3.57E-05
CO-60	2.56E-02
KR-85	3.14E-03
SR-89	1.27E-02
SR-90	3.55E-03
NB-95	6.00E-04
ZR-97	1.08E-04
MO-99	3.11E-05
RU-103	3.11E-05
AG-110	6.53E-03
SB-124	3.08E-04
SB-125	4.27E-03
I-131	1.69E-03
I-133	5.63E-05
XE-133	1.90E-02
CS-134	9.36E-04
CS-137	5.49E-03
LA-140	1.55E-04
CE-141	3.60E-07
W-187	4.21E-04

Total Airborne Tritium Released	2.99E+00 Ci
Total Liquid Tritium Released	2.57E+02 Ci
Volume of Waste Released (Prior to Dilution)	4.57E+06 liters
Volume of Dilution Water Used During Period	1.12E+11 liters

Installation: Turkey Point  
 Unit No.: 3&4

Location: 10 Mi E Florida City, FL

Effluent and Waste Disposal Annual Report for 1993  
 Solid Effluents

Unit Number: 3      Type: PWR  
 Docket Number: 50-250  
 Thermal Power(MWH): 1.18E+07  
 Commercial Operation: 12/14/72  
 Cooling Water Source: Closed Cycle Canal

Licensee: Florida Power & Light  
 Licensed Power(MWT): 2.20E+03  
 Net Electrical Power(MWH): 3.59E+06  
 Initial Criticality: 10/20/72

Unit Number: 4      Type: PWR  
 Docket Number: 50-251  
 Thermal Power(MWH): 7.14E+06  
 Commercial Operation: 09/07/73  
 Cooling Water Source: Closed Cycle Canal

Licensee: Florida Power & Light  
 Licensed Power(MWT): 2.20E+03  
 Net Electrical Power(MWH): 2.09E+06  
 Initial Criticality: 06/11/73

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
11	Sole Use Truck	Barnwell, SC
17	Sole Use Truck	Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
 (by type of waste)

Annual

	Annual
A	
CO-55	8.00E+00
CO-60	3.00E+01
CR-134	4.00E+00
CS-137	8.00E+00
FE-54	2.00E+00
FE-58	2.90E+01
H-3	1.00E+00
NI-63	1.60E+01
B	
CO-58	2.00E+00
CO-60	3.30E+01
CS-137	2.00E+00
FE-55	4.50E+01
NI-63	1.60E+01
SB-125	1.00E+00

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3	3.76E+01
	Ci	1.40E+02
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3	5.29E+01
	Ci	5.18E-01
C. Irradiated Components, Control Rods, etc.	m3	
	Ci	
D. Other (describe)	m3	
	Ci	

Installation: Vermont Yankee  
Unit No.: 1

Location: 5 Mi S Brattleboro, VT

Effluent and Waste Disposal Annual Report for 1993

Type: BWR  
Docket Number: 50-271  
Thermal Power(MWH): 1.06E+07  
Commercial Operation: 11/30/72  
Cooling Water Source: Connecticut River

Licensee: Vermont Yankee Nuclear Power  
Licensed Power(MWT): 1.59E+03  
Net Electrical Power(MWH): 3.37E+06  
Initial Criticality: 03/24/72

Airborne Effluents

Nuclide Released	Activity (Ci)
CR-51	1.90E-06
MN-54	1.16E-04
CO-58	2.39E-06
CO-60	5.18E-04
ZN-65	1.03E-05
KR-85	1.06E-03
KR-85M	1.43E+00
KR-87	1.05E+01
KR-88	5.30E+00
SR-89	2.83E-03
SR-90	5.44E-05
I-131	1.14E-02
I-133	4.08E-02
XE-133	6.42E-01
XE-135	8.89E+00
XE-135M	6.42E+01
CS-137	9.89E-05
XE-138	2.68E+02
BA/LA-140	4.88E-03
CE-141	1.06E-05

Total Airborne Tritium Released

2.37E+01 Ci

Installation: Vermont Yankee  
Unit No.: 1

Location: 5 Mi S Brattleboro, VT

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR  
Docket Number: 50-271  
Thermal Power(MWH): 1.06E+07  
Commercial Operation: 11/30/72  
Cooling Water Source: Connecticut River

Licensee: Vermont Yankee Nuclear Power  
Licensed Power(MWT): 1.59E+03  
Net Electrical Power(MWH): 3.37E+06  
Initial Criticality: 03/24/72

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
93	Truck	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June Jul-Dec

A

EA-140	3.47E+00	
CO-60	1.19E+01	2.06E+01
CS-134	3.89E+00	8.44E+00
CS-137	1.27E+01	2.42E+01
I-131	3.49E+00	
MN-54	2.07E+00	8.70E+00
NI-63	2.44E+00	
ZN-65	5.54E+01	3.34E+01

B

CO-60	1.02E+01	1.02E+01
CS-137		1.85E+00
FE-55	6.52E+01	6.54E+01
MN-54	5.67E+00	5.67E+00
ZN-55	1.09E+01	1.09E+01

Type of Waste

Unit

Description

A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 8.08E+01 Ci 7.37E+02	Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 4.87E+01 Ci 3.96E-01	Burial Volume
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Vogtle  
Unit No.: 1&2

Location: 25 Mi SSE Augusta, GA

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: PWR  
Docket Number: 50-424  
Thermal Power(MWH): 2.64E+07  
Commercial Operation: 05/31/87  
Cooling Water Source: Savannah River  
Unit Number: 2      Type: PWR  
Docket Number: 50-425  
Thermal Power(MWH): 2.66E+07  
Commercial Operation: 05/20/89  
Cooling Water Source: Savannah River

Licensee: Georgia Power  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 8.60E+06  
Initial Criticality: 03/09/87  
Licensee: Georgia Power  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 8.68E+06  
Initial Criticality: 03/28/89

Airborne Effluents

Nuclide Released	Activity (Ci)
NA-24	2.92E-06
AR-41	2.54E+00
CR-51	1.31E-05
MN-54	1.86E-06
CO-58	2.78E-05
CO-60	6.42E-06
KR-85	1.67E+00
KR-85M	3.84E-03
KR-87	1.53E-04
SR-89	2.49E-06
SR-90	2.52E-07
NB-95	1.08E-06
ZR-95	7.02E-07
I-131	4.67E-04
XE-131M	5.68E-01
I-133	4.90E-05
XE-133	2.28E+02
XE-133M	8.27E-01
XE-135	4.83E-01

Liquid Effluents

Nuclide Released	Activity (Ci)
BE-7	2.61E-05
NA-24	4.58E-06
CR-51	3.15E-02
MN-54	1.70E-02
FE-55	1.23E+00
CO-57	8.98E-04
CO-58	9.38E-02
FE-59	2.48E-03
CO-60	5.57E-02
ZN-65	1.87E-03
BR-82	1.54E-05
SR-89	1.64E-03
SR-90	1.89E-04
NB-95	9.85E-03
ZR-95	5.25E-03
NB-97	1.19E-03
AG-110M	6.81E-04



Installation: Vogtle  
Unit No.: 1&2

Location: 25 Mi SSE Augusta, GA

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
SN-113	3.24E-04
SB-122	2.26E-04
SB-124	1.42E-04
SB-125	4.78E-02
TE-129M	9.67E-05
I-131	4.20E-03
I-132	1.08E-04
TE-132	1.02E-04
I-133	8.02E-05
XE-133	3.19E-03
XE-133M	1.39E-04
CS-134	5.58E-03
XE-135	7.29E-05
CS-137	7.31E-03
LA-140	5.25E-08
CE-144	2.33E-04
HF-181	2.86E-05
W-187	3.04E-05

Total Airborne Tritium Released	2.23E+02 Ci
Total Liquid Tritium Released	7.61E+02 Ci
Volume of Waste Released (Prior to Dilution)	5.12E+07 liters
Volume of Dilution Water Used During Period	4.66E+09 liters

Installation: Vogtle  
 Unit No.: 1&2

Location: 25 Mi SSE Augusta, GA

Effluent and Waste Disposal Annual Report for 1993  
 Solid Effluents

Unit Number: 1      Type: PWR  
 Docket Number: 50-424  
 Thermal Power(MWH): 2.64E+07  
 Commercial Operation: 05/31/87  
 Cooling Water Source: Savannah River

Licensee: Georgia Power  
 Licensed Power(MWT): 3.41E+03  
 Net Electrical Power(MWH): 8.60E+06  
 Initial Criticality: 03/09/87

Unit Number: 2      Type: PWR  
 Docket Number: 50-425  
 Thermal Power(MWH): 2.66E+07  
 Commercial Operation: 05/20/89  
 Cooling Water Source: Savannah River

Licensee: Georgia Power  
 Licensed Power(MWT): 3.41E+03  
 Net Electrical Power(MWH): 8.68E+06  
 Initial Criticality: 03/28/89

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
9	Tractor/Trailer/Shielded Cask	CNSI, Barnwell, SC
1	Tractor/Trailer	Quadrex, Oak Ridge, TN
28	Tractor/Trailer	SEG, Oak Ridge, TN
2	Tractor/Trailer/Shielded Cask	SEG, Oak Ridge, TN

Estimate of Major Nuclide Composition ( % )  
 (by type of waste)

Jan-June      Jul-Dec

	Jan-June	Jul-Dec
A		
CO-60	8.88E+00	1.69E+01
FE-55	3.76E+01	1.89E+01
NI-63	1.26E+01	4.84E+01
Unidentified	4.09E+01	1.59E+01
B		
CO-58	2.06E+01	1.39E+01
FE-55	5.49E+01	5.95E+01
NI-63	6.62E+00	8.39E+00
Unidentified	1.79E+01	1.82E+01

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 4.25E+01 Ci 2.13E+02	Burial Volume
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 2.60E+01 Ci 9.97E+00	Burial Volume
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Waterford  
Unit No.: 3

Location: 20 Mi W New Orleans, LA

Effluent and Waste Disposal Annual Report for 1993

Type: PWR

Docket Number: 50-382

Thermal Power(MWH): 2.94E+07

Commercial Operation: 09/24/85

Cooling Water Source: Mississippi River

Licensee: Louisiana Power & Light

Licensed Power(MWT): 3.39E+03

Net Electrical Power(MWH): 9.14E+06

Initial Criticality: 03/04/85

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	5.63E+00
KR-85M	1.76E+00
I-131	1.08E-06
XE-131M	1.14E+00
XE-133	8.48E+02
XE-133M	6.05E-01
XE-135	5.68E+01

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	1.70E-05
AR-41	1.21E-03
CR-51	1.32E-03
MN-54	7.30E-03
FE-55	6.70E-02
CO-57	2.63E-04
CO-58	4.79E-02
FE-59	1.89E-04
CO-60	4.35E-02
BR-82	1.49E-04
KR-85	3.24E-02
KR-85M	1.51E-03
KR-87	3.33E-04
KR-88	1.69E-03
RB-88	1.10E-01
SR-92	2.33E-04
NB-95	1.19E-02
ZR-95	5.52E-03
NB-97	2.26E-03
ZR-97	1.64E-05
MO-99	2.00E-03
TC-99M	2.54E-03
RU-106	4.48E-04
AG-110M	3.90E-04
SN-113	1.82E-03
SB-122	7.87E-05
SB-124	3.03E-04
SB-125	2.23E-02
I-131	1.84E-01
XE-131M	3.26E-02
I-132	2.90E-04
I-133	5.03E-02
XE-133	1.47E+00
XE-133M	7.47E-03

Installation: Waterford  
Unit No.: 3

Location: 20 Mi W New Orleans, LA

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
CS-134	1.30E-02
I-135	7.91E-03
XE-135	3.90E-02
XE-135M	1.64E-02
CS-137	1.59E-02
BA-140	2.11E-04
LA-140	8.17E-05
LA-142	2.12E-04
CE-144	1.16E-04
W-187	4.69E-03

Total Airborne Tritium Released	1.02E+02 Ci
Total Liquid Tritium Released	4.90E+02 Ci
Volume of Waste Released (Prior to Dilution)	2.81E+07 liters
Volume of Dilution Water Used During Period	1.73E+12 liters

Installation: Waterford  
Unit No.: 3

Location: 20 Mi W New Orleans, LA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR  
Docket Number: 50-382  
Thermal Power(MWH): 2.94E+07  
Commercial Operation: 09/24/85  
Cooling Water Source: Mississippi River

Licensee: Louisiana Power & Light  
Licensed Power(MWT): 3.39E+03  
Net Electrical Power(MWH): 9.14E+06  
Initial Criticality: 03/04/85

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
3	Sole Use Cask	Barnwell, SC
1	Sole Use Flatbed	Hanford, WA
3	Sole Use Flatbed	Oak Ridge, TN
1	Sole Use Flatbed	Wampum, PA

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

	Annual
A	
AM-241	2.16E-05
C-14	2.19E-01
CE-144	9.19E-02
CM-242	5.50E-04
CM-243/244	5.93E-04
CO-58	3.70E+01
CO-60	8.32E+00
CS-134	4.18E+00
CS-137	6.14E+00
FE-55	1.01E+01
H-3	3.04E-01
MN-54	4.96E+00
NI-59	1.51E-02
NI-63	2.74E+01
PU-238	1.15E-04
PU-239/240	4.84E-05
PU-241	1.70E-02
SB-125	1.28E+00
SR-90	3.81E-03
B	
AM-241	1.48E-04
C-14	2.17E-01
CE-141	1.33E-01
CE-144	8.99E-02
CM-242	2.66E-03
CM-243/244	6.94E-04
CO-57	6.92E-01
CO-58	3.44E+01
CO-60	2.04E+01
CR-51	9.99E+00
CS-134	4.03E+00
CS-137	8.18E+00
FE-55	1.16E+01
FE-59	1.03E+00
H-3	3.28E-02

Installation: Waterford  
Unit No.: 3

Location: 20 Mi W New Orleans, LA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Estimate of Major Nuclide Composition ( % ) (continued) Jan-June July-Dec  
(by type of waste)

B

MN-54	4.03E+00
NB-95	9.97E-01
NI-59	2.62E-02
NI-63	3.43E+00
PU-238	1.18E-04
PU-241	4.43E-04
SB-125	1.18E-01
SN-113	2.31E-01
SR-89	3.19E-03
SR-90	1.34E-03
ZR-95	5.12E-01

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.53E+01 Ci 1.03E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 2.36E+02 Ci 3.07E-01	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: WNP-2  
Unit No.: 2

Location: 12 Mi NW Richland, WA

Effluent and Waste Disposal Annual Report for 1993

Type: BWR

Licensee: Washington Public Power Supply  
System

Docket Number: 50-397

Licensed Power(MWT): 3.32E+03

Thermal Power(MWH): 2.16E+07

Net Electrical Power(MWH): 7.13E+06

Commercial Operation: 12/13/84

Initial Criticality: 01/19/84

Cooling Water Source: Columbia River

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	1.30E+01
CO-60	1.20E-04
ZN-65	3.30E-05
BR-82	8.30E-06
KR-85M	3.50E+00
KR-87	4.00E+00
KR-88	3.00E+00
RB-89	1.71E-03
SR-89	3.50E-03
SR-90	1.67E-05
SR-91	1.61E-03
I-131	1.30E-02
I-132	1.29E-02
I-133	5.47E-02
XE-133	1.96E+01
XE-133M	8.50E-02
CS-134	6.70E-06
I-135	2.02E-02
XE-135	1.69E+01
XE-135M	1.69E+01
CS-137	7.20E-06
XE-137	1.50E+01
CS-138	7.80E+00
XE-138	4.89E+01
BA-139	1.98E+00
BA/LA-140	1.95E-02

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	2.00E-03
CR-51	1.70E-03
MN-54	1.20E-02
FE-55	4.70E-03
CO-58	5.20E-03
CO-60	7.20E-02
CU-64	1.50E-02
ZN-65	6.50E-02
SR-89	5.50E-04
SR-90	5.70E-05
TC-99M	4.20E-04
SB-124	1.60E-04
SB-125	8.60E-05
I-131	1.30E-03

Installation: WNP-2  
Unit No.: 2

Location: 12 Mi NW Richland, WA

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)	
XE-133	1.40E-03	
CS-134	6.30E-03	
XE-135	3.50E-03	
CS-137	1.90E-02	
BA/LA-140	6.90E-04	
Total Airborne Tritium Released		1.50E+02 Ci
Total Liquid Tritium Released		3.40E+01 Ci
Volume of Waste Released (Prior to Dilution)		1.10E+07 liters
Volume of Dilution Water Used During Period		3.80E+09 liters



Installation: WNP-2  
Unit No.: 2

Location: 12 Mi NW Richland, WA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: BWR

Licensee: Washington Public Power Supply  
System

Docket Number: 50-397

Licensed Power (MWT): 3.32E+03

Thermal Power (MWH): 2.16E+07

Net Electrical Power (MWH): 7.13E+06

Commercial Operation: 12/13/84

Initial Criticality: 01/19/84

Cooling Water Source: Columbia River

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
46	Tractor-Trailer	US Ecology, Richland, WA

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Annual

A

BA/LA-140	3.43E-01
C-14	5.36E-01
CD-10	7.07E-01
CO-58	2.63E+00
CO-60	3.37E+01
CR-51	3.68E+00
CS-134	3.58E-01
CS-137	3.45E+00
FE-55	1.51E+01
MN-54	2.52E+00
NI-63	2.92E+00
ZN-65	3.29E+01

B

CO-60	2.27E+01
CS-137	4.61E-01
FE-55	7.10E+01
H-3	1.48E+00
MN-54	2.66E-01
SB-125	3.17E-01
ZN-65	3.70E+00

D

BA/LA-140	5.10E-01
CO-58	1.13E+00
CO-60	9.84E+00
CR-51	9.31E+00
FE-55	7.00E+01
I-131	6.78E-01
MN-54	4.16E-01
ZN-65	7.46E+00

Installation: WNP-2  
Unit No.: 2

Location: 12 Mi NW Richland, WA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filtrate Sludges, Evaporator Bottoms, etc.	m3 1.74E+02 Ci 1.01E+03	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 2.44E+02 Ci 2.65E+01	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe) Solidified Liquid	m3 7.65E+00 Ci 1.67E+00	

Installation: Wolf Creek  
Unit No.: 1

Location: 3.5 Mi NE Burlington, KS

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-482  
Thermal Power(MWH): 2.27E+07  
Commercial Operation: 09/03/85  
Cooling Water Source: Cooling Lake

Licensee: Wolf Creek Nuclear Oper.  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 7.90E+06  
Initial Criticality: 05/22/85

Airborne Effluents

Nuclide Released	Activity (Ci)
AR-41	3.46E-01
KR-85	2.20E+01
KR-85M	5.85E-01
KR-88	4.54E-01
I-131	6.92E-04
XE-131M	1.14E+01
I-133	4.11E-04
XE-133	4.71E+02
XE-133M	3.03E+00
XE-135	1.15E+01

Liquid Effluents

Nuclide Released	Activity (Ci)
BE-7	6.61E-04
NA-24	1.22E-05
CR-51	3.14E-02
MN-54	1.09E-02
FE-55	2.23E-01
CO-57	1.55E-03
CO-58	1.31E-01
FE-59	3.44E-03
CO-60	1.42E-01
KR-85	4.08E-01
KR-85M	4.97E-05
KR-87	1.32E-04
SR-90	9.20E-05
SR-92	8.68E-06
NB-95	9.50E-03
ZR-95	5.09E-03
TC-99M	2.10E-05
RU-103	1.07E-03
AG-110M	2.79E-03
SN-113	1.87E-03
SN-117M	3.11E-04
SB-124	3.27E-03
SB-125	7.82E-02
SB-126	1.49E-04
I-131	5.23E-03
XE-131M	2.48E-01
I-132	9.35E-05
T-133	7.11E-05
KR-133	1.58E+01
XE-133M	1.15E-01
CS-134	2.25E-02

Installation: Wolf Creek  
Unit No.: 1

Location: 3.5 Mi NE Burlington, KS

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
XE-135	9.98E-03
CS-136	4.70E-05
CS-137	2.35E-02
IA-140	2.86E-04
CE-141	2.36E-04
CE-144	7.56E-03
HF-181	3.71E-04

Total Airborne Tritium Released	2.57E+01 Ci
Total Liquid Tritium Released	9.99E+02 Ci
Volume of Waste Released (Prior to Dilution)	4.02E+08 liters
Volume of Dilution Water Used During Period	1.06E+12 liters

Installation: Wolf Creek  
Unit No.: 1

Location: 3.5 Mi NE Burlington, KS

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR  
Docket Number: 50-482  
Thermal Power(MWH): 2.27E+07  
Commercial Operation: 09/03/85  
Cooling Water Source: Cooling Lake

Licensee: Wolf Creek Nuclear Oper.  
Licensed Power(MWT): 3.41E+03  
Net Electrical Power(MWH): 7.90E+06  
Initial Criticality: 05/22/85

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
6	Truck	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Annual

	Annual
A	
C-14	3.48E-01
CO-60	5.47E+00
CS-134	3.78E+01
CS-137	3.37E+01
H-3	2.80E-02
NI-63	8.80E+00
PU-241	2.20E-02
SR-90	7.90E-02
B	
CO-58	7.00E+00
CO-60	6.00E+00
FE-55	8.20E+01
NI-63	5.00E+00

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 1.58E+01 Ci 7.59E+02	Compacted
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 5.30E+01 Ci 2.61E+00	Compacted
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe)	m3 Ci	

Installation: Yankee Rowe  
Unit No.: 1

Location: 20 Mi NW Greenfield, MA

Effluent and Waste Disposal Annual Report for 1993

Type: PWR  
Docket Number: 50-029  
Thermal Power (MWH): 0.00E+00  
Commercial Operation: 07/01/61  
Cooling Water Source: Deerfield River

Licensee: Yankee Atomic Electric  
Licensed Power (MWT): 6.00E+02  
Net Electrical Power (MWH): 0.00E+00  
Initial Criticality 08/19/60

Airborne Effluents

Nuclide Released	Activity (Ci)
CO-60	6.97E-07
CS-137	1.00E-07

Liquid Effluents

Nuclide Released	Activity (Ci)
C-14	6.10E-04
MN-54	3.78E-08
CO-60	4.43E-05
CS-134	4.30E-06
CS-137	6.03E-05

Total Airborne Tritium Released	1.31E+00 Ci
Total Liquid Tritium Released	5.01E-01 Ci
Volume of Waste Released (Prior to Dilution)	9.77E+05 liters
Volume of Dilution Water Used During Period	1.76E+08 liters

Installation: Yankee Rowe  
Unit No.: 1

Location: 20 Mi NW Greenfield, MA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type: PWR  
Docket Number: 50-029  
Thermal Power(MWH): 0.00E+00  
Commercial Operation: 07/01/61  
Cooling Water Source: Deerfield River

Licensee: Yankee Atomic Electric  
Licensed Power(MWT): 6.00E+02  
Net Electrical Power(MWH): 0.00E+00  
Initial Criticality: 08/19/60

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
2	Railroad	Barnwell, SC
71	Truck	Barnwell, SC

Estimate of Major Nuclide Composition ( % )  
(by type of waste)

Jan-June Jul-Dec

A			
	CO-60	6.84E+00	
	FE-55	8.47E+01	
	NI-63	5.75E+00	
	PU-241	5.57E-01	
	SR-90	4.10E-01	
B			
	CE-144		6.70E-01
	CO-60		1.16E+01
	FE-55		7.33E+01
	FE-59		2.28E+00
	MN-54		2.24E+00
	NI-63		8.60E+00
	PU-241		7.90E-01
	RU-106		5.90E-01
C			
	AG-110M	3.82E+01	
	CD-109	6.10E+00	
	CO-60	2.04E+01	4.61E+01
	FE-55	2.84E+01	4.48E+01
	MN-54	1.60E+00	
	NB-95	4.00E-01	
	NI-63	2.20E+00	8.34E+00
	SB-125	2.20E+00	
D			
	CO-60		2.24E+01
	FE-55		5.07E+01
	FE-59		8.60E-04
	MN-54		1.31E+00
	NI-63		2.56E+01

Installation: Yankee Rowe  
Unit No.: 1

Location: 20 Mi NW Greenfield, MA

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 3.41E+00	Non-compacted Burial
	Ci 2.21E+01	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 6.25E+01	Compacted, Burial
	Ci 4.51E-01	
C. Irradiated Components, Control Rods, etc.	m3 1.68E-01	Uncompacted
	m3 1.43E+01	
	Ci 1.58E+04	
D. Other (describe) Coolant Pump, Generator & Pressurizer	m3 2.18E+02	
	Ci 1.30E+03	



Installation: Zion  
Unit No.: 1&2

Location: 6 Mi N Waukegan, IL

Effluent and Waste Disposal Annual Report for 1993

Unit Number: 1      Type: PWR  
Docket Number: 50-295  
Thermal Power(MWH): 2.18E+07  
Commercial Operation: 12/31/73  
Cooling Water Source: Lake Michigan  
Unit Number: 2      Type: PWR  
Docket Number: 50-304  
Thermal Power(MWH): 1.64E+07  
Commercial Operation: 09/17/74  
Cooling Water Source: Lake Michigan

Licensee: Commonwealth Edison  
Licensed Power(MWT): 3.25E+03  
Net Electrical Power(MWH): 7.02E+06  
Initial Criticality: 06/19/73  
Licensee: Commonwealth Edison  
Licensed Power(MWT): 3.25E+03  
Net Electrical Power(MWH): 5.29E+06  
Initial Criticality: 12/24/73

Airborne Effluents

Nuclide Released	Activity (Ci)
NA-24	1.22E-04
CR-51	1.05E-03
CO-58	2.01E-02
FE-59	3.30E-05
CO-60	1.60E-03
BR-82	7.83E-05
KR-85	8.81E+00
KR-85M	1.61E-01
RE-88	1.94E-01
NB-95	2.05E-04
ZR-95	1.07E-04
TC-99M	2.10E-05
RU-103	1.60E-05
I-131	1.09E-02
XE-131M	1.55E+00
I-132	1.00E-03
I-133	4.32E-03
XE-133	2.55E+03
XE-133M	1.27E+01
CS-134	2.50E-04
I-134	7.60E-08
I-135	1.11E-03
XE-135	2.79E+01
CS-136	7.00E-05
CS-137	2.92E-04
CS-138	6.87E-06

Liquid Effluents

Nuclide Released	Activity (Ci)
NA-24	5.76E-03
CR-51	1.03E-01
MN-54	3.07E-03
CO-57	8.10E-06
CO-58	3.62E-01
FE-59	1.11E-02
CO-60	2.13E-01
KR-85	1.25E-02
KR-85M	3.80E-05
SR-92	5.93E-03

Installation: Zion  
Unit No.: 1&2

Location: 6 Mi N Waukegan, IL

Effluent and Waste Disposal Annual Report for 1993

Liquid Effluents (continued)

Nuclide Released	Activity (Ci)
NB-95	7.36E-03
ZR-95	5.94E-03
ZR-97	5.10E-06
MO-99	2.31E-04
TC-99M	2.39E-04
RU-103	1.60E-04
AG-110M	4.87E-02
SN-113	1.51E-03
SN-117M	8.84E-02
SB-122	8.20E-04
SB-124	4.63E-02
SB-125	1.58E-01
SB-126	2.90E-05
I-131	1.36E-02
XE-131M	4.38E-02
I-132	3.90E-03
TE-132	2.50E-03
TE-132M	1.80E-06
I-133	1.88E-03
XE-133	3.59E+00
XE-133M	4.33E-02
CS-134	1.35E-02
XE-135	3.77E-02
CS-137	2.88E-02
CS-138	1.50E-03
LA-140	1.44E-03

Total Airborne Tritium Released	2.67E+02 Ci
Total Liquid Tritium Released	1.24E+03 Ci
Volume of Waste Released (Prior to Dilution)	3.07E+07 liters
Volume of Dilution Water Used During Period	1.09E+11 liters

Installation: Zion  
Unit No.: 1&2

Location: 6 Mi N Waukegan, IL

Effluent and Waste Disposal Annual Report for 1993  
Solid Effluents

Unit Number: 1      Type: PWR  
Docket Number: 50-295  
Thermal Power(MWH): 2.18E+07  
Commercial Operation: 12/31/73  
Cooling Water Source: Lake Michigan

Licensee: Commonwealth Edison  
Licensed Power(MWT): 3.25E+03  
Net Electrical Power(MWH): 7.02E+06  
Initial Criticality: 06/19/73

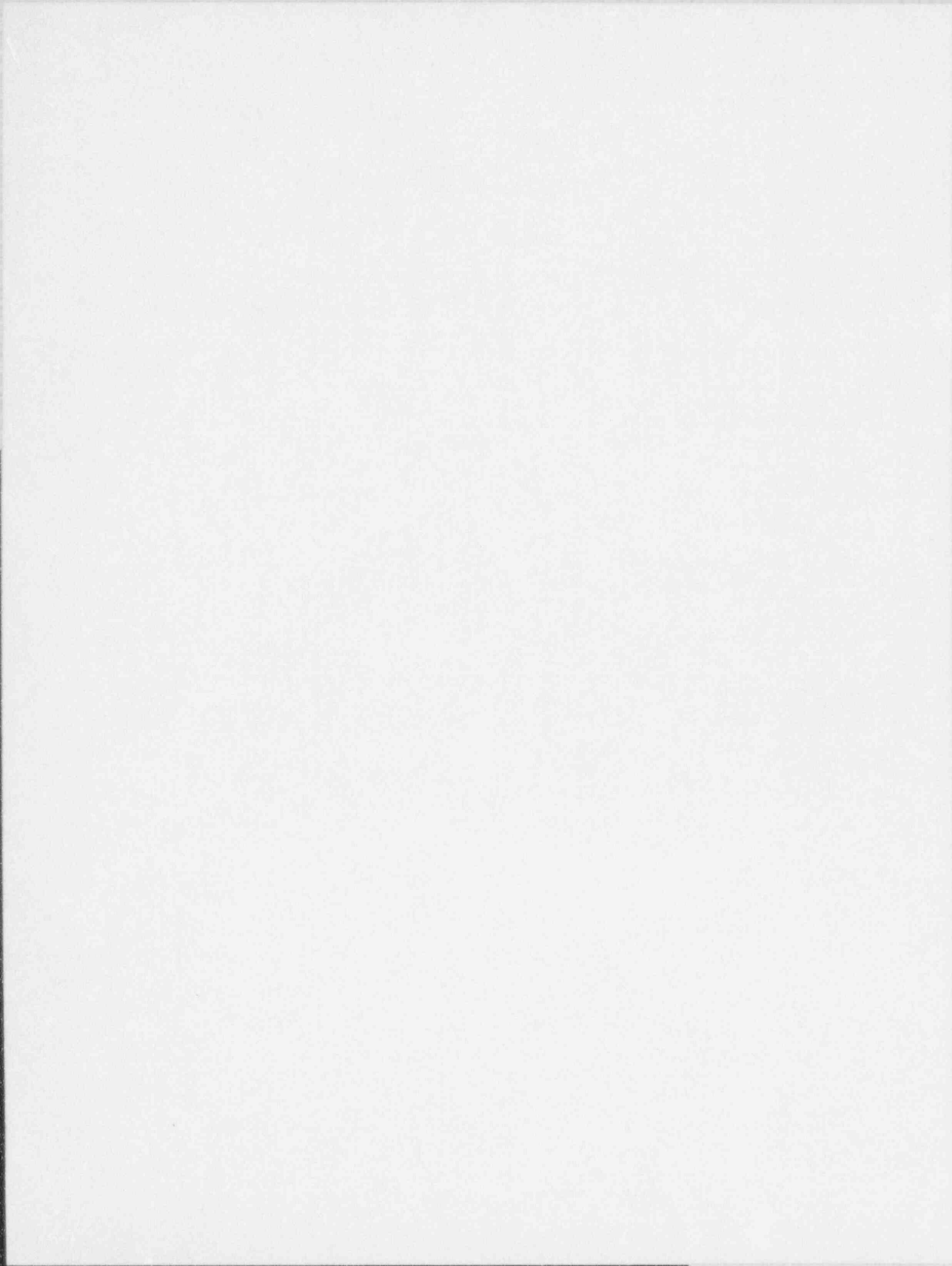
Unit Number: 2      Type: PWR  
Docket Number: 50-304  
Thermal Power(MWH): 1.64E+07  
Commercial Operation: 09/17/74  
Cooling Water Source: Lake Michigan

Licensee: Commonwealth Edison  
Licensed Power(MWT): 3.25E+03  
Net Electrical Power(MWH): 5.29E+06  
Initial Criticality: 12/24/73

Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
24	Truck	Barnwell, SC

Type of Waste	Unit	Description
A. Spent Resins, Filter Sludges, Evaporator Bottoms, etc.	m3 6.53E+01 Ci 7.56E+02	
B. Dry Compressible Waste, Contaminated Equipment, etc.	m3 5.36E+01 Ci 2.29E+02	
C. Irradiated Components, Control Rods, etc.	m3 Ci	
D. Other (describe) Filters	m3 3.41E+00 Ci 9.34E+00	



**BIBLIOGRAPHIC DATA SHEET**

(See instructions on the reverse)

1. REPORT NUMBER  
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Washington, DC 20555-0001

10. SUPPLEMENTARY NOTES

11. ABSTRACT (200 words or less)

Releases of radioactive materials in airborne and liquid effluents from commercial light water reactors during 1993 have been compiled and reported. Data on solid waste shipments as well as selected operating information have been included. This report supplements earlier annual reports issued by the former Atomic Energy Commission and the Nuclear Regulatory Commission. The 1993 release data are summarized in tabular form. Data covering specific radionuclides are summarized.

12. KEY WORDS/DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)

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solid waste disposal  
nuclear power plants  
liquid effluents

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