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Vol. 30

# Occupational Radiation Exposure at Commercial Nuclear Power Reactors and Other Facilities 2008

Forty-First Annual Report

U.S. Nuclear Regulatory Commission
Office of Nuclear Regulatory Research
Washington, DC 20555-0001

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NUREG-0713
Vol. 30

# Occupational Radiation Exposure at Commercial Nuclear Power Reactors and Other Facilities 2008

## Forty-First Annual Report

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# PREVIOUS REPORTS IN THIS SERIES

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| WASH-1311 | A Compilation of Occupational Radiation Exposure from Light Water Cooled Nuclear Power Plants, 1969–1973, U.S. Atomic Energy Commission, May 1974. |
| NUREG-75/032 | Occupational Radiation Exposure at Light Water Cooled Power Reactors, 1969–1974, U.S. Nuclear Regulatory Commission, June 1975. |
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Previous reports in the NUREG-0714 series, which are now combined with NUREG-0713, are as follows:

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| WASH-1350-R1 through WASH-1350 R6 | First through Sixth Annual Reports of the Operation of the U.S. AEC's Centralized Ionizing Radiation Exposure Records and Reporting System, U.S. Atomic Energy Commission. |
| NUREG-75/108 | Seventh Annual Occupational Radiation Exposure Report for Certain NRC Licensees, 1974, U.S. Nuclear Regulatory Commission, October 1975. |
| NUREG-0119 | Eighth Annual Occupational Radiation Exposure Report for 1975, U.S. Nuclear Regulatory Commission, October 1976. |
| NUREG-0322 | Ninth Annual Occupational Radiation Exposure Report for 1976, U.S. Nuclear Regulatory Commission, October 1977. |
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| NUREG-0714 | Occupational Radiation Exposure, Thirteenth and Fourteenth Annual Reports, 1980 and 1981, Vols. 2 and 3, U.S. Nuclear Regulatory Commission, October 1983. |
| NUREG-0714 | Occupational Radiation Exposure, Fifteenth and Sixteenth Annual Reports, 1982 and 1983, Vols. 4 and 5, U.S. Nuclear Regulatory Commission, October 1985. |

# ABSTRACT

This report summarizes the occupational exposure data that are maintained in the U.S. Nuclear Regulatory Commission (NRC) Radiation Exposure Information and Reporting System (REIRS). The bulk of the information contained in the report was compiled from the 2008 annual reports submitted by five of the seven categories[1] of NRC licensees subject to the reporting requirements of 10 CFR 20.2206. The annual reports submitted by these licensees consist of radiation exposure records for each monitored individual. These records are analyzed for trends and presented in this report in terms of collective dose and the distribution of dose among the monitored individuals. Because there are no geologic repositories for high-level waste currently licensed and no low-level waste disposal facilities in operation, only five categories will be considered in this report.

Annual reports for 2008 were received from a total of **194** NRC licensees. Compilations of the reports submitted by the **194** licensees indicated that **181,462** individuals were monitored, **86,169** of whom received a measurable dose (Table 3.2). The collective dose incurred by these individuals was **11,301** person-rem, which represents a **7% decrease** from the 2007 value. The number of workers receiving a measurable dose also decreased, resulting in an average measurable dose of **0.13** rem for 2008. The average measurable dose is defined as the total effective dose equivalent (TEDE) divided by the number of workers receiving a measurable dose.[2] The figures and tables for commercial reactors in this report have been adjusted to account for transient reactor workers where specifically noted in footnotes.

In calendar year 2008, the average annual collective dose per reactor for light water reactor (LWR) licensees was **88** person-rem. This represents a **9% decrease** from the value reported for 2007 (97 person-rem). The annual collective dose per reactor for boiling water reactors (BWRs) was **129** person-rem for **35** BWRs, and for pressurized water reactors (PWRs), it was **68** person-rem for **69** PWRs. Analyses of transient worker data indicate that **28,780** individuals completed work assignments at two or more licensees during the monitoring year. The dose distributions are adjusted each year to account for the duplicate reporting of transient workers by multiple licensees. In 2008, the average measurable dose per worker for all licensees calculated from reported data was **0.13** rem. The corrected dose distribution resulted in an average measurable dose per worker for all licensees of **0.18** rem.

[1]Commercial nuclear power reactors and test reactor facilities, industrial radiographers; fuel processors (including uranium enrichment facilities), fabricators, and reprocessors; manufacturing and distribution of byproduct material; independent spent fuel storage installations; facilities for land disposal of low-level waste; and geologic repositories for high-level waste. There are currently no NRC licensees involved in low-level waste disposal or geologic repositories for high-level waste.

[2]The number of workers with measurable dose includes any individual with a dose greater than zero rem and does not include doses reported as “not detectable.”

# EDITOR'S NOTE

Charles Hinson, Ronald LaVera, Steven Garry, Gregory Chapman, Richard Struckmeyer, Sami Sherbini, Janine Katanic, and Vincent Holahan assisted in the preparation of this NUREG, serving as technical reviewers. The U.S. Nuclear Regulatory Commission welcomes responses from readers.

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# PREFACE

A number of U.S. Nuclear Regulatory Commission (NRC) licensees have inquired as to how the occupational radiation exposure data that are compiled from the individual exposure reports required by §20.2206 are used by the NRC staff. In combination with other sources of information, the principal uses of the data are to provide facts regarding routine occupational exposures to radiation and radioactive material that occur in connection with certain NRC-licensed activities. These facts, as indicated below, are used by the NRC staff:

1. The data permit evaluation of trends, both favorable and unfavorable, from the viewpoint of the effectiveness of overall NRC/licensee radiation protection and as low as reasonably achievable (ALARA) efforts by licensees.

2. The external dose data assist in the evaluation of the radiological risk associated with certain categories of NRC-licensed activities and are used for comparative analyses of radiation protection performance: U.S./foreign, boiling water reactors/pressurized water reactors (BWRs/PWRs), civilian/military, facility/facility, nuclear industry/other industries, etc.

3. The data are used as one of the metrics of the NRC Reactor Oversight Program to evaluate the effectiveness of the licensees' ALARA programs and also for inspection planning purposes.

4. The data provide for the monitoring of transient workers who may affect dose distribution statistics through multiple counting.

5. The data help provide facts for evaluating the adequacy of the current risk limitation system (e.g., are individual lifetime dose limits, worker population collective dose limits, and requirements for optimization needed).

6. The data permit comparisons of occupational radiation risks with potential public risks when action for additional protection of the public involves worker exposures.

7. The data are used in the establishment of priorities for the utilization of NRC health physics resources: research, standards development, and regulatory program development.

8. The data provide facts for answering Congressional and administration inquiries and for responding to questions raised by the public.

9. The data are used to provide radiation exposure histories to individuals who were exposed to radiation at NRC-licensed facilities.

10. The data provide information that may be used in the planning of epidemiological studies.

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# FOREWORD

Through this annual report, the U.S. Nuclear Regulatory Commission (NRC) supports openness in its regulatory process by providing the public with accurate and timely information about the radiation protection program of NRC's licensees. Toward that end, NUREG-0713, Volume 30, summarizes the 2008 occupational radiation exposure data maintained in the NRC Radiation Exposure Information and Reporting System (REIRS) database.

Seven categories of NRC licensees are required to report annually on individual exposure in accordance with Title 10, Section 20.2206, of the Code of Federal Regulations (10 CFR 20.2206, "Reports of Individual Monitoring"). Specifically, these categories include commercial nuclear power plants; industrial radiographers; fuel processors (including uranium enrichment facilities), fabricators, and reprocessors; manufacturing and distribution of byproduct material; independent spent fuel storage installations; facilities for land disposal of low-level waste; and geologic repositories for high-level waste. Because NRC has not licensed any geologic repositories for high-level waste and no NRC-licensed low-level waste disposal facilities are currently in operation, this report considers only the first five categories of NRC licensees. As such, this report reflects the occupational radiation exposure data that NRC received from 194 licensees.

The data submitted by licensees consist of radiation exposure records for each monitored individual. In 2008, 130,830 individuals were monitored and 64,075 received a measurable dose (when adjusted for transient workers). This report analyzes and presents these records in terms of collective dose and the distribution of dose among the monitored individuals. During 2008, these individuals incurred a collective dose of 11,301 person-rem, which represents a 7% decrease from the 2007 value of 12,157 person-rem. The average measurable dose is the total collective dose divided by the number of workers receiving a measurable dose. The average measurable dose decreased from 0.19 rem in 2007 to 0.18 rem in 2008. This value can be compared with the 0.30 rem that the average person in the United States receives annually from natural background radiation. Worldwide annual exposures to natural radiation are generally expected to be in the range of 0.1 rem to 1.0 rem, with 0.24 rem [Ref. 12] being the current average worldwide value.

This annual report is useful in evaluating trends in occupational radiation exposure to assess the effectiveness of licensees' radiation protection programs to maintain exposures as low as reasonably achievable (ALARA). For example, the NRC staff uses the data presented in this report as one of the metrics of the NRC Reactor Oversight Program to evaluate the effectiveness of licensees' ALARA programs.

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# ABBREVIATIONS

| | |
|---|---|
| AEC | U.S. Atomic Energy Commission |
| ALARA | as low as reasonably achievable |
| BWR | boiling water reactor |
| CDE | committed dose equivalent |
| CEDE | committed effective dose equivalent |
| CFR | Code of Federal Regulations |
| D&D | decontamination and decommissioning |
| DDE | deep dose equivalent |
| DOE | U. S. Department of Energy |
| ERDA | Energy Research and Development Administration |
| ISFSI | independent spent fuel storage installation |
| LDE | lens dose equivalent |
| LWR | light water reactor |
| M&D | manufacturing and distribution |
| mSv | millisievert |
| MWe | megawatts electric |
| MW-yr | megawatt-year |
| ND | not detectable |
| NR | not required to be reported |
| NRC | U.S. Nuclear Regulatory Commission |
| NRR | Office of Nuclear Reactor Regulation |
| PSE | planned special exposures |
| PWR | pressurized water reactor |
| REIRS | Radiation Exposure Information and Reporting System |
| RES | Office of Nuclear Regulatory Research |
| SDE-ME | shallow dose equivalent maximum extremity |
| SDE-WB | shallow dose equivalent whole body |
| SI | international system of units |
| SR | collective dose ratio |
| Sv | sieverts |
| TEDE | total effective dose equivalent |
| TMI | Three Mile Island |
| TODE | total organ dose equivalent |
| $UF_6$ | uranium hexafluoride |
| UNSCEAR | United Nations Scientific Committee on the Effects of Atomic Radiation |
| USEC | United States Enrichment Corporation |

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# Section 1
# INTRODUCTION

## 1.1 BACKGROUND

One of the basic purposes of the Atomic Energy Act and the implementing regulations in Title 10, Code of Federal Regulations (CFR), Chapter I, Part 20, is to protect the health and safety of the public, including the employees of the licensees conducting operations under those regulations. Among the regulations designed to ensure that the standards for protection against radiation set out in 10 CFR 20 are met is a requirement that licensees provide individuals likely to be exposed to radiation with devices to monitor their exposures. Each licensee is also required to maintain indefinitely records of the results of such monitoring. However, there was no initial provision that these records or any summary of them be transmitted to a central location where the data could be retrieved and analyzed.

On November 4, 1968, the U.S. Atomic Energy Commission (AEC) published an amendment to 10 CFR 20 requiring the reporting of certain occupational radiation exposure information to a central repository at AEC Headquarters. This information was required of the four categories[3] of AEC licensees that were considered to involve the greatest potential for significant occupational doses and of AEC facilities and contractors exempt from licensing. A procedure was established whereby the appropriate occupational exposure data were extracted from these reports and entered into the AEC Radiation Exposure Information and Reporting System (REIRS), a computer system that was maintained at the Oak Ridge National Laboratory Computer Technology Center in Oak Ridge, Tennessee, until May 1990. At that time, the data were transferred to a database management system and are now maintained at the Oak Ridge Institute for Science and Energy, which is managed by Oak Ridge Associated Universities. The computerization of these data ensures that they are kept indefinitely and facilitates their retrieval and analysis. The data maintained in REIRS have been summarized and published in a report every year since 1969. Annual reports for each of the years 1969 through 1973 presented the data reported by both AEC licensees and contractors and were published in six documents designated as WASH-1350-R1 through WASH-1350-R6.

In January 1975, with the separation of AEC into the Energy Research and Development Administration (ERDA) and the U.S. Nuclear Regulatory Commission (NRC), each agency assumed responsibility for collecting and maintaining occupational radiation exposure information reported by the facilities under its jurisdiction. The annual reports published by NRC on occupational exposure for calendar year 1974 and subsequent years do not contain information pertaining to ERDA facilities or contractors. Comparable information for facilities and contractors under ERDA, now the U.S. Department of Energy (DOE), is collected and published by the DOE Office of Corporate Safety Analysis, a division of Health, Safety and Security, in Germantown, Maryland.

[3]Commercial nuclear power reactors; industrial radiographers; fuel processors (including uranium enrichment facilities as of 1997), fabricators, and reprocessors; and manufacturing and distribution of specified quantities of byproduct material.

In 1982 and 1983, Paragraph 20.408(a) of 10 CFR 20 was amended to require three additional categories of NRC licensees to submit annual statistical exposure reports and individual termination exposure reports. The three additional NRC licensee categories were: (1) geologic repositories for high-level radioactive waste, (2) independent spent fuel storage installations, and (3) facilities for the land disposal of low-level radioactive waste. This document presents the exposure information that was reported by NRC licensees representing two of these categories; there are no geologic repositories for high-level waste currently licensed.

This report and each of the predecessors summarize information reported for both the current year and previous years. More licensee-specific data for previous years, such as the annual reports submitted by each commercial power reactor pursuant to 10 CFR 20.407 and 20.2206 (after 1993) and their technical specifications (prior to Volume 20 of this report), may be found in the documents listed on the inside of the front cover of this report for the specific year desired. Additional operating data and statistics for each commercial power reactor for the years 1973 through 1982 may be found in a series of reports, Nuclear Power Plant Operating Experience [Refs. 1–9].

These documents are available for viewing at all NRC public document rooms, as well as on the NRC public Web site (www.nrc.gov), or they may be purchased from the National Technical Information Service, as shown in the References section.

In May 1991, 10 CFR 20 Standards for Protection Against Radiation; Final Rule was revised. The revision redefined the radiation monitoring and reporting requirements of NRC licensees. Instead of submitting summary annual reports (§20.407) and termination reports (§20.408), licensees are now required to submit an annual report of the dose received by each monitored worker (§20.2206). Licensees were required to implement the new requirements no later than January 1994.

## 1.2 RADIATION EXPOSURE INFORMATION ON THE INTERNET

In May 1995, NRC began pursuing the dissemination of radiation exposure information via a Web site on the Internet. This site allows interested parties with the appropriate equipment to access the data electronically rather than through the published NUREG-0713 document. A Web site was created for radiation exposure and linked into the main NRC Web page. The Web site contains up-to-date information on radiation exposure, as well as information and guidance on reporting radiation exposure information to NRC. Interested parties may read the documents online or download information to their systems for further analysis. Software, such as the Radiation Exposure Monitoring and Information Transmittal System, a software application designed to maintain licensee dose records, and REIRView, a software package designed to validate a licensee's annual data submittal, are also available for downloading via the Web site. There are also links to other Web sites dealing with the topics of radiation and health physics. Individuals and organizations may also submit requests for dose records contained in REIRS on this Web site.

NRC intends to continue pursuing the dissemination of radiation exposure information via the Web and will focus more resources on the electronic distribution of information rather than the publication of hard-copy reports.

The main Web address for NRC is

**http://www.nrc.gov**

The NRC radiation exposure information Web URL is

**http://www.reirs.com**

Comments on this report or the NRC's radiation exposure Web page should be directed to

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# Section 2

# LIMITATIONS OF THE DATA

All of the figures compiled in this report relating to exposures and occupational doses are based on the results and interpretations of the readings of various types of personnel-monitoring devices employed by each licensee. This information, obtained from routine personnel-monitoring programs, is sufficient to characterize the radiation exposure incident to individuals' work and is used in evaluating the radiation protection program.

Monitoring requirements are specified in 10 CFR 20.1502, which requires licensees to monitor individuals who receive or are likely to receive a dose in a year in excess of 10% of the applicable limits. For most adults, the annual limit for the whole body is 5 rem, so 0.5 rem per year is the level above which monitoring is required. Separate dose limits have been established for minors and declared pregnant workers. Monitoring is also required for any individual entering a high or very high radiation area. Depending on the administrative policy of each licensee, persons such as visitors and clerical workers may also be provided with monitoring devices, even though the probability of their exposure to measurable levels of radiation is extremely small. Licensees must report the dose records of those individuals for whom monitoring is required. Many licensees elect to report the doses for every individual for whom they provided monitoring. This practice increases the number of individuals that are considered to be radiation workers.

In an effort to account for this increase, the number of individuals reported as having "no measurable dose"[4] has been subtracted from the total number of individuals monitored in order to calculate an average dose per individual receiving a measurable dose, as well as the average dose per monitored individual.

The average dose per individual, as well as the dose distributions shown for groups of licensees, also can be affected by the multiple reporting of individuals who were monitored by two or more licensees during the year. Licensees are only required to report the doses received by individuals at their licensed facilities. A dose distribution for a single licensee does not consider that some of the individuals may have received doses at other facilities. When the data are summed to determine the total number of individuals monitored by a group of licensees, individuals may be counted more than once if they have worked at more than one facility during the calendar year. These occurrences can also affect the distribution of doses because individuals may be counted multiple times in the lower dose ranges rather than one time in the higher range corresponding to the actual accumulated dose for the year (the sum of an individual's dose accrued at all facilities). This source of error has the greatest potential impact on the data reported by nuclear power reactors since they employ many short-term workers. Section 5 contains an analysis that corrects for individuals being counted more than once.

When examining the annual statistical data it is important to note that all of the personnel included in the report may not have been

[4] The number of workers with measurable dose includes any individual with a total effective dose equivalent greater than zero rem. Workers reported with zero dose, or no detectable dose, are included in the number of workers with no measurable exposure.

monitored throughout the entire year. Many licensees, such as radiography firms and nuclear power reactors, may monitor numerous individuals for periods much less than a year. The average doses calculated from these data, therefore, are less than the average dose that an individual involved in that activity for the full year would receive.

Considerable attention should be given when referencing the collective totals presented in this report. The differences between the totals presented for all licensees that reported versus only those licensees that are required to report should be noted. Likewise, one should distinguish between the doses attributed to the pressurized water reactors (PWRs) and the doses attributed to boiling water reactors (BWRs). The totals may be inclusive or exclusive of those licensees that were in commercial operation for less than one full year. These parameters vary throughout the tables and appendices of this report. The apparent discrepancies among the various tables are a necessary side effect of this endeavor.

The data contained in this report are subject to change because licensees may submit corrections or additions to data for previous years. For the 2008 report, data for prior years may have been updated to account for these corrections and additions. Users should be aware of these changes, which are italicized for easy identification.

This report contains information reported by NRC licensees and some Agreement State[5] licensees. Since NRC licenses all commercial nuclear power reactors, fuel processors and fabricators, and independent spent fuel storage installations, information shown for these categories reflect all relevant activity in the United States. This is not the case, however, for the remaining categories of industrial radiography, manufacturing and distribution of specified quantities of byproduct material, and low-level waste disposal. Many companies that conduct these types of activities are located in Agreement States. More than three times as many facilities are regulated by Agreement States than are licensed by NRC. Agreement States are not required to adopt the reporting requirements in 10 CFR 20.2206. As a result, Agreement State licensees are not required to submit occupational dose reports to the NRC. Although some Agreement State licensees voluntarily submit occupational dose reports to NRC, these results are not included in the analyses presented in Sections 3, 5, and 6 of this report. The data are, however, included in Appendix A for completeness. In addition, this report does not include compilations of nonoccupational exposure, such as exposure received by medical patients from X-rays, fluoroscopy, or accelerators.

All dose equivalent values in this report are given in units of rem in accordance with the general provisions for records, 10 CFR 20.2101(a). In order to convert rem into the International System of Units (SI) unit of sieverts (Sv), readers should divide the value in rem by 100. Therefore, 1 rem = 0.01 Sv. In order to convert rem into millisieverts (mSv), readers should multiply the value in rem by 10.

[5]Agreement States are States that have entered into formal agreement with NRC under which the State regulates the use of certain byproduct, source, and small quantities of special nuclear material in that State. In 2008, there were 35 Agreement States.

# Section 3

# ANNUAL PERSONNEL MONITORING REPORTS – 10 CFR 20.2206

## 3.1 DEFINITION OF TERMS AND SOURCES OF DATA

### *3.1.1 Statistical Summary Reports*

The total effective dose equivalent (TEDE) is summed per individual and tabulated into the appropriate dose range to generate the dose distribution for each licensee. The total collective dose is more accurate using this method, because the licensee reported the dose to each individual and the total collective dose was calculated from the sum of these doses and not statistically derived from the dose distribution (see Section 3.1.4). The TEDE includes the dose contribution from the committed effective dose equivalent (CEDE) for those workers who had intakes that required monitoring and reporting of internal dose.

### *3.1.2 Number of Monitored Workers*

The number of monitored workers refers to the total number of workers that the NRC licensees (who are covered by 10 CFR 20.1502) reported as being monitored for exposure to external and internal radiation during the year. This number includes all workers for whom monitoring is required and may include visitors, service representatives, contract workers, clerical workers, and any other workers for whom the licensee determines that monitoring devices should be provided.

For licensees submitting under 10 CFR 20.2206, the total number of workers was determined from the number of unique personal identification numbers submitted per licensee. Uniqueness is defined by the combination of identification number and identification type [Ref. 10].

### *3.1.3 Number of Workers with Measurable Dose*

The number of workers with measurable dose includes any individual with a TEDE greater than zero rem. This does not include workers with a TEDE reported as zero, not detectable (ND), or not required to be reported (NR) [Ref. 10].

### *3.1.4 Collective Dose*

The concept of collective dose is used in this report to denote the summation of the TEDE received by all monitored workers and is reported in units of person-rem. Since 10 CFR 20.2206 requires that the TEDE be reported, the collective dose is calculated by summing the TEDE for all monitored workers. The phrase “collective dose” is used throughout this report to mean the collective TEDE, unless otherwise specified.

It should be noted that, prior to the implementation of the revised dose reporting requirements of 10 CFR 20.2206 in 1994, the collective dose was, in some cases, calculated from the dose distributions by summing the products obtained from multiplying the number of workers reported in each of the dose ranges by the midpoint of the corresponding dose range. This assumes that the midpoint of the range is equal to the arithmetic mean of the individual doses in the range. Experience has shown that the actual mean dose of workers reported in each dose range is less than the midpoint of the range. For this reason, the resultant calculated collective doses shown in this report for these licensees may be approximately 10% higher than the sum of the

actual individual doses. Care should be taken when comparing the actual collective dose calculated for 1994 to 2008 with the collective dose for years prior to 1994 because of this change in methodology. In addition, prior to 1994, doses only included the external whole-body dose with no internal dose contribution. Although the contribution of internal dose to the TEDE is minimal for most licensees, it should be considered when comparing collective doses for 1994 and later with the collective dose for years prior to 1994. One noted exception is for fuel fabrication licensees where the CEDE, in some cases, contributes the majority of the TEDE (see Section 3.3.5).

### *3.1.5 Average Individual Dose*

The average individual dose is obtained by dividing the collective dose by the total number of workers reported as being monitored. This figure is usually less than the average measurable dose because it includes the number of those workers who received zero or less than measurable doses.

### *3.1.6 Average Measurable Dose*

The average measurable dose is obtained by dividing the collective TEDE by the number of workers who received a measurable dose. This is the average most commonly used in this and other reports when examining trends and comparing doses received by workers in various segments of the nuclear industry, because it deletes those workers receiving zero or no detectable dose, many of whom were monitored for convenience or identification purposes.

### *3.1.7 Number of Licensees Reporting*

The number of licensees refers to the NRC licenses issued to use radioactive material for certain activities that would place the licensees in one of the seven[5] categories that are required to report pursuant to 10 CFR 20.2206. The third column in Table 3.1 shows the number of licensees that have filed such reports during the last 11 years. All nuclear power plants, fuel processors and fabricators, and independent spent fuel storage installations are required to report occupational exposure to NRC, whether or not they are in an Agreement State. The other types of Agreement State licensees are not required to submit exposure reports to NRC.

### *3.1.8 Collective TEDE Distribution by Dose Range*

The United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) 2000 report, entitled Sources and Effects of Ionizing Radiation, United Nations Scientific Committee on the Effects of Atomic Radiation UNSCEAR 2000 Report to the General Assembly, Volume I [Ref. 11], recommends the calculation of a parameter, SR (collective distribution ratio), to aid in the examination of the distribution of radiation exposure among workers. SR is defined as the ratio of the annual collective dose incurred by workers whose annual doses exceed a certain dose level to the total annual collective dose. UNSCEAR uses a subscript to denote the specific dose level in millisieverts. Therefore, $SR_{15}$ is the notation for the collective dose for individuals who received 15 mSv (1.5 rem) or more in the year, divided by the total annual collective dose. The UNSCEAR 2000

[6]These categories are commercial nuclear power reactors; industrial radiographers; fuel processors (including uranium enrichment facilities), fabricators, and reprocessors; manufacturing and distribution of byproduct material; independent spent fuel storage installations; facilities for land disposal of low-level waste; and geologic repositories for high-level waste. There are currently no NRC licensees involved in low-level waste disposal or geologic repositories for high-level waste.

## TABLE 3.1
### Average Annual Exposure Data for Certain Categories of NRC Licensees 1998–2008

| NRC License Category* and Program Code | Calendar Year | Number of Licensees Reporting | Number of Monitored Individuals | Number of Workers with Measurable TEDE | Collective TEDE (person-rem) | Average TEDE (rem) | Average Measurable TEDE per Worker (rem) |
|---|---|---|---|---|---|---|---|
| Industrial Radiography 03310 03320 | 1998 | 141 | 4,940 | 3,439 | 1,858.775 | 0.38 | 0.54 |
| | 1999 | 131 | 3,557 | 2,689 | 1,548.110 | 0.44 | 0.58 |
| | 2000 | 128 | 3,157 | 2,454 | 1,525.143 | 0.48 | 0.62 |
| | 2001 | 123 | 3,560 | 3,040 | 2,106.213 | 0.59 | 0.69 |
| | 2002 | 100 | 3,420 | 2,842 | 1,729.222 | 0.51 | 0.61 |
| | 2003 | 118 | 3,115 | 2,651 | 1,584.249 | 0.51 | 0.60 |
| | 2004 | 113 | 3,568 | 3,014 | 1,603.591 | 0.45 | 0.53 |
| | 2005 | 90 | 3,009 | 2,623 | 1,504.575 | 0.50 | 0.57 |
| | 2006 | 78 | 2,388 | 1,981 | 1,109.347 | 0.46 | 0.56 |
| | 2007 | 74 | 2,607 | 2,224 | 1,315.171 | 0.50 | 0.59 |
| | 2008 | 61 | 2,967 | 2,587 | 1,460.757 | 0.49 | 0.56 |
| Manufacturing and Distribution 02500 03211 03212 03214 | 1998 | 28 | 1,922 | 644 | 401.356 | 0.21 | 0.62 |
| | 1999 | 40 | 2,205 | 836 | 418.993 | 0.19 | 0.50 |
| | 2000 | 39 | 2,460 | 1,187 | 415.402 | 0.17 | 0.35 |
| | 2001 | 35 | 1,705 | 1,184 | 344.743 | 0.20 | 0.29 |
| | 2002 | 29 | 1,437 | 1,052 | 328.092 | 0.23 | 0.31 |
| | 2003 | 33 | 2,372 | 1,796 | 436.660 | 0.18 | 0.24 |
| | 2004 | 28 | 2,539 | 1,787 | 347.258 | 0.14 | 0.19 |
| | 2005 | 23 | 2,566 | 1,557 | 388.547 | 0.15 | 0.25 |
| | 2006 | 23 | 1,391 | 903 | 284.556 | 0.20 | 0.32 |
| | 2007 | 23 | 2,106 | 1,463 | 291.326 | 0.14 | 0.20 |
| | 2008 | 18 | 1,934 | 1,341 | 222.123 | 0.11 | 0.17 |
| Independent Spent Fuel Storage 23100 23200 | 1998 | 1 | 53 | 21 | 2.561 | 0.05 | 0.12 |
| | 1999 | 2 | 86 | 33 | 5.172 | 0.06 | 0.16 |
| | 2000 | 2 | 146 | 83 | 5.571 | 0.04 | 0.07 |
| | 2001 | 2 | 154 | 107 | 13.088 | 0.08 | 0.12 |
| | 2002 | 2 | 75 | 67 | 6.013 | 0.08 | 0.09 |
| | 2003 | 2 | 55 | 46 | 2.791 | 0.05 | 0.06 |
| | 2004 | 1 | 37 | 27 | 1.257 | 0.03 | 0.05 |
| | 2005 | 2 | 59 | 30 | 0.769 | 0.01 | 0.03 |
| | 2006 | 2 | 59 | 26 | 2.108 | 0.04 | 0.08 |
| | 2007 | 2 | 57 | 26 | 1.697 | 0.03 | 0.07 |
| | 2008 | 2 | 53 | 21 | 1.248 | 0.02 | 0.05 |
| Fuel Cycle Licenses – Fabrication Processing and Uranium Enrich. 21200 21210 | 1998 | 10 | 10,684 | 3,613 | 949.865 | 0.09 | 0.26 |
| | 1999 | 10 | 9,773 | 3,935 | 1,020.333 | 0.10 | 0.26 |
| | 2000 | 9 | 9,336 | 4,649 | 1,339.398 | 0.14 | 0.29 |
| | 2001 | 9 | 8,145 | 3,980 | 1,162.262 | 0.14 | 0.29 |
| | 2002 | 8 | 7,937 | 3,886 | 660.899 | 0.08 | 0.17 |
| | 2003 | 8 | 7,738 | 3,633 | 556.297 | 0.07 | 0.15 |
| | 2004 | 8 | 7,562 | 3,813 | 513.929 | 0.07 | 0.13 |
| | 2005 | 9 | 7,695 | 3,370 | 496.502 | 0.06 | 0.15 |
| | 2006 | 9 | 7,417 | 3,415 | 521.525 | 0.07 | 0.15 |
| | 2007 | 9 | 7,536 | 3,225 | 428.717 | 0.06 | 0.13 |
| | 2008 | 9 | 7,184 | 2,770 | 420.898 | 0.06 | 0.15 |
| Commercial Light Water Reactors (LWRs)** 41111 | 1998 | 104 | 114,367 | 57,466 | 13,187.392 | 0.12 | 0.23 |
| | 1999 | 104 | 113,916 | 59,031 | 13,665.711 | 0.12 | 0.23 |
| | 2000 | 104 | 110,557 | 57,233 | 12,651.682 | 0.11 | 0.22 |
| | 2001 | 104 | 104,928 | 52,292 | 11,108.552 | 0.11 | 0.21 |
| | 2002 | 104 | 107,900 | 54,460 | 12,126.190 | 0.11 | 0.22 |
| | 2003 | 104 | 109,990 | 55,967 | 11,955.570 | 0.11 | 0.21 |
| | 2004 | 104 | 110,290 | 52,873 | 10,367.897 | 0.09 | 0.20 |
| | 2005 | 104 | 114,344 | 57,566 | 11,455.807 | 0.10 | 0.20 |
| | 2006 | 104 | 116,354 | 58,788 | 11,021.186 | 0.09 | 0.19 |
| | 2007 | 104 | 114,583 | 57,267 | 10,120.013 | 0.09 | 0.18 |
| | 2008 | 104 | 118,692 | 57,356 | 9,195.940 | 0.08 | 0.16 |
| Grand Totals and Averages | 1998 | 284 | 131,966 | 65,183 | 16,399.949 | 0.12 | 0.25 |
| | 1999 | 287 | 129,537 | 66,524 | 16,658.319 | 0.13 | 0.25 |
| | 2000 | 282 | 125,656 | 65,606 | 15,937.196 | 0.13 | 0.24 |
| | 2001 | 273 | 118,492 | 60,603 | 14,734.858 | 0.12 | 0.24 |
| | 2002 | 243 | 120,769 | 62,307 | 14,850.416 | 0.12 | 0.24 |
| | 2003 | 265 | 123,270 | 64,093 | 14,535.567 | 0.12 | 0.23 |
| | 2004 | 254 | 123,996 | 61,514 | 12,833.932 | 0.10 | 0.21 |
| | 2005 | 228 | 127,673 | 65,146 | 13,846.200 | 0.11 | 0.21 |
| | 2006 | 216 | 127,609 | 65,113 | 12,938.722 | 0.10 | 0.20 |
| | 2007 | 212 | 126,889 | 64,205 | 12,156.924 | 0.10 | 0.19 |
| | 2008 | 194 | 130,830 | 64,075 | 11,300.966 | 0.09 | 0.18 |

* These categories consist only of NRC licensees. Agreement State licensed organizations are not required to report occupational exposure data to NRC.

** This category includes all LWRs in commercial operation for a full year for each of the years indicated. Reactor data have been corrected to account for the multiple counting of transient reactor workers (see Section 5).

report notes that the 1.5 rem dose level may not be useful where doses are consistently lower than this level, and UNSCEAR recommends that research organizations report SR values lower than 1.5 rem where appropriate. For this reason, NRC has adopted the policy of calculating and tracking the collective TEDE distribution by dose range at dose levels of 0.10, 0.25, 0.50, 1.0, and 2.0 rem. The collective TEDE distribution by dose range values in this report was calculated by summing the TEDE to each individual who received a TEDE greater than or equal to the specified dose range divided by the total collective TEDE. In addition, the distribution is presented as a percentage rather than as a decimal fraction.

Figures 3.2, 3.3, 3.5, 3.6, 3.8, 3.10, and 3.11 show the collective TEDE distribution by dose range calculated in terms of percentage of the collective dose delivered above the specified dose levels for each of the categories of NRC licensees. Two properties of these graphs help to further reveal the nature of the distribution of dose and dose trends at NRC licensees. The first is that the percentage of dose in the higher dose ranges (i.e., above 0.50 rem) should be relatively small. This would indicate that fewer workers are exposed at these higher levels of individual risk. The second property is the ability to track the shift in dose over time. For a given dose value, a reduction in the percentage from one year to the next indicates that less dose is being received by workers above this value. Therefore, these graphs can be useful in qualifying the dose received in a given year and the trends in doses from year to year.

## 3.2 ANNUAL TEDE DOSE DISTRIBUTIONS

Table 3.2 provides a statistical compilation of the occupational dose reports by categories of licensees (see Section 3.3 for a description of each licensee category). The dose distributions are generated by summing the TEDE for each individual and counting the number of individuals in each dose range. In nearly every licensee category, a large number of workers receive doses that are less than measurable, and very few doses exceed 4 rem. Ninety-two percent of the reported workers with measurable doses (shown in Table 3.2) were monitored by nuclear power facilities in 2008, where they received 82% of the total collective dose.

Under the regulatory limits in 10 CFR 20.1201, an annual TEDE greater than 5 rem, for an adult occupational worker, is a dose that exceeds the regulatory limits (see Section 6).

Table 3.3 gives a summary of the annual occupational dose records reported to NRC, as required by 10 CFR 20.2206, by certain categories of NRC licensees. Table 3.3 shows that for the past 11 years, the percentage of workers with <2 rem has been greater than 99%. The number of workers receiving an annual dose greater than 5 rem has been <0.01% since 1998. No individual monitored at any of the five NRC licensee categories included in this report received a dose above the 5 rem annual TEDE limit during the past 5 years (see Section 6).

# TABLE 3.2
## Distribution of Annual Collective TEDE by License Category
## 2008

| License Category (Number of sites reporting) | Number of Individuals with TEDE in the Ranges (rem)* | | | | | | | | | | | | | Total Number Monitored | Number with Meas. Dose | Total Collective Dose (TEDE) (person-rem) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No Meas. | Meas. <0.1 | 0.10-0.25 | 0.25-0.50 | 0.50-0.75 | 0.75-1.00 | 1.00-2.00 | 2.00-3.00 | 3.00-4.00 | 4.00-5.00 | 5.00-6.00 | 6.00-12.00 | >12 | | | |
| **INDUSTRIAL RADIOGRAPHY** | | | | | | | | | | | | | | | | |
| Fixed Locations (3) | 35 | 26 | | | | | | | | | | | | 61 | 26 | 0.509 |
| Temporary Job Sites (58) | 345 | 667 | 429 | 452 | 298 | 229 | 371 | 93 | 20 | 2 | | | | 2,906 | 2,561 | 1,460.248 |
| **Total (61)** | **380** | **693** | **429** | **452** | **298** | **229** | **371** | **93** | **20** | **2** | **0** | **0** | **0** | **2,967** | **2,587** | **1,460.757** |
| **MANUFACTURING AND DISTRIBUTION** | | | | | | | | | | | | | | | | |
| Type "A" Broad (2) | 153 | 122 | 60 | 50 | 43 | 22 | 14 | 1 | | | | | | 465 | 312 | 95.790 |
| Type "B" Broad and Other (4) | 91 | 91 | 15 | 7 | 1 | 0 | 0 | 0 | 0 | | | | | 205 | 114 | 8.421 |
| Nuclear Pharmacies (12) | 349 | 680 | 149 | 43 | 17 | 4 | 10 | 5 | 6 | 1 | | | | 1,264 | 915 | 117.912 |
| **Total (18)** | **593** | **893** | **224** | **100** | **61** | **26** | **24** | **6** | **6** | **1** | **0** | **0** | **0** | **1,934** | **1,341** | **222.123** |
| **INDEPENDENT SPENT FUEL STORAGE** | | | | | | | | | | | | | | | | |
| **Total (2)** | **32** | **17** | **3** | **1** | | | | | | | | | | **53** | **21** | **1.248** |
| **FUEL CYCLE**** | | | | | | | | | | | | | | | | |
| **Total (9)** | **4,414** | **1,515** | **648** | **416** | **164** | **24** | **3** | | | | | | | **7,184** | **2,770** | **420.898** |
| **COMMERCIAL POWER REACTORS***** | | | | | | | | | | | | | | | | |
| Boiling Water (35) | 27,150 | 21,809 | 7,276 | 3,841 | 1,098 | 392 | 221 | 5 | | | | | | 61,792 | 34,642 | 4,522.413 |
| Pressurized Water (69) | 62,724 | 30,022 | 10,061 | 3,737 | 749 | 191 | 48 | | | | | | | 107,532 | 44,808 | 4,673.527 |
| **Total (104)** | **89,874** | **51,831** | **17,337** | **7,578** | **1,847** | **583** | **269** | **5** | **0** | **0** | **0** | **0** | **0** | **169,324** | **79,450** | **9,195.940** |
| **GRAND TOTALS** | **95,293** | **54,949** | **18,641** | **8,547** | **2,370** | **862** | **667** | **104** | **26** | **3** | **0** | **0** | **0** | **181,462** | **86,169** | **11,300.966** |

* Dose values exactly equal to the values separating ranges are reported in the next higher range.

** This category includes fabrication, processing, and uranium enrichment plants (see Section 3.3.5).

*** This category includes all reactors in commercial operation for a full year during 2008. Although Brown's Ferry 1 was placed on administrative hold in 1985, it remains in the count of operating reactors and has resumed operation as of June, 2007. These values have not been adjusted for the multiple counting of transient reactor workers (see Section 5).

## TABLE 3.3
### Summary of Annual Dose Distributions for Certain* NRC Licensees 1998–2008

| Year | Total Number of Monitored Persons | | Percent of Individuals with Doses <2 rem *** | | Percent of Individuals with Doses <5 rem *** | | Number of Individuals with Doses >12 rem *** |
|---|---|---|---|---|---|---|---|
| | Reported Number | Corrected Number ** | | | | | |
| 1998 | 166,127 | 132,069 | 99.6% | (489) | >99.99% | (6) | 1 |
| 1999 | 166,084 | 129,117 | 99.6% | (534) | >99.99% | (1) | 0 |
| 2000 | 163,073 | 125,026 | 99.5% | (573) | >99.99% | (3) | 0 |
| 2001 | 154,717 | 118,150 | 99.4% | (734) | >99.99% | (1) | 0 |
| 2002 | 162,381 | 119,694 | 99.5% | (582) | >99.99% | (1) | 0 |
| 2003 | 165,941 | 122,213 | 99.7% | (419) | >99.99% | (1) | 1 |
| 2004 | 164,017 | 122,975 | 99.7% | (368) | 100% | (0) | 0 |
| 2005 | 174,021 | 126,627 | 99.7% | (370) | 100% | (0) | 0 |
| 2006 | 176,071 | 126,726 | 99.8% | (258) | 100% | (0) | 0 |
| 2007 | 176,367 | 125,869 | 99.8% | (243) | 100% | (0) | 0 |
| 2008 | 181,368 | 129,796 | 99.9% | (167) | 100% | (0) | 0 |

* Licensees required to submit radiation exposure reports to the NRC under 10 CFR 20.2206.

** This column lists the actual number of persons who may have been counted more than once because they worked at more than one facility during the calendar year (see Section 5).

*** Data for 1998–2008 are based on the distribution of individual doses after adjusting for the multiple counting of transient workers (see Section 5). The number of people exceeding both 2 and 5 rem are shown in parentheses from 1998–2008.

## 3.3 SUMMARY OF OCCUPATIONAL DOSE DATA BY LICENSE CATEGORY

### *3.3.1 Industrial Radiography Licenses, Fixed Locations and Temporary Job Sites*

Industrial radiography licenses are issued to allow the use of sealed radioactive materials, usually in exposure devices or "cameras," that primarily emit gamma rays for nondestructive testing of pipeline weld joints, steel structures, boilers, aircraft and ship parts, and other high-stress alloy parts. Some firms are licensed to conduct such activities in one location, usually in a permanent facility designed and shielded for radiography; others perform radiography at temporary job sites in the field. The radioisotopes most commonly used are cobalt-60 and iridium-192. As shown in Table 3.1, annual reports were received for 61 radiography licensees in 2008. Table 3.4 summarizes the reported data for the two types of industrial radiography licenses for 2008 and for the previous 2 years for comparison purposes.

The average measurable dose for workers performing radiography at a fixed location ranged from 5% to 10% of the average measurable dose of workers at temporary job sites over the past 3 years. This is because it is more difficult for workers to avoid exposure to radiation at temporary job sites in the field, where conditions are not optimal and may change daily. To view the contribution that each radiography licensee made to the total collective dose, see Appendix A which presents a summary of the information reported by each of these licensees in 2008.

High exposures in radiography can be directly attributable to the type and location of the radiography field work. For example, locations such as oil drilling platforms and aerial tanks offer the radiographer little available shielding. In these situations, there may not be an opportunity to use distance as a means of minimizing exposure and achieving doses that are as low as is reasonably achievable (ALARA). Although these licensed activities

**TABLE 3.4**
**Annual Exposure Information for Industrial Radiographers**
**2006–2008**

| Year | Type of License | Number of Licensees | Number of Monitored Individuals | Workers with Measurable Dose | Collective Dose (person-rem) | Average Measurable Dose (rem) |
|---|---|---|---|---|---|---|
| **2006** | Fixed Location | 8 | 122 | 22 | 0.784 | 0.04 |
| | Temporary Job Sites | 70 | 2,266 | 1,959 | 1,108.563 | 0.57 |
| | **Total** | **78** | **2,388** | **1,981** | **1,109.347** | **0.56** |
| **2007** | Fixed Location | 5 | 59 | 20 | 0.623 | 0.03 |
| | Temporary Job Sites | 69 | 2,548 | 2,204 | 1,314.548 | 0.60 |
| | **Total** | **74** | **2,607** | **2,224** | **1,315.171** | **0.59** |
| **2008** | Fixed Location | 3 | 61 | 26 | 0.509 | 0.02 |
| | Temporary Job Sites | 58 | 2,906 | 2,561 | 1,460.248 | 0.57 |
| | **Total** | **61** | **2,967** | **2,587** | **1,460.757** | **0.56** |

usually result in average measurable doses that are higher than those received by other licensees, they involve a relatively small number of exposed workers.

Figure 3.1 shows the number of workers with measurable dose per licensee, the total collective dose per licensee, and the average measurable dose per worker for both types of industrial radiography licensees from 1973 through 2008. While the number of workers with measurable TEDE per licensee increased from 2007 to 2008, the collective TEDE also increased, resulting in the average measurable TEDE remaining nearly the same for the past 3 years.

Figures 3.2 and 3.3 show the collective dose distribution by dose range (see Section 3.1.8) for fixed location and temporary job site radiography licensees. These graphs demonstrate that temporary job site licensees consistently have individuals receiving doses in the higher dose ranges and routinely have 20% to 30% of the collective dose delivered to individuals above 2 rem. It should be noted that the 2006 distribution for fixed location radiographers in Figure 3.2 has been adjusted due to a change in status for a radiographer who was initially identified as a fixed location radiographer and who was later determined to be a temporary job site radiographer.

### *3.3.2 Manufacturing and Distribution Licenses, Type "A" Broad, Type "B" Broad, Other, and Nuclear Pharmacies*

Manufacturing and distribution (M&D) licenses are issued to allow the manufacture and distribution of radionuclides in various forms for a number of diverse purposes. The products are usually distributed to organizations/ companies specifically licensed by NRC or an Agreement State. Type "A" Broad licenses are issued to larger organizations that may use many different radionuclides in many different ways and that have a comprehensive radiation protection program. Some Type "A" Broad license firms are medical suppliers that process, package, or distribute such products as diagnostic test kits, radioactive surgical implants, and tagged radiochemicals for use in medical research, diagnosis, and therapy. Type "B" Broad and Other licenses are usually issued to smaller firms requiring a more restrictive license. These firms are suppliers of industrial radionuclides and are involved in the processing, encapsulation, packaging, and distribution of the radionuclides that they have purchased in bulk quantities from production reactors and cyclotrons. Major products include gamma radiography sources, cobalt irradiation sources, well-logging sources, sealed sources for gauges and smoke detectors, and radiochemicals for nonmedical research. Nuclear pharmacies are involved in the compounding and dispensing of radioactive materials for use in nuclear medicine procedures.

Table 3.5 presents the annual data that were reported by the three types of licensees for 2008 and the previous 2 years. Looking at the information shown separately for the Type

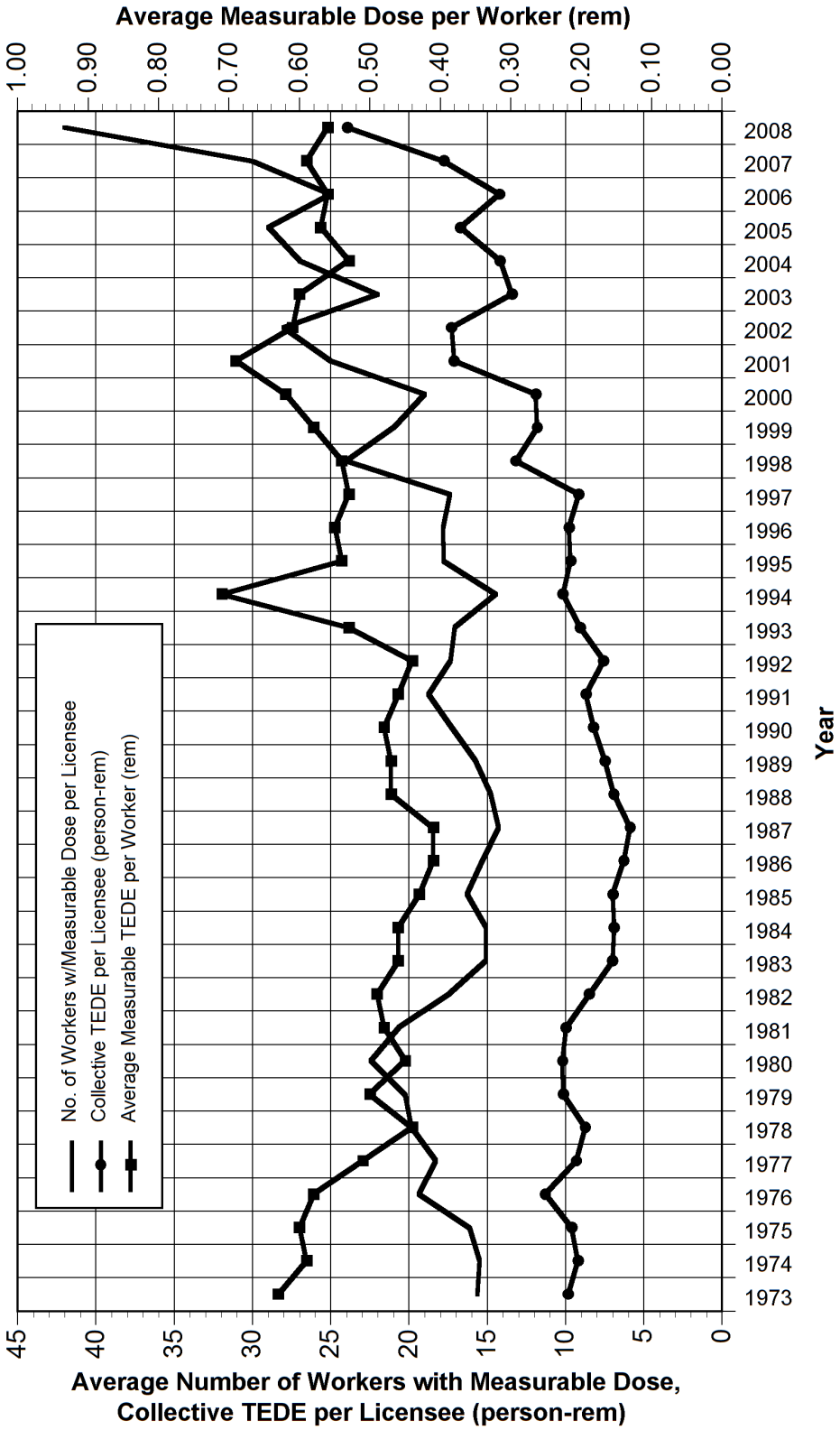


**FIGURE 3.1.** Average Annual Values for Industrial Radiography Licensees 1973–2008

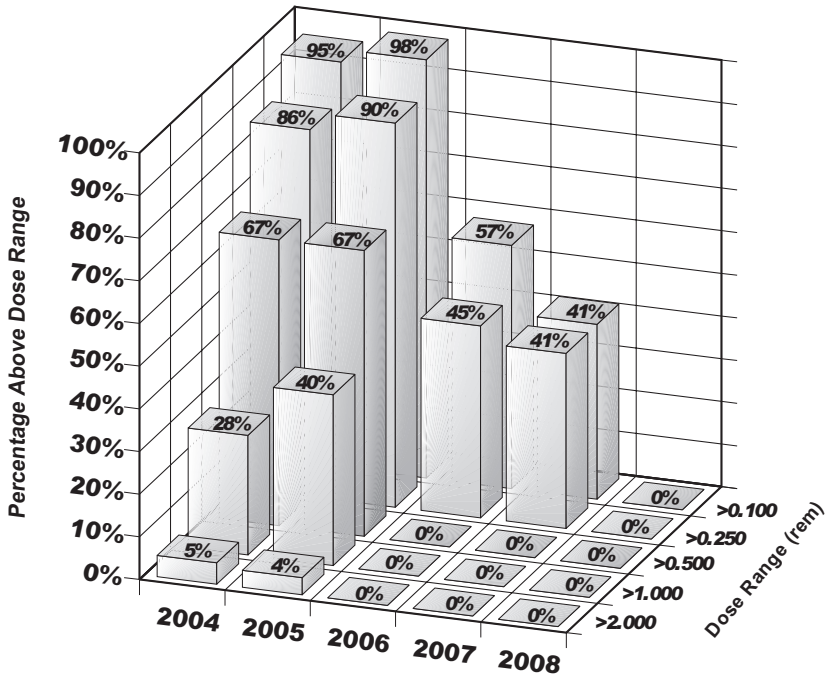


**FIGURE 3.2.** Collective TEDE Distribution by Dose Range
Industrial Radiographer—Fixed Location Licensees
2004–2008

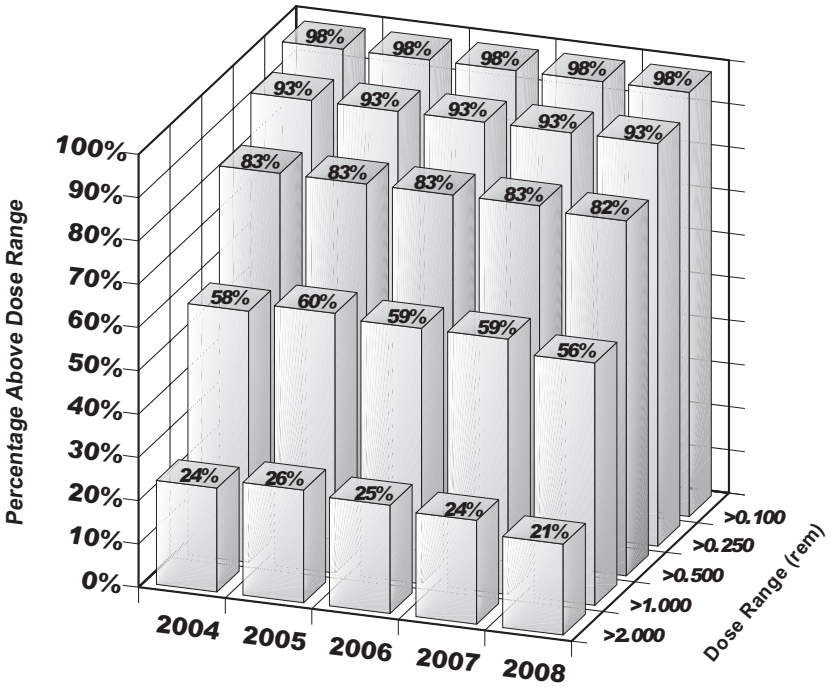


**FIGURE 3.3.** Collective TEDE Distribution by Dose Range
Industrial Radiographer—Temporary Job Site Licensees
2004–2008

"A" Broad licensees, it can be seen that the average measurable dose generally remains higher for the Type "A" Broad licensees. Only two Type "A" Broad licensees reported in 2008.

Figure 3.4 shows the number of workers with measurable dose per licensee, the total collective dose per licensee, and the average measurable dose per worker for Type "A" Broad, Type "B" Broad, Other, and Nuclear Pharmacy licensees. The number of workers with measurable dose per licensee increased and the collective TEDE per licensee decreased slightly in 2008. The average measurable dose decreased by 15% to 0.17 rem. The figures for Type "A" Broad licensees are primarily attributed to Mallinckrodt, Inc., which accounted for 86% of the collective dose, in 2008, for this licensee category.

Figure 3.5 shows the collective dose distribution by dose range (see Section 3.1.8) for Type "A" Broad licensees and Figure 3.6 shows the collective dose distribution by dose range for Type "B" Broad, Other, and Nuclear Pharmacy licensees. These graphs show that, for 2005 through 2008, the Type "B" Broad, Other, and Nuclear Pharmacy manufacturing and distribution licensees have more individuals receiving dose in the higher dose ranges.

For Type "A" Broad licensees, the decrease in values for 2005 through 2008 has been due to one licensee decreasing its collective TEDE by 45% from the 2007 value and accounted for 49% of the collective dose in this licensee category in 2008. Appendix A lists the contribution that each of these licensees made toward the total values of the number of workers monitored, number of workers, and collective dose for 2008.

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**TABLE 3.5**
**Annual Exposure Information for Manufacturing and Distribution 2006–2008**

| Year | Type of Manufacturing and Distribution | Number of Licensees | Number of Monitored Individuals | Workers with Measurable Dose | Collective Dose (person-rem) | Average Measurable Dose (rem) |
|---|---|---|---|---|---|---|
| **2006** | Type "A" Broad | 2 | 501 | 363 | 153.846 | 0.42 |
| | Type "B" Broad and Other | 4 | 245 | 161 | 15.291 | 0.09 |
| | Nuclear Pharmacies | 17 | 645 | 379 | 115.419 | 0.30 |
| | **Total** | **23** | **1,391** | **903** | **284.556** | **0.32** |
| **2007** | Type "A" Broad | 2 | 504 | 352 | 113.354 | 0.32 |
| | Type "B" Broad and Other | 3 | 83 | 58 | 5.447 | 0.09 |
| | Nuclear Pharmacies | 18 | 1,519 | 1,053 | 172.525 | 0.16 |
| | **Total** | **23** | **2,106** | **1,463** | **291.326** | **0.20** |
| **2008** | Type "A" Broad | 2 | 465 | 312 | 95.790 | 0.31 |
| | Type "B" Broad and Other | 4 | 205 | 114 | 8.421 | 0.07 |
| | Nuclear Pharmacies | 12 | 1,264 | 915 | 117.912 | 0.13 |
| | **Total** | **18** | **1,934** | **1,341** | **222.123** | **0.17** |

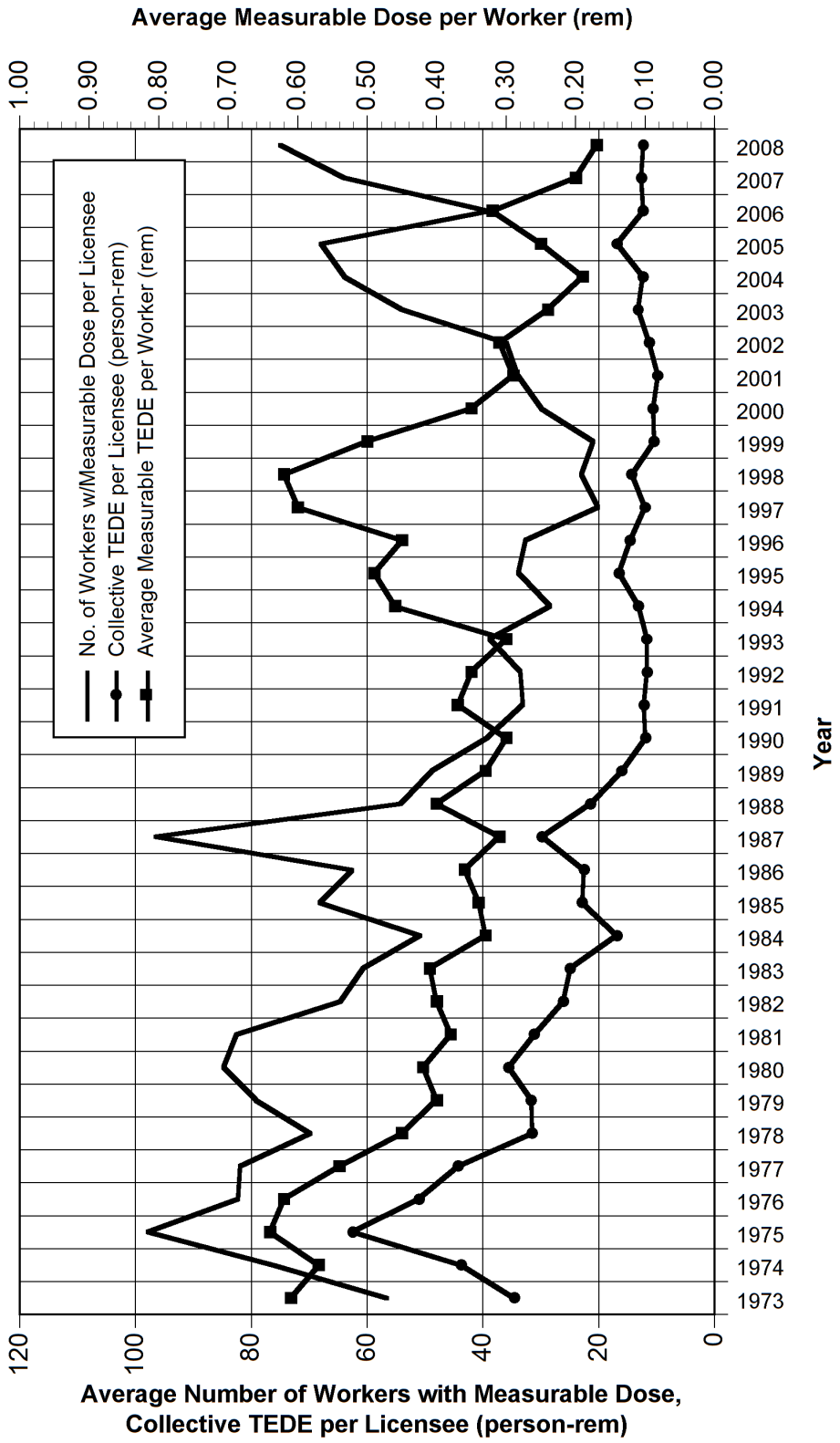



**FIGURE 3.4.** Average Annual Values for Manufacturing and Distribution Licensees 1973–2008

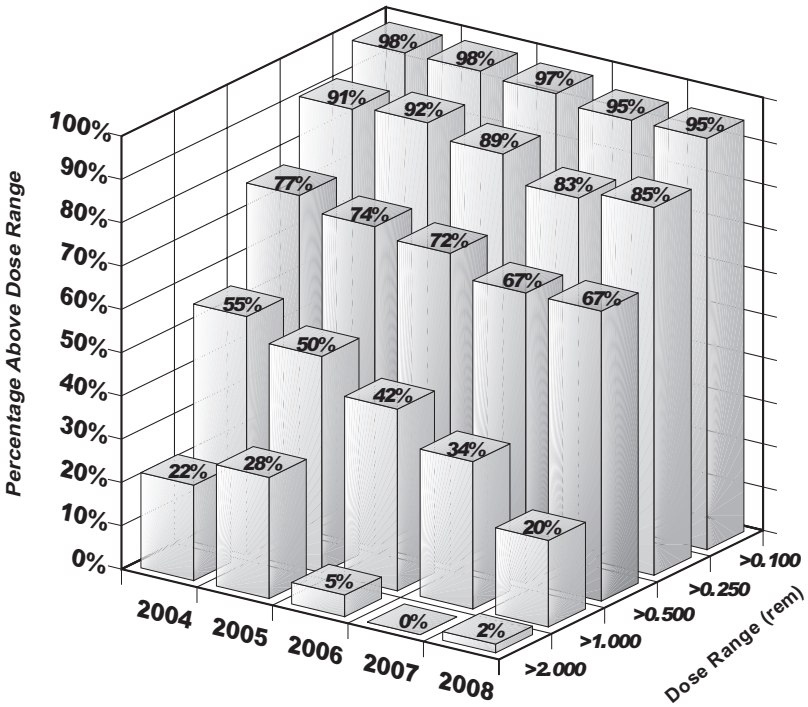



**FIGURE 3.5.** Collective TEDE Distribution by Dose Range Type "A" Broad Manufacturing and Distribution Licensees 2004–2008

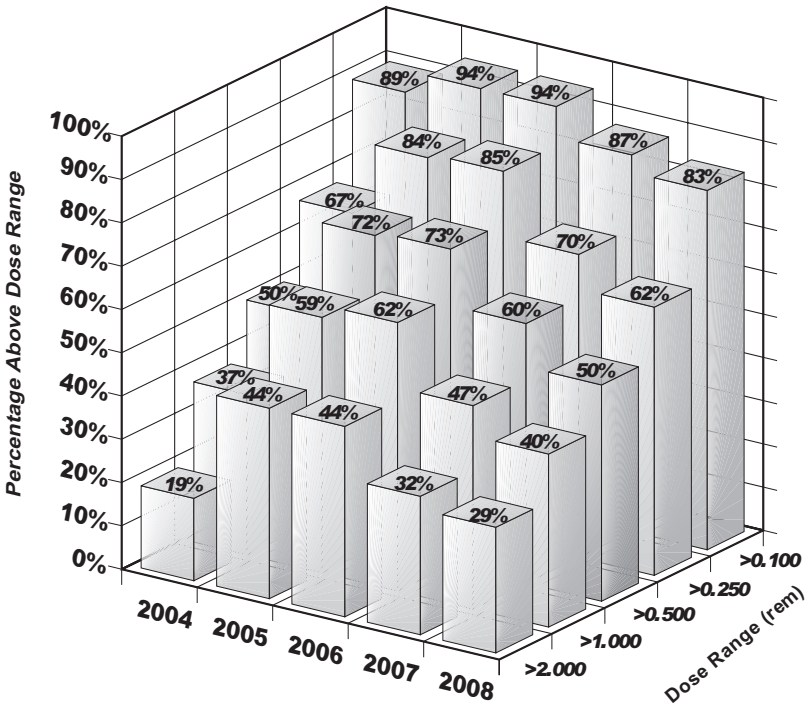



**FIGURE 3.6.** Collective TEDE Distribution by Dose Range Type "B" Broad, Other, and Nuclear Pharmacy Licensees 2004–2008

### *3.3.3 Low-Level Waste Disposal Licenses*

Low-level waste disposal licenses are issued to allow the receipt, possession, and disposal of low-level radioactive wastes at a land disposal facility. The licensee has the appropriate facilities to receive wastes from such places as hospitals and laboratories, store them for a short time, and dispose of them in a properly prepared burial ground. The licensees in this category are located in and licensed by Agreement States, which have primary regulatory authority over the licensees' activities. Since 1999, all licensees that have conducted these activities have been located in Agreement States; therefore, there are no NRC low-level waste licensees reporting radiation exposure data to REIRS.

### *3.3.4 Independent Spent Fuel Storage Installation Licenses*

Independent spent fuel storage installation (ISFSI) licenses are issued to allow the possession of power reactor spent fuel and other associated radioactive materials for the purpose of storage of such fuel in an ISFSI. Here, the spent fuel, which has undergone at least 1 year of decay since being used as a source of energy in a power reactor, is provided interim storage, protection, and safeguarding for a limited time, pending its ultimate disposal.

The majority of ISFSI facilities are located onsite at commercial power reactors. Since the doses from these ISFSI facilities are usually included with the doses reported by the power reactors, the doses from these ISFSI facilities are not reported separately to NRC. The doses from the two ISFSI licensees that are not associated with power reactors are reported here for 2008. One is the GE Morris facility located in Illinois, and the second is the Trojan ISFSI. The Trojan nuclear power plant is no longer in commercial operation and has been decommissioned. However, the ISFSI facility at Trojan remains in operation and the occupational dose information is reported to NRC under the ISFSI license. Appendix A summarizes the occupational dose information reported by these licensees.

Figure 3.7 shows the number of workers with measurable dose per licensee, the total collective dose per licensee, and the average measurable dose per worker for ISFSI facilities. The large increase in the collective dose per licensee and number of workers per licensee in 1994 was mainly because only one licensee reported separately for 1994 through 1998, rather than the two licensees that reported in prior years. The number of workers with measurable dose and collective TEDE per licensee have decreased between 2001 and 2008. Figure 3.8 shows the collective dose distribution by dose range (see Section 3.1.8) for ISFSI licensees from 2004 to 2008. In 2008, the percentages were similar to those of 2004 and 2007.

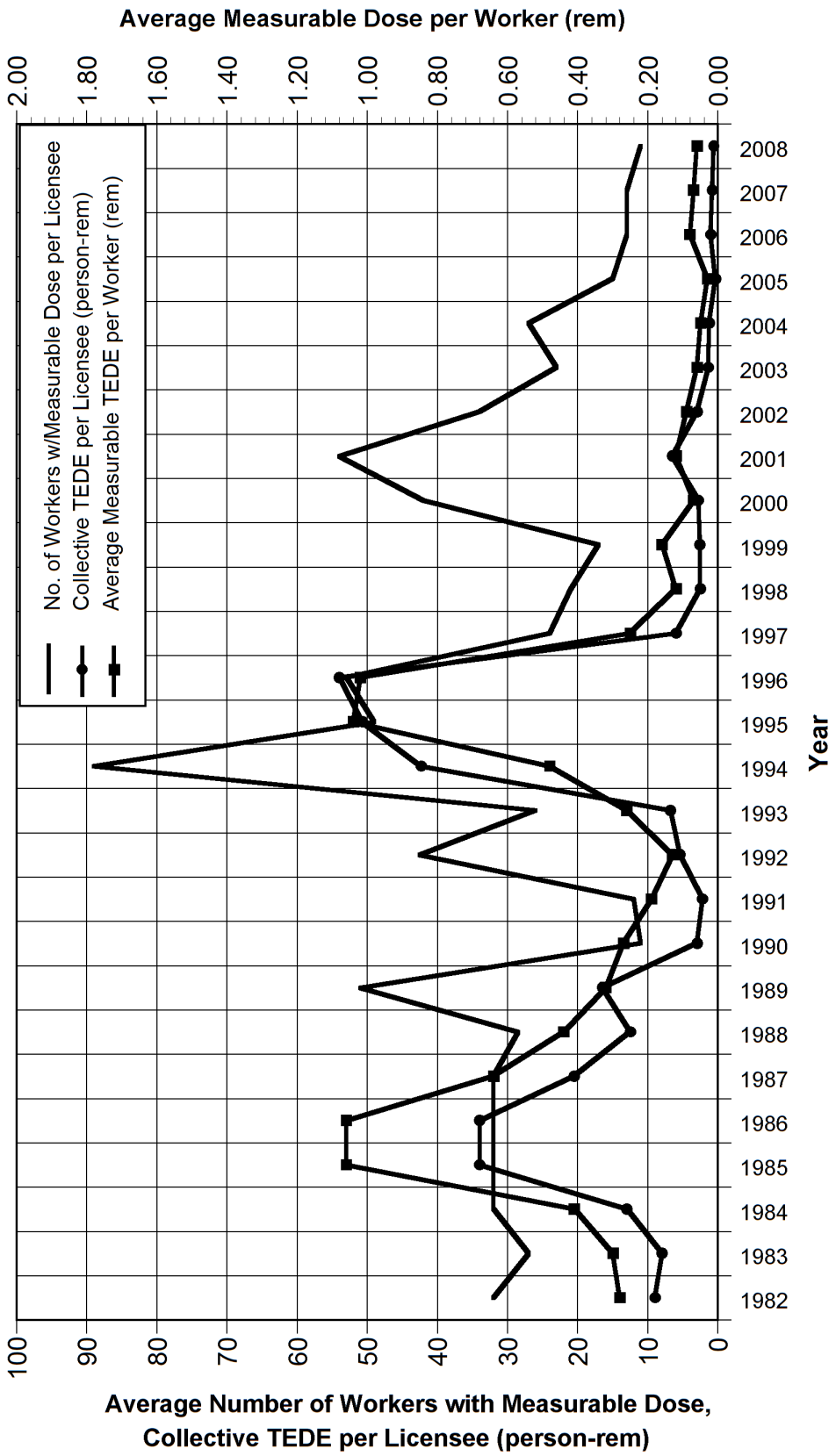



**FIGURE 3.7.** Average Annual Values for Independent Spent Fuel Storage Installations 1982–2008

### *3.3.5 Fuel Cycle Licenses*

Fuel cycle licenses are issued to allow the processing, enrichment, and fabrication of reactor fuels. In most uranium facilities where light water reactor (LWR) fuels are fabricated, enriched uranium hexafluoride is converted to solid uranium dioxide pellets and inserted into zirconium alloy tubes. The tubes are fabricated into fuel assemblies that are shipped to nuclear power plants. Some facilities also perform chemical operations to recover the uranium from scrap and other off-specification materials prior to disposal of these materials. In 1997, the regulatory oversight for the uranium enrichment facilities at Portsmouth, Ohio and Paducah, Kentucky was transferred from DOE to NRC and were added to the NRC's fuel cycle license category. In 2005, a third uranium enrichment facility, the United States Enrichment Corporation (USEC), Inc., was also added to this category.

Figure 3.9 shows the number of workers with measurable dose per licensee, the total collective dose per licensee, and the average measurable dose per worker for fuel cycle licensees. In addition to the collective TEDE and average measurable dose, the deep dose equivalent (DDE) collective dose and DDE

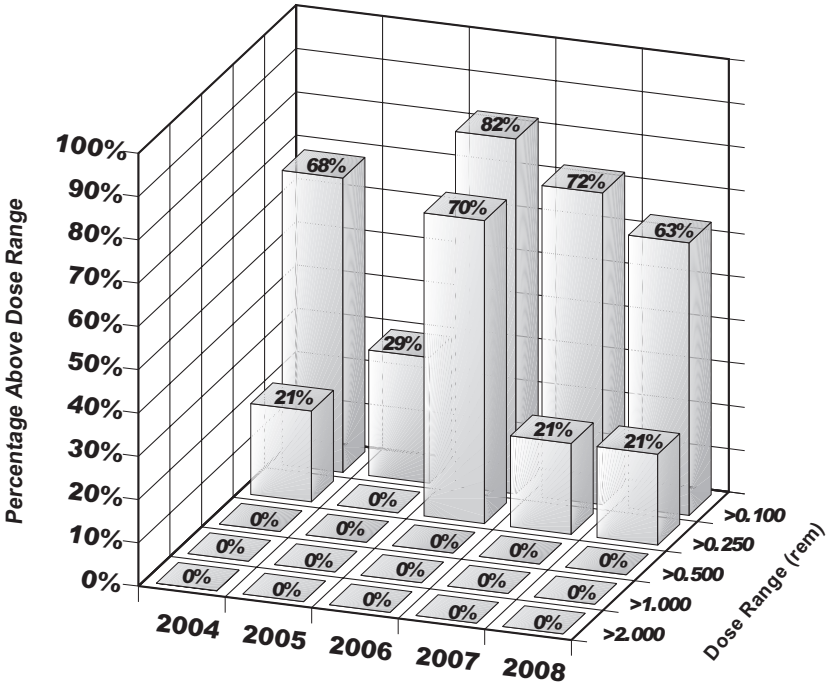



**FIGURE 3.8.** Collective TEDE Distribution by Dose Range Independent Spent Fuel Storage Installation Licensees 2004–2008

average measurable dose are also shown since the CEDE is a significant contribution to the TEDE for fuel fabrication facilities.

Figure 3.10 shows the collective dose distribution by dose range (see Section 3.1.8) for fuel cycle licensees from 2004 to 2008. From 2004 to 2005, the percentages remained fairly constant, and in 2006, there was an increase in the dose range above 1.00 rem. Although in 2007 there was a decrease in all dose ranges, in 2008 the dose increased in the dose ranges 0.100 rem to 0.250 rem and was attributable to Westinghouse Electric Co. at the Commercial Nuclear Fuel Division in South Carolina.

As shown in Table 3.6, the collective DDE decreased by 4%, while the collective CEDE increased by less than 1% in 2008.

Table 3.6 shows that there were nine licensed fuel cycle (fabrication and enrichment) facilities reporting in 2008. Appendix A lists each of the nine licensees with the number of workers monitored, the number of workers receiving measurable external doses, and the collective dose for each licensee.

### *3.3.6 Light Water Reactor Licenses*

LWR licenses are issued to utilities to allow them to use special nuclear material in a reactor that produces heat to generate electricity to be sold to consumers. There are two major types of commercial LWRs in the United States, PWRs and BWRs, each of which uses water as the primary coolant.

Table 3.1 shows the number of licensees, number of monitored individuals, number of workers with measurable dose, total collective dose, and average dose per worker for reactor facilities that were in commercial operation for at least a full year for each of the years

**TABLE 3.6**
**Annual Exposure Information for Fuel Cycle Licensees**
**2006–2008**

| Year | Type of License | Number of Licensees | Number of Monitored Individuals | Workers with Meas. TEDE | Collective TEDE (person-rem) | Average Meas. TEDE (rem) | Workers with Meas. DDE | Collective DDE (person-rem) | Average Meas. DDE (rem) | Workers with Meas. CEDE | Collective CEDE (person-rem) | Average Meas. CEDE (rem) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2006 | Fuel Cycle | 9 | 7,417 | 3,413 | 521.525 | 0.15 | 2,475 | 283 | 0.11 | 2,131 | 238.139 | 0.112 |
| 2007 | Fuel Cycle | 9 | 7,536 | 3,225 | 428.717 | 0.13 | 2,254 | 230 | 0.10 | 1,983 | 198.914 | 0.100 |
| 2008 | Fuel Cycle | 9 | 7,184 | 2,770 | 420.899 | 0.15 | 1,849 | 221 | 0.12 | 1,786 | 199.949 | 0.112 |

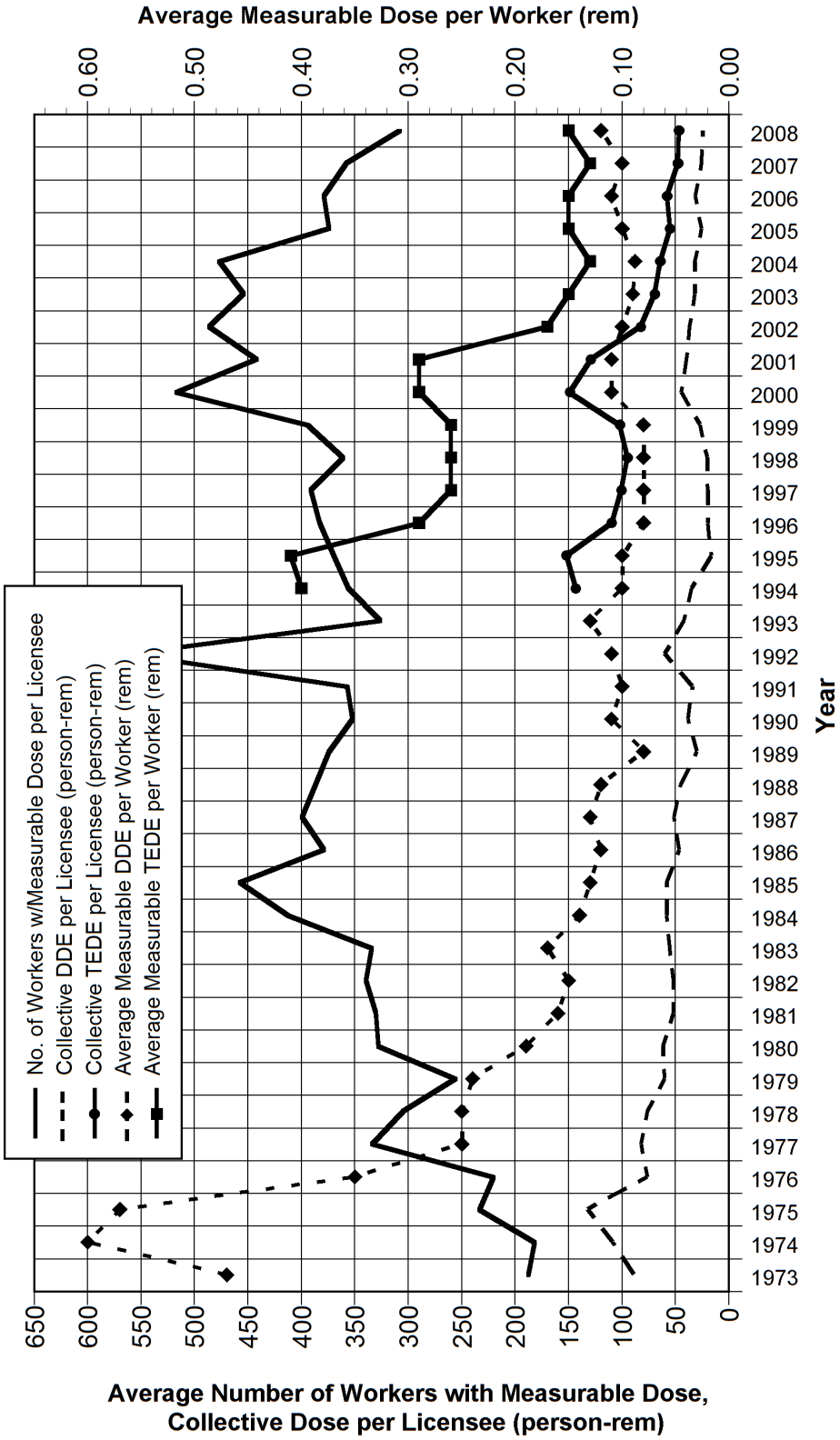



**FIGURE 3.9.** Average Annual Values for Fuel Cycle Licensees 1973–2008

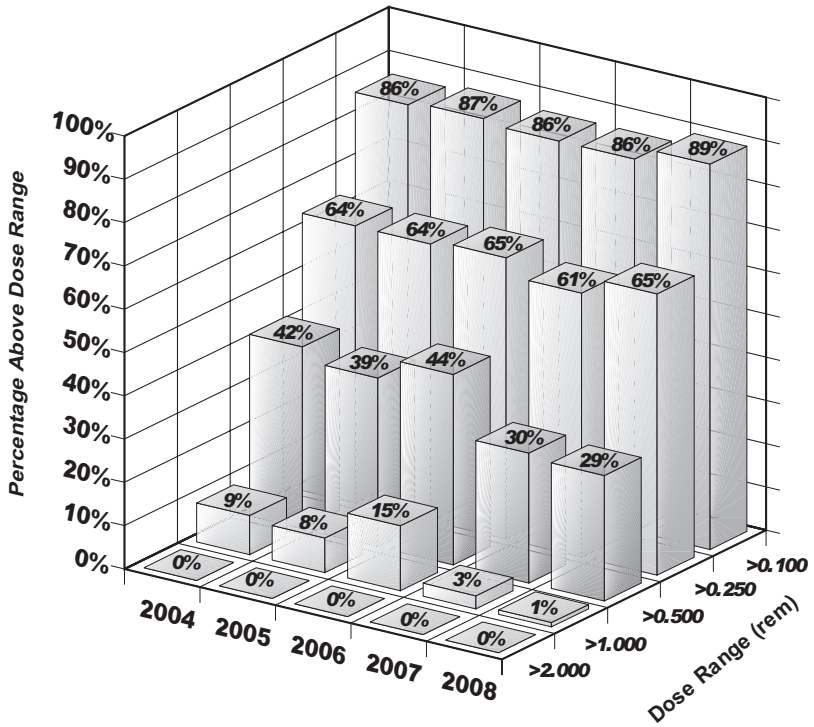



**FIGURE 3.10.** Collective TEDE Distribution by Dose Range
Fuel Cycle Licensees
2004–2008

1998 through 2008. The values do not include reactors that have been permanently shut down or reactors that have not been in commercial operation for a full year. The figures for reactors have been adjusted for the multiple counting of transient workers (see Section 5).

The reported dose distribution of workers monitored at each plant site for the year 2008 is presented in alphabetical order by plant name in Appendix B.

Figure 3.11 shows the collective dose distribution by dose range (see Section 3.1.8) for reactor licensees from 2004 to 2008. The distribution of collective dose has been fairly constant over the past 5 years, with a slight decrease noted from 2004 to 2008 in each dose range.

More detailed presentations and analyses of the annual dose information reported by nuclear power facilities can be found in Sections 4 and 5.

### *3.3.7 Other Facilities Reporting to NRC*

The end of Appendix A contains additional facilities that reported occupational radiation dose reports to NRC in 2008. These facilities are not among the seven categories of licensees required to report under 10 CFR 20.2206 (see Section 3.1.7) and are not included in the analysis presented in this report. However, these facilities may be of interest to researchers, and since they are not included in any other published reports, they are included here in the interest of completeness. The facility with the largest collective dose for these additional facilities reported under the category of uranium hexafluoride ($UF_6$) production plants.

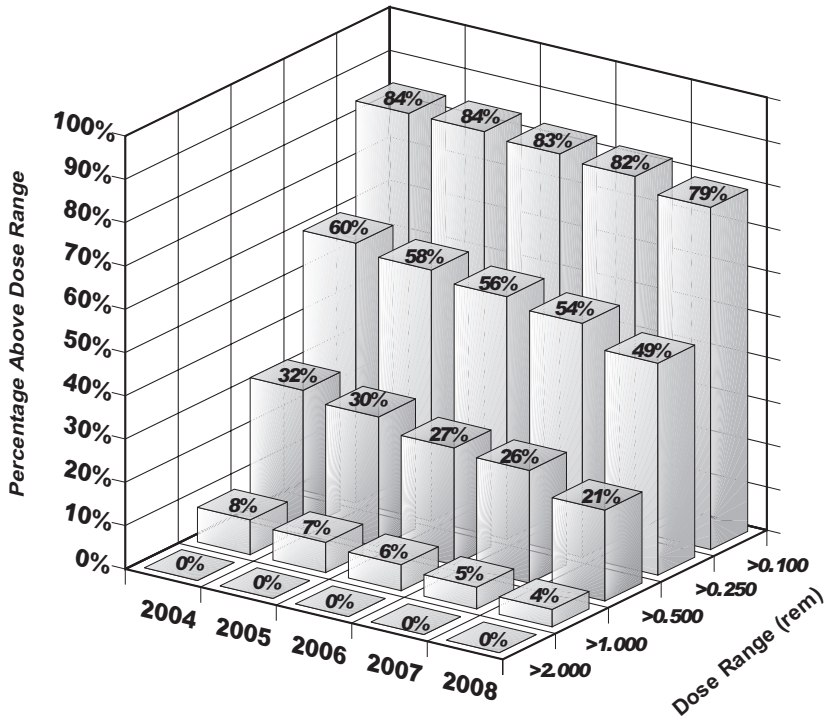



**FIGURE 3.11.** Collective TEDE Distribution by Dose Range
Reactor Licensees
2004–2008

## 3.4 SUMMARY OF INTAKE DATA BY LICENSEE CATEGORY

Licensees are required for each intake to list the radionuclide that was taken into the body, pulmonary clearance class, intake mode, and amount of the intake in microcuries. An NRC Form 5 report containing this information is required to be completed and submitted to NRC under 10 CFR 20.2206. Tables 3.7 and 3.8 summarize the intake data reported to NRC during 2008. The data are categorized by licensee type and are listed in order of radionuclide and pulmonary clearance class. Table 3.7 lists the intakes where the mode of intake into the body was recorded as ingestion. Table 3.8 lists the intakes where the mode of intake was inhalation from ambient airborne radioactive material in the workplace. The pulmonary clearance class is recorded as F, M, S, D, W, or Y (fast, medium, slow, days, weeks, or years), corresponding to the clearance half-time from the pulmonary region of the lung into the blood and gastrointestinal tract. The pulmonary clearance class designation depends on whether the licensee is using 10 CFR 20 (D, W, Y) or ICRP 68 (F, M, S) nomenclature. [Ref. 12] The amount of material taken into the body is given in microcuries, a unit of measure of the quantity of radioactive material. For each category of licensee, the maximum number of intake records and the maximum intake are highlighted in the table in bold for ease of reference.

Table 3.9 lists the number of individuals with measurable CEDE, the collective CEDE, and the average measurable CEDE per individual for each licensee category. Fuel fabrication facilities have the majority of internal dose (97%) in 2008 and the highest average CEDE per individual. This is due to the workers' exposure to uranium during the processing and fabrication of the uranium fuel.

Table 3.10 shows the distribution of internal dose (CEDE) from 1994 to 2008 for licensees required to report under 10 CFR 20.2206. For the purposes of this table, the definition of a "measurable CEDE" is any reported value greater than zero. As noted above, the vast majority of the internal doses are received by individuals working at fuel fabrication facilities.

**TABLE 3.7**
**Intake by Licensee Category and Radionuclide Mode of Intake—*Ingestion***
**2008**

| Mode | Licensee Category | Program Code | Radionuclide | Number of Intake Records* | Collective Intake in Microcuries (sci. notation) |
|---|---|---|---|---|---|
| Ingestion | Fuel Fabrication | 21210 | U-234 | **1** | **4.32E-04** |
| | Power Reactors | 41111 | C-14 | 1 | 3.61E-02 |
| | | 41111 | CO-58 | **5** | 2.14E-01 |
| | | 41111 | CO-60 | 4 | 7.02E-01 |
| | | 41111 | FE-55 | 1 | 2.21E-01 |
| | | 41111 | H-3 | 1 | 3.36E-03 |
| | | 41111 | MN-54 | 2 | 2.06E-01 |
| | | 41111 | NB-95 | 2 | 8.01E-01 |
| | | 41111 | NI-63 | 1 | 4.46E-02 |
| | | 41111 | RU-103 | 1 | 1.58E-01 |
| | | 41111 | ZR-95 | 1 | **2.79E+00** |

NOTE: The data values shown bolded and in boxes represent the highest value in each category.

* An intake event may involve multiple nuclides, and individuals may incur multiple intakes during the year. The number of intake records given here indicates the number of separate intake reports that were submitted on NRC Form 5 reports under 10 CFR 20.2206.

## TABLE 3.8
### Intake by Licensee Category and Radionuclide Mode of Intake—*Inhalation*
### 2008

| Licensee Category | Program Code | Radionuclide | Pulmonary Clearance Class | Number of Intake Records* | Collective Intake in Microcuries (sci. notation) |
|---|---|---|---|---|---|
| Manufacturing and Distribution | 02500 | I-123 | W | 23 | 2.10E+01 |
| | 02500 | I-131 | D | 10 | 1.24E+00 |
| | 02500 | I-131 | W | **100** | **3.35E+01** |
| | 03211 | I-131 | D | 4 | 1.77E+00 |
| Uranium Enrichment | 21200 | NP-237 | W | 3 | 2.74E-05 |
| | 21200 | U-234 | D | **43** | **4.43E-02** |
| Fuel Fabrication | 21210 | AM-241 | M | 14 | 1.68E-04 |
| | 21210 | CO-60 | Y | 31 | 3.91E-01 |
| | 21210 | MN-54 | W | 1 | 4.10E-02 |
| | 21210 | PU-239 | M | 14 | 4.70E-04 |
| | 21210 | RA-224 | M | 14 | 1.99E-04 |
| | 21210 | SR-90 | S | 196 | 5.71E-01 |
| | 21210 | TH-228 | M | 103 | 6.83E-04 |
| | 21210 | TH-228 | S | 77 | 6.49E-04 |
| | 21210 | TH-232 | M | 14 | 3.00E-04 |
| | 21210 | U-232 | F | 89 | 4.36E-04 |
| | 21210 | U-232 | S | 105 | 7.53E-04 |
| | 21210 | U-232 | Y | 141 | 2.06E-04 |
| | 21210 | U-234 | D | 358 | 1.47E-01 |
| | 21210 | U-234 | F | 158 | 3.78E-01 |
| | 21210 | U-234 | M | 207 | 4.04E-02 |
| | 21210 | U-234 | S | 885 | 3.37E+00 |
| | 21210 | U-234 | W | 79 | 1.66E-02 |
| | 21210 | U-234 | Y | **1,016** | **3.40E+00** |
| | 21210 | U-235 | D | 133 | 3.64E-03 |
| | 21210 | U-235 | F | 89 | 1.25E-03 |
| | 21210 | U-235 | M | 5 | 1.49E-05 |
| | 21210 | U-235 | S | 478 | 8.56E-02 |
| | 21210 | U-235 | W | 79 | 6.15E-04 |
| | 21210 | U-235 | Y | 263 | 5.56E-02 |
| | 21210 | U-236 | D | 296 | 2.51E-04 |
| | 21210 | U-236 | F | 89 | 1.89E-02 |
| | 21210 | U-236 | M | 5 | 1.86E-04 |
| | 21210 | U-236 | S | 115 | 3.29E-02 |
| | 21210 | U-236 | W | 79 | 2.53E-05 |
| | 21210 | U-236 | Y | 263 | 2.84E-02 |
| | 21210 | U-238 | D | 191 | 2.16E-02 |
| | 21210 | U-238 | F | 6 | 3.94E-07 |
| | 21210 | U-238 | M | 181 | 1.45E-02 |
| | 21210 | U-238 | S | 375 | 2.94E-01 |
| | 21210 | U-238 | W | 79 | 2.30E-03 |
| | 21210 | U-238 | Y | **1,016** | 5.12E-01 |
| Power Reactors | 41111 | AM-241 | Y | 2 | 1.68E-04 |
| | 41111 | CO-58 | Y | 11 | 1.03E+00 |
| | 41111 | CO-60 | Y | 10 | 1.50E+00 |
| | 41111 | CS-137 | D | 4 | 5.95E-01 |
| | 41111 | H-3 | W | 1 | **2.40E+05** |
| | 41111 | I-131 | D | **202** | 9.22E+01 |
| | 41111 | MN-54 | W | 11 | 5.77E-01 |

NOTE: The data values shown bolded and in boxes represent the highest value in each category.

* An intake event may involve multiple nuclides, and individuals may incur multiple intakes during the year. The number of intake records given here indicates the number of separate intake reports that were submitted on NRC Form 5 reports under 10 CFR 20.2206.

## TABLE 3.9
### Collective and Average CEDE by Licensee Category
### 2008

| Licensee Category | Licensee Name | License Number | Number with Meas. CEDE | Collective CEDE (person-rem) | Average Meas. CEDE (rem) |
|---|---|---|---|---|---|
| **Manufacturing and Distribution** | | | | | |
| **02500** | CARDINAL HEALTH | 34-29200-01MD | **72** | **0.831** | **0.012** |
| **02500** | GE HEALTHCARE - ST. LOUIS/OVERLAND | 24-32462-01MD | 1 | 0.003 | 0.003 |
| **02500** | GE HEALTHCARE - KENTWOOD | 21-26707-01MD | 5 | 0.015 | 0.003 |
| **02500** | IBA MOLECULAR NORTH AMERICA, INC. | 45-25221-01MD | 7 | 0.019 | 0.003 |
| **03211** | INTERNATIONAL ISOTOPES IDAHO, INC. | 11-27680-01 | 4 | 0.044 | 0.011 |
| | | **Total** | **89** | **0.912** | **0.010** |
| **Uranium Enrichment** | | | | | |
| **21200** | U. S. ENRICHMENT CORP. - PADUCAH | GDP-1 | **30** | **0.135** | **0.005** |
| | | **Total** | **30** | **0.135** | **0.005** |
| **Fuel Fabrication** | | | | | |
| **21210** | B&W NUCLEAR OPERATIONS GROUP | SNM-0042 | 196 | 20.245 | 0.103 |
| | AREVA NP, INC. | SNM-1168 | 36 | 1.334 | 0.037 |
| | AREVA NP, INC. | SNM-1227 | 225 | 45.374 | **0.202** |
| | NUCLEAR FUEL SERVICES, INC. | SNM-0124 | 336 | 13.039 | 0.039 |
| | GLOBAL NUCLEAR FUEL - AMERICAS, LLC | SNM-1097 | **614** | 57.757 | 0.094 |
| | WESTINGHOUSE ELECTRIC COMPANY | SNM-1107 | 349 | **62.065** | 0.178 |
| | | **Total** | **1,756** | **199.814** | **0.114** |
| **Power Reactors** | | | | | |
| **41111** | ARKANSAS | DPR-51 | 4 | 0.033 | 0.008 |
| | MILLSTONE | NPF-49 | 1 | 0.008 | 0.008 |
| | SEQUOYAH | DPR-77 | 2 | 0.002 | 0.001 |
| | NINE MILE POINT | DPR-63 | 3 | 0.037 | 0.012 |
| | VERMONT YANKEE | DPR-28 | 1 | 0.025 | 0.025 |
| | HUMBOLDT BAY | DPR-07 | 2 | 0.054 | 0.027 |
| | MONTICELLO | DPR-22 | 1 | 0.002 | 0.002 |
| | PALO VERDE | NPF-41 | **201** | **3.069** | 0.015 |
| | WOLF CREEK | NPF-42 | 8 | 0.010 | 0.001 |
| | RIVER BEND | NPF-47 | 8 | 0.304 | **0.038** |
| | DIABLO CANYON | DPR-80 | 2 | 0.049 | 0.025 |
| | BROWNS FERRY | DPR-33 | 25 | 0.858 | 0.034 |
| | SAN ONOFRE | DPR-13 | 2 | 0.043 | 0.022 |
| | BRAIDWOOD | NPF-72 | 1 | 0.015 | 0.015 |
| | COMANCHE PEAK | NPF-87 | 3 | 0.059 | 0.020 |
| | LIMERICK | NPF-39 | 1 | 0.014 | 0.014 |
| | SOUTH TEXAS | NPF-76 | 2 | 0.018 | 0.009 |
| | CALLAWAY | NPF-30 | 3 | 0.014 | 0.005 |
| | | **Total** | **270** | **4.614** | **0.017** |
| **Grand Totals** | | | **2,145** | **205.475** | **0.096** |

NOTE: The data values shown bolded and in boxes represent the highest value in each category.

## TABLE 3.10
Internal Dose (CEDE) Distribution
1994–2008

| Year | Number of Individuals with CEDE in the Ranges (rem)* | | | | | | | | | | Total with Meas. CEDE | Collective CEDE (person-rem) | Average Meas. CEDE (rem) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Meas. 0.020 | 0.020–0.100 | 0.100–0.250 | 0.250 – 0.500 | 0.500–0.750 | 0.750–1.000 | 1– 2 | 2–3 | 3–4 | 4 – 5 | | | |
| 1994 | 3,425 | 577 | 287 | 351 | 196 | 138 | 293 | 69 | 2 | - | 5,338 | 1,033.688 | 0.194 |
| 1995 | 2,868 | 691 | 338 | 362 | 216 | 145 | 288 | 49 | 2 | - | 4,959 | 1,019.045 | 0.205 |
| 1996 | 3,096 | 598 | 305 | 317 | 190 | 121 | 185 | 22 | 2 | 2 | 4,838 | 741.373 | 0.153 |
| 1997 | 3,835 | 869 | 381 | 366 | 242 | 148 | 169 | 30 | - | - | 6,040 | 826.280 | 0.137 |
| 1998 | 3,310 | 932 | 426 | 355 | 230 | 140 | 153 | 21 | 2 | - | 5,569 | 779.148 | 0.140 |
| 1999 | 3,399 | 630 | 402 | 425 | 206 | 117 | 173 | 29 | - | - | 5,381 | 792.586 | 0.147 |
| 2000 | 3,248 | 891 | 514 | 373 | 214 | 98 | 224 | 58 | 7 | 1 | 5,628 | 969.792 | 0.172 |
| 2001 | 1,767 | 766 | 572 | 277 | 109 | 51 | 146 | 82 | 15 | 1 | 3,786 | 810.128 | 0.214 |
| 2002 | 1,759 | 739 | 555 | 370 | 95 | 20 | 23 | 3 | - | - | 3,564 | 377.016 | 0.106 |
| 2003 | 2,208 | 727 | 572 | 271 | 98 | 13 | 4 | - | - | - | 3,893 | 311.641 | 0.080 |
| 2004 | 1,987 | 738 | 440 | 252 | 90 | 14 | 3 | - | - | - | 3,524 | 274.606 | 0.078 |
| 2005 | 1,204 | 633 | 432 | 223 | 89 | 25 | 2 | - | - | - | 2,608 | 263.857 | 0.101 |
| 2006 | 1,294 | 583 | 383 | 245 | 80 | 13 | 3 | - | - | - | 2,601 | 245.743 | 0.094 |
| 2007 | 1,418 | 524 | 415 | 228 | 38 | 1 | 3 | - | - | - | 2,627 | 207.121 | 0.079 |
| 2008 | 900 | 547 | 411 | 254 | 29 | 3 | 1 | - | - | - | 2,145 | 205.475 | 0.096 |

* Dose values exactly equal to the values separating ranges are reported in the next higher range.

# Section 4

# COMMERCIAL LIGHT WATER REACTORS – FURTHER ANALYSIS

## 4.1 INTRODUCTION

General trends in occupational radiation exposures at nuclear power reactors are best evaluated within the context of other pertinent information. In this Section, some of the tables and appendices that summarize dose data also show the type, capacity, amount of electricity generated, and age of the reactor. Dose data are then presented as a function of these data.

## 4.2 DEFINITION OF TERMS AND SOURCES OF DATA

### *4.2.1 Number of Reactors*

The number of reactors shown in Tables 4.1, 4.2, and 4.3 is the number of BWRs, PWRs, and LWRs, respectively, that had been in commercial operation for at least 1 full year as of December 31 of each of the indicated years. This is the number of reactors in which the average number of workers with measurable dose and average collective dose per reactor is based. Excluded are reactors that have been in commercial operation for less than 12 months during the first year and reactors that have been permanently defueled. This technique yields conservative values for many of the averages shown in the tables. The date that each reactor was declared to be in commercial operation was taken from Ref. 13.

Three Mile Island (TMI) 2 was included in the compilation of data for commercially operating reactors from 1975 through 1988 and has not been included in the data analysis since 1988. TMI 1 and 2 reported data separately beginning in 1986.

Browns Ferry Unit 1 (BWR) was restarted in 2007 and was in commercial power production operation during 2008. From 1985 to 2007, Browns Ferry Unit 1 was on administrative hold, and although not producing electric power, it remained in the count of operating reactors. Therefore, its return to commercial power production does not officially change the number of operating BWRs in 2008.

There were no changes to the count of operating reactors in 2008. The number of operating BWRs remains the same as in 2007 at 35, and the number of operating PWRs remains the same at 69. The dose information for these reactors and for others that are no longer in commercial operation is listed at the end of Appendix B.

### *4.2.2 Electric Energy Generated*

The electric energy generated in megawatt years (MW-yr) each year by each reactor is graphically represented in Appendix D. This number was obtained by dividing the megawatt hours of electricity annually produced by each facility by 8,760, the number of hours in the year, except for leap years, when the number is 8,784 hours. The number of megawatt hours of electricity produced each year was obtained from Ref. 13. For the years 1973 to 1996, the electricity generated is the gross electricity output of the reactor. For 1997 to 2008, the number reflects the net electricity produced, which is the gross electricity minus the amount the plant uses for operations. This change is the result of a change in NRC power generation reporting requirements. The electricity generated (in MW-yr) that is presented in Tables 4.1, 4.2, and 4.3 is the summation of electricity

## TABLE 4.1
### Summary of Information Reported by Commercial Boiling Water Reactors 1973–2008

| Year | Number of Reactors Included* | Annual Collective Dose (person-rem) | No. of Workers with Measurable Dose** | Electricity Generated*** (MW-yr) | Average Measurable Dose per Worker (rem)** | Average Collective Dose per Reactor (person-rem) | Average No. Personnel with Measurable Doses per Reactor** | Average Collective Dose per MW-yr (person-rem/ MW-yr) | Average Electricity Generated per Reactor (MW-yr) | Average Maximum Dependable Capacity Net (MWe) | Maximum Dependable Capacity Achieved |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1973 | 12 | 4,564 | 5,340 | 3,393.9 | 0.86 | 380 | 445 | 1.35 | 283 | 438 | 65% |
| 1974 | 14 | 7,095 | 8,769 | 4,060.2 | 0.81 | 507 | 626 | 1.75 | 290 | 485 | 60% |
| 1975 | 18 | 12,633 | 17,350 | 5,786.4 | 0.73 | 702 | 964 | 2.18 | 321 | 595 | 54% |
| 1976 | 22 | 12,298 | 16,927 | 8,137.9 | 0.73 | 559 | 769 | 1.51 | 370 | 630 | 59% |
| 1977 | 23 | 19,054 | 21,515 | 9,102.5 | 0.89 | 828 | 935 | 2.09 | 396 | 637 | 62% |
| 1978 | 25 | 15,257 | 20,381 | 11,856.0 | 0.75 | 610 | 815 | 1.29 | 474 | 660 | 72% |
| 1979 | 25 | 18,251 | 25,425 | 11,671.0 | 0.72 | 730 | 1,017 | 1.56 | 467 | 660 | 71% |
| 1980 | 26 | 29,472 | 34,220 | 10,868.2 | 0.86 | 1,134 | 1,316 | 2.71 | 418 | 663 | 63% |
| 1981 | 26 | 25,490 | 34,873 | 10,899.2 | 0.73 | 980 | 1,341 | 2.34 | 419 | 663 | 63% |
| 1982 | 26 | 24,447 | 32,318 | 10,614.6 | 0.76 | 940 | 1,243 | 2.30 | 408 | 663 | 62% |
| 1983 | 26 | 27,467 | 33,581 | 9,730.1 | 0.82 | 1,056 | 1,292 | 2.82 | 374 | 663 | 56% |
| 1984 | 27 | 27,111 | 41,315 | 10,019.2 | 0.66 | 1,004 | 1,530 | 2.71 | 371 | 754 | 49% |
| 1985 | 29 | 20,578 | 38,336 | 12,284.0 | 0.54 | 710 | 1,322 | 1.68 | 424 | 775 | 55% |
| 1986 | 30 | 19,353 | 37,999 | 12,102.1 | 0.51 | 645 | 1,267 | 1.60 | 403 | 786 | 51% |
| 1987 | 32 | 16,722 | 41,806 | 15,109.0 | 0.40 | 523 | 1,306 | 1.11 | 472 | 832 | 57% |
| 1988 | 34 | 17,986 | 40,371 | 16,665.4 | 0.45 | 529 | 1,187 | 1.08 | 490 | 845 | 58% |
| 1989 | 36 | 15,550 | 44,384 | 17,543.5 | 0.35 | 432 | 1,233 | 0.89 | 487 | 857 | 57% |
| 1990 | 37 | 15,781 | 41,585 | 21,336.1 | 0.38 | 427 | 1,124 | 0.74 | 577 | 862 | 67% |
| 1991 | 37 | 12,007 | 38,508 | 21,505.8 | 0.31 | 325 | 1,041 | 0.56 | 581 | 860 | 68% |
| 1992 | 37 | 13,312 | 42,107 | 20,592.2 | 0.32 | 360 | 1,138 | 0.65 | 557 | 859 | 65% |
| 1993 | 37 | 12,221 | 39,352 | 21,995.6 | 0.31 | 330 | 1,064 | 0.56 | 594 | 798 | 74% |
| 1994 | 37 | 12,098 | 39,171 | 22,139.0 | 0.31 | 327 | 1,059 | 0.55 | 598 | 801 | 75% |
| 1995 | 37 | 9,471 | 35,686 | 24,737.0 | 0.27 | 256 | 964 | 0.38 | 669 | 835 | 80% |
| 1996 | 37 | 9,466 | 37,792 | 24,322.2 | 0.25 | 256 | 1,021 | 0.39 | 657 | 838 | 78% |
| 1997 | 37 | 7,603 | 34,021 | 22,866.1 | 0.22 | 205 | 919 | 0.33 | 618 | 845 | 73% |
| 1998 | 36 | 6,829.296 | 32,899 | 23,781.2 | 0.21 | 190 | 914 | 0.29 | 661 | 874 | 76% |
| 1999 | 35 | 6,434.430 | 31,482 | 26,962.6 | 0.20 | 184 | 899 | 0.24 | 770 | 885 | 87% |
| 2000 | 35 | 6,089.676 | 31,186 | 28,476.9 | 0.20 | 174 | 891 | 0.21 | 814 | 893 | 91% |
| 2001 | 35 | 4,835.397 | 28,797 | 28,730.4 | 0.17 | 138 | 823 | 0.17 | 821 | 895 | 92% |
| 2002 | 35 | 6,107.767 | 30,978 | 29,460.0 | 0.20 | 175 | 885 | 0.21 | 842 | 907 | 93% |
| 2003 | 35 | 5,659.434 | 30,759 | 29,094.4 | 0.18 | 162 | 879 | 0.19 | 831 | 912 | 91% |
| 2004 | 35 | 5,450.982 | 33,948 | 29,424.8 | 0.16 | 156 | 970 | 0.19 | 841 | 893 | 94% |
| 2005 | 35 | 5,995.975 | 33,544 | 29,386.8 | 0.18 | 171 | 958 | 0.20 | 840 | 946 | 89% |
| 2006 | 35 | 4,989.761 | 34,159 | 30,238.4 | 0.15 | 143 | 976 | 0.17 | 864 | 954 | 91% |
| 2007 | 35 | 5,388.416 | 37,515 | 30,189.3 | 0.14 | 154 | 1,072 | 0.18 | 863 | 955 | 90% |
| 2008 | 35 | 4,522.413 | 34,642 | 31,248.3 | 0.13 | 129 | 990 | 0.14 | 893 | 957 | 93% |

* Includes only those reactors that had been in commercial operation for at least one full year as of December 31 of each of the indicated years.
** Figures are not adjusted for the multiple reporting of transient individuals (see section 5).
*** Electricity generated reflects the gross electricity generated for the years 1973–1996. Beginning in 1997, it reflects the net electricity generated.

## TABLE 4.2
### Summary of Information Reported by Commercial Pressurized Water Reactors 1973–2008

| Year | Number of Reactors Included* | Annual Collective Dose (person-rem) | No. of Workers with Measurable Dose** | Electricity Generated*** (MW-yr) | Average Measurable Dose per Worker (rem)** | Average Collective Dose per Reactor (person-rem) | Average No. Personnel with Measurable Doses Per Reactor** | Average Collective Dose per MW-yr (person-rem/ MW-yr) | Average Electricity Generated per Reactor (MW-yr) | Average Maximum Dependable Capacity Net (MWe) | Maximum Dependable Capacity Achieved |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1973 | 12 | 9,398 | 9,440 | 3,770.2 | 1.00 | 783 | 787 | 2.49 | 314 | 544 | 58% |
| 1974 | 19 | 6,555 | 9,370 | 6,530.7 | 0.70 | 345 | 493 | 1.00 | 344 | 591 | 58% |
| 1975 | 26 | 8,268 | 10,884 | 11,982.5 | 0.76 | 318 | 419 | 0.69 | 461 | 647 | 71% |
| 1976 | 30 | 13,807 | 17,588 | 13,325.0 | 0.79 | 460 | 586 | 1.04 | 444 | 701 | 63% |
| 1977 | 34 | 13,467 | 20,878 | 17,345.8 | 0.65 | 396 | 614 | 0.78 | 510 | 688 | 74% |
| 1978 | 39 | 16,528 | 25,700 | 19,840.5 | 0.64 | 424 | 659 | 0.83 | 509 | 706 | 72% |
| 1979 | 42 | 21,657 | 38,828 | 18,255.0 | 0.56 | 516 | 924 | 1.19 | 435 | 746 | 58% |
| 1980 | 42 | 24,267 | 46,237 | 18,289.3 | 0.53 | 578 | 1,101 | 1.33 | 435 | 746 | 58% |
| 1981 | 44 | 28,673 | 47,351 | 20,553.7 | 0.61 | 652 | 1,076 | 1.40 | 467 | 752 | 62% |
| 1982 | 48 | 27,754 | 52,149 | 22,140.6 | 0.53 | 578 | 1,086 | 1.25 | 461 | 777 | 59% |
| 1983 | 49 | 29,017 | 52,170 | 23,195.5 | 0.56 | 592 | 1,065 | 1.25 | 473 | 785 | 60% |
| 1984 | 51 | 28,140 | 56,994 | 26,478.4 | 0.49 | 552 | 1,118 | 1.06 | 519 | 809 | 64% |
| 1985 | 53 | 22,470 | 54,632 | 29,470.7 | 0.41 | 424 | 1,031 | 0.76 | 556 | 820 | 68% |
| 1986 | 60 | 23,033 | 62,998 | 33,593.0 | 0.37 | 384 | 1,050 | 0.69 | 560 | 878 | 64% |
| 1987 | 64 | 23,684 | 62,597 | 37,007.3 | 0.38 | 370 | 978 | 0.64 | 578 | 900 | 64% |
| 1988 | 68 | 22,786 | 62,923 | 42,929.7 | 0.36 | 335 | 925 | 0.53 | 631 | 885 | 71% |
| 1989 | 71 | 20,381 | 63,894 | 44,679.5 | 0.32 | 287 | 900 | 0.46 | 629 | 897 | 70% |
| 1990 | 73 | 20,821 | 67,082 | 46,955.6 | 0.31 | 285 | 919 | 0.44 | 643 | 907 | 71% |
| 1991 | 74 | 16,512 | 60,274 | 51,942.6 | 0.27 | 223 | 815 | 0.32 | 702 | 913 | 77% |
| 1992 | 73 | 15,985 | 61,048 | 53,419.8 | 0.26 | 219 | 836 | 0.30 | 732 | 923 | 79% |
| 1993 | 69 | 13,376 | 54,397 | 48,709.3 | 0.25 | 194 | 788 | 0.28 | 706 | 941 | 75% |
| 1994 | 70 | 9,574 | 44,283 | 52,397.6 | 0.22 | 137 | 633 | 0.18 | 749 | 928 | 81% |
| 1995 | 70 | 11,762 | 49,985 | 54,138.2 | 0.24 | 168 | 714 | 0.22 | 773 | 929 | 83% |
| 1996 | 72 | 9,417 | 46,852 | 55,337.8 | 0.20 | 131 | 651 | 0.17 | 769 | 935 | 82% |
| 1997 | 72 | 9,546 | 50,690 | 48,985.3 | 0.19 | 133 | 704 | 0.20 | 680 | 943 | 72% |
| 1998 | 69 | 6,358.096 | 38,586 | 53,288.7 | 0.17 | 92 | 559 | 0.12 | 772 | 942 | 82% |
| 1999 | 69 | 7,231.281 | 43,938 | 56,235.0 | 0.17 | 105 | 637 | 0.13 | 815 | 942 | 86% |
| 2000 | 69 | 6,562.006 | 42,922 | 57,529.9 | 0.15 | 95 | 622 | 0.11 | 834 | 943 | 88% |
| 2001 | 69 | 6,273.155 | 38,773 | 58,822.4 | 0.16 | 91 | 562 | 0.11 | 852 | 946 | 90% |
| 2002 | 69 | 6,018.423 | 42,264 | 59,369.7 | 0.14 | 87 | 613 | 0.10 | 860 | 947 | 91% |
| 2003 | 69 | 6,296.136 | 44,054 | 57,920.6 | 0.14 | 91 | 638 | 0.11 | 839 | 949 | 88% |
| 2004 | 69 | 4,916.915 | 35,901 | 60,398.7 | 0.14 | 71 | 520 | 0.08 | 875 | 943 | 93% |
| 2005 | 69 | 5,459.832 | 44,583 | 59,790.9 | 0.12 | 79 | 646 | 0.09 | 867 | 955 | 91% |
| 2006 | 69 | 6,031.425 | 46,106 | 59,751.3 | 0.13 | 87 | 668 | 0.10 | 866 | 960 | 90% |
| 2007 | 69 | 4,731.597 | 42,015 | 61,955.6 | 0.11 | 69 | 609 | 0.08 | 898 | 961 | 93% |
| 2008 | 69 | 4,673.527 | 44,808 | 60,586.0 | 0.10 | 68 | 649 | 0.08 | 878 | 964 | 91% |

* Includes only those reactors that had been in commercial operation for at least one full year as of December 31 of each of the indicated years.
** Figures are not adjusted for the multiple reporting of transient individuals (see section 5).
*** Electricity generated reflects the gross electricity generated for the years 1973–1996. Beginning in 1997, it reflects the net electricity generated.

## TABLE 4.3
### Summary of Information Reported by Commercial Light Water Reactors 1973–2008

| Year | Number of Reactors Included* | Annual Collective Dose (person-rem) | No. of Workers with Measurable Dose** | Electricity Generated*** (MW-yr) | Average Measurable Dose per Worker (rem)** | Average Collective Dose per Reactor (person-rem) | Average No. Personnel with Measurable Doses Per Reactor** | Average Collective Dose per MW-yr (person-rem/ MW-yr) | Average Electricity Generated per Reactor (MW-yr) | Average Maximum Dependable Capacity Net (MWe) | Maximum Dependable Capacity Achieved |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1973 | 24 | 13,962 | 14,780 | 7,164.1 | 0.95 | 582 | 616 | 1.95 | 299 | 491 | 61% |
| 1974 | 33 | 13,650 | 18,139 | 10,590.9 | 0.75 | 414 | 550 | 1.29 | 321 | 546 | 59% |
| 1975 | 44 | 20,901 | 28,234 | 17,768.9 | 0.74 | 475 | 642 | 1.18 | 404 | 626 | 65% |
| 1976 | 52 | 26,105 | 34,515 | 21,462.9 | 0.76 | 502 | 664 | 1.22 | 413 | 671 | 62% |
| 1977 | 57 | 32,521 | 42,393 | 26,448.3 | 0.77 | 571 | 744 | 1.23 | 464 | 667 | 70% |
| 1978 | 64 | 31,785 | 46,081 | 31,696.5 | 0.69 | 497 | 720 | 1.00 | 495 | 688 | 72% |
| 1979 | 67 | 39,908 | 64,253 | 29,926.0 | 0.62 | 596 | 959 | 1.33 | 447 | 714 | 63% |
| 1980 | 68 | 53,739 | 80,457 | 29,157.5 | 0.67 | 790 | 1,183 | 1.84 | 429 | 714 | 60% |
| 1981 | 70 | 54,163 | 82,224 | 31,452.9 | 0.66 | 774 | 1,175 | 1.72 | 449 | 719 | 63% |
| 1982 | 74 | 52,201 | 84,467 | 32,755.2 | 0.62 | 705 | 1,141 | 1.59 | 443 | 737 | 60% |
| 1983 | 75 | 56,484 | 85,751 | 32,925.6 | 0.66 | 753 | 1,143 | 1.72 | 439 | 743 | 59% |
| 1984 | 78 | 55,251 | 98,309 | 36,497.6 | 0.56 | 708 | 1,260 | 1.51 | 468 | 790 | 59% |
| 1985 | 82 | 43,048 | 92,968 | 41,754.7 | 0.46 | 525 | 1,134 | 1.03 | 509 | 804 | 63% |
| 1986 | 90 | 42,386 | 100,997 | 45,695.1 | 0.42 | 471 | 1,122 | 0.93 | 508 | 847 | 60% |
| 1987 | 96 | 40,406 | 104,403 | 52,116.3 | 0.39 | 421 | 1,088 | 0.78 | 543 | 877 | 62% |
| 1988 | 102 | 40,772 | 103,294 | 59,595.1 | 0.40 | 400 | 1,013 | 0.68 | 584 | 871 | 67% |
| 1989 | 107 | 35,931 | 108,278 | 62,223.0 | 0.33 | 336 | 1,012 | 0.58 | 582 | 883 | 66% |
| 1990 | 110 | 36,602 | 108,667 | 68,291.7 | 0.34 | 333 | 988 | 0.54 | 621 | 892 | 70% |
| 1991 | 111 | 28,519 | 98,782 | 73,448.4 | 0.29 | 257 | 890 | 0.39 | 662 | 895 | 74% |
| 1992 | 110 | 29,297 | 103,155 | 74,012.0 | 0.28 | 266 | 938 | 0.40 | 673 | 901 | 75% |
| 1993 | 106 | 25,597 | 93,749 | 70,704.9 | 0.27 | 241 | 884 | 0.36 | 667 | 891 | 75% |
| 1994 | 107 | 21,672 | 83,454 | 74,536.6 | 0.26 | 203 | 780 | 0.29 | 697 | 884 | 79% |
| 1995 | 107 | 21,233 | 85,671 | 78,875.2 | 0.25 | 198 | 801 | 0.27 | 737 | 896 | 82% |
| 1996 | 109 | 18,883 | 84,644 | 79,660.0 | 0.22 | 173 | 777 | 0.24 | 731 | 902 | 81% |
| 1997 | 109 | 17,149 | 84,711 | 71,851.4 | 0.20 | 157 | 777 | 0.24 | 659 | 910 | 72% |
| 1998 | 105 | 13,187.392 | 71,485 | 77,069.9 | 0.18 | 126 | 681 | 0.17 | 734 | 918 | 80% |
| 1999 | 104 | 13,665.711 | 75,420 | 83,197.6 | 0.18 | 131 | 725 | 0.16 | 800 | 923 | 87% |
| 2000 | 104 | 12,651.682 | 74,108 | 86,006.8 | 0.17 | 122 | 713 | 0.15 | 827 | 926 | 89% |
| 2001 | 104 | 11,108.552 | 67,570 | 87,552.8 | 0.16 | 107 | 650 | 0.13 | 842 | 929 | 91% |
| 2002 | 104 | 12,126.190 | 73,242 | 88,829.7 | 0.17 | 117 | 704 | 0.14 | 854 | 934 | 91% |
| 2003 | 104 | 11,955.570 | 74,813 | 87,015.0 | 0.16 | 115 | 719 | 0.14 | 837 | 936 | 89% |
| 2004 | 104 | 10,367.897 | 69,849 | 89,823.5 | 0.15 | 100 | 672 | 0.12 | 864 | 926 | 93% |
| 2005 | 104 | 11,455.807 | 78,127 | 89,177.7 | 0.15 | 110 | 751 | 0.13 | 857 | 952 | 90% |
| 2006 | 104 | 11,021.186 | 80,265 | 89,989.7 | 0.14 | 106 | 772 | 0.12 | 865 | 958 | 90% |
| 2007 | 104 | 10,120.013 | 79,530 | 92,144.9 | 0.13 | 97 | 765 | 0.11 | 886 | 959 | 92% |
| 2008 | 104 | 9,195.940 | 79,450 | 91,834.3 | 0.12 | 88 | 764 | 0.10 | 883 | 961 | 92% |

* Includes only those reactors that had been in commercial operation for at least one full year as of December 31 of each of the indicated years.
** Figures are not adjusted for the multiple reporting of transient individuals (see section 5).
*** Electricity generated reflects the gross electricity generated for the years 1973–1996. Beginning in 1997, it reflects the net electricity generated.

generated by the number of reactors included in each year. These sums are divided by the number of operating reactors included in each year to yield the average amount of electric energy generated per reactor, which is also shown in Tables 4.1, 4.2, and 4.3.

As shown in Table 4.3, there was a less than 0.3% decrease in the net electricity generated at LWRs in 2008. Contributors to this decrease included North Anna and Cook for PWRs and Fermi 2 for BWRs. These plants experienced the largest decreases in power production (in MW-yr) from 2007 to 2008. The return of Browns Ferry Unit 1 to power production in 2007 contributed significantly to the 4% increase in the electricity generated from BWRs in 2008.

### *4.2.3 Collective Dose per Megawatt-Year*

The number of MW-yr of electricity generated was used in determining the ratio of the average value of the annual collective dose (TEDE) to the number of MW-yr of electricity generated. The ratio was calculated by dividing the total collective dose in person-rem by the electric energy generated in MW-yr and is a measure of the dose incurred by workers at power plants in relation to the electric energy produced. For the years 1973 to 1996, the electricity generated is the gross electricity output of the reactor. For 1997 to 2008, the number reflects the net electricity produced. This ratio, calculated by year for BWRs, PWRs, and LWRs is presented in Tables 4.1, 4.2, and 4.3. This ratio was also calculated for each reactor site (see Appendix C). The average collective dose per MW-yr for LWRs decreased to a value of 0.10 rem/MW-yr in 2008 from a value of 0.11 rem/MW-yr in 2007 due to a combination of a 9% decrease in the collective dose and a 0.3% decrease in power production.

### *4.2.4 Average Maximum Dependable Capacity*

Average maximum dependable capacity as shown in Tables 4.1, 4.2, and 4.3 was calculated by dividing the sum of the net maximum dependable capacities of the reactors in megawatts (net MWe) by the number of reactors included each year. The net maximum dependable capacity is defined as the gross electrical output as measured at the output terminals of the turbine generator during the most restrictive seasonal conditions less the normal station service loads. This “capacity” of each plant was found in Ref. 13.

### *4.2.5 Percent of Maximum Dependable Capacity Achieved*

The percent of maximum dependable capacity achieved is shown for all LWRs in Table 4.3. This parameter gives an indication of the overall power generation performance of LWRs as compared with the maximum dependable capacity that could be obtained in a given year. It is calculated by dividing the average electricity generated per reactor by the average maximum dependable capacity for each year.

From 1973 to 1978, this indicator exhibited an increasing trend as a number of new reactors began producing power at higher efficiencies. Following the accident at TMI, reactor operations personnel concentrated on improving safety systems and complying with

the new regulations for these systems. During this time period, from 1979 to 1987, the percent of maximum dependable capacity remained around 61%. Following the completion of most of these mandated repairs, reactors increased the percent of maximum dependable capacity from 62% in 1987 to 81% in 1996, a gain of nearly 20% in 10 years. The decrease in maximum dependable capacity from 1996 to 1997 was due to the change from measuring the gross electricity generated to the net electricity generated. The percent of maximum dependable capacity for LWRs remained the same at 92% in 2008.

## 4.3 ANNUAL TEDE DISTRIBUTIONS

Table 4.4 summarizes the distribution of the annual TEDE doses received by workers at all commercial LWRs during each of the years 1977 through 2008. This distribution is the sum of the annual dose distributions reported by each licensed LWR each year. As previously noted, the distribution reported by each LWR site for 2008 is shown in Appendix B. Table 4.4 shows the reported dose distributions corrected for the number of transient workers that were reported by more than one site (see Section 5).

Table 4.4 includes only those reactors in operation for a full year for each year presented in the table. In 2008, the total collective dose decreased by 9% to a value of 9,196 person-rem. The PWR with the largest decrease in the collective dose was Ft. Calhoun. TMI1 experienced the highest increase in collective dose among PWRs. The BWR with the largest decrease in the collective dose was Cooper Station. Pilgrim experienced the highest increase in collective dose among BWRs.

## 4.4 AVERAGE ANNUAL TEDE DOSES

Some of the data presented in Tables 4.1, 4.2, and 4.3 are graphically displayed in Figure 4.1, where it can be seen that the average collective dose and average number of workers per BWR have been higher than those for PWRs since 1974 and that the values of both parameters, in general, continued to rise at both types of facilities until 1983. Between 1983 and 2008, the annual collective dose per LWR dropped by 84%. Between 2007 and 2008, the collective dose per reactor for PWRs decreased by 1% to 68 person-rem. The collective dose per reactor for BWRs decreased by 16% to 129 person-rem from 2007 to 2008. The overall collective dose per reactor for LWRs decreased by 9% from 97 person-rem in 2007 to 88 person-rem in 2008. This is the second year that this value has been below 100 person-rem since tracking began in 1973. The overall decreasing trend in average reactor collective doses since 1983 indicates that licensees are continuing to successfully implement ALARA dose reduction processes at their facilities. In 2008 the number of workers with measurable dose per reactor increased to 649 for PWRs and decreased to 990 for BWRs.

Figures 4.2 and 4.3 are plots of most of the other information that is given in Tables 4.1, 4.2, and 4.3. Figure 4.2 shows that in 2008 the net electricity generated decreased slightly to 91,834 MW-yr while the number of operating

## TABLE 4.4
### Summary Distribution of Annual Whole-Body Doses at Commercial Light Water Reactors*
### 1977–2008

| Year | No Measurable Exposure | Measurable <0.10 | Number of Individuals with Whole-Body Doses in the Ranges (rem)** | | | | | | | | | | | | | | | Total Number Monitored | Number with Measurable Exposure | Collective Dose*** (person-rem) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.10–0.25 | 0.25–0.5 | 0.50–0.75 | 0.75–1.0 | 1.0–2.0 | 2.0–3.0 | 3.0–4.0 | 4.0–5.0 | 5.0–6.0 | 6.0–7.0 | 7.0–8.0 | 8.0–9.0 | 9.0–10.0 | 10.0–12.0 | >12 | | | |
| 1977 | 22,688 | 12,436 | 6,056 | 4,538 | 2,905 | 2,230 | 5,660 | 2,858 | 1,290 | 661 | 186 | 89 | 47 | 23 | 6 | - | - | 61,673 | 38,985 | 32,521 |
| 1978 | 26,360 | 15,165 | 6,349 | 5,010 | 3,094 | 2,255 | 5,984 | 3,050 | 1,194 | 517 | 110 | 37 | 9 | - | 1 | - | 2 | 69,137 | 42,777 | 31,785 |
| 1979 | 40,535 | 22,642 | 9,012 | 7,485 | 4,795 | 3,262 | 7,574 | 3,401 | 1,403 | 545 | 117 | 42 | 17 | 3 | 1 | - | - | 100,834 | 60,299 | 39,908 |
| 1980 | 44,716 | 26,990 | 10,697 | 8,913 | 5,573 | 4,139 | 10,672 | 4,607 | 1,816 | 831 | 235 | 119 | 29 | 7 | 1 | - | - | 119,345 | 74,629 | 53,739 |
| 1981 | 39,258 | 26,916 | 11,241 | 9,338 | 6,051 | 4,501 | 11,174 | 4,809 | 1,999 | 533 | 103 | 93 | 9 | 3 | 1 | - | 1 | 116,030 | 76,772 | 54,163 |
| 1982 | 41,704 | 29,278 | 11,734 | 9,907 | 6,235 | 4,422 | 10,220 | 4,716 | 2,066 | 596 | 97 | 31 | 5 | - | 1 | 1 | - | 121,013 | 79,309 | 52,201 |
| 1983 | 47,027 | 29,200 | 11,200 | 9,345 | 5,854 | 4,279 | 11,342 | 5,334 | 2,270 | 716 | 121 | 38 | 8 | 2 | - | - | - | 126,736 | 79,709 | 56,484 |
| 1984 | 54,637 | 36,488 | 13,438 | 10,277 | 6,338 | 4,804 | 11,284 | 5,208 | 2,122 | 487 | 52 | 22 | - | - | - | - | - | 145,157 | 90,520 | 55,251 |
| 1985 | 59,625 | 36,920 | 13,015 | 11,044 | 6,626 | 4,545 | 10,042 | 3,574 | 1,002 | 157 | 1 | - | - | - | - | - | - | 146,551 | 86,926 | 43,048 |
| 1986 | 67,677 | 41,536 | 14,574 | 11,842 | 7,017 | 4,693 | 10,241 | 3,062 | 868 | 146 | - | - | - | - | - | - | - | 161,656 | 93,979 | 42,386 |
| 1987 | 85,170 | 41,283 | 15,842 | 12,838 | 7,586 | 5,333 | 10,611 | 2,192 | 477 | 69 | - | - | - | - | - | - | - | 181,401 | 96,231 | 40,406 |
| 1988 | 87,281 | 40,290 | 15,915 | 13,152 | 7,905 | 5,461 | 10,310 | 2,442 | 511 | 26 | - | 1 | - | - | - | - | - | 183,294 | 96,013 | 40,772 |
| 1989 | 83,954 | 45,302 | 17,270 | 13,778 | 7,944 | 5,138 | 8,633 | 1,615 | 370 | 34 | - | - | - | - | - | - | - | 184,038 | 100,084 | 35,931 |
| 1990 | 83,875 | 42,612 | 17,526 | 14,199 | 8,226 | 5,261 | 8,594 | 1,791 | 337 | 21 | - | - | - | - | - | - | - | 182,442 | 98,567 | 36,602 |
| 1991 | 87,247 | 42,603 | 16,770 | 13,182 | 7,188 | 4,192 | 5,977 | 938 | 219 | 17 | - | - | - | - | - | - | - | 178,333 | 91,086 | 28,519 |
| 1992 | 87,717 | 41,943 | 17,821 | 14,779 | 8,135 | 4,521 | 6,076 | 808 | 85 | 4 | - | - | - | - | - | - | - | 181,889 | 94,172 | 29,297 |
| 1993 | 83,066 | 37,332 | 17,235 | 13,734 | 7,562 | 4,289 | 5,322 | 638 | 76 | 5 | - | - | - | - | - | - | - | 169,259 | 86,193 | 26,364 |
| 1994 | 67,777 | 30,185 | 15,010 | 11,823 | 6,185 | 3,620 | 4,242 | 508 | 40 | - | - | - | - | - | - | - | - | 139,390 | 71,613 | 21,704 |
| 1995 | 61,445 | 29,631 | 15,096 | 12,023 | 6,125 | 3,304 | 3,912 | 595 | 133 | 2 | - | - | - | - | - | - | - | 132,266 | 70,821 | 21,688 |
| 1996 | 58,097 | 30,204 | 14,831 | 11,343 | 5,423 | 2,833 | 3,196 | 408 | 67 | - | - | - | - | - | - | - | - | 126,402 | 68,305 | 18,883 |
| 1997 | 58,409 | 31,955 | 14,890 | 10,913 | 5,233 | 2,455 | 2,599 | 286 | 41 | - | - | - | - | - | - | - | - | 126,781 | 68,372 | 17,149 |
| 1998 | 56,901 | 27,998 | 12,849 | 8,816 | 3,940 | 1,841 | 1,827 | 179 | 15 | 1 | - | - | - | - | - | - | - | 114,367 | 57,466 | 13,187.392 |
| 1999 | 54,885 | 29,048 | 13,184 | 8,949 | 3,793 | 1,900 | 1,894 | 245 | 18 | - | - | - | - | - | - | - | - | 113,916 | 59,031 | 13,665.711 |
| 2000 | 53,324 | 28,480 | 12,921 | 8,679 | 3,571 | 1,644 | 1,734 | 186 | 18 | - | - | - | - | - | - | - | - | 110,557 | 57,233 | 12,651.682 |
| 2001 | 52,636 | 27,246 | 11,491 | 7,659 | 2,907 | 1,323 | 1,392 | 221 | 53 | - | - | - | - | - | - | - | - | 104,928 | 52,292 | 11,108.552 |
| 2002 | 53,440 | 28,523 | 11,610 | 7,668 | 3,004 | 1,479 | 1,820 | 320 | 35 | 1 | - | - | - | - | - | - | - | 107,900 | 54,460 | 12,126.190 |
| 2003 | 54,023 | 29,164 | 11,978 | 8,199 | 3,249 | 1,524 | 1,651 | 184 | 18 | - | - | - | - | - | - | - | - | 109,990 | 55,967 | 11,955.570 |
| 2004 | 57,417 | 28,863 | 11,179 | 7,334 | 2,873 | 1,233 | 1,190 | 188 | 13 | - | - | - | - | - | - | - | - | 110,290 | 52,873 | 10,367.897 |
| 2005 | 56,778 | 31,043 | 12,427 | 7,815 | 3,104 | 1,537 | 1,490 | 147 | 3 | - | - | - | - | - | - | - | - | 114,344 | 57,566 | 11,455.807 |
| 2006 | 57,566 | 32,426 | 12,685 | 7,796 | 2,975 | 1,416 | 1,406 | 82 | 2 | - | - | - | - | - | - | - | - | 116,354 | 58,788 | 11,021.186 |
| 2007 | 57,316 | 32,706 | 11,961 | 7,396 | 2,714 | 1,283 | 1,101 | 97 | 9 | - | - | - | - | - | - | - | - | 114,583 | 57,267 | 10,120.013 |
| 2008 | 61,336 | 33,832 | 12,324 | 6,786 | 2,429 | 1,026 | 921 | 38 | - | - | - | - | - | - | - | - | - | 118,692 | 57,356 | 9,195.940 |

* Summary of reports submitted in accordance with 10 CFR 20.407 or 20.2206 by BWRs and PWRs that had been in commercial operation for at least 1 full year as of December 31 of each of the indicated years. Figures shown have been adjusted for the multiple reporting of transient individuals (see section 5).

** Dose values exactly equal to the values separating ranges are reported in the next higher range.

*** The collective dose, when not reported by the licensee, was calculated by the NRC staff using methods described in section 3.1.4.

reactors has remained constant for the past 10 years. Figure 4.3 shows that the value for the total collective dose for all LWRs decreased by 9% from a value of 10,120 person-rem in 2007 to 9,196 person-rem in 2008. The average measurable dose per worker also decreased to 0.12 rem in 2008 (not adjusted for transient workers).

The fluctuations in the parameters for the years following the accident at the TMI plant in 1979 may reflect some of the impact that this incident had on the nuclear power industry. The decrease seen in dose trends since 1983 may be attributable to several factors. Utilities have completed the tasks initiated as a result of the lessons learned from the TMI accident, and they are increasing efforts to avoid and reduce exposure. The importance of exposure control and the concept of keeping exposures to ALARA levels are continually being stressed, and most utilities have established programs to collect and share information relative to tasks, techniques, and exposures.

To further assist in the identification of any trends that might exist, Figures 4.4 and 4.5 together display the average and median[7] values of the collective dose per reactor for BWRs and for PWRs for the years 1973 through 2008. The ranges of the values reported each year are shown by the vertical lines with a small bar at each end marking the two extreme values. The rectangles indicate the range of values of the collective dose exhibited by those plants ranked in the 25th through the 75th percentiles. The median collective dose for PWRs increased from 60 person-rem in 2007 to 63 person-rem in 2008. The median collective dose for BWRs decreased from 145 person-rem in 2007 to 109 person-rem in 2008. Figure 4.5 also shows that, in 2008, 50% of the PWRs reported collective doses between 43 and 84 person-rem, while 50% of the BWRs reported collective doses between 95 and 168 person-rem. (Note that these values are based on an annual average, not the 3-year rolling average that is presented in Section 4.5.) Nearly every year the median collective dose is less than the average, which indicates that the collective dose for most plants is less than the average collective dose per reactor (the value that is widely quoted).

[7]The median is the value at which 50% of the reactors reported greater collective doses and the other 50% reported smaller collective doses.

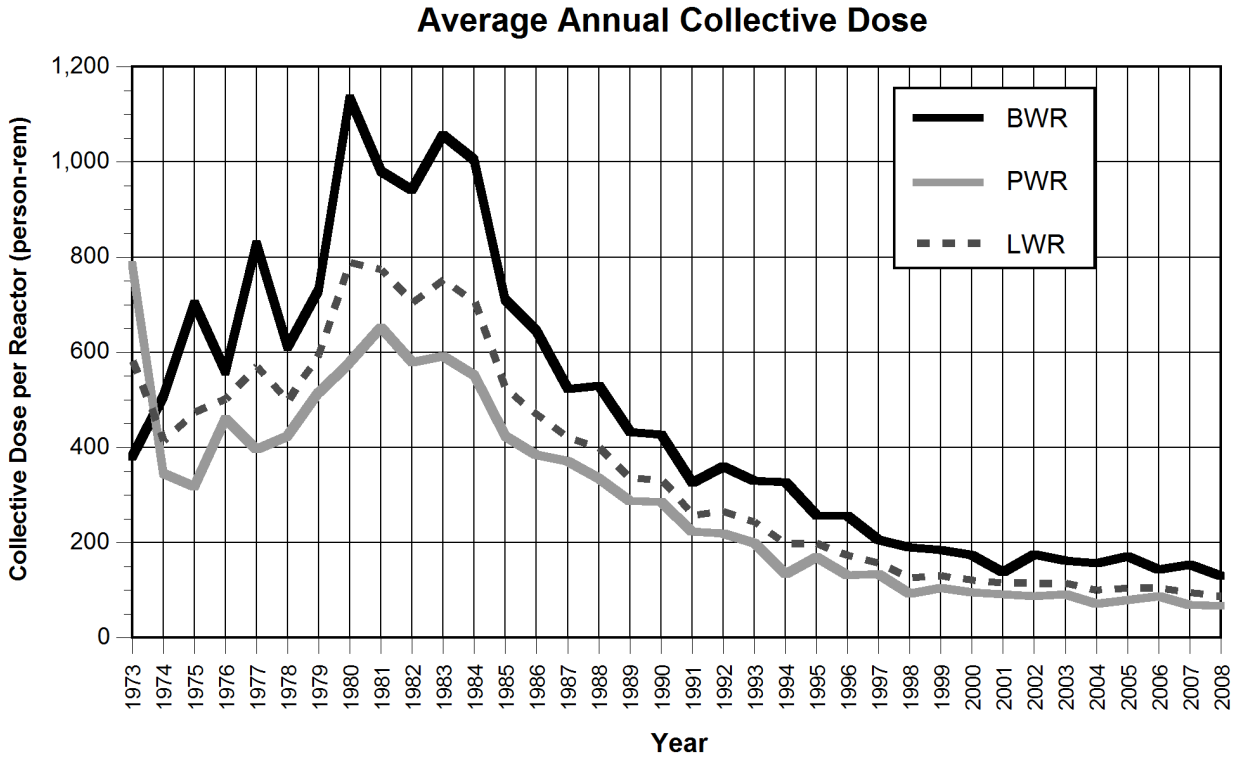
## 4.5 THREE-YEAR AVERAGE COLLECTIVE TEDE PER REACTOR

The 3-year average collective dose per reactor is one of the metrics that the NRC uses in the Reactor Oversight Program to evaluate the effectiveness of the licensee's ALARA program. Tables 4.5 and 4.6 list the sites that had been in commercial operation for at least 3 years as of December 31, 2008, and show the values of several parameters for each of the sites. These tables also give averages for the two types of reactors.

Based on the 105 reactor-years of operation accumulated over a three-year period by the 35 BWRs listed, the average 3-year collective TEDE per reactor was found to be 142 person-rem, the average measurable TEDE per worker was 0.14 rem, and the average collective TEDE per MW-yr was 0.16 person-rem per MW-yr. All values decreased slightly from 2007 to 2008.

Based on the 207 reactor-years of operation accumulated over a three-year period at the 69 PWRs listed, the average annual collective TEDE per reactor, average measurable TEDE per worker, and average collective TEDE per MW-yr were found to be 75 person-rem, 0.12 rem, and 0.08 person-rem per MW-yr, respectively. For PWRs from 2007 to 2008, all values either decreased slightly or remained the same.

In addition to the listings provided in Tables 4.5 and 4.6, considerable attention is paid to the quartile ranking of reactors for the 3-year average dose per reactor. The quartile ranking is used by the NRC as a factor in planning the number of inspection hours assigned per reactor. For this reason, Tables 4.7 and 4.8 have been included in the 2008 annual report. These tables show the plant name, 3-year collective TEDE per reactor, the percent change in the 3-year average from the previous 3-year period, and the quartile ranking from the previous period if the ranking has changed.



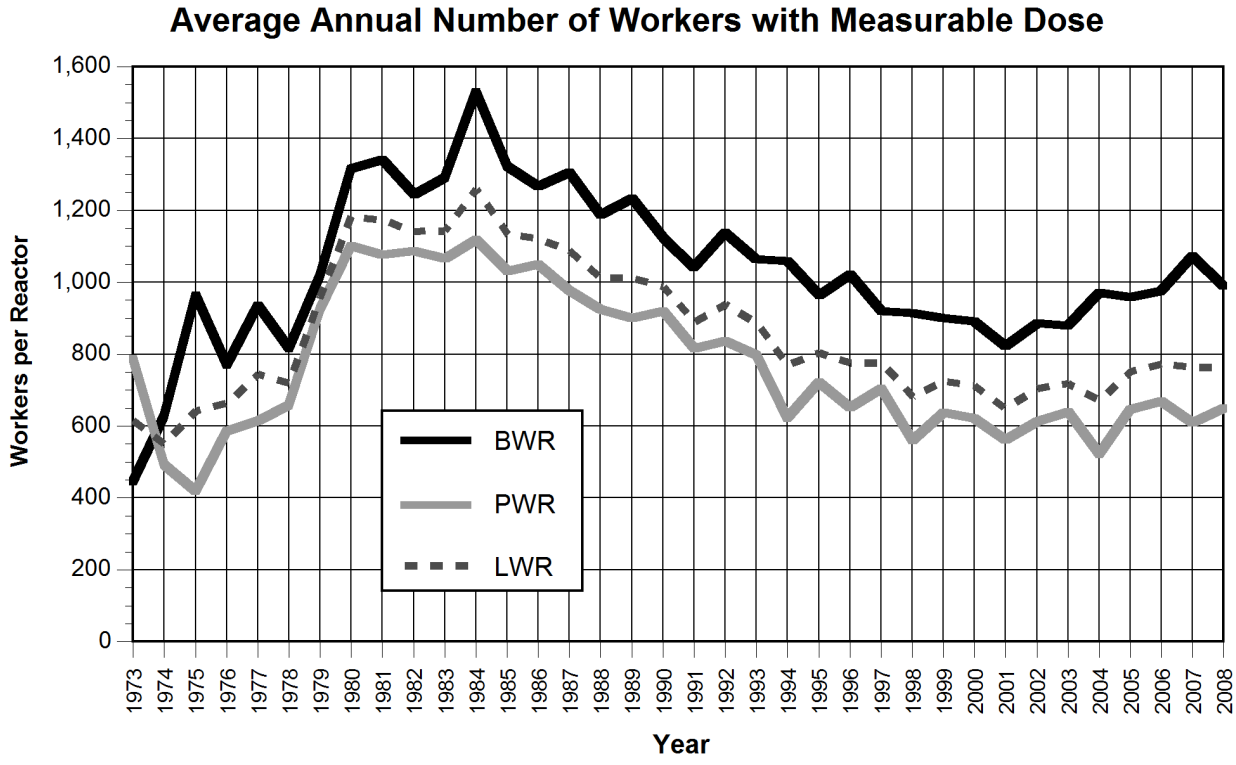
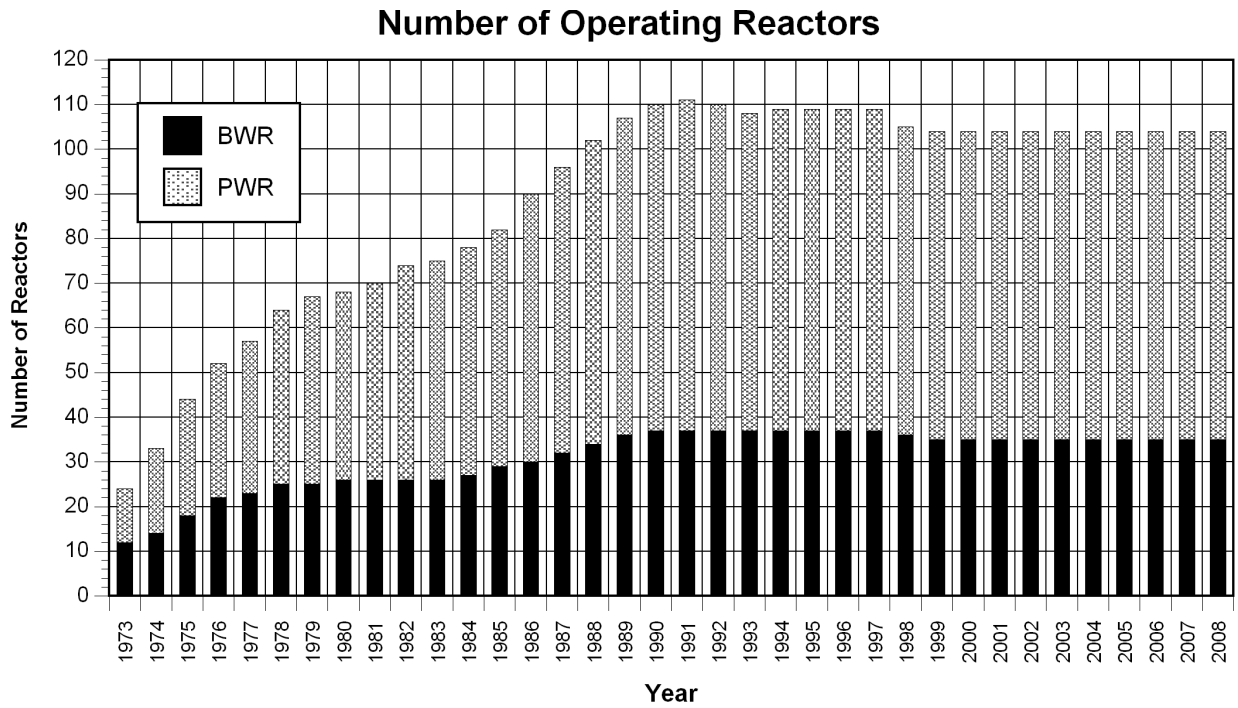
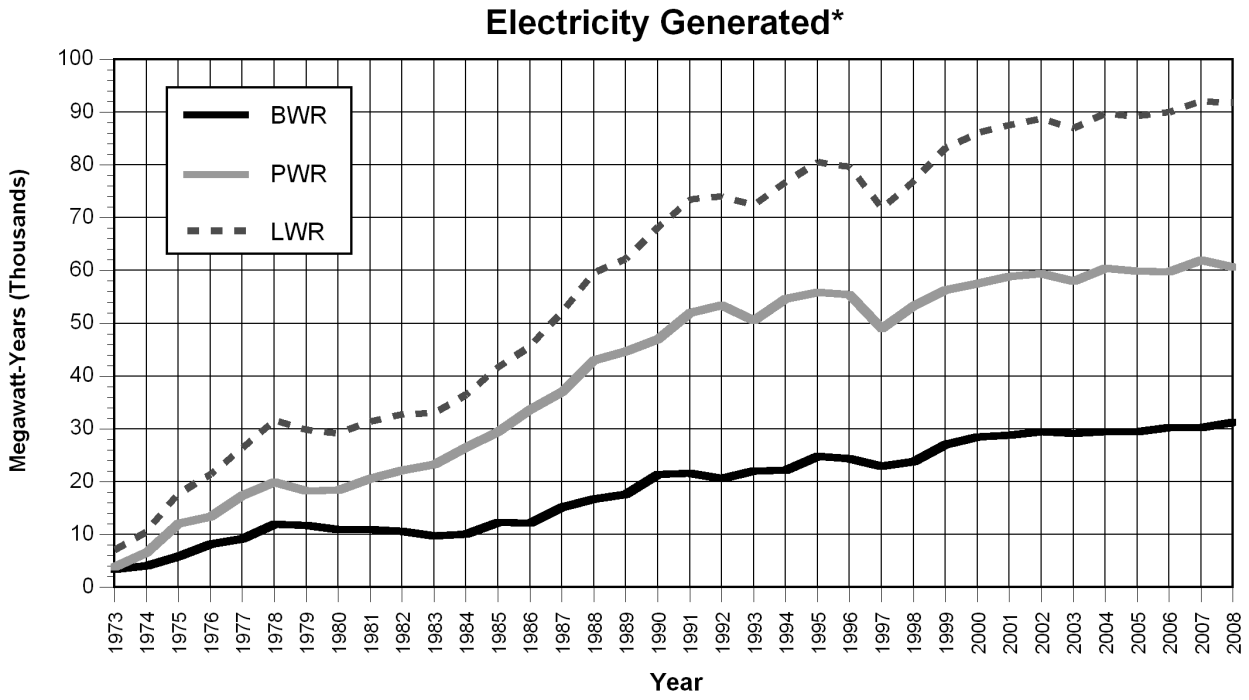



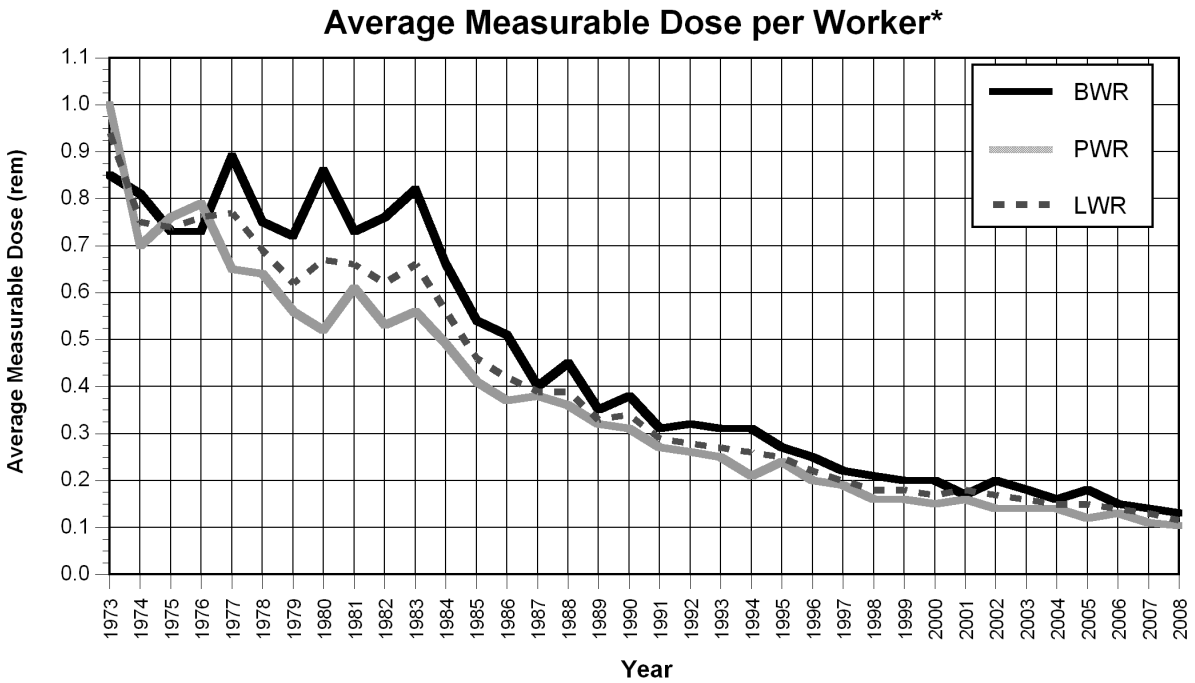

**FIGURE 4.1.** Average Collective Dose and Number of Workers with Measurable Dose per Reactor 1973–2008

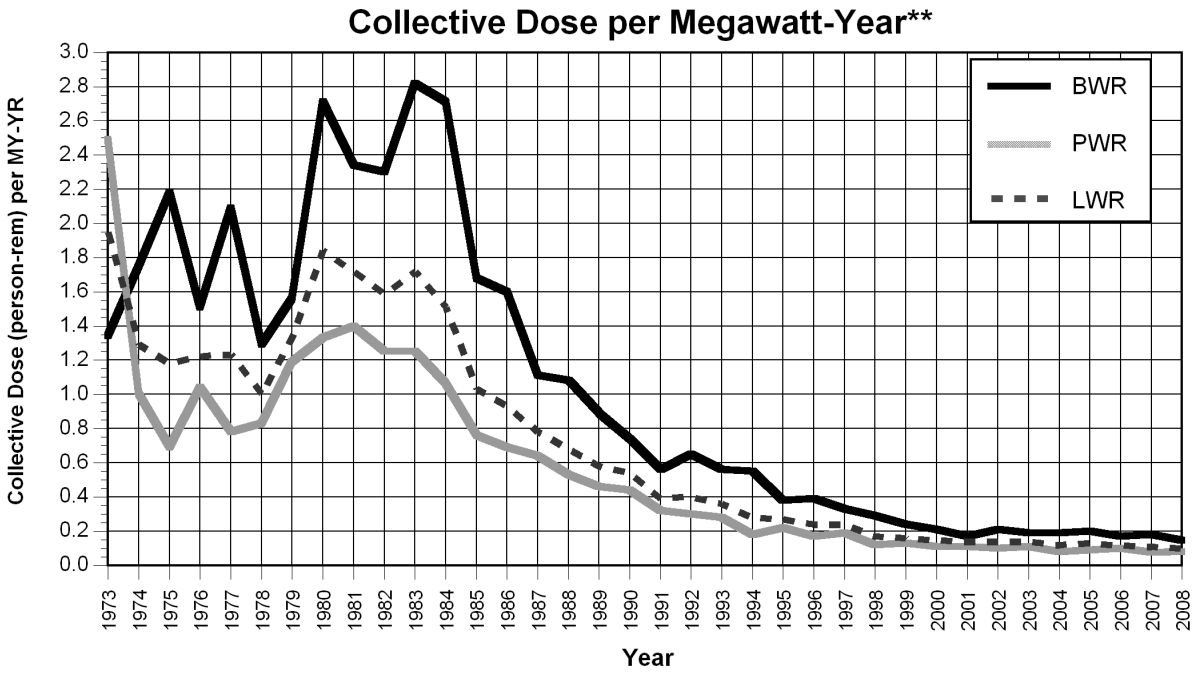



* Gross electricity is shown for 1973–1996, net electricity is shown for 1997–2008.

**FIGURE 4.2.** Number of Operating Reactors and Electricity Generated 1973–2008




* Not adjusted for transient workers. See Section 5.

** Gross electricity is shown for 1973–1996, net electricity is shown for 1997–2008.

**FIGURE 4.3.** Average Measurable Dose per Worker and Collective Dose per Megawatt-Year 1973–2008

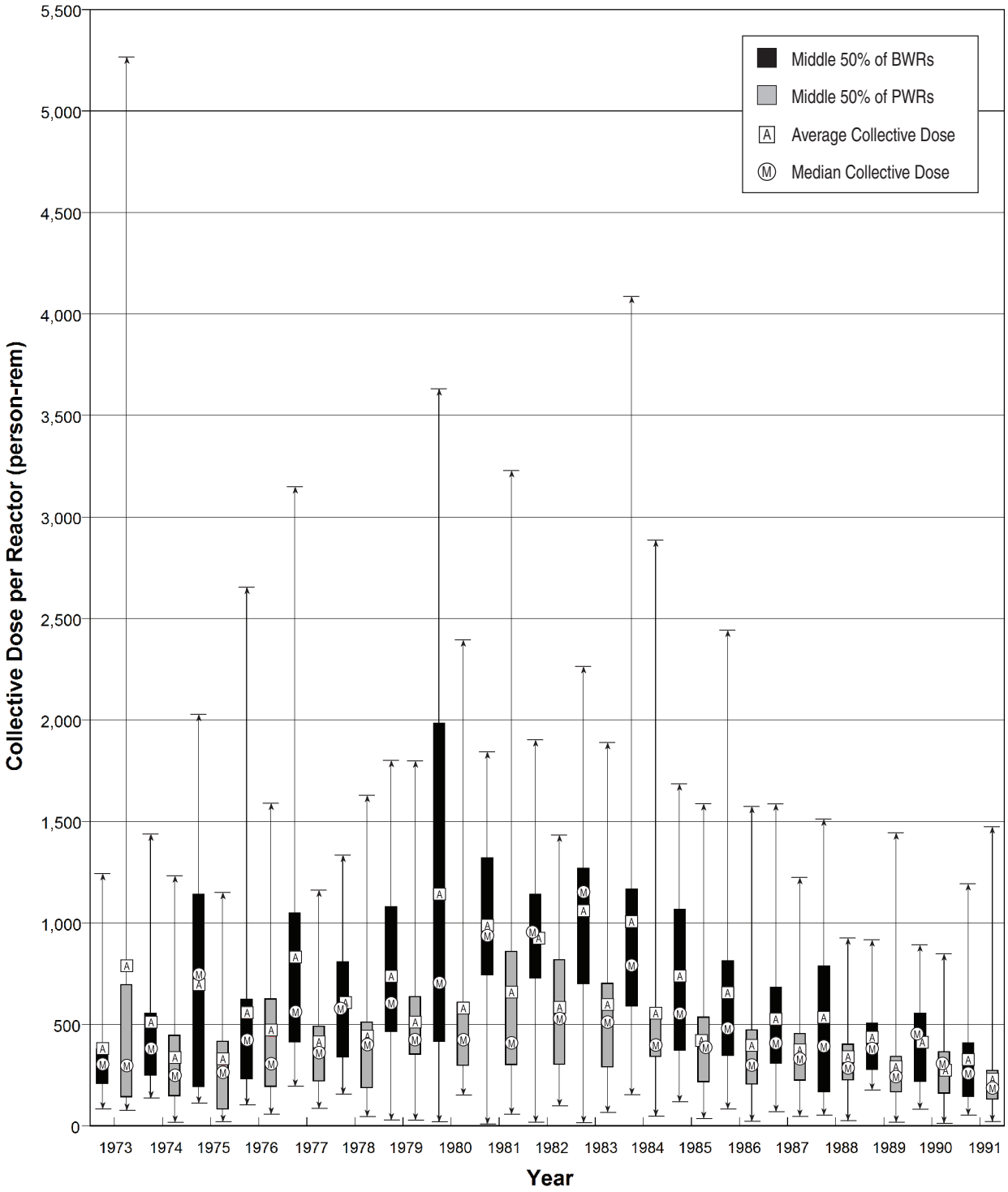



**FIGURE 4.4.** Average, Median, and Extreme Values of the Collective Dose per Reactor 1973–1991

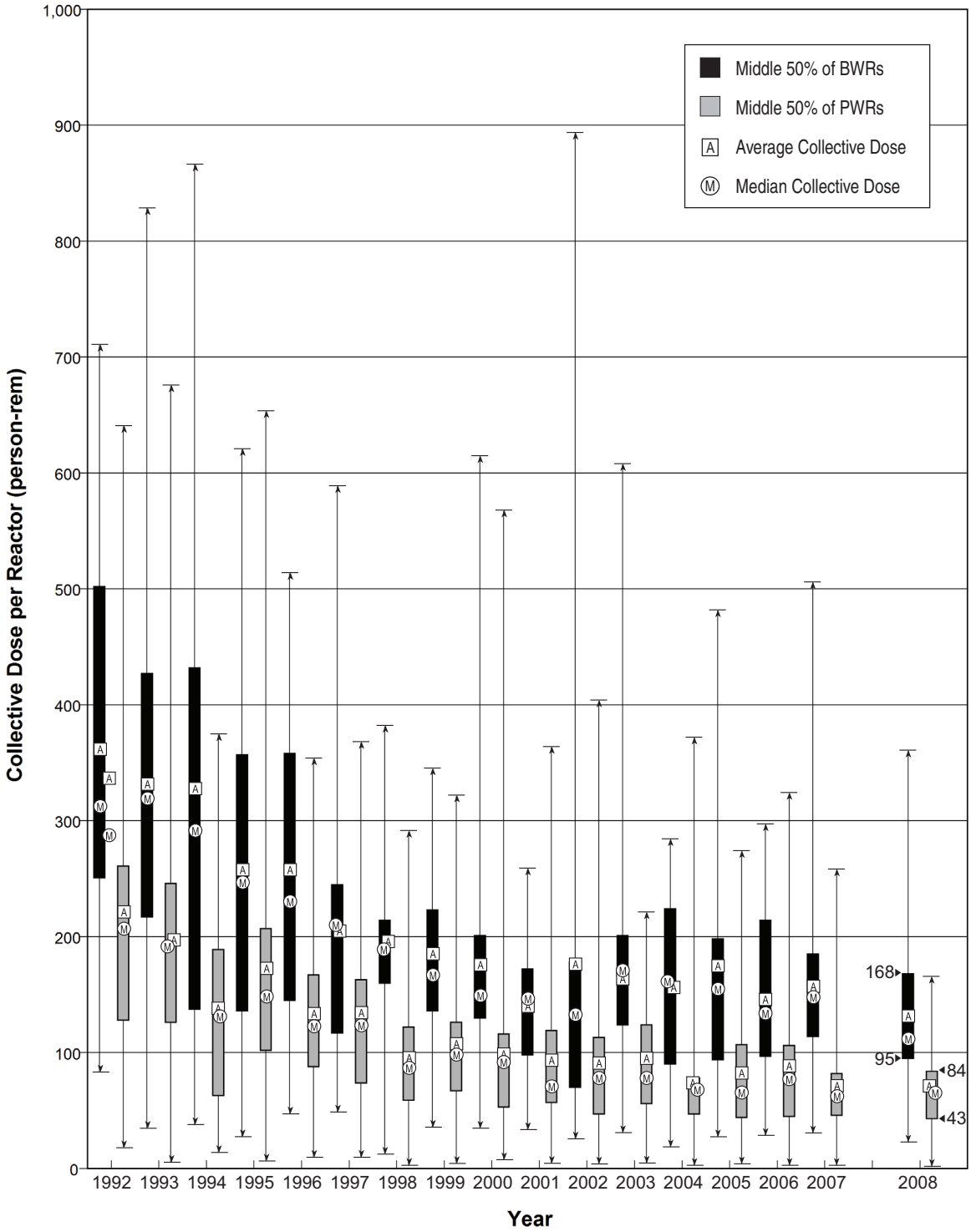



**FIGURE 4.5.** Average, Median, and Extreme Values of the Collective Dose per Reactor 1992–2008

## TABLE 4.5
### Three-Year Totals and Averages Listed in Ascending Order of Collective TEDE per BWR 2006–2008

| Plant Name * | Reactor Years | Collective TEDE per Reactor Year | Collective TEDE per Site | Number of Workers with Measurable TEDE | Average TEDE per Worker | Total MW-Yr | Average TEDE per MW-Yr |
|---|---|---|---|---|---|---|---|
| DUANE ARNOLD | 3 | 79.063 | 237.188 | 1,592 | 0.15 | 1,698.9 | 0.14 |
| MONTICELLO | 3 | 89.530 | 269.591 | 1,699 | 0.16 | 1,613.0 | 0.17 |
| LIMERICK 1,2 | 6 | 94.560 | 567.358 | 4,472 | 0.13 | 6,562.2 | 0.09 |
| HATCH 1,2 | 6 | 97.670 | 586.019 | 4,143 | 0.14 | 4,815.4 | 0.12 |
| PILGRIM | 3 | 102.208 | 306.625 | 2,438 | 0.13 | 1,918.0 | 0.16 |
| SUSQUEHANNA 1,2 | 6 | 106.802 | 640.814 | 6,071 | 0.11 | 6,303.7 | 0.10 |
| LASALLE 1,2 | 6 | 115.732 | 694.394 | 6,361 | 0.11 | 6,493.8 | 0.11 |
| HOPE CREEK 1 | 3 | 119.716 | 359.148 | 5,355 | 0.07 | 3,052.2 | 0.12 |
| DRESDEN 2,3 | 6 | 127.170 | 763.017 | 6,659 | 0.11 | 4,945.8 | 0.15 |
| GRAND GULF | 3 | 135.226 | 405.678 | 4,609 | 0.09 | 3,376.3 | 0.12 |
| FERMI 2 | 3 | 136.842 | 410.525 | 3,374 | 0.12 | 2,900.6 | 0.14 |
| COLUMBIA GENERATING | 3 | 139.072 | 417.217 | 3,485 | 0.12 | 3,045.8 | 0.14 |
| PEACH BOTTOM 2,3 | 6 | 140.869 | 845.212 | 5,235 | 0.16 | 6,448.2 | 0.13 |
| NINE MILE POINT 1,2 | 6 | 143.447 | 860.682 | 4,347 | 0.20 | 4,887.5 | 0.18 |
| VERMONT YANKEE | 3 | 144.806 | 434.417 | 2,973 | 0.15 | 1,677.2 | 0.26 |
| OYSTER CREEK | 3 | 149.491 | 448.472 | 3,418 | 0.13 | 1,640.9 | 0.27 |
| BRUNSWICK 1,2 | 6 | 154.128 | 924.770 | 6,835 | 0.14 | 5,070.6 | 0.18 |
| FITZPATRICK | 3 | 159.313 | 477.938 | 3,483 | 0.14 | 2,323.3 | 0.21 |
| CLINTON | 3 | 177.141 | 531.424 | 3,340 | 0.16 | 2,962.1 | 0.18 |
| QUAD CITIES 1,2 | 6 | 180.622 | 1,084.733 | 6,339 | 0.17 | 4,794.6 | 0.23 |
| BROWNS FERRY 1,2,3** | 9 | 186.399 | 1,678.595 | 9,278 | 0.18 | 7,297.7 | 0.23 |
| PERRY | 3 | 207.444 | 622.331 | 2,666 | 0.23 | 3,331.4 | 0.19 |
| RIVER BEND 1 | 3 | 219.160 | 657.479 | 4,434 | 0.15 | 2,401.5 | 0.27 |
| COOPER STATION | 3 | 226.654 | 679.963 | 3,710 | 0.18 | 2,115.3 | 0.32 |
| **Totals and Averages** | **105** | | **14,901.590** | **106,316** | **0.14** | **91,676.0** | **0.16** |
| **Average per Reactor-Year** | | **141.910** | | **1,013** | | **873.1** | |

* Sites where not all reactors had completed three full years of commercial operation as of December 31, 2008, are not included.

** Although Brown's Ferry 1 was placed on administrative hold in 1985, it remains in the count of operating reactors and has resumed operation as of June, 2007.

## TABLE 4.6
### Three-Year Totals and Averages Listed in Ascending Order of Collective TEDE per PWR 2006–2008

| Plant Name * | Reactor Years | Collective TEDE per Reactor Year | Collective TEDE per Site | Number of Workers with Measurable TEDE | Average TEDE per Worker | Total MW-Yr | Average TEDE per MW-Yr |
|---|---|---|---|---|---|---|---|
| INDIAN POINT 3 | 3 | 36.266 | 108.798 | 2,072 | 0.05 | 2,957.7 | 0.04 |
| SUMMER 1 | 3 | 37.705 | 113.115 | 1,374 | 0.08 | 2,643.7 | 0.04 |
| POINT BEACH 1,2 | 6 | 39.274 | 235.641 | 1,946 | 0.12 | 2,825.1 | 0.08 |
| THREE MILE ISLAND 1 | 3 | 40.526 | 121.577 | 1,455 | 0.08 | 2,422.1 | 0.05 |
| FARLEY 1,2 | 6 | 41.123 | 246.738 | 2,642 | 0.09 | 4,701.1 | 0.05 |
| CALLAWAY 1 | 3 | 41.761 | 125.282 | 2,033 | 0.06 | 3,290.1 | 0.04 |
| PRAIRIE ISLAND 1,2 | 6 | 45.059 | 270.351 | 2,293 | 0.12 | 2,865.5 | 0.09 |
| GINNA | 3 | 50.329 | 150.988 | 1,601 | 0.09 | 1,574.7 | 0.10 |
| ROBINSON 2 | 3 | 50.818 | 152.453 | 1,764 | 0.09 | 2,008.6 | 0.08 |
| PALO VERDE 1,2,3 | 9 | 51.121 | 460.089 | 5,663 | 0.08 | 9,129.6 | 0.05 |
| SEABROOK | 3 | 51.969 | 155.907 | 2,892 | 0.05 | 3,365.9 | 0.05 |
| HARRIS | 3 | 54.130 | 162.389 | 1,979 | 0.08 | 2,537.9 | 0.06 |
| TURKEY POINT 3,4 | 6 | 59.028 | 354.166 | 3,473 | 0.10 | 3,828.2 | 0.09 |
| KEWAUNEE | 3 | 59.604 | 178.811 | 1,282 | 0.14 | 1,446.9 | 0.12 |
| VOGTLE 1,2 | 6 | 62.274 | 373.644 | 3,028 | 0.12 | 6,162.6 | 0.06 |
| WOLF CREEK 1 | 3 | 65.364 | 196.092 | 1,791 | 0.11 | 3,219.4 | 0.06 |
| BRAIDWOOD 1,2 | 6 | 66.731 | 400.388 | 4,117 | 0.10 | 6,730.6 | 0.06 |
| BYRON 1,2 | 6 | 67.351 | 404.103 | 3,957 | 0.10 | 6,579.1 | 0.06 |
| CRYSTAL RIVER 3 | 3 | 68.379 | 205.138 | 1,555 | 0.13 | 2,352.4 | 0.09 |
| DIABLO CANYON 1,2 | 6 | 71.525 | 429.148 | 4,476 | 0.10 | 6,192.5 | 0.07 |
| SOUTH TEXAS 1,2 | 6 | 71.539 | 429.231 | 3,140 | 0.14 | 7,419.0 | 0.06 |
| MCGUIRE 1,2 | 6 | 71.681 | 430.087 | 4,206 | 0.10 | 6,054.9 | 0.07 |
| CALVERT CLIFFS 1,2 | 6 | 71.879 | 431.274 | 3,151 | 0.14 | 4,894.1 | 0.09 |
| OCONEE 1,2,3 | 9 | 73.388 | 660.493 | 5,698 | 0.12 | 6,921.1 | 0.10 |
| CATAWBA 1,2 | 6 | 73.645 | 441.868 | 4,301 | 0.10 | 6,191.4 | 0.07 |
| ARKANSAS 1,2 | 6 | 74.109 | 444.653 | 4,362 | 0.10 | 5,123.9 | 0.09 |
| COMANCHE PEAK 1,2 | 6 | 74.766 | 448.594 | 3,339 | 0.13 | 6,612.3 | 0.07 |
| SEQUOYAH 1,2 | 6 | 74.881 | 449.286 | 3,909 | 0.11 | 6,337.6 | 0.07 |
| NORTH ANNA 1,2 | 6 | 75.385 | 452.309 | 3,125 | 0.14 | 4,962.8 | 0.09 |
| WATERFORD 3 | 3 | 88.009 | 264.028 | 2,928 | 0.09 | 3,220.2 | 0.08 |
| SAN ONOFRE 2,3 | 6 | 88.659 | 531.952 | 3,711 | 0.14 | 5,269.8 | 0.10 |
| SALEM 1,2 | 6 | 89.484 | 536.906 | 6,173 | 0.09 | 6,368.6 | 0.08 |
| BEAVER VALLEY 1,2 | 6 | 90.023 | 540.135 | 4,120 | 0.13 | 4,719.9 | 0.11 |
| SURRY 1,2 | 6 | 98.730 | 592.377 | 3,407 | 0.17 | 4,479.8 | 0.13 |
| MILLSTONE 2,3 | 6 | 101.802 | 610.811 | 3,787 | 0.16 | 5,534.7 | 0.11 |
| COOK 1,2 | 6 | 104.584 | 627.503 | 4,061 | 0.15 | 5,486.0 | 0.11 |
| DAVIS-BESSE | 3 | 105.964 | 317.892 | 2,505 | 0.13 | 2,385.0 | 0.13 |
| ST. LUCIE 1,2 | 6 | 107.026 | 642.155 | 4,800 | 0.13 | 4,411.0 | 0.15 |
| FORT CALHOUN | 3 | 129.748 | 389.245 | 2,530 | 0.15 | 1,254.2 | 0.31 |
| WATTS BAR 1 | 3 | 132.581 | 397.744 | 3,085 | 0.13 | 2,838.6 | 0.14 |
| INDIAN POINT 2 | 3 | 144.533 | 433.600 | 2,989 | 0.15 | 2,854.8 | 0.15 |
| PALISADES | 3 | 173.254 | 519.762 | 2,219 | 0.23 | 2,119.5 | 0.25 |
| **Totals and Averages** | **207** | | **15,436.723** | **132,939** | **0.12** | **182,292.9** | **0.08** |
| **Average per Reactor-Year** | | **74.574** | | **642** | | **880.6** | |

* Sites where not all reactors had completed three full years of commercial operation as of December 31, 2008, are not included.

## TABLE 4.7
### Three-Year Collective TEDE per Reactor-Year for BWRs 2006-2008

| | Plant Name | Three-Year Coll. TEDE per Reactor Year 2006-2008 | Percent Change From 2005-2007 | 2005 - 2007 Quartile (if changed) |
|---|---|---|---|---|
| 1st Quartile | DUANE ARNOLD | 79.063 | -33%▼ | |
| | MONTICELLO | 89.530 | -33%▼ | 2 |
| | LIMERICK 1, 2 | 94.670 | -2%▼ | |
| | HATCH 1, 2 | 97.670 | -3%▼ | |
| | PILGRIM | 102.208 | -37%▼ | 4 |
| | SUSQUEHANNA 1, 2 | 106.802 | 2%▲ | |
| 2nd Quartile | LASALLE 1, 2 | 115.732 | -14%▼ | |
| | HOPE CREEK 1 | 119.716 | -8%▼ | |
| | DRESDEN 2, 3 | 127.170 | -7%▼ | 3 |
| | GRAND GULF | 135.226 | 0%▲ | |
| | FERMI 2 | 136.842 | -6%▼ | 3 |
| | COLUMBIA GENERATING | 139.072 | -39%▼ | 4 |
| | PEACH BOTTOM 2, 3 | 140.869 | -10%▼ | 3 |
| 3rd Quartile | NINE MILE POINT 1, 2 | 143.447 | -10%▼ | |
| | VERMONT YANKEE | 144.806 | 4%▲ | |
| | OYSTER CREEK | 149.491 | 70%▲ | 1 |
| | BRUNSWICK 1, 2 | 154.128 | 6%▲ | |
| | FITZPATRICK | 159.313 | 34%▲ | 1 |
| 4th Quartile | CLINTON | 177.141 | 47%▲ | 2 |
| | QUAD CITIES 1, 2 | 180.622 | -39%▼ | |
| | BROWNS FERRY 1, 2, 3 | 186.399 | -8%▼ | |
| | PERRY | 207.444 | -37%▼ | |
| | RIVER BEND 1 | 219.160 | 64%▲ | 2 |
| | COOPER STATION | 226.654 | 14%▲ | |
| | **Average per Reactor-Year** | **141.910** | **-9%▼** | |

< *Average 141.9*

## TABLE 4.8
### Three-Year Collective TEDE per Reactor-Year for PWRs 2006-2008

| | Plant Name | Three-Year Coll. TEDE per Reactor Year 2006-2008 | Percent Change From 2005-2007 | 2005 - 2007 Quartile (if changed) |
|---|---|---|---|---|
| 1st Quartile | INDIAN POINT 3 | 36.266 | -39%▼ | 2 |
| | SUMMER 1 | 37.705 | -17%▼ | |
| | POINT BEACH 1, 2 | 39.274 | 7%▲ | |
| | THREE MILE ISLAND 1 | 40.526 | -34%▼ | 2 |
| | FARLEY 1, 2 | 41.123 | -10%▼ | |
| | CALLAWAY 1 | 41.761 | -59%▼ | 4 |
| | PRAIRIE ISLAND 1, 2 | 45.059 | 19%▲ | |
| | GINNA | 50.329 | 24%▲ | |
| | ROBINSON 2 | 50.818 | 3%▲ | |
| | PALO VERDE 1,2,3 | 51.121 | -8%▼ | |
| | SEABROOK | 51.969 | 17%▲ | |
| 2nd Quartile | HARRIS | 54.130 | 1%▲ | 1 |
| | TURKEY POINT 3, 4 | 59.028 | -3%▼ | |
| | KEWAUNEE | 59.604 | 99%▲ | 1 |
| | VOGTLE 1, 2 | 62.274 | -3%▼ | |
| | WOLF CREEK 1 | 65.364 | -6%▼ | |
| | BRAIDWOOD 1, 2 | 66.731 | 4%▲ | |
| | BYRON 1, 2 | 67.351 | -13%▼ | 3 |
| | CRYSTAL RIVER 3 | 68.379 | -34%▼ | 4 |
| | DIABLO CANYON 1, 2 | 71.525 | 35%▲ | 1 |
| | SOUTH TEXAS 1, 2 | 71.539 | -12%▼ | 3 |
| 3rd Quartile | MCGUIRE 1, 2 | 71.681 | -2%▼ | 2 |
| | CALVERT CLIFFS 1, 2 | 71.879 | -18%▼ | |
| | OCONEE 1, 2, 3 | 73.388 | 6%▲ | 2 |
| | CATAWBA 1, 2 | 73.645 | 0%▲ | 2 |
| | ARKANSAS 1, 2 | 74.109 | -39%▼ | 4 |
| | COMANCHE PEAK 1, 2 | 74.766 | -14%▼ | |
| | SEQUOYAH 1, 2 | 74.881 | -2%▼ | |
| | NORTH ANNA 1, 2 | 75.385 | 0%▲ | |
| | WATERFORD 3 | 88.009 | -1%▼ | |
| | SAN ONOFRE 2, 3 | 88.659 | 27%▲ | 2 |
| 4th Quartile | SALEM 1, 2 | 89.484 | 20%▲ | 3 |
| | BEAVER VALLEY 1, 2 | 90.023 | 1%▲ | |
| | SURRY 1, 2 | 98.730 | 12%▲ | 3 |
| | MILLSTONE 2, 3 | 101.802 | 13%▲ | |
| | COOK 1, 2 | 104.584 | -2%▼ | |
| | DAVIS-BESSE | 105.964 | 21%▲ | 3 |
| | ST. LUCIE 1, 2 | 107.026 | -31%▼ | |
| | FORT CALHOUN | 129.748 | -31%▼ | |
| | WATTS BAR 1 | 132.581 | -15%▼ | |
| | INDIAN POINT 2 | 144.533 | 42%▲ | |
| | PALISADES | 173.254 | 3%▲ | |
| | **Average per Reactor-Year** | **74.574** | **-4%▼** | |

< *Average 74.6*

## 4.6 GRAPHICAL REPRESENTATION OF DOSE TRENDS IN APPENDIX D

Each page of Appendix D presents a graph of selected dose performance indicators from 1973 through 2008. The dose and performance indicators illustrate the history of the collective dose per reactor for the site, the rolling 3-year average collective dose per reactor, and the electricity generated at the site. These data are plotted, beginning with each plant's first full year of commercial operation and continuing through 2008. Data for years when a plant was not in commercial operation have been included when available. However, any data reported prior to 1973 are not included. The 3-year average collective dose per reactor data are included because they provide an overall indication of each plant's general trend in collective dose. The 3-year average collective dose per reactor is also one of the metrics used by NRC in the Reactor Oversight Program to evaluate a plant's ALARA program. This average is determined by summing the collective dose for the current year and the previous 2 years and then dividing this sum by the number of reactors reporting during those years. Depicting dose trends by using a 3-year average reduces the sporadic effects on annual doses of refueling operations (usually an 18- to 24-month cycle) and occasional high-dose maintenance activities and provides a more representative depiction of collective dose trends over the life of a plant. The annual average collective dose per reactor for all reactors of the same type is also shown on the graph.

## 4.7 DECONTAMINATION AND DECOMMISSIONG OF NUCLEAR POWER PLANTS

While 104 nuclear power plants are currently in commercial operation, several have undergone the process of decontamination and decommissioning (D&D), which involves the cleanup, dismantlement, and closure of the site. As more nuclear power plants reach the end of their operating license, there will be a commensurate increase in activities involving radiation exposure related to D&D. For this reason, there is an increased need to provide further information on plants undergoing D&D.

Appendix B contains a list of the plants that are no longer in commercial operation along with the dose distribution and collective dose for these plants. It should be noted that these plants may be in different stages of D&D, so that a comparison of dose at one plant versus another would not be meaningful. In addition, Appendix B lists the plant units that are no longer in commercial operation but report along with other units at the site. Under the licensing conditions and reporting requirements, it is permitted to report this information together in one report. Table 4.9 lists the plants that have ceased operation and have changed the status to "Decommissioned" as of the date shown.

**TABLE 4.9**
**Plants No Longer in Operation**
**2008**

| Plant Name | Date of First Commercial Operation | Decommissioning Date |
|---|---|---|
| BIG ROCK POINT | 3/29/1963 | 9/20/1997 |
| DRESDEN 1 | 8/1/1960 | 8/31/1978 |
| FORT ST. VRAIN | 7/1/1979 | 8/29/1989 |
| HADDAM NECK | 1/1/1968 | 12/4/1996 |
| HUMBOLDT BAY 3 | 8/1/1963 | 7/1/1983 |
| LACROSSE | 11/1/1969 | 4/30/1987 |
| MAINE YANKEE | 12/28/1972 | 8/6/1997 |
| MILLSTONE 1 | 3/1/1971 | 6/30/1998 |
| RANCHO SECO | 4/17/1975 | 6/7/1989 |
| SAN ONOFRE 1 | 1/1/1968 | 11/30/1992 |
| SHOREHAM | | 6/6/1987 |
| THREE MILE ISLAND 2 | 12/30/1978 | 3/28/1979 |
| TROJAN | 5/20/1976 | 12/31/1992 |
| YANKEE-ROWE | 7/1/1961 | 2/26/1992 |
| ZION 1 | 12/31/1973 | 12/31/1997 |
| ZION 2 | 9/17/1974 | 12/31/1997 |

# Section 5

# TRANSIENT WORKERS AND CAREER DOSES AT NRC-LICENSED FACILITIES

## 5.1 TERMINATION REPORTS

Under 10 CFR 20, licensees are required to submit an NRC Form 5 to NRC for each individual who is required to be monitored at the end of the monitoring year or upon the individual's termination of employment at the facility. The termination report submitted in accordance with the old §20.408, listing the individual's complete dose history during employment at the facility, is no longer required.

However, the Form 5 submitted to NRC upon an individual's termination of employment serves the same function as the previous requirements with regard to the analysis of transient workers at NRC-licensed facilities. The following analysis examines the workers who had more than one Form 5 dose record at more than one NRC-licensed facility during the monitoring year. These workers are defined as "transient" because they worked at more than one facility during the monitoring year.

The term "monitoring year" is used here in accordance with the definition of a year given in §20.1003, which defines a year as "the period of time beginning in January used to determine compliance with the provisions of Part 20. The licensee may change the start date of the monitoring year used to determine compliance provided that the change is made at the beginning of the monitoring/calendar year and that no day is omitted or duplicated in consecutive years."

## 5.2 TRANSIENT WORKERS AT NRC FACILITIES

Examination of the data reported for workers who began and terminated two or more periods of employment with two or more different facilities within one monitoring year is useful in many ways. For example, the number of transients and the individual doses received by them can be determined from examining these data.

Additionally, the distribution of the doses received by transient workers can be useful in determining the impact that the inclusion of these individuals in each of two or more licensees' annual reports has on the annual summary (as reported in Appendix B) for all nuclear power facilities and all NRC licensees combined (one of the issues mentioned in Section 2). Table 5.1 shows the actual distribution of transient worker doses as determined from the NRC Form 5 termination reports and compares it with the reported distribution of the doses of these workers as they would have appeared in a summation of the annual reports submitted by each of the licensees.

In 2008, over 99% of the transient individuals were reported by nuclear power facilities. For this reason, these data are shown separately in Table 5.1.

## TABLE 5.1
### Effects of Transient Workers on Annual Statistical Compilations
### 2008

| License Category | Number of Individuals with TEDE in the Ranges (rem)* | | | | | | | | | | | | Total Number Monitored | Number with Measurable Exposure | Collective TEDE (person-rem) | Average Meas. TEDE (rem) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No Measurable Exposure | Measurable <0.10 | 0.10 - 0.25 | 0.25 - 0.50 | 0.50 - 0.75 | 0.75 - 1.0 | 1.0 - 2.0 | 2.0 - 3.0 | 3.0 - 4.0 | 4.0 - 5.0 | 5.0 - 6.0 | >6 | | | | |
| **POWER REACTORS** | | | | | | | | | | | | | | | | |
| (1) Form 5 Summation | 89,874 | 51,831 | 17,337 | 7,578 | 1,847 | 583 | 269 | 5 | | | | | 169,324 | 79,450 | 9,195.940 | 0.12 |
| (2) Transients, As Reported | 36,342 | 26,509 | 10,214 | 4,564 | 1,076 | 360 | 148 | 1 | | | | | 79,214 | 42,872 | 5,362.857 | 0.13 |
| (3) Transients, Actual | 7,804 | 8,510 | 5,201 | 3,772 | 1,658 | 803 | 800 | 34 | | | | | 28,582 | 20,778 | 5,362.857 | 0.26 |
| **Corrected Distribution (1-[2-3])** | **61,336** | **33,832** | **12,324** | **6,786** | **2,429** | **1,026** | **921** | **38** | | | | | **118,692** | **57,356** | **9,195.940** | **0.16** |
| **ALL LICENSEES** | | | | | | | | | | | | | | | | |
| (1) Form 5 Summation | 95,293 | 54,949 | 18,641 | 8,547 | 2,370 | 862 | 667 | 104 | 26 | 3 | | | 181,462 | 86,169 | 11,300.966 | 0.13 |
| (2) Transients, As Reported | 36,932 | 26,741 | 10,338 | 4,666 | 1,121 | 378 | 169 | 7 | | | | | 80,352 | 43,420 | 5,650.483 | 0.13 |
| (3) Transients, Actual | 7,767 | 8,528 | 5,246 | 3,823 | 1,704 | 833 | 838 | 40 | 1 | | | | 28,780 | 21,013 | 5,650.483 | 0.27 |
| **Corrected Distribution (1-[2-3])** | **66,128** | **36,736** | **13,549** | **7,704** | **2,953** | **1,317** | **1,336** | **137** | **27** | **3** | | | **129,890** | **63,762** | **11,300.966** | **0.18** |

* Dose values exactly equal to the values separating ranges are reported in the next higher range.

Table 5.1 illustrates the impact that the multiple reporting of these transient individuals had on the summation of the dose reports for 2008. Because each licensee reports the doses received by workers while they are monitored by the particular licensee during the year, it is expected that a summation of these reports would result in individuals being counted several times in dose ranges lower than the range in which their total accumulated doses (the sum of the personnel monitoring results incurred at each facility during the year) would actually place them. Thus, while the total collective dose would remain the same, the number of workers, their dose distributions, and average doses would be affected by this multiple reporting. This was found to be true because too few workers were reported in the higher dose ranges. For example, in 2008, Table 5.1 shows that the summation of annual reports for reactor licensees indicated that 5 individuals received doses greater than 2 rem. After accounting for those individuals who were reported more than once, the corrected distribution indicated that there were really 38 transient workers who received doses greater than 2 rem. Correcting for the multiple counting of individuals also has a significant effect on the average measurable dose for these workers. The corrected average measurable dose for transient workers is twice as high as the value calculated by the summation of licensee records. The transient workers represent 33% of the workforce that receives measurable dose. The correction for the transient workers increases the average measurable dose by a factor of 2 from 0.13 rem to 0.26 rem for the transient workforce for all licensees. It should be noted that this analysis of transient workers does not include workers who may have been exposed at facilities that are not required to report to the NRC REIRS database (see Section 1), such as Agreement State licensees or DOE facilities.

One purpose of the REIRS database, which tracks occupational radiation exposures at NRC-licensed facilities, is to identify individuals who may have exceeded the occupational radiation dose limits because of multiple exposures at different facilities throughout the year. The REIRS database stores the radiation dose information for an individual by his/her unique identification number and identification type [Ref. 10, Section 1.5] and sums the dose for all facilities during the monitoring year. An individual exceeding the TEDE 5 rem per year regulatory limit would be identified in Table 5.1 in one of the dose ranges >5 rem. In 2008, there were no individuals reported by NRC licensees that exceeded the 5 rem annual TEDE limit.

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# Section 6

# EXPOSURES TO PERSONNEL IN EXCESS OF REGULATORY LIMITS

## 6.1 REPORTING CATEGORIES

Doses in excess of regulatory limits are sometimes referred to as "overexposures." The phrase "doses in excess of regulatory limits" is preferred to "overexposures" because the latter suggests that a worker has been subjected to an unacceptable biological risk, which may or may not be the case.

The implementation date for the revised 10 CFR 20 was January 1, 1994. Section 10 CFR 20 includes requirements for summing internal and external dose equivalents to yield TEDEs and to implement a similar limitation system for organs and tissues (such as the gonads, red bone marrow, bone surfaces, lung, thyroid, and breast). Section 10 CFR 20.1201 limits the TEDE of workers to ionizing radiation from licensed material and other sources of radiation within the licensee's control. Section 10 CFR 20 no longer contains quarterly dose limits but has reporting requirements for planned special exposures (PSEs).[8] The annual TEDE limit for adult occupational radiation workers is 5 rem.

Sections 10 CFR 20.2202 and 10 CFR 20.2203 require that all licensees submit reports of all occurrences involving personnel radiation doses that exceed certain control levels, thus providing for investigations and corrective actions as necessary. Based on the magnitude of the dose, the occurrence may be placed into one of three categories as follows:

1. Category A
   10 CFR 20.2202(a)(1)—a TEDE to any individual of 25 rem or more, a lens dose equivalent of 75 rem or more, or a shallow-dose equivalent to the skin or extremities of 250 rad or more. The Commission must be notified immediately of these events.

2. Category B
   10 CFR 20.2202(b)(1)— In a 24-hour period, the Commission must be notified of the following events: a TEDE to any individual exceeding 5 rem, a lens dose equivalent exceeding 15 rem, or a shallow-dose equivalent to the skin or extremities exceeding 50 rem.

3. Category C
   10 CFR 20.2203—In addition to the notification required by 10 CFR 20.2202 (Category A or B events), each licensee must submit a written report within 30 days after learning of any of the following occurrences:

   a. Any incident for which notification is required by 10 CFR 20.2202

   b. Doses that exceed the limits in §20.1201, §20.1207, §20.1208, or §20.1301 (for adults, minors, the embryo/fetus of a declared pregnant worker, and the public, respectively), or any applicable limit in the license

[8]See 10 CFR 20.1206, 20.2204, and Regulatory Guide 8.35 for more information on PSEs and their reporting requirements.

c. Levels of radiation or concentrations of radioactive material that exceed any applicable license limit for restricted areas or that, for unrestricted areas, are in excess of 10 times any applicable limit set forth in 10 CFR 20 or in the license (whether or not involving dose of any individual in excess of the limits in §20.1301)

d. For licensees subject to the provisions of the Environmental Protection Agency's generally applicable environmental radiation standards in 40 CFR 190, levels of radiation or releases of radioactive material in excess of those standards or license conditions related to those standards

## 6.2 LIMITATIONS OF THE DATA

It is important to note that this summary of events includes only

- Occupational radiation doses in excess of the regulatory limits
- Events at NRC-licensed facilities
- Final dose of record assigned to an individual

It **does not** include

- Medical events as defined in 10 CFR 35
- Doses in excess of the regulatory limits to the general public
- Agreement State-licensed activities or DOE facilities
- Other radiation-related violations, such as high dose-rate areas or effluent limits
- Exposures to dosimeters that, upon evaluation, have been determined to be high dosimeter readings only and are not assigned to an individual as the dose of record by the licensee

Care should be taken when comparing the summary information presented here with other reports and analyses published by NRC or other agencies. Various reports may include other types of "overexposure" events; therefore, the distinctions should be noted.

The analysis and summary of incidents presented here involving doses in excess of regulatory limits represent the status of events as of the publication of this report.

Exposure events of this type typically undergo a long review and evaluation process by the licensee, the NRC inspector for the regional office, and NRC Headquarters. Preliminary dose estimates submitted by licensees are often conservatively high and do not represent the final (record) dose assigned for the event. It is, therefore, not uncommon for a dose in excess of a regulatory limits event to be reassessed and the final assigned dose to be categorized as not having been in excess of the regulatory limits. In other cases, the exposure event may not be identified until a later date, such as during the next scheduled audit or inspection of the licensee's exposure event records.

For these reasons, an attempt is made to keep the exposure events summary presented here current. An event that has been reassessed and determined not to be a dose in excess of the regulatory limits is not included in this report. In addition, events that occurred in prior years are added to the summary in the appropriate year of occurrence. The reader should note that the summary presented here represents a snapshot of the status of events as of the publication date of this report. Previous or future reports may not correlate in the exact number of events because of the review cycle and reassessment of the events.

## 6.3 SUMMARY OF OCCUPATIONAL RADIATION DOSES IN EXCESS OF NRC REGULATORY LIMITS

Table 6.1 summarizes the occupational radiation doses in excess of regulatory limits as reported by NRC licensees pursuant to 10 CFR 20.2202 and 10 CFR 20.2203 from 1994 to 2008. Table 6.2 shows the data reported under 10 CFR 20.403 and 10 CFR 20.405 for the period 1985 to 1993. Note that the categorization criteria changed with the revision of 10 CFR 20 in 1994.

For the period 1990 to 1993, Table 6.2 shows the number of individuals who exceeded various regulatory limits while employed by one of several types of licensees. For the period 1985 to 1989, only the doses in excess of regulatory limits reported by licensed industrial radiography firms are shown separately. Most of the occurrences included in the “All Other” category come from research facilities, universities, and measuring and well-logging activities.

In 2008, there were no category A, B, or C occurrences reported under the licensed activities included in this report.

## TABLE 6.1
### Occupational Doses in Excess of Regulatory Limits
### 1994–2008

| Year | License Category | Persons and Doses (rem) | Types of Exposures and Doses | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | TEDE (rem) | | Lens of the Eye (rem) | | Skin/Extremity (rem) | |
| | | | 5–25 | >25 | 15–75 | >75 | 50–250 | >250 rad |
| 2008 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | | | | | | |
| | | SUM OF DOSES | | | | | | |
| | POWER REACTORS | NO. OF PERSONS | | | | | | |
| | | SUM OF DOSES | | | | | | |
| | NUCLEAR PHARMACIES | NO. OF PERSONS | | | | | | |
| | | SUM OF DOSES | | | | | | |
| | MANUFACTURING AND DISTRIBUTION | NO. OF PERSONS | | | | | | |
| | | SUM OF DOSES | | | | | | |
| | OTHER | NO. OF PERSONS | | | | | | |
| | | SUM OF DOSES | | | | | | |
| 2007 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | | | | | | |
| | | SUM OF DOSES | | | | | | |
| | OTHER | NO. OF PERSONS | | | | | | |
| | | SUM OF DOSES | | | | | | |
| 2006 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | | | | | | |
| | | SUM OF DOSES | | | | | | |
| | OTHER | NO. OF PERSONS | | | | | | |
| | | SUM OF DOSES | | | | | | |
| 2005 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | | | | | 2 | |
| | | SUM OF DOSES | | | | | 154 | |
| | OTHER | NO. OF PERSONS | | | | | | |
| | | SUM OF DOSES | | | | | | |
| 2004 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | | | | | | |
| | | SUM OF DOSES | | | | | | |
| | OTHER | NO. OF PERSONS | | | | | | |
| | | SUM OF DOSES | | | | | | |
| 2003 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | 1[g] | | 1[g] | | | |
| | | SUM OF DOSES | 15,678 | | 15,667 | | | |
| | OTHER | NO. OF PERSONS | | | | | | |
| | | SUM OF DOSES | | | | | | |
| 2002 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | 1 | | | | | |
| | | SUM OF DOSES | 5.860 | | | | | |
| | OTHER | NO. OF PERSONS | | | | | | |
| | | SUM OF DOSES | | | | | | |
| 2001 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | 1 | | | | 1 | |
| | | SUM OF DOSES | 5.606 | | | | 80 | |
| | OTHER | NO. OF PERSONS | | | | | 1 | 3 |
| | | SUM OF DOSES | | | | | 127 | 1,260 |
| 2000 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | 2 | | | | | |
| | | SUM OF DOSES | 11.373 | | | | | |
| | OTHER | NO. OF PERSONS | 2 | | | | | 3 |
| | | SUM OF DOSES | 10.636 | | | | | 2,677 |
| 1999 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | 1 | | | | | |
| | | SUM OF DOSES | 5.67 | | | | | |
| | OTHER | NO. OF PERSONS | | | | | 5[f] | 2[f] |
| | | SUM OF DOSES | | | | | 566 | 1,080 |
| 1998 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | 4[a] | | | | 1 | |
| | | SUM OF DOSES | 34.8 | | | | 50-200 | |
| | OTHER | NO. OF PERSONS | | | | | 5[f] | 3[f] |
| | | SUM OF DOSES | | | | | 675 | 1,115 |
| 1997 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | | | | | 1[b] | |
| | | SUM OF DOSES | | | | | 51.1 | |
| | OTHER | NO. OF PERSONS | | | | | 5[f] | 3[f] |
| | | SUM OF DOSES | | | | | 431 | 1,199 |
| 1996 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | 1 | | | | | |
| | | SUM OF DOSES | 8.3 | | | | | |
| | OTHER | NO. OF PERSONS | | | | | 7[c,f] | |
| | | SUM OF DOSES | | | | | 810.6 | |
| 1995 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | 1 | | | | | |
| | | SUM OF DOSES | 5.1 | | | | | |
| | OTHER | NO. OF PERSONS | | | | | 4[d,f] | 1[f] |
| | | SUM OF DOSES | | | | | 782 | 255 |
| 1994 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | 2 | | | | | |
| | | SUM OF DOSES | 12.2 | | | | | |
| | OTHER | NO. OF PERSONS | | | | | 1[e] | |
| | | SUM OF DOSES | | | | | 180 | |

NONE REPORTED

NONE REPORTED

NONE REPORTED

NONE REPORTED

[a]One of these individuals also received the extremity exposure as shown.

[b]This exposure was from a hot particle to a localized area of the skin.

[c]This exposure was from a hot particle to a localized area of the skin.

[d]Two of these exposures (230 rem and 342 rem) were the result of hot particles.

[e]This exposure was from a hot particle to a localized area of the skin.

[f]These exposures have been added due to a reassessment of extremity dose from the direct handling of vials containing indium at a radiopharmaceutical manufacturing licensee.

[g]These exposures were received by the same individual.

## TABLE 6.2
### Occupational Doses in Excess of Regulatory Limits
### 1985–1993

| Year | License Category | Persons and Doses (rem) | Types of Exposures and Doses | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Whole-Body (rem) | | | Skin (rem) | | | Extremity (rem) | | |
| | | | <5 | 5– 25 | >25 | <7.5<30 | 30–50 | >150 | >18.75>75 | 75–375 | >375 |
| 1993 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS<br>SUM OF DOSES | | 1<br>6 | | | | | | | |
| | OTHER | NO. OF PERSONS<br>SUM OF DOSES | 8[a]<br>15.9 | 1[a]<br>5.4 | | | | | | 4[f]<br>462.3 | |
| 1992 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS<br>SUM OF DOSES | | | | | | | | | 1<br>300-1,000 |
| | OTHER | NO. OF PERSONS<br>SUM OF DOSES | 2[b]<br>3.8 | | | 5<br>81.8 | | | 5<br>184.1 | 1<br>272 | |
| 1991 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS<br>SUM OF DOSES | 2<br>5.6 | | | | | | | | |
| | OTHER | NO. OF PERSONS<br>SUM OF DOSES | 3<br>6.2 | | | | | | | 1<br>22.3 | |
| 1990 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS<br>SUM OF DOSES | 3<br>7.2 | 3[c, d]<br>49.9 | | | | 1[c]<br>6,000 | | | |
| | OTHER | NO. OF PERSONS<br>SUM OF DOSES | 4[e]<br>11.2 | | | | | | 1<br>48.8 | | |
| 1989 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS<br>SUM OF DOSES | 3<br>8.1 | | 1<br>93 | | | | 1<br>72 | | |
| | ALL OTHER | NO. OF PERSONS<br>SUM OF DOSES | 4<br>6.6 | | | 1<br>9.2 | | | 2<br>105 | 1<br>178 | |
| 1988 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS<br>SUM OF DOSES | 3<br>8.1 | 1<br>6.1 | | | | | | 1<br>118 | |
| | ALL OTHER | NO. OF PERSONS<br>SUM OF DOSES | 7<br>19.34 | | | 4<br>66.8 | 1<br>61 | 1<br>278 | 1<br>58 | 1<br>127 | |
| 1987 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS<br>SUM OF DOSES | 1<br>3.1 | | | | | | | 1<br>180 | |
| | ALL OTHER | NO. OF PERSONS<br>SUM OF DOSES | 2<br>2.8 | 1<br>7.5 | | 5<br>128.4 | | | 3<br>72.0 | | 1<br>650 |
| 1986 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS<br>SUM OF DOSES | 2<br>4.4 | | | | | | | | |
| | ALL OTHER | NO. OF PERSONS<br>SUM OF DOSES | 3<br>9.6 | | | | | | 1<br>41.2 | 1<br>115 | 2<br>930 |
| 1985 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS<br>SUM OF DOSES | 6<br>16.7 | 3<br>32.6 | 1<br>27.0 | | | | | 1<br>288 | |
| | ALL OTHER | NO. OF PERSONS<br>SUM OF DOSES | 7<br>11.8 | | | | | | 3<br>60.2 | 1<br>93 | |

[a]Same individual exceeded 1.25 rem/qtr limit twice during 1993.

[b]This 1992 exposure was reported in 1994.

[c]This individual received a whole-body dose of 24 rem in addition to a 6,000 rem skin dose.

[d]One of these individuals received a 9 rem whole-body dose in addition to a 1,070 rem extremity dose.

[e]One of these individuals exceeded the quarterly whole-body dose limits three times in one calendar year.

[f]An additional 1993 exposure was reported in 1994.

## 6.4 MAXIMUM OCCUPATIONAL RADIATION DOSES BELOW NRC REGULATORY LIMITS

Because few radiation doses exceed the NRC occupational radiation dose limits, certain researchers have expressed an interest in a listing of the maximum radiation doses received at NRC licensees that do not exceed the regulatory limits. This would allow an examination of doses that approach, but do not exceed, the regulatory limits. Table 6.3 shows the maximum doses for each dose category required to be reported to the NRC. In addition, the number of doses in certain dose ranges is shown to reflect the number of doses that approach NRC regulatory limits. As shown in Table 6.3, few doses exceed half of the NRC occupational annual limits. In 2008, seven individuals exceeded 75% of the TEDE dose limit, but no individual exceeded the 5 rem TEDE annual limit or any other annual limit.

**TABLE 6.3**
**Maximum Occupational Doses for Each Exposure Category***
**2008**

| Dose Category** | Annual Dose Limit 10CFR20*** | Maximum Dose Reported (rem) | Max Dose Percent of the Limit | Number of Individuals with Measurable Dose | Number of Individuals >25% of the Limit | Number of Individuals >50% of the Limit | Number of Individuals >75% of the Limit | Number of Individuals >95% of the Limit | Number of Individuals > Limit |
|---|---|---|---|---|---|---|---|---|---|
| SDE-ME | 50 rem | 49.270 | 99% | 59,187 | 141 | 30 | 7 | 1 | 0 |
| SDE-WB | 50 rem | 5.470 | 10% | 63,933 | 0 | 0 | 0 | 0 | 0 |
| LDE | 15 rem | 4.270 | 28% | 62,064 | 7 | 0 | 0 | 0 | 0 |
| CEDE | | 1.028 | | 2,145 | | | | | |
| CDE | | 8.564 | | 1,877 | | | | | |
| DDE | | 4.198 | | 62,709 | | | | | |
| TEDE | 5 rem | 4.198 | 84% | 63,621 | 836 | 58 | 7 | 0 | 0 |
| TODE | 50 rem | 8.716 | 17% | 62,963 | 0 | 0 | 0 | 0 | 0 |

* Only records reported by licensees required to report under 10 CFR 20.2206 are included. Numbers have been adjusted for the multiple reporting of transient individuals.

**SDE-ME = shallow dose equivalent to the maximally exposed extremity
SDE-WB = shallow dose equivalent to the whole body
LDE = eye dose equivalent to the lens of the eye
CEDE = committed effective dose equivalent
CDE = committed dose equivalent
DDE = deep dose equivalent
TEDE = total effective dose equivalent
TODE = total organ dose equivalent

*** Shaded boxes represent dose categories that do not have specific dose limits defined in 10 CFR 20.

# Section 7

# REFERENCES


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10. *Instructions for Recording and Reporting Occupational Radiation Exposure Data,* USNRC Regulatory Guide 8.7, Rev. 2, November 2005.

11. United Nations, *Sources and Effects of Ionizing Radiation, United Nations Scientific Committee on the Effects of Atomic Radiation UNSCEAR 2000 Report to the General Assembly, Volume I,* General Assembly of Official Records, United Nations, New York, 2000.

12. International Commission on Radiological Protection Publication 68, *Dose Coefficients for Intakes of Radionuclides by Workers*, Annals of the ICRP Volume 24/4, December 1994.

13. *Licensed Operating Reactors, Status Summary Report,* compiled from reactor monthly operating reports submitted to the NRC. Data provided electronically from the Idaho National Engineering and Environmental Laboratory Risk, Reliability and Regulatory Support Department under contract to the NRC in support of NRC's Performance Indicator Project.


*Report is available for purchase from the National Technical Information Service, Springfield, VA, 22161, and/or the Superintendent of Documents, U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20402-9328.

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Appendix A

# ANNUAL TEDE FOR NONREACTOR NRC LICENSEES AND OTHER FACILITIES REPORTING TO THE NRC

# 2008

# APPENDIX A

## Table A1 - Annual TEDE for Nonreactor NRC Licensees 2008

| PROGRAM CODE – LICENSEE NAME | LICENSE# | Number of Individuals with Whole-Body Doses in the Ranges (rem)* | | | | | | | | | | | | | Total Number Monitored | Number with Meas. Dose | Total Collective TEDE (person-rem) | Average Meas. TEDE (rem) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Meas. Exposure | Meas. <0.10 | 0.10–0.25 | 0.25–0.50 | 0.50–0.75 | 0.75–1.00 | 1.00–2.00 | 2.00–3.00 | 3.00–4.00 | 4.00–5.00 | 5.00–6.00 | 6.00–12.00 | >12.0 | | | | |
| ***INDUSTRIAL RADIOGRAPHY – FIXED LOCATION – 03310*** | | | | | | | | | | | | | | | | | | |
| DEPARTMENT OF THE ARMY | 13-18235-01 | 26 | 25 | - | - | - | - | - | - | - | - | - | - | - | **51** | **25** | **0.484** | 0.019 |
| HARRISON STEEL CASTINGS CO. | 13-02141-01 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | 6 | - | - | - |
| INTERMET - ARCHER CREEK | 45-17464-01 | 3 | 1 | - | - | - | - | - | - | - | - | - | - | - | 4 | 1 | 0.025 | **0.025** |
| **Total** | **3** | **35** | **26** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **61** | **26** | **0.509** | **0.020** |
| ***INDUSTRIAL RADIOGRAPHY – TEMPORARY JOB SITE – 03320*** | | | | | | | | | | | | | | | | | | |
| ACUREN INSPECTION, INC. | 42-27593-01 | 1 | 12 | 6 | 4 | 5 | 3 | 4 | 2 | - | - | - | - | - | 37 | 36 | 18.815 | 0.523 |
| ACUREN USA, INC. | 42-32443-01 | 22 | 80 | 42 | 30 | 13 | 5 | 5 | - | - | - | - | - | - | 197 | 175 | 38.220 | 0.218 |
| ALASKA INDUSTRIAL X-RAY | 50-16084-01 | - | 1 | 1 | 4 | 2 | 1 | 1 | 1 | 1 | - | - | - | - | 12 | 12 | 11.405 | 0.950 |
| ALLIED INSPECTION SERVICES, INC. | 21-18428-01 | - | - | - | 1 | 1 | 1 | 1 | - | - | - | - | - | - | 4 | 4 | 2.958 | 0.740 |
| ALONSO & CARUS IRON WORKS, INC. | 52-21350-01 | 1 | 1 | 1 | 1 | - | - | 1 | - | - | - | - | - | - | 5 | 4 | 2.091 | 0.523 |
| AMERICAN ENGINEERING TESTING, INC. | 22-20271-02 | - | 3 | - | 1 | 1 | 2 | 1 | 1 | 1 | - | - | - | - | 10 | 10 | 9.829 | 0.983 |
| APPLIED TECHNICAL SERVICES, INC. | 45-25477-01 | 6 | 26 | 6 | 7 | 2 | 2 | 6 | 1 | - | - | - | - | - | 56 | 50 | 17.005 | 0.340 |
| BRANCH RADIOGRAPHIC LABS. | 29-03405-02 | 4 | 7 | 3 | 2 | 6 | 3 | 1 | - | - | - | - | - | - | 26 | 22 | 9.532 | 0.433 |
| CALUMET TESTING SERVICES | 13-16347-01 | 3 | 5 | 4 | 3 | - | - | 5 | 2 | - | - | - | - | - | 22 | 19 | 14.858 | 0.782 |
| CAPITAL X-RAY SERVICES, INC. | 35-11114-01 | 7 | 8 | 1 | 1 | 3 | 2 | 6 | 4 | 1 | - | - | - | - | 33 | 26 | 26.071 | 1.003 |
| CENTURY INSPECTION, INC. | 42-08456-02 | 34 | 28 | 14 | 9 | 6 | 4 | 3 | - | 1 | - | - | - | - | 99 | 65 | 20.341 | 0.313 |
| CERTIFIED TESTING LABS., INC | 29-14150-01 | 4 | 10 | 4 | 1 | - | - | 1 | - | - | - | - | - | - | 20 | 16 | 2.938 | 0.184 |
| COLBY-THIELMEIER TESTING CO. | 24-13737-01 | - | 2 | - | 4 | 1 | - | 4 | - | - | - | - | - | - | 11 | 11 | 8.762 | 0.797 |
| COMO TECH INSPECTION | 15-26978-01 | - | - | - | 3 | 1 | - | 1 | - | - | - | - | - | - | 5 | 5 | 3.427 | 0.685 |
| CONAM INSPECTION | 12-16559-02 | 2 | 20 | 18 | 13 | 9 | 6 | 9 | 2 | - | - | - | - | - | 79 | 77 | 35.736 | 0.464 |
| CONCRETE IMAGING, INC. | 47-31316-01 | 2 | - | - | 2 | - | 1 | - | - | - | - | - | - | - | 5 | 3 | 1.492 | 0.497 |
| CONSUMERS ENERGY LAB SERVICES | 21-08606-03 | 13 | 2 | 2 | 9 | 3 | - | 1 | - | - | - | - | - | - | 30 | 17 | 6.566 | 0.386 |
| DBI, INC. QUALITY INSPECTION | 49-29301-01 | 1 | 3 | 5 | 3 | 2 | 4 | 18 | 2 | - | - | - | - | - | 38 | 37 | 39.396 | 1.065 |
| EASTERN TESTING & INSPECTION, INC. | 29-09814-01 | 3 | 1 | 3 | 4 | 2 | - | - | - | - | - | - | - | - | 13 | 10 | 3.368 | 0.337 |

NOTE: The data values shown bolded and in boxes represent the highest value in each category. These values have not been adjusted for the multiple counting of transient workers (see section 5).
*Dose values exactly equal to the values separating ranges are reported in the next higher range.

# APPENDIX A

## Table A1 - Annual TEDE for Nonreactor NRC Licensees 2008 (continued)

| PROGRAM CODE – LICENSEE NAME | LICENSE# | Number of Individuals with Whole-Body Doses in the Ranges (rem)* | | | | | | | | | | | | | Total Number Monitored | Number with Meas. Dose | Total Collective TEDE (person-rem) | Average Meas. TEDE (rem) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Meas. Exposure | Meas. <0.10 | 0.10–0.25 | 0.25–0.50 | 0.50–0.75 | 0.75–1.00 | 1.00–2.00 | 2.00–3.00 | 3.00–4.00 | 4.00–5.00 | 5.00–6.00 | 6.00–12.00 | >12.0 | | | | |
| ***INDUSTRIAL RADIOGRAPHY – TEMPORARY JOB SITE – 03320 (Continued)*** | | | | | | | | | | | | | | | | | | |
| FROEHLING & ROBERTSON, INC. | 45-08890-01 | 3 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | 6 | 3 | 0.339 | 0.113 |
| G. E. INSPECTION SERVICES, INC. | 39-24888-01 | 9 | 28 | 8 | 10 | 2 | - | 1 | - | - | - | - | - | - | 58 | 49 | 8.662 | 0.177 |
| GENERAL DYNAMICS CORP - ELEC BOAT | 06-01781-08 | 5 | 23 | 7 | - | - | - | - | - | - | - | - | - | - | 35 | 30 | 1.867 | 0.062 |
| GENERAL TESTING & INSPECTION CO. | 47-32191-01 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | 2 | 2 | 0.024 | 0.012 |
| H & H X-RAY SERVICES, INC. | 17-19236-01 | 5 | 15 | 37 | 61 | 60 | 34 | 50 | 10 | 3 | - | - | - | - | 275 | 270 | 200.159 | 0.741 |
| HIGH MOUNTAIN INSPECTION SERVICES | 49-26808-02 | - | 5 | 4 | 4 | 6 | 6 | 23 | 10 | 2 | - | - | - | - | 60 | 60 | 75.395 | 1.257 |
| HUDSON GLOBAL RESOURCES | 37-27891-02 | 4 | 6 | 5 | 5 | - | 1 | 3 | - | - | - | - | - | - | 24 | 20 | 7.468 | 0.373 |
| HUNTINGTON TESTING & TECHNOLOGY | 47-23076-01 | 5 | 7 | 9 | 3 | 1 | 6 | 5 | 2 | - | - | - | - | - | 38 | 33 | 20.309 | 0.615 |
| INTEGRITY TESTING AND INSPECTION | 16-31189-01 | - | 2 | 2 | 5 | 6 | 2 | 5 | 1 | - | - | - | - | - | 23 | 23 | 16.823 | 0.731 |
| INTEGRITY TESTLAB | 07-30791-01 | 1 | 4 | 3 | 3 | 3 | 7 | 7 | 2 | 1 | - | - | - | - | 31 | 30 | 27.949 | 0.932 |
| JANX INTEGRITY GROUP | 21-16560-01 | 82 | 63 | 54 | 68 | 52 | 43 | 85 | 8 | 1 | - | - | - | - | **456** | **374** | **245.700** | 0.657 |
| J CORE DRILLING, INC. | 45-30846-01 | 1 | 2 | 1 | - | - | 1 | - | - | - | - | - | - | - | 5 | 4 | 1.029 | 0.257 |
| KAKIVIK ASSET MANAGEMENT | 50-27667-01 | 37 | 38 | 29 | 32 | 10 | 13 | 6 | 2 | - | - | - | - | - | 167 | 130 | 49.210 | 0.379 |
| LKS INSPECTION SERVICES, LLC | 53-27795-01 | - | 2 | 2 | - | - | - | - | 1 | - | - | - | - | - | 5 | 5 | 2.490 | 0.498 |
| MARTIN INDUSTRIAL TESTING, INC. | 45-25452-01 | - | 1 | - | - | 1 | - | 1 | - | - | - | - | - | - | 3 | 3 | 1.594 | 0.531 |
| MARYLAND Q.C. LABORATORIES, INC. | 19-28683-01 | 5 | 7 | 3 | 2 | 1 | - | - | - | - | - | - | - | - | 18 | 13 | 1.760 | 0.135 |
| MASSACHUSETTS MATERIALS RESEARCH | 07-01173-03 | 1 | 3 | - | - | - | - | - | - | - | - | - | - | - | 4 | 3 | 0.012 | 0.004 |
| MECHANICAL INTEGRITY SOLUTIONS | 52-25615-01 | - | 5 | 8 | 1 | - | - | - | - | - | - | - | - | - | 14 | 14 | 1.792 | 0.128 |
| MID AMERICAN INSPECTION SERVICES, INC. | 21-26060-01 | - | 2 | 3 | 2 | 1 | - | 6 | 4 | - | - | - | - | - | 18 | 18 | 20.433 | 1.135 |
| NEWPORT NEWS SHIPBUILDING & DRY DOCK CO. | 45-09428-02 | 3 | 22 | 4 | - | - | - | - | - | - | - | - | - | - | 29 | 26 | 1.155 | 0.044 |
| PACIFIC TESTING SERVICES, INC. | 53-29118-01 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | 8 | 8 | 0.018 | 0.002 |
| POLE BROTHERS IMAGING COMPANY | 45-25383-01 | - | - | - | - | 2 | - | 2 | - | - | - | - | - | - | 4 | 4 | 3.841 | 0.960 |
| PRECISION CUSTOM COMPONENTS, LLC. | 37-16280-01 | 12 | 7 | - | - | - | - | - | - | - | - | - | - | - | 19 | 7 | 0.024 | 0.003 |
| PRIME NDT SERVICES, INC. | 37-23370-01 | 1 | 9 | 8 | 9 | 12 | 6 | 8 | 5 | - | - | - | - | - | 58 | 57 | 40.988 | 0.719 |

NOTE: The data values shown bolded and in boxes represent the highest value in each category. These values have not been adjusted for the multiple counting of transient workers (see section 5).
*Dose values exactly equal to the values separating ranges are reported in the next higher range.

# APPENDIX A

## Table A1 - Annual TEDE for Nonreactor NRC Licensees 2008 (continued)

| PROGRAM CODE – LICENSEE NAME | LICENSE# | Number of Individuals with Whole-Body Doses in the Ranges (rem)* | | | | | | | | | | | | | Total Number Monitored | Number with Meas. Dose | Total Collective TEDE (person-rem) | Average Meas. TEDE (rem) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Meas. Exposure | Meas. <0.10 | 0.10–0.25 | 0.25–0.50 | 0.50–0.75 | 0.75–1.00 | 1.00–2.00 | 2.00–3.00 | 3.00–4.00 | 4.00–5.00 | 5.00–6.00 | 6.00–12.00 | >12.0 | | | | |
| ***INDUSTRIAL RADIOGRAPHY – TEMPORARY JOB SITE – 03320 (Continued)*** | | | | | | | | | | | | | | | | | | |
| PROFESSIONAL SERVICE INDUSTRIES | 12-16941-03 | 2 | 1 | 1 | 1 | 1 | - | 4 | - | - | - | - | - | - | 10 | 8 | 8.060 | 1.008 |
| QUALITY INSPECTION SERVICES, INC. | 31-30187-01 | 7 | 26 | 13 | 15 | 8 | 3 | 9 | - | - | - | - | - | - | 81 | 74 | 27.117 | 0.366 |
| QUALITY TESTING SERVICE, INC. | 24-32292-01 | - | 12 | 3 | - | - | - | 1 | - | - | - | - | - | - | 16 | 16 | 2.145 | 0.134 |
| SCIENTIFIC TECHNICAL, INC. | 45-24882-01 | 6 | 2 | - | - | - | - | - | - | - | - | - | - | - | 8 | 2 | 0.087 | 0.044 |
| SHAW PIPELINE SERVICES | 35-23193-01 | 12 | 46 | 55 | 73 | 35 | 35 | 32 | 4 | 1 | - | - | - | - | 293 | 281 | 144.569 | 0.514 |
| SOUTHWEST X-RAY CORP | 49-29277-01 | - | 2 | 2 | 2 | - | 1 | - | - | - | - | - | - | - | 7 | 7 | 1.771 | 0.253 |
| T & K INSPECTION, INC. | 33-27678-01 | - | - | 1 | 3 | 2 | - | 9 | 3 | - | - | - | - | - | 18 | 18 | 22.582 | 1.255 |
| TEAM INDUSTRIAL SERVICES, INC. | 42-32219-01 | 20 | 47 | 19 | 27 | 10 | 7 | 10 | 7 | - | - | - | - | - | 147 | 127 | 57.858 | 0.456 |
| TEI ANALYTICAL SERVICES, INC. | 37-28004-01 | - | 9 | 9 | 5 | 5 | 13 | 13 | 4 | - | - | - | - | - | 58 | 58 | 44.688 | 0.770 |
| TESTING TECHNOLOGIES, INC. | 45-25007-01 | - | 4 | 8 | 4 | 3 | 4 | 2 | - | - | - | - | - | - | 25 | 25 | 10.774 | 0.431 |
| TESTMASTER INSPECTION COMPANY | 34-24872-02 | - | - | 1 | 1 | 3 | 1 | 1 | - | - | - | - | - | - | 7 | 7 | 4.651 | 0.664 |
| TULSA GAMMA RAY, INC. | 35-17178-01 | 6 | 14 | 16 | 14 | 17 | 12 | 17 | 13 | 8 | 2 | - | - | - | 119 | 113 | 122.565 | 1.085 |
| TVA - INSPECTION SERVICES ORG | 41-06832-06 | 10 | 5 | - | - | - | - | - | - | - | - | - | - | - | 15 | 5 | 0.117 | 0.023 |
| VALLEY INSPECTION SERVICE, INC. | 37-28385-01 | - | - | 1 | - | - | - | 3 | 2 | - | - | - | - | - | 6 | 6 | 10.486 | **1.748** |
| WASHINGTON GROUP INTERNATIONAL | 29-27761-01 | 5 | 28 | 1 | - | - | - | - | - | - | - | - | - | - | 34 | 29 | 0.927 | 0.032 |
| **Total** | **58** | **345** | **667** | **429** | **452** | **298** | **229** | **371** | **93** | **20** | **2** | **0** | **0** | **0** | **2,906** | **2,561** | **1,460.248** | **0.570** |

NOTE: The data values shown bolded and in boxes represent the highest value in each category. These values have not been adjusted for the multiple counting of transient workers (see section 5).
*Dose values exactly equal to the values separating ranges are reported in the next higher range.

# APPENDIX A

## Table A1 - Annual TEDE for Nonreactor NRC Licensees 2008 (continued)

| PROGRAM CODE – LICENSEE NAME | LICENSE# | Number of Individuals with Whole-Body Doses in the Ranges (rem)* | | | | | | | | | | | | | Total Number Monitored | Number with Meas. Dose | Total Collective TEDE (person-rem) | Average Meas. TEDE (rem) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Meas. Exposure | Meas. <0.10 | 0.10-0.25 | 0.25-0.50 | 0.50-0.75 | 0.75-1.00 | 1.00-2.00 | 2.00-3.00 | 3.00-4.00 | 4.00-5.00 | 5.00-6.00 | 6.00-12.00 | >12.0 | | | | |
| ***MANUFACTURING AND DISTRIBUTION - NUCLEAR PHARMACIES - 02500*** | | | | | | | | | | | | | | | | | | |
| CAPITAL PHARMACY INCORPORATED | 21-26597-01MD | 8 | 7 | 2 | - | - | - | - | - | - | - | - | - | - | 17 | 9 | 0.521 | 0.058 |
| CARDINAL HEALTH | 34-29200-01MD | 185 | 564 | 108 | 26 | 11 | 1 | 3 | - | - | - | - | - | - | **898** | **713** | 50.665 | 0.071 |
| GE HEALTHCARE - KENTWOOD | 21-26707-01MD | 18 | 7 | - | - | - | - | - | - | - | - | - | - | - | 25 | 7 | 0.266 | 0.038 |
| GE HEALTHCARE - LIVINGSTON, NJ | 29-28341-02MD | 21 | 8 | 10 | 5 | - | - | - | - | - | - | - | - | - | 44 | 23 | 3.564 | 0.155 |
| GE HEALTHCARE - LIVONIA | 21-24828-01MD | 14 | 15 | 2 | 1 | - | - | - | - | - | - | - | - | - | 32 | 18 | 1.114 | 0.062 |
| GE HEALTHCARE - ST. LOUIS/OVERLAND | 24-32462-01MD | 6 | 12 | - | - | - | - | - | - | - | - | - | - | - | 18 | 12 | 0.361 | 0.030 |
| IBA MOLECULAR NORTH AMERICA, INC. | 45-25221-01MD | 13 | 42 | 23 | 10 | 5 | 2 | 7 | 5 | 6 | 1 | - | - | - | 114 | 101 | **58.082** | **0.575** |
| MALLINCKRODT, INC. | 24-04206-08MD | 10 | 7 | - | - | - | - | - | - | - | - | - | - | - | 17 | 7 | 0.312 | 0.045 |
| MALLINCKRODT MEDICAL, INC. | 24-04206-01MD | 15 | 2 | 1 | - | - | - | - | - | - | - | - | - | - | 18 | 3 | 0.217 | 0.072 |
| MALLINCKRODT MEDICAL, INC. | 24-04206-10MD | 15 | 5 | - | - | - | - | - | - | - | - | - | - | - | 20 | 5 | 0.101 | 0.020 |
| MALLINCKRODT MEDICAL, INC. | 24-04206-13MD | 9 | 5 | - | - | - | - | - | - | - | - | - | - | - | 14 | 5 | 0.145 | 0.029 |
| MID-AMERICA ISOTOPES, INC. | 24-26241-01MD | 35 | 6 | 3 | 1 | 1 | 1 | - | - | - | - | - | - | - | 47 | 12 | 2.564 | 0.214 |
| **Total** | **12** | **349** | **680** | **149** | **43** | **17** | **4** | **10** | **5** | **6** | **1** | **0** | **0** | **0** | **1,264** | **915** | **117.912** | **0.129** |
| ***MANUFACTURING AND DISTRIBUTION - TYPE "A" BROAD - 03211*** | | | | | | | | | | | | | | | | | | |
| INTERNATIONAL ISOTOPES IDAHO, INC. | 11-27680-01 | 6 | 12 | 6 | 3 | 7 | 2 | 2 | 1 | - | - | - | - | - | 39 | 33 | 13.456 | **0.408** |
| MALLINCKRODT MEDICAL, INC. | 24-04206-01 | 147 | 110 | 54 | 47 | 36 | 20 | 12 | - | - | - | - | - | - | **426** | **279** | **82.334** | 0.295 |
| **Total** | **2** | **153** | **122** | **60** | **50** | **43** | **22** | **14** | **1** | **0** | **0** | **0** | **0** | **0** | **465** | **312** | **95.790** | **0.307** |
| ***MANUFACTURING AND DISTRIBUTION - TYPE "B" BROAD - 03212*** | | | | | | | | | | | | | | | | | | |
| BEST MEDICAL INTERNATIONAL, INC. | 45-19757-01 | 65 | 85 | 13 | 6 | 1 | - | - | - | - | - | - | - | - | **170** | **105** | **7.610** | **0.072** |
| **Total** | **1** | **65** | **85** | **13** | **6** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **170** | **105** | **7.610** | **0.072** |

NOTE: The data values shown bolded and in boxes represent the highest value in each category. These values have not been adjusted for the multiple counting of transient workers (see section 5).
*Dose values exactly equal to the values separating ranges are reported in the next higher range.

# APPENDIX A

## Table A1 - Annual TEDE for Nonreactor NRC Licensees 2008 (continued)

| PROGRAM CODE – LICENSEE NAME | LICENSE# | Number of Individuals with Whole-Body Doses in the Ranges (rem)* | | | | | | | | | | | | | Total Number Monitored | Number with Meas. Dose | Total Collective TEDE (person-rem) | Average Meas. TEDE (rem) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Meas. Exposure | Meas. <0.10 | 0.10-0.25 | 0.25-0.50 | 0.50-0.75 | 0.75-1.00 | 1.00-2.00 | 2.00-3.00 | 3.00-4.00 | 4.00-5.00 | 5.00-6.00 | 6.00-12.00 | >12.0 | | | | |
| ***MANUFACTURING AND DISTRIBUTION - OTHER - 03214*** | | | | | | | | | | | | | | | | | | |
| BEST THERATRONICS | 45-31299-01 | - | 1 | - | 1 | - | - | - | - | - | - | - | - | - | 2 | 2 | **0.427** | **0.214** |
| INTERGRATED INDUSTRIAL SYSTEMS, INC. | 06-21253-01 | 17 | 2 | 2 | - | - | - | - | - | - | - | - | - | - | **21** | **4** | 0.358 | 0.090 |
| PRINCETON GAMMA-TECH, INC. | 29-12783-01 | 9 | 3 | - | - | - | - | - | - | - | - | - | - | - | 12 | 3 | 0.026 | 0.009 |
| **Total** | **3** | **26** | **6** | **2** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **35** | **9** | **0.811** | **0.090** |
| ***INDEPENDENT SPENT FUEL STORAGE INSTALLATION - 23200*** | | | | | | | | | | | | | | | | | | |
| GENERAL ELECTRIC - MORRIS OPERATION | SNM-2500 | 2 | 17 | 3 | 1 | - | - | - | - | - | - | - | - | - | 23 | **21** | **1.248** | **0.059** |
| TROJAN ISFSI | SNM-2509 | 30 | - | - | - | - | - | - | - | - | - | - | - | - | **30** | - | - | - |
| **Total** | **2** | **32** | **17** | **3** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **53** | **21** | **1.248** | **0.059** |
| ***FUEL CYCLE URANIUM ENRICHMENT PLANTS - 21200*** | | | | | | | | | | | | | | | | | | |
| USEC, INC. | SNM-7003 | 467 | 30 | - | - | - | - | - | - | - | - | - | - | - | 497 | 30 | 0.472 | 0.016 |
| USEC - PADUCAH GDP | GDP-1 | 1,614 | 98 | 17 | 3 | - | - | - | - | - | - | - | - | - | **1,732** | 118 | 6.600 | **0.056** |
| USEC - PORTSMOUTH GDP | GDP-2 | 1,188 | 211 | 20 | 1 | - | - | - | - | - | - | - | - | - | 1,420 | **232** | **8.555** | 0.037 |
| **Total** | **3** | **3,269** | **339** | **37** | **4** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **3,649** | **380** | **15.627** | **0.041** |
| ***FUEL CYCLE FUEL FABRICATION FACILITIES - 21210*** | | | | | | | | | | | | | | | | | | |
| AREVA NP, INC. | SNM-1168 | 575 | 129 | 54 | 30 | 7 | - | - | - | - | - | - | - | - | 795 | 220 | 27.504 | 0.125 |
| AREVA NP, INC. | SNM-1227 | 84 | 136 | 59 | 41 | 44 | 12 | 2 | - | - | - | - | - | - | 378 | 294 | 66.884 | 0.227 |
| B&W NUCLEAR OPERATIONS GROUP | SNM-0042 | 23 | 142 | 55 | 17 | 2 | 2 | 1 | - | - | - | - | - | - | 242 | 219 | 24.347 | 0.111 |
| GLOBAL NUCLEAR FUEL AMERICAS | SNM-1097 | 384 | 417 | 169 | 101 | 4 | - | - | - | - | - | - | - | - | **1,075** | **691** | 73.459 | 0.106 |
| NUCLEAR FUEL SERVICES, INC. | SNM-0124 | - | 163 | 110 | 42 | 16 | 6 | - | - | - | - | - | - | - | 337 | 337 | 54.363 | 0.161 |
| WESTINGHOUSE ELECTRIC COMPANY | SNM-1107 | 79 | 189 | 164 | 181 | 91 | 4 | - | - | - | - | - | - | - | 708 | 629 | **158.714** | **0.252** |
| **Total** | **6** | **1,145** | **1,176** | **611** | **412** | **164** | **24** | **3** | **0** | **0** | **0** | **0** | **0** | **0** | **3,535** | **2,390** | **405.271** | **0.170** |

NOTE: The data values shown bolded and in boxes represent the highest value in each category. These values have not been adjusted for the multiple counting of transient workers (see section 5).
*Dose values exactly equal to the values separating ranges are reported in the next higher range.

# APPENDIX A

## Table A2 - Other Facilities Reporting to the NRC 2008

| PROGRAM CODE – LICENSEE NAME | LICENSE# | Number of Individuals with Whole-Body Doses in the Ranges (rem)* | | | | | | | | | | | | | Total Number Monitored | Number with Meas. Dose | Total Collective TEDE (person-rem) | Average Meas. TEDE (rem) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Meas. Exposure | Meas. <0.10 | 0.10-0.25 | 0.25-0.50 | 0.50-0.75 | 0.75-1.00 | 1.00-2.00 | 2.00-3.00 | 3.00-4.00 | 4.00-5.00 | 5.00-6.00 | 6.00-12.00 | >12.0 | | | | |
| ***MEASURING SYSTEMS FIXED GAUGES - 03120*** | | | | | | | | | | | | | | | | | | |
| TRANSCANADA | 21-29258-01 | 1 | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - |
| TVA - CUMBERLAND FOSSIL PLANT | 41-25219-01 | 12 | - | - | - | - | - | - | - | - | - | - | - | - | 12 | - | - | - |
| TVA - PARADISE FOSSIL PLANT | 16-25243-01 | 15 | - | - | - | - | - | - | - | - | - | - | - | - | 15 | - | - | - |
| TVA - WIDOWS CREEK FOSSIL PLANT | 01-25207-01 | 28 | - | - | - | - | - | - | - | - | - | - | - | - | **28** | - | - | - |
| **Total** | **4** | **56** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **56** | **0** | **0.000** | **0** |
| ***INSTRUMENT CALIBRATION SERVICE ONLY - SOURCE > 100 CURIES - 03222*** | | | | | | | | | | | | | | | | | | |
| GENERAL DYNAMICS CORP - ELEC BOAT | 06-01781-03 | 1 | 6 | - | - | - | - | - | - | - | - | - | - | - | **7** | **6** | **0.036** | **0.006** |
| **Total** | **1** | **1** | **6** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **7** | **6** | **0.036** | **0.006** |
| ***OTHER SERVICES - 03225*** | | | | | | | | | | | | | | | | | | |
| TVA - POWER SERVICE CENTER | 41-08165-08 | 69 | 2 | - | - | - | - | - | - | - | - | - | - | - | **71** | **2** | **0.040** | **0.020** |
| TVA - WESTERN AREA RADIOLOGICAL LAB | 01-06113-04 | 15 | - | - | - | - | - | - | - | - | - | - | - | - | 15 | - | - | - |
| **Total** | **2** | **84** | **2** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **86** | **2** | **0.040** | **0.020** |
| ***INDUSTRIAL RADIOGRAPHY - TEMPORARY JOB SITES - 03320*** | | | | | | | | | | | | | | | | | | |
| BRAUN INTERTEC CORP. | MN-1082-100-27 | 4 | 7 | 3 | 6 | 3 | 5 | 3 | 2 | - | - | - | - | - | 33 | 29 | 18.129 | 0.625 |
| VALLEY INDUSTRIAL X-RAY & INSPECTION | CA-4182-15 | 9 | 40 | 14 | 15 | 15 | 16 | 29 | 7 | 1 | - | - | - | - | **146** | **137** | **91.811** | **0.670** |
| WYLE LABORATORIES | FL-2953-1 | 20 | 9 | - | - | - | - | - | - | - | - | - | - | - | 29 | 9 | 0.203 | 0.023 |
| YUBA HEAT TRANSFER | OK-13735-01 | - | 1 | 3 | - | - | - | - | - | - | - | - | - | - | 4 | 4 | 0.347 | 0.087 |
| **Total** | **4** | **33** | **57** | **20** | **21** | **18** | **21** | **32** | **9** | **1** | **0** | **0** | **0** | **0** | **212** | **179** | **110.490** | **0.617** |

NOTE: The data values shown bolded and in boxes represent the highest value in each category. These values have not been adjusted for the multiple counting of transient workers (see section 5).
*Dose values exactly equal to the values separating ranges are reported in the next higher range.

# APPENDIX A

## Table A2 - Other Facilities Reporting to the NRC 2008 (continued)

| PROGRAM CODE – LICENSEE NAME | LICENSE# | Number of Individuals with Whole-Body Doses in the Ranges (rem)* | | | | | | | | | | | | | Total Number Monitored | Number with Meas. Dose | Total Collective TEDE (person-rem) | Average Meas. TEDE (rem) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Meas. Exposure | Meas. <0.10 | 0.10-0.25 | 0.25-0.50 | 0.50-0.75 | 0.75-1.00 | 1.00-2.00 | 2.00-3.00 | 3.00-4.00 | 4.00-5.00 | 5.00-6.00 | 6.00-12.00 | >12.0 | | | | |
| ***IRRADIATORS OTHER GREATER THAN 10000 CURIES - 03521*** | | | | | | | | | | | | | | | | | | |
| ARMED FORCES RADIOBIO. RES. INST. | 19-08330-03 | 58 | 13 | - | - | - | - | - | - | - | - | - | - | - | **71** | **13** | **0.161** | **0.012** |
| **Total** | **1** | **58** | **13** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **71** | **13** | **0.161** | **0.012** |
| ***MULTI-SITE, MULTI-REGIONAL MATERIALS LICENSE - 03613*** | | | | | | | | | | | | | | | | | | |
| DEPARTMENT OF THE NAVY | 45-23645-01NA | 97 | 98 | 3 | 2 | - | - | - | - | - | - | - | - | - | **200** | **103** | **2.964** | **0.029** |
| **Total** | **1** | **97** | **98** | **3** | **2** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **200** | **103** | **2.964** | **0.029** |
| ***BYPRODUCT MATERIAL STANDBY - NO OPERATIONS - 03810*** | | | | | | | | | | | | | | | | | | |
| TVA - ERC MIXED WASTE STORAGE | 01-25284-01 | 5 | - | - | - | - | - | - | - | - | - | - | - | - | **5** | **-** | **-** | **-** |
| **Total** | **1** | **5** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **5** | **0** | **0.000** | **0** |
| ***URANIUM HEXAFLUORIDE ($UF_6$) PRODUCTION PLANTS - 11400*** | | | | | | | | | | | | | | | | | | |
| HONEYWELL INTERNATIONAL, INC. | SUB-0526 | 29 | 370 | 137 | 79 | 40 | 13 | 15 | - | - | - | - | - | - | **683** | **654** | **117.303** | **0.179** |
| **Total** | **1** | **29** | **370** | **137** | **79** | **40** | **13** | **15** | **0** | **0** | **0** | **0** | **0** | **0** | **683** | **654** | **117.303** | **0.179** |

NOTE: The data values shown bolded and in boxes represent the highest value in each category. These values have not been adjusted for the multiple counting of transient workers (see section 5).
*Dose values exactly equal to the values separating ranges are reported in the next higher range.

# APPENDIX A

## Table A2 - Other Facilities Reporting to the NRC 2008 (continued)

| PROGRAM CODE – LICENSEE NAME | LICENSE# | Number of Individuals with Whole-Body Doses in the Ranges (rem)* | | | | | | | | | | | | | Total Number Monitored | Number with Meas. Dose | Total Collective TEDE (person-rem) | Average Meas. TEDE (rem) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Meas. Exposure | Meas. <0.10 | 0.10-0.25 | 0.25-0.50 | 0.50-0.75 | 0.75-1.00 | 1.00-2.00 | 2.00-3.00 | 3.00-4.00 | 4.00-5.00 | 5.00-6.00 | 6.00-12.00 | >12.0 | | | | |
| ***NUCLEAR REACTOR - 41111 (INTERNATIONAL)*** | | | | | | | | | | | | | | | | | | |
| TOMARI NPP | TOMARI-1 | - | 27 | 36 | 58 | 10 | - | - | - | - | - | - | - | - | **131** | **131** | **32.541** | **0.248** |
| **Total** | **1** | **0** | **27** | **36** | **58** | **10** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **131** | **131** | **32.541** | **0.248** |
| ***TEST REACTOR FACILITIES - 42140***** | | | | | | | | | | | | | | | | | | |
| NAT'L AERONAUTICS AND SPACE ADMIN | TR-3 | 142 | 21 | - | - | - | - | - | - | - | - | - | - | - | 163 | 21 | 0.225 | 0.011 |
| NAT'L INSTITUTE OF STANDARDS & TECH | TR-5 | 8 | 131 | 18 | 11 | - | - | - | - | - | - | - | - | - | **168** | **160** | **9.831** | **0.061** |
| **Total** | **2** | **150** | **152** | **18** | **11** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **331** | **181** | **10.056** | **0.056** |
| ***PROGRAM CODE - 42150*** | | | | | | | | | | | | | | | | | | |
| UNIVERSITY OF ARIZONA | R-52 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | **6** | **-** | **-** | **-** |
| **Total** | **1** | **6** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **6** | **0** | **0.000** | **0** |
| ***PROGRAM CODE - NONE*** | | | | | | | | | | | | | | | | | | |
| AEROTEST OPERATIONS, INC. | R-98 | - | - | - | 1 | 1 | 5 | 5 | 7 | 2 | - | - | - | - | 21 | 21 | 36.238 | **1.726** |
| ENVIRONMENTAL MANAGEMENT & CONTROL | 3546-50 | - | - | 2 | 2 | 1 | - | - | - | - | - | - | - | - | 5 | 5 | 1.717 | 0.343 |
| WELDSONIX, INC. | L05718 | 7 | 15 | 23 | 21 | 17 | 7 | 5 | 1 | 1 | - | - | - | - | **97** | **90** | **41.157** | 0.457 |
| **Total** | **3** | **7** | **15** | **25** | **24** | **19** | **12** | **10** | **8** | **3** | **0** | **0** | **0** | **0** | **123** | **116** | **79.112** | **0.682** |

NOTE: The data values shown bolded and in boxes represent the highest value in each category. These values have not been adjusted for the multiple counting of transient workers (see section 5).
*Dose values exactly equal to the values separating ranges are reported in the next higher range.
**Test reactor facilities are required to report to NRC, but only two facilities report under this category and one of the facilities is in decommissioning.

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Appendix B

# ANNUAL WHOLE-BODY DOSES AT LICENSED NUCLEAR POWER FACILITIES

# 2008

# APPENDIX B
## Annual Whole-Body Doses at Licensed Nuclear Power Facilities
## 2008

| PLANT NAME | TYPE | Number of Individuals with Whole-Body Doses in the Ranges (rem)* | | | | | | | | | | | | | | Total Number Monitored | Number with Meas. Dose | Total Collective TEDE (person-rem) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Meas. Exposure | Meas. <0.10 | 0.10–0.25 | 0.25–0.50 | 0.50–0.75 | 0.75–1.00 | 1.00–2.00 | 2.00-3.00 | 3.00–4.00 | 4.00–5.00 | 5.00–6.00 | 6.00–7.00 | 7.00–12.00 | >12.0 | | | |
| ARKANSAS 1, 2 | PWR | 1,386 | 1,201 | 374 | 158 | 37 | 18 | 3 | - | - | - | - | - | - | - | 3,177 | 1,791 | 196.047 |
| BEAVER VALLEY 1, 2 | PWR | 1,669 | 713 | 210 | 64 | 4 | - | - | - | - | - | - | - | - | - | 2,660 | 991 | 83.394 |
| BRAIDWOOD 1, 2 | PWR | 1,844 | 852 | 333 | 50 | - | - | - | - | - | - | - | - | - | - | 3,079 | 1,235 | 103.180 |
| BROWNS FERRY 1, 2, 3 | BWR | 1,947 | 1,384 | 566 | 422 | 171 | 67 | 23 | - | - | - | - | - | - | - | 4,580 | 2,633 | 482.127 |
| BRUNSWICK 1, 2 | BWR | 1,394 | 1,586 | 508 | 308 | 94 | 34 | 16 | - | - | - | - | - | - | - | 3,940 | 2,546 | 354.212 |
| BYRON 1, 2 | PWR | 1,990 | 996 | 355 | 118 | 13 | 1 | - | - | - | - | - | - | - | - | 3,473 | 1,483 | 140.809 |
| CALLAWAY 1 | PWR | 1,216 | 602 | 105 | 19 | 3 | - | - | - | - | - | - | - | - | - | 1,945 | 729 | 45.738 |
| CALVERT CLIFFS 1,2 | PWR | 1,404 | 503 | 171 | 61 | 9 | 1 | - | - | - | - | - | - | - | - | 2,149 | 745 | 74.149 |
| CATAWBA 1, 2 | PWR | 2,431 | 837 | 221 | 46 | 5 | 1 | - | - | - | - | - | - | - | - | 3,541 | 1,110 | 85.080 |
| CLINTON | BWR | 1,610 | 706 | 399 | 216 | 51 | 8 | 1 | - | - | - | - | - | - | - | 2,991 | 1,381 | 205.086 |
| COLUMBIA GENERATING | BWR | 938 | 519 | 159 | 35 | 2 | - | - | - | - | - | - | - | - | - | 1,653 | 715 | 54.957 |
| COMANCHE PEAK 1, 2 | PWR | 1,465 | 566 | 227 | 184 | 34 | 21 | 5 | - | - | - | - | - | - | - | 2,502 | 1,037 | 168.836 |
| COOK 1, 2 | PWR | 2,299 | 695 | 238 | 35 | 3 | - | - | - | - | - | - | - | - | - | 3,270 | 971 | 76.460 |
| COOPER STATION | BWR | 620 | 990 | 291 | 178 | 127 | 73 | 51 | 5 | - | - | - | - | - | - | 2,335 | 1,715 | 359.926 |
| CRYSTAL RIVER 3 | PWR | 953 | 229 | 47 | 6 | - | - | - | - | - | - | - | - | - | - | 1,235 | 282 | 16.110 |
| DAVIS-BESSE 1 | PWR | 1,201 | 616 | 248 | 115 | 6 | - | - | - | - | - | - | - | - | - | 2,186 | 985 | 106.603 |
| DIABLO CANYON 1, 2 | PWR | 1,910 | 1,314 | 558 | 212 | 32 | 5 | - | - | - | - | - | - | - | - | 4,031 | 2,121 | 235.034 |
| DRESDEN 2, 3 | BWR | 1,402 | 1,688 | 457 | 144 | 18 | - | - | - | - | - | - | - | - | - | 3,709 | 2,307 | 198.153 |
| DUANE ARNOLD | BWR | 912 | 187 | 74 | 14 | 1 | - | - | - | - | - | - | - | - | - | 1,188 | 276 | 24.187 |
| FARLEY 1, 2 | PWR | 1,173 | 537 | 127 | 5 | - | - | - | - | - | - | - | - | - | - | 1,842 | 669 | 40.833 |
| FERMI 2 | BWR | 1,075 | 328 | 115 | 17 | - | - | - | - | - | - | - | - | - | - | 1,535 | 460 | 35.186 |
| FITZPATRICK | BWR | 607 | 899 | 275 | 194 | 45 | 10 | 7 | - | - | - | - | - | - | - | 2,037 | 1,430 | 184.772 |
| FT CALHOUN | PWR | 808 | 531 | 215 | 62 | 26 | 5 | - | - | - | - | - | - | - | - | 1,647 | 839 | 96.155 |
| GINNA | PWR | 1,134 | 633 | 220 | 106 | 16 | - | 1 | - | - | - | - | - | - | - | 2,110 | 976 | 101.996 |
| GRAND GULF | BWR | 892 | 1,316 | 333 | 163 | 25 | 6 | - | - | - | - | - | - | - | - | 2,735 | 1,843 | 167.859 |
| HARRIS 1 | PWR | 972 | 159 | 27 | 6 | - | - | - | - | - | - | - | - | - | - | 1,164 | 192 | 10.356 |
| HATCH 1, 2 | BWR | 985 | 765 | 386 | 208 | 29 | 7 | 2 | - | - | - | - | - | - | - | 2,382 | 1,397 | 189.433 |
| HOPE CREEK 1 | BWR | 127 | 734 | 167 | 78 | 17 | 3 | - | - | - | - | - | - | - | - | 1,126 | 999 | 34.510 |
| INDIAN POINT 2 | PWR | 12 | 604 | 232 | 116 | 47 | 12 | 2 | - | - | - | - | - | - | - | 1,025 | 1,013 | 139.683 |
| INDIAN POINT 3 | PWR | 151 | 443 | - | - | - | - | - | - | - | - | - | - | - | - | 594 | 443 | 3.045 |
| KEWAUNEE | PWR | 1,001 | 346 | 115 | 98 | 29 | 7 | 3 | - | - | - | - | - | - | - | 1,599 | 598 | 92.951 |
| LASALLE 1, 2 | BWR | 1,481 | 1,777 | 403 | 179 | 33 | 4 | 6 | - | - | - | - | - | - | - | 3,883 | 2,402 | 217.567 |
| LIMERICK 1, 2 | BWR | 1,758 | 833 | 323 | 198 | 35 | 4 | - | - | - | - | - | - | - | - | 3,151 | 1,393 | 176.825 |
| MCGUIRE 1, 2 | PWR | 1,940 | 1,007 | 464 | 128 | 12 | 2 | - | - | - | - | - | - | - | - | 3,553 | 1,613 | 165.767 |
| MILLSTONE 2, 3 | PWR | 1,949 | 737 | 371 | 217 | 92 | 38 | 12 | - | - | - | - | - | - | - | 3,416 | 1,467 | 272.693 |
| MONTICELLO | BWR | 1,115 | 188 | 110 | 49 | 3 | 1 | - | - | - | - | - | - | - | - | 1,466 | 351 | 43.777 |
| NINE MILE POINT 1, 2 | BWR | 1,269 | 636 | 353 | 219 | 105 | 42 | 36 | - | - | - | - | - | - | - | 2,660 | 1,391 | 301.824 |
| NORTH ANNA 1, 2 | PWR | 2,960 | 603 | 163 | 24 | 4 | 1 | - | - | - | - | - | - | - | - | 3,755 | 795 | 61.003 |

Note: Totals corrected for transients on page B-3.
* Dose values exactly equal to the values separating ranges are reported in the next higher range.

# APPENDIX B

## Annual Whole-Body Doses at Licensed Nuclear Power Facilities 2008 (continued)

| PLANT NAME | TYPE | Number of Individuals with Whole-Body Doses in the Ranges (rem)* | | | | | | | | | | | | | | Total Number Monitored | Number with Meas. Dose | Total Collective TEDE (person-rem) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Meas. Exposure | Meas. <0.10 | 0.10–0.25 | 0.25–0.50 | 0.50–0.75 | 0.75–1.00 | 1.00-2.00 | 2.00–3.00 | 3.00–4.00 | 4.00–5.00 | 5.00–6.00 | 6.00–7.00 | 7.00–12.00 | >12.0 | | | |
| OCONEE 1, 2, 3 | PWR | 2,589 | 1,269 | 516 | 124 | 15 | - | - | - | - | - | - | - | - | - | 4,513 | 1,924 | 186.335 |
| OYSTER CREEK | BWR | 1,600 | 899 | 351 | 185 | 47 | 19 | 10 | - | - | - | - | - | - | - | 3,111 | 1,511 | 211.932 |
| PALISADES | PWR | 849 | 178 | 80 | 13 | 1 | - | - | - | - | - | - | - | - | - | 1,121 | 272 | 23.478 |
| PALO VERDE 1, 2, 3 | PWR | 2,492 | 1,171 | 377 | 144 | 12 | 1 | 1 | - | - | - | - | - | - | - | 4,198 | 1,706 | 159.913 |
| PEACH BOTTOM 2, 3 | BWR | 1,593 | 1,222 | 364 | 167 | 40 | 17 | 6 | - | - | - | - | - | - | - | 3,409 | 1,816 | 212.741 |
| PERRY | BWR | 1,003 | 338 | 142 | 45 | 3 | - | - | - | - | - | - | - | - | - | 1,531 | 528 | 52.058 |
| PILGRIM 1 | BWR | 238 | 294 | 68 | 14 | 1 | - | - | - | - | - | - | - | - | - | 615 | 377 | 22.568 |
| POINT BEACH 1, 2 | PWR | 1,378 | 527 | 239 | 141 | 42 | 6 | 3 | - | - | - | - | - | - | - | 2,336 | 958 | 144.021 |
| PRAIRIE ISLAND 1, 2 | PWR | 911 | 650 | 274 | 106 | 24 | 3 | 3 | - | - | - | - | - | - | - | 1,971 | 1,060 | 126.723 |
| QUAD CITIES 1, 2 | BWR | 1,582 | 1,203 | 503 | 299 | 53 | 4 | 3 | - | - | - | - | - | - | - | 3,647 | 2,065 | 274.444 |
| RIVER BEND 1 | BWR | 794 | 1,116 | 276 | 225 | 103 | 49 | 40 | - | - | - | - | - | - | - | 2,603 | 1,809 | 311.697 |
| ROBINSON 2 | PWR | 1,105 | 534 | 218 | 35 | 1 | - | - | - | - | - | - | - | - | - | 1,893 | 788 | 68.381 |
| SALEM 1, 2 | PWR | 425 | 2,469 | 562 | 262 | 57 | 10 | 2 | - | - | - | - | - | - | - | 3,787 | 3,362 | 328.761 |
| SAN ONOFRE 2, 3 | PWR | 2,547 | 671 | 177 | 115 | 42 | 7 | 2 | - | - | - | - | - | - | - | 3,561 | 1,014 | 125.320 |
| SEABROOK | PWR | 889 | 1,101 | 138 | 45 | 8 | 5 | - | - | - | - | - | - | - | - | 2,186 | 1,297 | 74.992 |
| SEQUOYAH 1, 2 | PWR | 1,553 | 670 | 227 | 55 | 5 | 3 | - | - | - | - | - | - | - | - | 2,513 | 960 | 83.730 |
| SOUTH TEXAS 1, 2 | PWR | 1,507 | 642 | 279 | 177 | 65 | 12 | 6 | - | - | - | - | - | - | - | 2,688 | 1,181 | 187.295 |
| ST. LUCIE 1, 2 | PWR | 1,750 | 747 | 264 | 106 | 8 | 2 | - | - | - | - | - | - | - | - | 2,877 | 1,127 | 112.234 |
| SUMMER 1 | PWR | 1,257 | 467 | 120 | 35 | 1 | - | - | - | - | - | - | - | - | - | 1,880 | 623 | 49.091 |
| SURRY 1, 2 | PWR | 3,101 | 560 | 354 | 118 | 25 | 8 | 4 | - | - | - | - | - | - | - | 4,170 | 1,069 | 150.269 |
| SUSQUEHANNA 1, 2 | BWR | 1,811 | 1,306 | 396 | 148 | 35 | 8 | 2 | - | - | - | - | - | - | - | 3,706 | 1,895 | 192.892 |
| THREE MILE ISLAND 1 | PWR | 1,128 | 62 | 2 | - | - | - | - | - | - | - | - | - | - | - | 1,192 | 64 | 2.219 |
| TURKEY POINT 3, 4 | PWR | 1,783 | 753 | 237 | 66 | 11 | - | - | - | - | - | - | - | - | - | 2,850 | 1,067 | 97.357 |
| VERMONT YANKEE | BWR | 397 | 895 | 257 | 136 | 60 | 36 | 18 | - | - | - | - | - | - | - | 1,799 | 1,402 | 213.680 |
| VOGTLE 1, 2 | PWR | 1,251 | 720 | 312 | 137 | 12 | 3 | 1 | - | - | - | - | - | - | - | 2,436 | 1,185 | 137.620 |
| WATERFORD 3 | PWR | 902 | 856 | 257 | 113 | 29 | 13 | - | - | - | - | - | - | - | - | 2,170 | 1,268 | 134.221 |
| WATTS BAR 1 | PWR | 2,550 | 649 | 198 | 35 | 5 | - | - | - | - | - | - | - | - | - | 3,437 | 887 | 70.648 |
| WOLF CREEK 1 | PWR | 889 | 602 | 209 | 80 | 14 | 6 | - | - | - | - | - | - | - | - | 1,800 | 911 | 94.997 |
| **Totals BWRs** | **BWRs** | **27,150** | **21,809** | **7,276** | **3,841** | **1,098** | **392** | **221** | **5** | **-** | **-** | **-** | **-** | **-** | **-** | **61,792** | **34,642** | **4,522.413** |
| **Totals PWRs** | **PWRs** | **62,724** | **30,022** | **10,061** | **3,737** | **749** | **191** | **48** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **107,532** | **44,808** | **4,673.527** |
| **Total LWR** | **LWRs** | **89,874** | **51,831** | **17,337** | **7,578** | **1,847** | **583** | **269** | **5** | **-** | **-** | **-** | **-** | **-** | **-** | **169,324** | **79,450** | **9,195.940** |
| **Corrected for Transients** | **LWRs** | **61,336** | **33,832** | **12,324** | **6,786** | **2,429** | **1,026** | **921** | **38** | **-** | **-** | **-** | **-** | **-** | **-** | **118,692** | **57,356** | **9,195.940** |

Note: Totals corrected for transients on page B-3.

* Dose values exactly equal to the values separating ranges are reported in the next higher range.

# APPENDIX B

## Annual Whole-Body Doses at Licensed Nuclear Power Facilities 2008 (continued)

| PLANT NAME | TYPE | Number of Individuals with Whole-Body Doses in the Ranges (rem)* | | | | | | | | | | | | | Total Number Monitored | Number with Meas. Dose | Total Collective TEDE (person-rem) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Meas. Exposure | Meas. <0.10 | 0.10–0.25 | 0.25–0.50 | 0.50–0.75 | 0.75–1.00 | 1.00–2.00 | 2.00–3.00 | 3.00–4.00 | 4.00–5.00 | 5.00–6.00 | 6.00–7.00 | 7.00–12.00 | >12.0 | | | |
| **REACTORS NOT YET IN COMMERCIAL OPERATION** | | | | | | | | | | | | | | | | | |
| WATTS BAR 2 | PWR | Reported with Watts Bar 1 | | | | | | | | | | | | | | | |
| **REACTORS NO LONGER IN COMMERCIAL OPERATION** | | | | | | | | | | | | | | | | | |
| BIG ROCK POINT | BWR | 26 | - | - | - | - | - | - | - | - | - | - | - | - | 26 | - | - |
| HADDAM NECK | PWR | 35 | 1 | - | - | - | - | - | - | - | - | - | - | - | 36 | 1 | 0.011 |
| HUMBOLDT BAY | BWR | 211 | 52 | 4 | - | - | - | - | - | - | - | - | - | - | 267 | 56 | 2.051 |
| INDIAN POINT 1 | PWR | 72 | 227 | 2 | 5 | - | - | - | - | - | - | - | - | - | 306 | 234 | 4.322 |
| LACROSSE | BWR | 30 | 34 | 6 | - | - | - | - | - | - | - | - | - | - | 70 | 40 | 1.759 |
| MAINE YANKEE | PWR | 31 | 1 | - | - | - | - | - | - | - | - | - | - | - | 32 | 1 | 0.013 |
| RANCHO SECO | PWR | 88 | 74 | 10 | - | - | - | - | - | - | - | - | - | - | 172 | 84 | 2.434 |
| SAN ONOFRE 1 | PWR | 490 | 2 | - | - | - | - | - | - | - | - | - | - | - | 492 | 2 | 0.043 |
| YANKEE-ROWE | PWR | 48 | 1 | - | - | - | - | - | - | - | - | - | - | - | 49 | 1 | 0.019 |
| ZION 1, 2 | PWR | 181 | 7 | - | - | - | - | - | - | - | - | - | - | - | 188 | 7 | 0.147 |
| **REACTORS NO LONGER IN COMMERCIAL OPERATION, REPORTED WITH OTHER UNITS** | | | | | | | | | | | | | | | | | |
| DRESDEN 1 | BWR | Reported with Dresden 2,3 | | | | | | | | | | | | | | | |
| MILLSTONE 1 | BWR | Reported with Millstone Units 2 & 3; estimated dose from Unit 1 is 0.222 person-rem. | | | | | | | | | | | | | | | |
| THREE MILE ISLAND 2 | PWR | Reported with Three Mile Island 1; estimated dose from Unit 2 is 0.138 person-rem. | | | | | | | | | | | | | | | |
| TROJAN | PWR | Reported with ISFSI | | | | | | | | | | | | | | | |
| **Total Reporting**** | **11** | **1,212** | **399** | **22** | **5** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **1,638** | **426** | **10.799** |

Note: Totals corrected for transients on page B-3.
* Dose values exactly equal to the values separating ranges are reported in the next higher range.
** These numbers are for the reactors no longer in commercial operation that report their doses separately (i.e., do not report their doses with other units).

Appendix C*

# PERSONNEL, DOSE, AND POWER GENERATION SUMMARY

# 1969–2008

*A discussion of the methods used to collect and calculate the information contained in this appendix is given in sections 3.1 and 4.2.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **ARKANSAS 1, 2** | 1975 | 588.0 | 76.5 | 147 | 21 | 0.14 | 0.04 |
| Docket 50-313, 50-368; | 1976 | 464.6 | 56.6 | 476 | 289 | 0.61 | 0.62 |
| DPR-51; NPF-6 | 1977 | 610.3 | 76.8 | 601 | 256 | 0.43 | 0.42 |
| 1st commercial operation | 1978 | 627.2 | 77.5 | 722 | 189 | 0.26 | 0.30 |
| 12/74, 3/80 | 1979 | 397.0 | 55.3 | 1,321 | 369 | 0.28 | 0.93 |
| Type - PWRs | 1980 | 452.8 | 63.7 | 1,233 | 342 | 0.28 | 0.76 |
| Capacity - 836, 988 MWe | 1981 | 1,104.7 | 68.3 | 2,225 | 1,102 | 0.50 | 1.00 |
| | 1982 | 905.4 | 58.6 | 1,608 | 803 | 0.50 | 0.89 |
| | 1983 | 915.0 | 54.7 | 2,109 | 1,397 | 0.66 | 1.53 |
| | 1984 | 1,289.1 | 77.4 | 1,742 | 806 | 0.46 | 0.63 |
| | 1985 | 1,192.3 | 73.6 | 1,262 | 286 | 0.23 | 0.24 |
| | 1986 | 1,070.3 | 66.9 | 2,135 | 1,141 | 0.53 | 1.07 |
| | 1987 | 1,366.1 | 88.9 | 1,123 | 382 | 0.34 | 0.28 |
| | 1988 | 1,070.3 | 69.4 | 2,421 | 1,387 | 0.57 | 1.30 |
| | 1989 | 1,066.3 | 72.0 | 2,063 | 711 | 0.34 | 0.67 |
| | 1990 | 1,351.9 | 84.2 | 2,493 | 762 | 0.31 | 0.56 |
| | 1991 | 1,515.8 | 88.4 | 2,064 | 351 | 0.17 | 0.23 |
| | 1992 | 1,352.1 | 77.4 | 3,114 | 876 | 0.28 | 0.65 |
| | 1993 | 1,606.0 | 91.3 | 1,981 | 268 | 0.14 | 0.17 |
| | 1994 | 1,662.8 | 93.6 | 1,361 | 172 | 0.13 | 0.10 |
| | 1995 | 1,397.0 | 82.7 | 2,259 | 386 | 0.17 | 0.28 |
| | 1996 | 1,596.0 | 89.5 | 1,441 | 203 | 0.14 | 0.13 |
| | 1997 | 1,621.9 | 95.9 | 1,195 | 119 | 0.10 | 0.07 |
| | 1998 | 1,494.6 | 88.1 | 1,249 | 166.599 | 0.13 | 0.11 |
| | 1999 | 1,477.3 | 86.9 | 1,463 | 183.997 | 0.13 | 0.12 |
| | 2000 | 1,329.2 | 79.5 | 1,977 | 242.326 | 0.12 | 0.18 |
| | 2001 | 1,684.0 | 95.8 | 1,082 | 106.040 | 0.10 | 0.06 |
| | 2002 | 1,659.0 | 91.8 | 1,581 | 265.337 | 0.17 | 0.16 |
| | 2003 | 1,675.8 | 93.1 | 973 | 99.003 | 0.10 | 0.06 |
| | 2004 | 1,759.5 | 95.0 | 1,227 | 106.172 | 0.09 | 0.06 |
| | 2005 | 1,560.0 | 84.5 | 2,335 | 475.784 | 0.20 | 0.31 |
| | 2006 | 1,739.8 | 95.0 | 1,184 | 143.296 | 0.12 | 0.08 |
| | 2007 | 1,769.3 | 96.0 | 1,387 | 105.310 | 0.08 | 0.06 |
| | 2008 | 1,614.8 | 89.7 | 1,791 | 196.047 | 0.11 | 0.12 |
| **BEAVER VALLEY 1, 2** | 1977 | 355.6 | 57.0 | 331 | 87 | 0.26 | 0.24 |
| Docket 50-334, 50-412; | 1978 | 304.2 | 40.8 | 646 | 190 | 0.29 | 0.62 |
| DPR-66; NPF-73 | 1979 | 221.0 | 40.0 | 704 | 132 | 0.19 | 0.60 |
| 1st commercial operation | 1980 | 39.8 | 6.8 | 1,817 | 553 | 0.30 | 13.89 |
| 10/76, 11/87 | 1981 | 573.4 | 73.6 | 1,237 | 229 | 0.19 | 0.40 |
| Type - PWRs | 1982 | 326.7 | 41.6 | 1,755 | 599 | 0.34 | 1.83 |
| Capacity - 892, 846 MWe | 1983 | 561.2 | 68.2 | 1,485 | 772 | 0.52 | 1.38 |
| | 1984 | 576.7 | 71.8 | 1,393 | 504 | 0.36 | 0.87 |
| | 1985 | 717.7 | 91.9 | 619 | 60 | 0.10 | 0.08 |
| | 1986 | 581.3 | 70.7 | 1,575 | 627 | 0.40 | 1.08 |
| | 1987 | 684.1 | 83.8 | 1,282 | 210 | 0.16 | 0.31 |
| | 1988 | 1,386.1 | 87.4 | 1,764 | 530 | 0.30 | 0.38 |
| | 1989 | 1,017.4 | 69.6 | 2,349 | 1,378 | 0.59 | 1.35 |
| | 1990 | 1,271.0 | 85.3 | 1,675 | 348 | 0.21 | 0.27 |
| | 1991 | 1,267.5 | 78.6 | 1,689 | 495 | 0.29 | 0.39 |
| | 1992 | 1,441.9 | 89.1 | 1,414 | 289 | 0.20 | 0.20 |
| | 1993 | 1,157.9 | 73.1 | 2,087 | 621 | 0.30 | 0.54 |
| | 1994 | 1,514.6 | 88.6 | 487 | 44 | 0.09 | 0.03 |
| | 1995 | 1,389.2 | 83.1 | 1,536 | 453 | 0.29 | 0.33 |
| | 1996 | 1,269.0 | 76.5 | 1,688 | 449 | 0.27 | 0.35 |
| | 1997 | 1,159.3 | 72.1 | 1,391 | 306 | 0.22 | 0.26 |
| | 1998 | 523.1 | 33.5 | 700 | 59.311 | 0.08 | 0.11 |
| | 1999 | 1,353.7 | 85.9 | 841 | 99.461 | 0.12 | 0.07 |
| | 2000 | 1,378.7 | 87.3 | 1,730 | 337.867 | 0.20 | 0.24 |
| | 2001 | 1,500.8 | 92.3 | 1,202 | 184.361 | 0.15 | 0.12 |
| | 2002 | 1,548.0 | 95.4 | 1,048 | 90.479 | 0.09 | 0.06 |
| | 2003 | 1,437.0 | 88.4 | 1,623 | 277.168 | 0.17 | 0.19 |
| | 2004 | 1,593.1 | 96.3 | 1,270 | 156.509 | 0.12 | 0.10 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **BEAVER VALLEY 1, 2** | 2005 | 1,590.4 | 96.7 | 978 | 79.055 | 0.08 | 0.05 |
| (continued) | 2006 | 1,385.6 | 84.0 | 2,174 | 370.146 | 0.17 | 0.27 |
| | 2007 | 1,664.1 | 96.0 | 955 | 86.595 | 0.09 | 0.05 |
| | 2008 | 1,670.2 | 94.4 | 991 | 83.394 | 0.08 | 0.05 |
| **BIG ROCK POINT**[1] | 1969 | 48.1 | | 165 | 136 | 0.82 | 2.83 |
| Docket 50-155; DPR-6 | 1970 | 43.5 | | 290 | 194 | 0.67 | 4.46 |
| 1st commercial operation 3/63 | 1971 | 44.4 | | 260 | 184 | 0.71 | 4.14 |
| Type - BWR | 1972 | 43.5 | | 195 | 181 | 0.93 | 4.16 |
| Capacity - (67) MWe | 1973 | 50.9 | | 241 | 285 | 1.18 | 5.60 |
| | 1974 | 40.7 | 70.3 | 281 | 276 | 0.98 | 6.78 |
| | 1975 | 35.1 | 59.8 | 300 | 180 | 0.60 | 5.13 |
| | 1976 | 29.5 | 50.1 | 488 | 289 | 0.59 | 9.80 |
| | 1977 | 43.6 | 73.4 | 465 | 334 | 0.72 | 7.66 |
| | 1978 | 48.5 | 77.9 | 285 | 175 | 0.61 | 3.61 |
| | 1979 | 13.0 | 23.5 | 623 | 455 | 0.73 | 35.00 |
| | 1980 | 48.9 | 79.0 | 599 | 354 | 0.59 | 7.24 |
| | 1981 | 56.9 | 90.6 | 479 | 160 | 0.33 | 2.81 |
| | 1982 | 43.6 | 70.8 | 521 | 328 | 0.63 | 7.52 |
| | 1983 | 42.3 | 71.0 | 493 | 263 | 0.53 | 6.22 |
| | 1984 | 50.3 | 78.6 | 297 | 155 | 0.52 | 3.08 |
| | 1985 | 43.8 | 73.5 | 435 | 291 | 0.67 | 6.64 |
| | 1986 | 61.0 | 95.5 | 202 | 84 | 0.42 | 1.38 |
| | 1987 | 45.3 | 71.0 | 251 | 222 | 0.88 | 4.90 |
| | 1988 | 46.1 | 72.8 | 303 | 170 | 0.56 | 3.69 |
| | 1989 | 50.2 | 79.0 | 418 | 177 | 0.42 | 3.53 |
| | 1990 | 51.3 | 77.2 | 351 | 232 | 0.66 | 4.52 |
| | 1991 | 59.1 | 85.2 | 435 | 226 | 0.52 | 3.82 |
| | 1992 | 32.7 | 54.5 | 496 | 277 | 0.56 | 8.47 |
| | 1993 | 51.2 | 79.4 | 419 | 152 | 0.36 | 2.97 |
| | 1994 | 49.5 | 75.3 | 310 | 119 | 0.38 | 2.40 |
| | 1995 | 62.2 | 95.0 | 205 | 54 | 0.26 | 0.87 |
| | 1996 | 1,265.6 | 76.5 | 1,688 | 449 | 0.27 | 0.36 |
| | 1997 | 22.4 | 54.1 | 258 | 55 | 0.21 | 2.46 |
| | 1998 | 0.0 | 0.0 | 432 | 104.130 | 0.24 | --- |
| | 1999 | 0.0 | 0.0 | 285 | 86.577 | 0.31 | --- |
| | 2000 | 0.0 | 0.0 | 226 | 89.271 | 0.40 | --- |
| | 2001 | 0.0 | 0.0 | 167 | 47.556 | 0.28 | --- |
| | 2002 | 0.0 | 0.0 | 170 | 43.538 | 0.26 | --- |
| | 2003 | 0.0 | 0.0 | 336 | 121.045 | 0.36 | --- |
| | 2004 | 0.0 | 0.0 | 227 | 57.599 | 0.25 | --- |
| | 2005 | 0.0 | 0.0 | 223 | 20.227 | 0.09 | --- |
| | 2006 | 0.0 | 0.0 | 27 | 0.382 | 0.01 | --- |
| | 2007 | 0.0 | 0.0 | 0 | 0.000 | --- | --- |
| | 2008 | 0.0 | 0.0 | 0 | 0.000 | --- | --- |
| **BRAIDWOOD 1, 2** | 1989 | 1,381.8 | 75.4 | 1,460 | 296 | 0.20 | 0.21 |
| Docket 50-456, 50-457; | 1990 | 1,740.2 | 84.1 | 1,081 | 186 | 0.17 | 0.11 |
| NPF-72, -77 | 1991 | 1,377.2 | 68.9 | 1,641 | 550 | 0.34 | 0.40 |
| 1st commercial operation | 1992 | 1,885.9 | 89.0 | 1,059 | 228 | 0.22 | 0.12 |
| 7/88, 10/88 | 1993 | 1,899.3 | 86.9 | 1,043 | 273 | 0.26 | 0.14 |
| Type - PWRs | 1994 | 1,666.1 | 77.2 | 1,237 | 298 | 0.24 | 0.18 |
| Capacity - 1,156, 1,131 MWe | 1995 | 1,914.7 | 85.4 | 1,134 | 236 | 0.21 | 0.12 |
| | 1996 | 1,854.9 | 82.1 | 1,356 | 334 | 0.25 | 0.18 |
| | 1997 | 1,863.3 | 85.4 | 1,693 | 321 | 0.19 | 0.17 |
| | 1998 | 1,979.1 | 88.9 | 1,869 | 259.236 | 0.14 | 0.13 |
| | 1999 | 2,161.6 | 95.8 | 1,153 | 145.976 | 0.13 | 0.07 |
| | 2000 | 2,142.8 | 94.9 | 1,562 | 194.126 | 0.12 | 0.09 |
| | 2001 | 2,186.4 | 95.8 | 881 | 100.570 | 0.11 | 0.05 |
| | 2002 | 2,284.0 | 96.8 | 975 | 90.716 | 0.09 | 0.04 |

[1] Big Rock Point was shut down in September 1997 and is no longer included in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **BRAIDWOOD 1, 2** | 2003 | 2,279.9 | 95.6 | 1,572 | 244.860 | 0.16 | 0.11 |
| (continued) | 2004 | 2,277.8 | 97.3 | 986 | 94.942 | 0.10 | 0.04 |
| | 2005 | 2,253.7 | 96.6 | 926 | 88.084 | 0.10 | 0.04 |
| | 2006 | 2,234.1 | 95.0 | 1,624 | 199.168 | 0.12 | 0.09 |
| | 2007 | 2,244.0 | 96.0 | 1,258 | 98.040 | 0.08 | 0.04 |
| | 2008 | 2,252.5 | 96.3 | 1,235 | 103.180 | 0.08 | 0.05 |
| **BROWNS FERRY 1[2], 2, 3** | 1975 | 161.7 | 17.8 | 2,743 | 347 | 0.13 | 2.15 |
| Docket 50-259, 50-260, | 1976 | 337.6 | 26.9 | 2,530 | 232 | 0.09 | 0.69 |
| 50-296 | 1977 | 1,327.5 | 73.7 | 1,985 | 876 | 0.44 | 0.66 |
| DPR -33, -52, -68 | 1978 | 1,992.1 | 73.5 | 2,479 | 1,776 | 0.72 | 0.89 |
| 1st commercial operation | 1979 | 2,393.0 | 79.1 | 2,869 | 1,593 | 0.56 | 0.67 |
| 8/74, 3/75, 3/77 | 1980 | 2,182.1 | 73.6 | 2,838 | 1,768 | 0.62 | 0.81 |
| Type - BWRs | 1981 | 2,132.9 | 69.5 | 3,497 | 2,398 | 0.69 | 1.12 |
| Capacity - 1,079, 1,104, | 1982 | 2,025.4 | 67.6 | 3,360 | 2,230 | 0.66 | 1.10 |
| 1,105 MWe | 1983 | 1,641.0 | 54.3 | 3,410 | 3,375 | 0.99 | 2.06 |
| | 1984 | 1,431.9 | 54.2 | 3,172 | 1,954 | 0.62 | 1.36 |
| | 1985 | 368.2 | 11.9 | 2,854 | 1,164 | 0.41 | 3.16 |
| | 1986 | 0.0 | 0.0 | 3,074 | 1,054 | 0.34 | --- |
| | 1987 | 0.0 | 0.0 | 3,184 | 1,186 | 0.37 | --- |
| | 1988 | 0.0 | 0.0 | 3,390 | 1,158 | 0.34 | --- |
| | 1989 | 0.0 | 0.0 | 2,707 | 657 | 0.24 | --- |
| | 1990 | 0.0 | 0.0 | 2,725 | 1,311 | 0.48 | --- |
| | 1991 | 445.0 | 17.7 | 1,831 | 356 | 0.19 | 0.80 |
| | 1992 | 979.9 | 32.2 | 2,670 | 519 | 0.19 | 0.53 |
| | 1993 | 675.1 | 66.8 | 3,594 | 870 | 0.24 | 1.29 |
| | 1994 | 860.2 | 83.4 | 3,362 | 861 | 0.26 | 1.00 |
| | 1995 | 1,165.8 | 98.6 | 2,567 | 413 | 0.16 | 0.35 |
| | 1996 | 1,972.8 | 93.0 | 1,904 | 389 | 0.20 | 0.20 |
| | 1997 | 1,928.8 | 90.2 | 2,268 | 522 | 0.23 | 0.27 |
| | 1998 | 1,961.9 | 87.7 | 1,612 | 367.716 | 0.23 | 0.19 |
| | 1999 | 2,091.0 | 85.1 | 1,741 | 446.941 | 0.26 | 0.21 |
| | 2000 | 2,143.8 | 97.1 | 1,657 | 333.215 | 0.20 | 0.16 |
| | 2001 | 2,074.0 | 90.7 | 1,525 | 293.879 | 0.19 | 0.14 |
| | 2002 | 2,069.0 | 95.4 | 1,977 | 357.573 | 0.18 | 0.17 |
| | 2003 | 2,014.5 | 93.6 | 2,608 | 602.535 | 0.23 | 0.30 |
| | 2004 | 2,104.7 | 95.5 | 3,242 | 672.714 | 0.21 | 0.32 |
| | 2005 | 2,044.2 | 94.3 | 3,743 | 636.282 | 0.17 | 0.31 |
| | 2006 | 2,040.1 | 94.0 | 3,618 | 641.154 | 0.18 | 0.31 |
| | 2007 | 2,420.2 | 90.0 | 3,027 | 554.314 | 0.18 | 0.23 |
| | 2008 | 2,837.4 | 88.5 | 2,633 | 482.127 | 0.18 | 0.17 |
| **BRUNSWICK 1, 2** | 1976 | 297.2 | 56.0 | 1,265 | 326 | 0.26 | 1.10 |
| Docket 50-324, 50-325; | 1977 | 291.1 | 55.7 | 1,512 | 1,120 | 0.74 | 3.85 |
| DPR-62, -71 | 1978 | 1,173.1 | 83.7 | 1,458 | 1,004 | 0.69 | 0.86 |
| 1st commercial operation | 1979 | 810.0 | 60.1 | 2,891 | 2,602 | 0.90 | 3.21 |
| 3/77, 11/75 | 1980 | 687.2 | 52.2 | 3,788 | 3,870 | 1.02 | 5.63 |
| Type - BWRs | 1981 | 925.2 | 56.9 | 3,854 | 2,638 | 0.68 | 2.85 |
| Capacity - 938, 937 MWe | 1982 | 540.3 | 50.3 | 4,957 | 3,792 | 0.76 | 7.02 |
| | 1983 | 636.7 | 44.3 | 5,602 | 3,475 | 0.62 | 5.46 |
| | 1984 | 761.3 | 51.5 | 5,046 | 3,260 | 0.65 | 4.28 |
| | 1985 | 822.2 | 58.4 | 4,057 | 2,804 | 0.69 | 3.41 |
| | 1986 | 1,051.3 | 69.1 | 3,370 | 1,909 | 0.57 | 1.82 |
| | 1987 | 1,152.4 | 80.6 | 3,052 | 1,419 | 0.46 | 1.23 |
| | 1988 | 990.8 | 70.1 | 2,648 | 1,747 | 0.66 | 1.76 |
| | 1989 | 990.9 | 65.8 | 3,844 | 1,786 | 0.46 | 1.80 |
| | 1990 | 991.6 | 67.8 | 3,182 | 1,548 | 0.49 | 1.56 |
| | 1991 | 952.8 | 64.5 | 2,586 | 778 | 0.30 | 0.82 |
| | 1992 | 375.9 | 27.9 | 2,690 | 623 | 0.23 | 1.66 |
| | 1993 | 470.0 | 33.8 | 2,921 | 872 | 0.30 | 1.86 |

[2] All three Brown's Ferry units were placed on administrative hold in 1985. Units 2 & 3 were restarted in 1991 and 1995, respectively. Brown's Ferry Unit 1 was restarted during 2007.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **BRUNSWICK 1, 2** | 1994 | 1,268.4 | 83.0 | 3,049 | 999 | 0.33 | 0.79 |
| (continued) | 1995 | 1,411.7 | 92.9 | 2,657 | 683 | 0.26 | 0.48 |
| | 1996 | 1,261.1 | 85.9 | 2,784 | 716 | 0.26 | 0.57 |
| | 1997 | 1,474.0 | 94.1 | 2,212 | 411 | 0.19 | 0.28 |
| | 1998 | 1,521.0 | 94.3 | 2,005 | 395.526 | 0.20 | 0.26 |
| | 1999 | 1,494.7 | 92.8 | 1,818 | 418.417 | 0.23 | 0.28 |
| | 2000 | 1,571.2 | 95.6 | 1,648 | 321.785 | 0.20 | 0.20 |
| | 2001 | 1,576.0 | 95.8 | 1,623 | 302.812 | 0.19 | 0.19 |
| | 2002 | 1,568.0 | 94.5 | 1,743 | 275.534 | 0.16 | 0.18 |
| | 2003 | 1,676.9 | 95.6 | 1,794 | 248.622 | 0.14 | 0.15 |
| | 2004 | 1,690.6 | 94.5 | 2,140 | 244.577 | 0.11 | 0.14 |
| | 2005 | 1,654.9 | 92.2 | 1,944 | 305.978 | 0.16 | 0.19 |
| | 2006 | 1,661.2 | 90.0 | 2,103 | 280.465 | 0.13 | 0.17 |
| | 2007 | 1,714.9 | 92.0 | 2,186 | 290.093 | 0.13 | 0.17 |
| | 2008 | 1,694.5 | 91.7 | 2,546 | 354.212 | 0.14 | 0.21 |
| **BYRON 1, 2** | 1986 | 894.5 | 88.6 | 1,081 | 76 | 0.07 | 0.08 |
| Docket 50-454, 50-455; | 1987 | 650.9 | 70.9 | 1,826 | 769 | 0.42 | 1.18 |
| NPF-37, NPF-66 | 1988 | 1,534.7 | 86.3 | 1,222 | 459 | 0.38 | 0.30 |
| 1st commercial operation | 1989 | 1,812.6 | 90.2 | 1,109 | 172 | 0.16 | 0.09 |
| 9/85, 8/87 | 1990 | 1,567.3 | 78.8 | 1,396 | 434 | 0.31 | 0.28 |
| Type - PWRs | 1991 | 1,816.3 | 89.9 | 1,077 | 268 | 0.25 | 0.15 |
| Capacity - 1,152, 1,125 MWe | 1992 | 1,888.4 | 90.1 | 1,021 | 199 | 0.19 | 0.11 |
| | 1993 | 1,785.6 | 83.5 | 1,370 | 432 | 0.32 | 0.24 |
| | 1994 | 1,953.3 | 90.7 | 962 | 280 | 0.29 | 0.14 |
| | 1995 | 1,900.6 | 85.5 | 1,107 | 306 | 0.28 | 0.16 |
| | 1996 | 1,758.4 | 79.3 | 1,610 | 455 | 0.28 | 0.26 |
| | 1997 | 1,856.7 | 86.6 | 1,546 | 241 | 0.16 | 0.13 |
| | 1998 | 1,869.8 | 85.9 | 1,809 | 275.221 | 0.15 | 0.15 |
| | 1999 | 2,064.2 | 92.3 | 1,478 | 239.102 | 0.16 | 0.12 |
| | 2000 | 2,196.9 | 97.4 | 959 | 193.871 | 0.20 | 0.09 |
| | 2001 | 2,301.5 | 97.8 | 719 | 59.451 | 0.08 | 0.03 |
| | 2002 | 2,205.0 | 93.8 | 1,287 | 195.013 | 0.15 | 0.09 |
| | 2003 | 2,294.8 | 97.2 | 824 | 87.129 | 0.11 | 0.04 |
| | 2004 | 2,277.4 | 97.7 | 906 | 89.147 | 0.10 | 0.04 |
| | 2005 | 2,175.6 | 94.2 | 1,542 | 199.812 | 0.13 | 0.09 |
| | 2006 | 2,223.3 | 95.0 | 1,163 | 134.497 | 0.12 | 0.06 |
| | 2007 | 2,152.1 | 93.0 | 1,311 | 128.797 | 0.10 | 0.06 |
| | 2008 | 2,203.7 | 94.6 | 1,483 | 140.809 | 0.09 | 0.06 |
| **CALLAWAY 1** | 1985 | 967.4 | 90.0 | 964 | 36 | 0.04 | 0.04 |
| Docket 50-483; NPF-30 | 1986 | 865.2 | 81.3 | 1,052 | 225 | 0.21 | 0.26 |
| 1st commercial operation 12/84 | 1987 | 759.0 | 71.1 | 1,082 | 393 | 0.36 | 0.52 |
| Type - PWR | 1988 | 1,069.2 | 93.4 | 353 | 27 | 0.08 | 0.03 |
| Capacity - 1,190 MWe | 1989 | 1,000.3 | 85.4 | 1,055 | 283 | 0.27 | 0.28 |
| | 1990 | 960.7 | 84.1 | 1,134 | 442 | 0.39 | 0.46 |
| | 1991 | 1,193.1 | 99.7 | 280 | 21 | 0.07 | 0.02 |
| | 1992 | 967.5 | 83.0 | 1,133 | 336 | 0.30 | 0.35 |
| | 1993 | 1,002.9 | 86.4 | 1,126 | 225 | 0.20 | 0.22 |
| | 1994 | 1,196.4 | 100.0 | 191 | 14 | 0.07 | 0.01 |
| | 1995 | 989.6 | 84.7 | 1,062 | 187 | 0.18 | 0.19 |
| | 1996 | 1,066.0 | 90.5 | 980 | 248 | 0.25 | 0.23 |
| | 1997 | 1,022.2 | 100.0 | 248 | 12 | 0.05 | 0.01 |
| | 1998 | 972.2 | 91.3 | 929 | 200.729 | 0.22 | 0.21 |
| | 1999 | 981.3 | 88.7 | 1,098 | 320.554 | 0.29 | 0.33 |
| | 2000 | 1,137.5 | 99.8 | 244 | 16.058 | 0.07 | 0.01 |
| | 2001 | 954.5 | 86.7 | 873 | 106.782 | 0.12 | 0.11 |
| | 2002 | 955.0 | 86.2 | 983 | 95.648 | 0.10 | 0.10 |
| | 2003 | 1,104.3 | 96.2 | 252 | 8.297 | 0.03 | 0.01 |
| | 2004 | 892.8 | 78.9 | 1,124 | 120.621 | 0.11 | 0.14 |
| | 2005 | 913.2 | 80.7 | 1,600 | 222.629 | 0.14 | 0.24 |
| | 2006 | 1,152.8 | 95.0 | 225 | 6.308 | 0.03 | 0.01 |
| | 2007 | 1,069.7 | 89.0 | 1,079 | 73.236 | 0.07 | 0.07 |
| | 2008 | 1,067.6 | 89.8 | 729 | 45.738 | 0.06 | 0.04 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **CALVERT CLIFFS 1, 2** | 1976 | 753.4 | 95.2 | 507 | 74 | 0.15 | 0.10 |
| Docket 50-317, 50-318; | 1977 | 583.0 | 72.1 | 2,265 | 547 | 0.24 | 0.94 |
| DPR-53, -69 | 1978 | 1,188.5 | 75.8 | 1,391 | 500 | 0.36 | 0.42 |
| 1st commercial operation | 1979 | 1,161.0 | 74.0 | 1,428 | 805 | 0.56 | 0.69 |
| 5/75, 4/77 | 1980 | 1,309.9 | 84.1 | 1,496 | 677 | 0.45 | 0.52 |
| Type - PWRs | 1981 | 1,379.7 | 83.1 | 1,555 | 607 | 0.39 | 0.44 |
| Capacity - 870, 858 MWe | 1982 | 1,238.3 | 73.7 | 1,805 | 1,057 | 0.59 | 0.85 |
| | 1983 | 1,397.2 | 81.6 | 1,915 | 668 | 0.35 | 0.48 |
| | 1984 | 1,389.4 | 79.3 | 1,369 | 479 | 0.35 | 0.34 |
| | 1985 | 1,189.8 | 68.4 | 1,598 | 694 | 0.43 | 0.58 |
| | 1986 | 1,530.0 | 87.2 | 1,296 | 347 | 0.27 | 0.23 |
| | 1987 | 1,207.3 | 71.8 | 1,384 | 412 | 0.30 | 0.34 |
| | 1988 | 1,397.7 | 81.0 | 1,296 | 291 | 0.22 | 0.21 |
| | 1989 | 333.6 | 20.1 | 1,786 | 346 | 0.19 | 1.04 |
| | 1990 | 161.1 | 11.0 | 2,019 | 304 | 0.15 | 1.89 |
| | 1991 | 1,085.0 | 64.7 | 1,974 | 132 | 0.07 | 0.12 |
| | 1992 | 1,271.2 | 73.9 | 1,979 | 330 | 0.17 | 0.26 |
| | 1993 | 1,462.1 | 83.9 | 1,462 | 405 | 0.28 | 0.28 |
| | 1994 | 1,342.1 | 79.4 | 1,482 | 454 | 0.31 | 0.34 |
| | 1995 | 1,542.8 | 89.9 | 1,203 | 235 | 0.20 | 0.15 |
| | 1996 | 1,438.5 | 82.4 | 1,167 | 239 | 0.20 | 0.17 |
| | 1997 | 1,499.6 | 89.1 | 1,091 | 229 | 0.21 | 0.15 |
| | 1998 | 1,523.1 | 89.3 | 1,042 | 186.887 | 0.18 | 0.12 |
| | 1999 | 1,521.4 | 90.1 | 1,134 | 191.778 | 0.17 | 0.13 |
| | 2000 | 1,575.7 | 92.7 | 912 | 134.689 | 0.15 | 0.09 |
| | 2001 | 1,554.7 | 91.7 | 895 | 166.864 | 0.19 | 0.11 |
| | 2002 | 1,380.0 | 81.7 | 1,582 | 245.075 | 0.16 | 0.18 |
| | 2003 | 1,558.4 | 90.9 | 1,671 | 265.164 | 0.16 | 0.17 |
| | 2004 | 1,653.7 | 95.7 | 1,205 | 143.944 | 0.12 | 0.09 |
| | 2005 | 1,678.1 | 97.2 | 942 | 168.390 | 0.18 | 0.10 |
| | 2006 | 1,581.8 | 92.0 | 1,215 | 203.790 | 0.17 | 0.13 |
| | 2007 | 1,641.6 | 95.0 | 1,191 | 153.335 | 0.13 | 0.09 |
| | 2008 | 1,670.7 | 97.4 | 745 | 74.149 | 0.10 | 0.04 |
| **CATAWBA 1, 2** | 1986 | 638.9 | 49.9 | 1,724 | 286 | 0.17 | 0.45 |
| Docket 50-413, 50-414; | 1987 | 1,651.2 | 75.9 | 1,865 | 449 | 0.24 | 0.27 |
| NPF-35, -52 | 1988 | 1,675.2 | 77.2 | 2,009 | 556 | 0.28 | 0.33 |
| 1st commercial operation | 1989 | 1,733.6 | 79.5 | 1,660 | 334 | 0.20 | 0.19 |
| 6/85, 8/86 | 1990 | 1,616.3 | 70.8 | 2,174 | 809 | 0.37 | 0.50 |
| Type - PWRs | 1991 | 1,691.5 | 74.6 | 1,871 | 462 | 0.25 | 0.27 |
| Capacity - 1,129, 1,129 MWe | 1992 | 1,962.8 | 83.9 | 1,515 | 414 | 0.27 | 0.21 |
| | 1993 | 1,896.1 | 81.5 | 1,564 | 396 | 0.25 | 0.21 |
| | 1994 | 2,105.2 | 90.2 | 1,268 | 207 | 0.16 | 0.10 |
| | 1995 | 2,011.9 | 85.3 | 1,892 | 462 | 0.24 | 0.23 |
| | 1996 | 1,879.1 | 80.5 | 1,588 | 302 | 0.19 | 0.16 |
| | 1997 | 2,028.2 | 89.3 | 1,561 | 266 | 0.17 | 0.13 |
| | 1998 | 2,006.4 | 89.6 | 1,123 | 162.068 | 0.14 | 0.08 |
| | 1999 | 2,046.7 | 90.2 | 1,024 | 118.662 | 0.12 | 0.06 |
| | 2000 | 2,038.3 | 90.3 | 1,185 | 186.532 | 0.16 | 0.09 |
| | 2001 | 2,119.9 | 92.9 | 960 | 116.241 | 0.12 | 0.06 |
| | 2002 | 2,238.0 | 97.2 | 884 | 81.325 | 0.09 | 0.04 |
| | 2003 | 1,991.8 | 89.2 | 1,409 | 210.617 | 0.15 | 0.11 |
| | 2004 | 2,111.4 | 93.0 | 1,123 | 122.831 | 0.11 | 0.06 |
| | 2005 | 2,194.5 | 96.0 | 1,019 | 83.679 | 0.08 | 0.04 |
| | 2006 | 1,928.6 | 85.0 | 1,792 | 212.570 | 0.12 | 0.11 |
| | 2007 | 2,102.5 | 92.0 | 1,399 | 144.218 | 0.10 | 0.07 |
| | 2008 | 2,160.3 | 93.5 | 1,110 | 85.080 | 0.08 | 0.04 |
| **CLINTON** | 1988 | 701.3 | 84.2 | 769 | 130 | 0.17 | 0.19 |
| Docket 50-461; NPF-62 | 1989 | 348.3 | 48.5 | 1,196 | 372 | 0.31 | 1.07 |
| 1st commercial operation 11/87 | 1990 | 435.8 | 55.1 | 1,390 | 553 | 0.40 | 1.27 |
| Type - BWR | 1991 | 722.7 | 80.8 | 1,010 | 233 | 0.23 | 0.32 |
| Capacity - 1,022 MWe | 1992 | 589.7 | 68.6 | 1,195 | 431 | 0.36 | 0.73 |
| | 1993 | 701.5 | 79.6 | 1,253 | 498 | 0.40 | 0.71 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **CLINTON** | 1994 | 883.3 | 94.8 | 409 | 63 | 0.15 | 0.07 |
| (continued) | 1995 | 731.1 | 83.0 | 1,182 | 316 | 0.27 | 0.43 |
| | 1996 | 634.7 | 66.7 | 1,154 | 350 | 0.30 | 0.55 |
| | 1997 | 0.0 | 0.0 | 738 | 172 | 0.23 | --- |
| | 1998 | 0.0 | 0.0 | 866 | 144.140 | 0.17 | --- |
| | 1999 | 537.0 | 63.5 | 637 | 87.489 | 0.14 | 0.16 |
| | 2000 | 784.2 | 87.8 | 1,248 | 253.382 | 0.20 | 0.32 |
| | 2001 | 896.8 | 98.5 | 329 | 33.770 | 0.10 | 0.04 |
| | 2002 | 872.0 | 90.5 | 1,418 | 208.094 | 0.15 | 0.24 |
| | 2003 | 990.5 | 99.1 | 372 | 57.118 | 0.15 | 0.06 |
| | 2004 | 910.8 | 92.6 | 1,622 | 282.833 | 0.17 | 0.31 |
| | 2005 | 989.1 | 97.4 | 298 | 36.019 | 0.12 | 0.04 |
| | 2006 | 939.9 | 92.0 | 1,649 | 295.720 | 0.18 | 0.32 |
| | 2007 | 1,049.2 | 100.0 | 310 | 30.618 | 0.10 | 0.03 |
| | 2008 | 973.0 | 93.3 | 1,381 | 205.086 | 0.15 | 0.21 |
| **COLUMBIA GENERATING**[3] | 1985 | 616.0 | 87.6 | 755 | 119 | 0.16 | 0.19 |
| Docket 50-397; NPF-21 | 1986 | 616.0 | 74.4 | 1,013 | 222 | 0.22 | 0.36 |
| 1st commercial operation 12/84 | 1987 | 639.0 | 70.8 | 1,201 | 406 | 0.34 | 0.64 |
| Type - BWR | 1988 | 707.7 | 71.8 | 1,050 | 353 | 0.34 | 0.50 |
| Capacity - 1,107 MWe | 1989 | 727.2 | 78.3 | 1,299 | 492 | 0.38 | 0.68 |
| | 1990 | 684.7 | 67.5 | 1,348 | 536 | 0.40 | 0.78 |
| | 1991 | 508.5 | 50.3 | 1,088 | 387 | 0.36 | 0.76 |
| | 1992 | 682.3 | 65.6 | 1,489 | 612 | 0.41 | 0.90 |
| | 1993 | 849.6 | 79.5 | 1,385 | 469 | 0.34 | 0.55 |
| | 1994 | 803.8 | 75.2 | 1,870 | 866 | 0.46 | 1.08 |
| | 1995 | 824.7 | 83.8 | 1,694 | 456 | 0.27 | 0.55 |
| | 1996 | 662.9 | 82.2 | 1,453 | 373 | 0.26 | 0.56 |
| | 1997 | 697.0 | 72.7 | 1,218 | 251 | 0.21 | 0.36 |
| | 1998 | 789.5 | 75.3 | 1,220 | 286.020 | 0.23 | 0.36 |
| | 1999 | 694.7 | 70.0 | 1,022 | 155.109 | 0.15 | 0.22 |
| | 2000 | 979.6 | 96.3 | 706 | 53.152 | 0.08 | 0.05 |
| | 2001 | 939.3 | 88.1 | 1,515 | 226.675 | 0.15 | 0.24 |
| | 2002 | 1,023.0 | 97.5 | 647 | 46.650 | 0.07 | 0.05 |
| | 2003 | 866.9 | 81.8 | 1,618 | 205.225 | 0.13 | 0.24 |
| | 2004 | 1,022.5 | 94.6 | 716 | 66.130 | 0.09 | 0.06 |
| | 2005 | 938.3 | 87.3 | 1,718 | 325.025 | 0.19 | 0.35 |
| | 2006 | 1,064.9 | 98.0 | 623 | 55.817 | 0.09 | 0.05 |
| | 2007 | 925.6 | 87.0 | 2,147 | 306.443 | 0.14 | 0.33 |
| | 2008 | 1,055.3 | 98.3 | 715 | 54.957 | 0.08 | 0.05 |
| **COMANCHE PEAK 1, 2** | 1991 | 644.4 | 82.2 | 985 | 148 | 0.15 | 0.23 |
| Docket 50-445, 50-446; | 1992 | 830.8 | 84.0 | 1,128 | 188 | 0.17 | 0.23 |
| NPF-87, 89 | 1993 | 853.8 | 81.2 | 945 | 109 | 0.12 | 0.13 |
| 1st commercial operation | 1994 | 1,750.0 | 93.7 | 970 | 90 | 0.09 | 0.05 |
| 8/90, 8/93 | 1995 | 2,022.6 | 92.5 | 951 | 179 | 0.19 | 0.09 |
| Type - PWR | 1996 | 1,804.8 | 81.4 | 1,462 | 288 | 0.20 | 0.16 |
| Capacity - 1,150, 1,150 MWe | 1997 | 2,002.4 | 93.4 | 870 | 146 | 0.17 | 0.07 |
| | 1998 | 2,037.8 | 94.9 | 967 | 232.026 | 0.24 | 0.11 |
| | 1999 | 1,981.5 | 90.9 | 1,316 | 251.276 | 0.19 | 0.13 |
| | 2000 | 2,104.7 | 95.3 | 759 | 77.679 | 0.10 | 0.04 |
| | 2001 | 2,085.9 | 94.7 | 853 | 114.968 | 0.13 | 0.06 |
| | 2002 | 1,887.0 | 86.9 | 1,106 | 225.317 | 0.20 | 0.12 |
| | 2003 | 2,020.6 | 91.6 | 639 | 66.313 | 0.10 | 0.03 |
| | 2004 | 2,169.5 | 95.1 | 864 | 135.388 | 0.16 | 0.06 |
| | 2005 | 2,099.6 | 91.5 | 1,365 | 242.481 | 0.18 | 0.12 |
| | 2006 | 2,271.3 | 97.0 | 686 | 59.959 | 0.09 | 0.03 |
| | 2007 | 2,151.3 | 93.0 | 1,616 | 219.799 | 0.14 | 0.10 |
| | 2008 | 2,189.7 | 94.3 | 1,037 | 168.836 | 0.16 | 0.08 |

[3] Energy Northwest has changed the name of Washington Nuclear 2 to Columbia Generating Station.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **COOK 1, 2** | 1976 | 807.4 | 83.1 | 395 | 116 | 0.29 | 0.14 |
| Docket 50-315; DPR-58, -74 | 1977 | 573.0 | 76.1 | 802 | 300 | 0.37 | 0.52 |
| 1st commercial operation | 1978 | 744.8 | 73.6 | 778 | 336 | 0.43 | 0.45 |
| 8/75, 7/78 | 1979 | 1,373.0 | 65.3 | 1,445 | 718 | 0.50 | 0.52 |
| Type - PWRs | 1980 | 1,552.4 | 74.1 | 1,345 | 493 | 0.37 | 0.32 |
| Capacity - 1,030, 1,077 MWe | 1981 | 1,557.3 | 73.4 | 1,341 | 656 | 0.49 | 0.42 |
| | 1982 | 1,461.6 | 69.8 | 1,527 | 699 | 0.46 | 0.48 |
| | 1983 | 1,456.5 | 71.2 | 1,418 | 658 | 0.46 | 0.45 |
| | 1984 | 1,526.0 | 75.3 | 1,559 | 762 | 0.49 | 0.50 |
| | 1985 | 925.4 | 47.6 | 1,984 | 945 | 0.48 | 1.02 |
| | 1986 | 1,307.1 | 73.4 | 1,774 | 745 | 0.42 | 0.57 |
| | 1987 | 1,199.5 | 70.2 | 1,696 | 666 | 0.39 | 0.56 |
| | 1988 | 1,160.4 | 63.5 | 2,266 | 867 | 0.38 | 0.75 |
| | 1989 | 1,433.1 | 72.8 | 1,575 | 493 | 0.31 | 0.34 |
| | 1990 | 1,318.5 | 67.9 | 1,851 | 580 | 0.31 | 0.44 |
| | 1991 | 1,837.4 | 90.2 | 815 | 69 | 0.08 | 0.04 |
| | 1992 | 760.9 | 50.8 | 1,954 | 492 | 0.25 | 0.65 |
| | 1993 | 1,927.7 | 98.5 | 587 | 44 | 0.07 | 0.02 |
| | 1994 | 1,105.2 | 65.2 | 1,748 | 479 | 0.27 | 0.43 |
| | 1995 | 1,656.0 | 82.1 | 1,310 | 203 | 0.15 | 0.12 |
| | 1996 | 1,938.9 | 92.7 | 1,114 | 214 | 0.19 | 0.11 |
| | 1997 | 1,189.7 | 59.7 | 1,864 | 550 | 0.30 | 0.46 |
| | 1998 | 0.0 | 0.0 | 1,155 | 104.638 | 0.09 | --- |
| | 1999 | 0.0 | 0.0 | 1,662 | 171.479 | 0.10 | --- |
| | 2000 | 560.1 | 28.1 | 2,506 | 337.584 | 0.14 | 0.60 |
| | 2001 | 1,794.3 | 89.2 | 423 | 27.290 | 0.06 | 0.02 |
| | 2002 | 1,756.0 | 87.3 | 1,624 | 278.001 | 0.17 | 0.16 |
| | 2003 | 1,557.6 | 75.7 | 1,408 | 209.526 | 0.15 | 0.13 |
| | 2004 | 1,909.2 | 91.4 | 1,015 | 156.213 | 0.15 | 0.08 |
| | 2005 | 1,989.0 | 95.0 | 852 | 91.192 | 0.11 | 0.05 |
| | 2006 | 1,790.5 | 86.0 | 1,780 | 312.214 | 0.18 | 0.17 |
| | 2007 | 1,983.7 | 93.0 | 1,310 | 238.829 | 0.18 | 0.12 |
| | 2008 | 1,711.8 | 80.8 | 971 | 76.460 | 0.08 | 0.05 |
| **COOPER STATION** | 1975 | 456.4 | 83.6 | 579 | 117 | 0.20 | 0.26 |
| Docket 50-298; DPR-46 | 1976 | 433.3 | 75.5 | 763 | 350 | 0.46 | 0.81 |
| 1st commercial operation 7/74 | 1977 | 538.2 | 86.2 | 315 | 198 | 0.63 | 0.37 |
| Type - BWR | 1978 | 576.0 | 91.0 | 297 | 158 | 0.53 | 0.27 |
| Capacity - 769 MWe | 1979 | 591.0 | 87.6 | 426 | 221 | 0.52 | 0.37 |
| | 1980 | 448.3 | 71.2 | 785 | 859 | 1.09 | 1.92 |
| | 1981 | 457.1 | 71.2 | 935 | 579 | 0.62 | 1.27 |
| | 1982 | 622.3 | 84.6 | 743 | 542 | 0.73 | 0.87 |
| | 1983 | 396.6 | 63.3 | 1,383 | 1,293 | 0.93 | 3.26 |
| | 1984 | 411.9 | 67.2 | 1,598 | 799 | 0.50 | 1.94 |
| | 1985 | 127.3 | 21.5 | 1,980 | 1,333 | 0.67 | 10.47 |
| | 1986 | 480.0 | 74.7 | 895 | 320 | 0.36 | 0.67 |
| | 1987 | 652.3 | 96.2 | 549 | 103 | 0.19 | 0.16 |
| | 1988 | 493.4 | 67.9 | 942 | 251 | 0.27 | 0.51 |
| | 1989 | 564.3 | 76.2 | 1,202 | 343 | 0.29 | 0.61 |
| | 1990 | 602.0 | 79.4 | 1,174 | 379 | 0.32 | 0.63 |
| | 1991 | 566.3 | 78.8 | 1,099 | 405 | 0.37 | 0.72 |
| | 1992 | 731.0 | 96.4 | 463 | 84 | 0.18 | 0.11 |
| | 1993 | 436.1 | 58.8 | 1,130 | 391 | 0.35 | 0.90 |
| | 1994 | 262.2 | 35.1 | 333 | 79 | 0.24 | 0.30 |
| | 1995 | 486.5 | 66.8 | 1,095 | 228 | 0.21 | 0.47 |
| | 1996 | 742.1 | 97.9 | 468 | 48 | 0.10 | 0.06 |
| | 1997 | 622.8 | 84.4 | 1,125 | 174 | 0.16 | 0.28 |
| | 1998 | 555.9 | 75.9 | 977 | 181.858 | 0.19 | 0.33 |
| | 1999 | 743.2 | 98.1 | 318 | 47.815 | 0.15 | 0.06 |
| | 2000 | 539.2 | 74.2 | 963 | 199.589 | 0.21 | 0.37 |
| | 2001 | 592.7 | 80.9 | 1,309 | 168.665 | 0.13 | 0.28 |
| | 2002 | 719.0 | 98.6 | 362 | 38.739 | 0.11 | 0.05 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **COOPER STATION** | 2003 | 511.4 | 74.1 | 882 | 135.249 | 0.15 | 0.26 |
| (continued) | 2004 | 702.6 | 94.7 | 481 | 47.064 | 0.10 | 0.07 |
| | 2005 | 670.8 | 89.4 | 1,266 | 275.652 | 0.22 | 0.41 |
| | 2006 | 674.7 | 90.0 | 1,265 | 270.135 | 0.21 | 0.40 |
| | 2007 | 761.6 | 99.0 | 730 | 49.902 | 0.07 | 0.07 |
| | 2008 | 679.0 | 89.9 | 1,715 | 359.926 | 0.21 | 0.53 |
| **CRYSTAL RIVER 3** | 1978 | 311.5 | 41.4 | 643 | 321 | 0.50 | 1.03 |
| Docket 50-302; DPR-72 | 1979 | 453.0 | 58.9 | 1,150 | 495 | 0.43 | 1.09 |
| 1st commercial operation 3/77 | 1980 | 404.1 | 53.2 | 1,053 | 625 | 0.59 | 1.55 |
| Type - PWR | 1981 | 490.4 | 62.2 | 1,120 | 408 | 0.36 | 0.83 |
| Capacity - 838 MWe | 1982 | 589.8 | 76.0 | 780 | 177 | 0.23 | 0.30 |
| | 1983 | 452.1 | 58.8 | 1,720 | 552 | 0.32 | 1.22 |
| | 1984 | 774.2 | 94.5 | 549 | 49 | 0.09 | 0.06 |
| | 1985 | 344.2 | 47.6 | 1,976 | 689 | 0.35 | 2.00 |
| | 1986 | 319.5 | 41.8 | 1,057 | 472 | 0.45 | 1.48 |
| | 1987 | 436.0 | 60.9 | 1,384 | 488 | 0.35 | 1.12 |
| | 1988 | 690.2 | 84.0 | 569 | 64 | 0.11 | 0.09 |
| | 1989 | 352.8 | 48.8 | 880 | 234 | 0.27 | 0.66 |
| | 1990 | 497.8 | 63.8 | 1,441 | 476 | 0.33 | 0.96 |
| | 1991 | 654.6 | 82.0 | 821 | 116 | 0.14 | 0.18 |
| | 1992 | 632.1 | 76.1 | 1,403 | 424 | 0.30 | 0.67 |
| | 1993 | 722.4 | 85.0 | 683 | 60 | 0.09 | 0.08 |
| | 1994 | 711.9 | 84.3 | 1,079 | 228 | 0.21 | 0.32 |
| | 1995 | 866.3 | 100.0 | 209 | 8 | 0.04 | 0.01 |
| | 1996 | 290.8 | 37.7 | 1,192 | 353 | 0.30 | 1.21 |
| | 1997 | 0.0 | 0.0 | 973 | 179 | 0.18 | --- |
| | 1998 | 739.9 | 90.3 | 313 | 19.298 | 0.06 | 0.03 |
| | 1999 | 727.5 | 87.8 | 1,324 | 251.077 | 0.19 | 0.35 |
| | 2000 | 819.4 | 97.6 | 257 | 14.649 | 0.06 | 0.02 |
| | 2001 | 741.6 | 89.2 | 902 | 147.946 | 0.16 | 0.20 |
| | 2002 | 831.0 | 99.4 | 128 | 5.039 | 0.04 | 0.01 |
| | 2003 | 749.0 | 90.8 | 961 | 126.554 | 0.13 | 0.17 |
| | 2004 | 831.4 | 98.1 | 131 | 4.044 | 0.03 | 0.0 |
| | 2005 | 723.0 | 88.5 | 939 | 122.608 | 0.13 | 0.17 |
| | 2006 | 793.8 | 95.0 | 138 | 4.474 | 0.03 | 0.01 |
| | 2007 | 761.7 | 91.0 | 1,135 | 184.554 | 0.16 | 0.24 |
| | 2008 | 796.9 | 93.7 | 282 | 16.110 | 0.06 | 0.02 |
| **DAVIS-BESSE 1** | 1978 | 326.4 | 48.7 | 421 | 48 | 0.11 | 0.15 |
| Docket 50-346; NPF-3 | 1979 | 381.0 | 67.0 | 304 | 30 | 0.10 | 0.08 |
| 1st commercial operation 7/78 | 1980 | 256.4 | 36.2 | 1,283 | 154 | 0.12 | 0.60 |
| Type - PWR | 1981 | 531.4 | 67.4 | 578 | 58 | 0.10 | 0.11 |
| Capacity - 879 MWe | 1982 | 390.8 | 51.5 | 1,350 | 164 | 0.12 | 0.42 |
| | 1983 | 592.1 | 73.0 | 718 | 80 | 0.11 | 0.14 |
| | 1984 | 518.5 | 62.5 | 1,088 | 177 | 0.16 | 0.34 |
| | 1985 | 238.3 | 31.2 | 718 | 71 | 0.10 | 0.30 |
| | 1986 | 3.3 | 1.3 | 981 | 124 | 0.13 | 37.58 |
| | 1987 | 618.0 | 89.6 | 625 | 47 | 0.08 | 0.08 |
| | 1988 | 144.1 | 27.1 | 1,183 | 307 | 0.26 | 2.13 |
| | 1989 | 880.0 | 98.6 | 404 | 38 | 0.09 | 0.04 |
| | 1990 | 500.0 | 56.7 | 1,377 | 489 | 0.36 | 0.98 |
| | 1991 | 703.6 | 81.8 | 1,000 | 216 | 0.22 | 0.31 |
| | 1992 | 915.2 | 100.0 | 287 | 19 | 0.07 | 0.02 |
| | 1993 | 729.5 | 83.4 | 1,244 | 348 | 0.28 | 0.48 |
| | 1994 | 768.4 | 88.0 | 861 | 144 | 0.17 | 0.19 |
| | 1995 | 920.4 | 100.0 | 256 | 7 | 0.03 | 0.01 |
| | 1996 | 775.8 | 85.3 | 949 | 167 | 0.18 | 0.22 |
| | 1997 | 820.0 | 94.0 | 213 | 10 | 0.05 | 0.01 |
| | 1998 | 699.8 | 83.2 | 980 | 155.269 | 0.16 | 0.22 |
| | 1999 | 841.3 | 95.6 | 397 | 27.951 | 0.07 | 0.03 |
| | 2000 | 770.8 | 87.3 | 1,109 | 168.044 | 0.15 | 0.22 |
| | 2001 | 875.6 | 100.0 | 119 | 5.505 | 0.05 | 0.01 |
| | 2002 | 106.0 | 12.6 | 1,983 | 402.766 | 0.20 | 3.81 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **DAVIS-BESSE 1** | 2003 | 0.0 | 0.0 | 1,047 | 219.696 | 0.21 | --- |
| (continued) | 2004 | 657.8 | 77.6 | 161 | 6.594 | 0.04 | 0.01 |
| | 2005 | 817.1 | 93.3 | 577 | 51.332 | 0.09 | 0.06 |
| | 2006 | 727.8 | 84.0 | 1,331 | 204.201 | 0.15 | 0.28 |
| | 2007 | 879.7 | 100.0 | 189 | 7.088 | 0.04 | 0.01 |
| | 2008 | 777.5 | 89.4 | 985 | 106.603 | 0.11 | 0.14 |
| **DIABLO CANYON 1, 2** | 1986 | 641.5 | 80.6 | 1,260 | 304 | 0.24 | 0.47 |
| Docket 50-275, 50-323; | 1987 | 1,688.6 | 83.0 | 1,170 | 336 | 0.29 | 0.20 |
| DPR-80, DPR-82 | 1988 | 1,386.1 | 67.6 | 1,826 | 877 | 0.48 | 0.63 |
| 1st commercial operation | 1989 | 1,899.0 | 87.5 | 1,646 | 465 | 0.28 | 0.24 |
| 5/85, 3/86 | 1990 | 1,952.6 | 91.0 | 1,441 | 323 | 0.22 | 0.17 |
| Type - PWRs | 1991 | 1,809.6 | 83.8 | 2,040 | 546 | 0.27 | 0.30 |
| Capacity - 1,122, 1,118 MWe | 1992 | 1,995.7 | 90.9 | 1,850 | 459 | 0.25 | 0.23 |
| | 1993 | 2,008.6 | 91.4 | 1,508 | 281 | 0.19 | 0.14 |
| | 1994 | 1,832.6 | 83.3 | 2,317 | 590 | 0.25 | 0.32 |
| | 1995 | 1,950.3 | 90.0 | 1,615 | 286 | 0.18 | 0.15 |
| | 1996 | 2,003.6 | 90.7 | 1,462 | 176 | 0.12 | 0.09 |
| | 1997 | 1,948.7 | 92.7 | 1,331 | 219 | 0.17 | 0.11 |
| | 1998 | 1,955.1 | 92.8 | 1,313 | 173.238 | 0.13 | 0.09 |
| | 1999 | 1,902.8 | 90.1 | 1,566 | 448.634 | 0.29 | 0.24 |
| | 2000 | 1,940.1 | 92.0 | 1,057 | 180.792 | 0.17 | 0.09 |
| | 2001 | 2,067.7 | 96.4 | 1,074 | 117.804 | 0.11 | 0.06 |
| | 2002 | 1,860.0 | 88.4 | 1,016 | 148.690 | 0.15 | 0.08 |
| | 2003 | 1,970.7 | 91.6 | 1,004 | 135.482 | 0.13 | 0.07 |
| | 2004 | 1,736.3 | 83.5 | 1,230 | 254.367 | 0.21 | 0.15 |
| | 2005 | 2,022.4 | 94.8 | 955 | 124.469 | 0.13 | 0.06 |
| | 2006 | 2,109.0 | 94.0 | 1,086 | 82.248 | 0.08 | 0.04 |
| | 2007 | 2,131.4 | 95.0 | 1,269 | 111.866 | 0.09 | 0.05 |
| | 2008 | 1,952.1 | 87.7 | 2,121 | 235.034 | 0.11 | 0.12 |
| **DRESDEN 1[4], 2, 3** | 1969 | 99.7 | | | 286 | | 2.87 |
| Docket 50-010, 50-237, 50-249; | 1970 | 163.1 | | | 143 | | 0.88 |
| DPR-2, -19, -25 | 1971 | 394.5 | | | 715 | | 1.81 |
| 1st commercial operation 7/60, | 1972 | 1,243.7 | | | 728 | | 0.59 |
| 6/70, 11/71 | 1973 | 1,112.2 | | 1,341 | 939 | 0.70 | 0.84 |
| Type - BWRs | 1974 | 842.5 | 54.9 | 1,594 | 1,662 | 1.04 | 1.97 |
| Capacity - (197), 850, 850 MWe | 1975 | 708.1 | 54.6 | 2,310 | 3,423 | 1.48 | 4.83 |
| | 1976 | 1,127.2 | 80.8 | 1,746 | 1,680 | 0.96 | 1.49 |
| | 1977 | 1,132.9 | 77.0 | 1,862 | 1,694 | 0.91 | 1.50 |
| | 1978 | 1,242.2 | 79.5 | 1,946 | 1,529 | 0.79 | 1.23 |
| | 1979 | 1,013.0 | 74.7 | 2,407 | 1,800 | 0.75 | 1.78 |
| | 1980 | 1,074.4 | 55.0 | 2,717 | 2,105 | 0.77 | 1.96 |
| | 1981 | 1,035.7 | 51.5 | 2,331 | 2,802 | 1.20 | 2.71 |
| | 1982 | 1,085.3 | 77.9 | 2,572 | 2,923 | 1.14 | 2.69 |
| | 1983 | 913.6 | 65.6 | 2,854 | 3,582 | 1.26 | 3.92 |
| | 1984 | 789.8 | 55.3 | 2,261 | 1,774 | 0.78 | 2.25 |
| | 1985 | 903.0 | 64.5 | 2,817 | 1,686 | 0.60 | 1.87 |
| | 1986 | 740.5 | 52.6 | 3,111 | 2,668 | 0.86 | 3.60 |
| | 1987 | 933.9 | 74.0 | 2,052 | 1,145 | 0.56 | 1.23 |
| | 1988 | 1,014.7 | 75.8 | 2,414 | 1,409 | 0.58 | 1.39 |
| | 1989 | 1,184.2 | 83.1 | 2,259 | 1,131 | 0.50 | 0.96 |
| | 1990 | 1,107.8 | 76.6 | 2,235 | 1,400 | 0.63 | 1.26 |
| | 1991 | 675.2 | 60.7 | 2,044 | 1,005 | 0.49 | 1.49 |
| | 1992 | 872.4 | 75.4 | 1,812 | 619 | 0.34 | 0.71 |
| | 1993 | 960.1 | 68.5 | 2,751 | 1,655 | 0.60 | 1.72 |
| | 1994 | 690.2 | 51.7 | 2,336 | 833 | 0.36 | 1.21 |
| | 1995 | 643.1 | 49.8 | 2,482 | 875 | 0.35 | 1.36 |
| | 1996 | 612.6 | 47.7 | 1,788 | 456 | 0.26 | 0.74 |
| | 1997 | 1,096.2 | 79.5 | 2,747 | 467 | 0.17 | 0.43 |

[4] Dresden 1 has been shut down since 1978, and in 1985, it was decided that it would not be put in commercial operation again. Therefore, it is no longer included in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **DRESDEN 1[4], 2, 3** | 1998 | 1,354.7 | 90.6 | 2,311 | 426.918 | 0.18 | 0.32 |
| (continued) | 1999 | 1,410.9 | 92.5 | 3,243 | 591.443 | 0.18 | 0.42 |
| | 2000 | 1,506.4 | 97.3 | 2,341 | 261.684 | 0.11 | 0.17 |
| | 2001 | 1,427.4 | 94.5 | 2,769 | 400.702 | 0.14 | 0.28 |
| | 2002 | 1,547.0 | 95.7 | 2,819 | 355.011 | 0.13 | 0.23 |
| | 2003 | 1,555.9 | 93.5 | 2,098 | 356.572 | 0.17 | 0.23 |
| | 2004 | 1,405.5 | 84.8 | 2,044 | 381.054 | 0.19 | 0.27 |
| | 2005 | 1,550.8 | 92.0 | 2,006 | 258.799 | 0.13 | 0.17 |
| | 2006 | 1,649.0 | 96.0 | 2,042 | 289.167 | 0.14 | 0.18 |
| | 2007 | 1,658.8 | 97.0 | 2,310 | 275.697 | 0.12 | 0.17 |
| | 2008 | 1,638.0 | 95.9 | 2,307 | 198.153 | 0.09 | 0.12 |
| **DUANE ARNOLD** | 1976 | 305.2 | 78.0 | 350 | 105 | 0.30 | 0.34 |
| Docket 50-331; DPR-49 | 1977 | 353.6 | 78.9 | 538 | 299 | 0.56 | 0.85 |
| 1st commercial operation 2/75 | 1978 | 149.2 | 33.2 | 1,112 | 974 | 0.88 | 6.53 |
| Type - BWR | 1979 | 352.0 | 78.0 | 757 | 275 | 0.36 | 0.78 |
| Capacity - 593 MWe | 1980 | 339.1 | 73.3 | 1,108 | 671 | 0.61 | 1.98 |
| | 1981 | 277.7 | 69.8 | 1,286 | 790 | 0.61 | 2.84 |
| | 1982 | 278.5 | 74.7 | 524 | 229 | 0.44 | 0.82 |
| | 1983 | 283.0 | 62.9 | 1,468 | 1,135 | 0.77 | 4.01 |
| | 1984 | 329.4 | 72.9 | 611 | 189 | 0.31 | 0.57 |
| | 1985 | 236.2 | 53.8 | 1,414 | 1,112 | 0.79 | 4.71 |
| | 1986 | 365.5 | 82.0 | 476 | 187 | 0.39 | 0.51 |
| | 1987 | 308.4 | 64.7 | 1,094 | 667 | 0.61 | 2.16 |
| | 1988 | 386.5 | 75.2 | 1,136 | 614 | 0.54 | 1.59 |
| | 1989 | 388.5 | 79.0 | 425 | 194 | 0.46 | 0.50 |
| | 1990 | 367.4 | 75.8 | 1,460 | 861 | 0.59 | 2.34 |
| | 1991 | 503.7 | 94.5 | 336 | 202 | 0.60 | 0.40 |
| | 1992 | 416.5 | 81.9 | 1,043 | 502 | 0.48 | 1.21 |
| | 1993 | 393.4 | 79.5 | 1,043 | 407 | 0.39 | 1.03 |
| | 1994 | 498.6 | 94.0 | 493 | 120 | 0.24 | 0.24 |
| | 1995 | 452.5 | 83.8 | 1,129 | 357 | 0.32 | 0.79 |
| | 1996 | 476.8 | 90.7 | 1,093 | 270 | 0.25 | 0.57 |
| | 1997 | 474.4 | 94.4 | 352 | 63 | 0.18 | 0.13 |
| | 1998 | 438.3 | 86.6 | 1,019 | 236.693 | 0.23 | 0.54 |
| | 1999 | 416.6 | 84.3 | 834 | 201.196 | 0.24 | 0.48 |
| | 2000 | 507.3 | 98.4 | 317 | 44.181 | 0.14 | 0.09 |
| | 2001 | 439.5 | 86.8 | 898 | 137.564 | 0.15 | 0.31 |
| | 2002 | 522.0 | 94.4 | 319 | 35.061 | 0.11 | 0.07 |
| | 2003 | 455.2 | 84.8 | 829 | 124.402 | 0.15 | 0.27 |
| | 2004 | 561.2 | 98.3 | 220 | 18.993 | 0.09 | 0.03 |
| | 2005 | 517.4 | 90.5 | 879 | 139.622 | 0.16 | 0.27 |
| | 2006 | 581.7 | 99.0 | 254 | 29.392 | 0.12 | 0.05 |
| | 2007 | 515.8 | 88.0 | 1,062 | 183.609 | 0.17 | 0.36 |
| | 2008 | 601.4 | 100.0 | 276 | 24.187 | 0.09 | 0.04 |
| **FARLEY 1, 2** | 1978 | 713.8 | 86.5 | 527 | 108 | 0.20 | 0.15 |
| Docket 50-348, 50-364; | 1979 | 211.0 | 28.6 | 1,227 | 643 | 0.52 | 3.05 |
| NPF-2, -8 | 1980 | 557.3 | 69.3 | 1,330 | 435 | 0.33 | 0.78 |
| 1st commercial operation | 1981 | 310.2 | 41.4 | 1,331 | 512 | 0.38 | 1.65 |
| 12/77, 7/81 | 1982 | 1,271.5 | 79.2 | 1,453 | 484 | 0.33 | 0.38 |
| Type - PWRs | 1983 | 1,356.5 | 83.0 | 1,938 | 1,021 | 0.53 | 0.75 |
| Capacity - 851, 860 MWe | 1984 | 1,447.0 | 86.6 | 2,046 | 902 | 0.44 | 0.62 |
| | 1985 | 1,368.2 | 81.1 | 2,551 | 799 | 0.31 | 0.58 |
| | 1986 | 1,409.4 | 83.8 | 2,314 | 858 | 0.37 | 0.61 |
| | 1987 | 1,369.7 | 84.7 | 1,871 | 598 | 0.32 | 0.44 |
| | 1988 | 1,567.7 | 92.3 | 1,840 | 552 | 0.30 | 0.35 |
| | 1989 | 1,402.9 | 84.6 | 2,206 | 749 | 0.34 | 0.53 |
| | 1990 | 1,464.0 | 86.7 | 1,700 | 457 | 0.27 | 0.31 |
| | 1991 | 1,464.0 | 88.1 | 1,645 | 648 | 0.39 | 0.44 |

[4] Dresden 1 has been shut down since 1978, and in 1985, it was decided that it would not be put in commercial operation again. Therefore, it is no longer included in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **FARLEY 1, 2** | 1992 | 1,331.7 | 81.8 | 2,018 | 805 | 0.40 | 0.60 |
| (continued) | 1993 | 1,455.5 | 88.3 | 1,284 | 333 | 0.26 | 0.23 |
| | 1994 | 1,587.2 | 93.0 | 1,035 | 250 | 0.24 | 0.16 |
| | 1995 | 1,311.2 | 83.8 | 1,574 | 460 | 0.29 | 0.35 |
| | 1996 | 1,549.2 | 90.9 | 1,150 | 232 | 0.20 | 0.15 |
| | 1997 | 1,449.7 | 89.0 | 1,105 | 278 | 0.25 | 0.19 |
| | 1998 | 1,313.9 | 80.9 | 1,380 | 431.821 | 0.31 | 0.33 |
| | 1999 | 1,436.0 | 91.4 | 1,102 | 190.463 | 0.17 | 0.13 |
| | 2000 | 1,430.1 | 88.6 | 1,683 | 359.855 | 0.21 | 0.25 |
| | 2001 | 1,384.3 | 84.4 | 1,810 | 320.509 | 0.18 | 0.23 |
| | 2002 | 1,558.0 | 93.5 | 772 | 96.431 | 0.13 | 0.06 |
| | 2003 | 1,592.6 | 95.3 | 788 | 111.016 | 0.14 | 0.07 |
| | 2004 | 1,496.8 | 89.4 | 1,141 | 107.227 | 0.09 | 0.07 |
| | 2005 | 1,564.2 | 93.3 | 810 | 67.826 | 0.08 | 0.04 |
| | 2006 | 1,602.7 | 94.0 | 747 | 66.189 | 0.09 | 0.04 |
| | 2007 | 1,495.8 | 88.0 | 1,226 | 139.716 | 0.11 | 0.09 |
| | 2008 | 1,602.6 | 94.4 | 669 | 40.833 | 0.06 | 0.03 |
| **FERMI 2** | 1989 | 624.0 | 68.5 | 1,270 | 255 | 0.20 | 0.41 |
| Docket 50-341; NPF-43 | 1990 | 848.2 | 84.7 | 462 | 83 | 0.18 | 0.10 |
| 1st commercial operation 1/88 | 1991 | 739.0 | 77.0 | 1,223 | 228 | 0.19 | 0.31 |
| Type - BWR | 1992 | 874.3 | 81.3 | 1,213 | 245 | 0.20 | 0.28 |
| Capacity - 1,087 MWe | 1993 | 984.3 | 92.9 | 360 | 35 | 0.10 | 0.04 |
| | 1994 | 0.0 | 2.2 | 1,130 | 213 | 0.19 | --- |
| | 1995 | 618.3 | 86.9 | 390 | 28 | 0.07 | 0.05 |
| | 1996 | 577.5 | 69.1 | 1,402 | 157 | 0.11 | 0.27 |
| | 1997 | 637.0 | 66.6 | 623 | 49 | 0.08 | 0.08 |
| | 1998 | 815.8 | 79.9 | 1,362 | 207.593 | 0.15 | 0.25 |
| | 1999 | 1,082.7 | 99.5 | 461 | 36.152 | 0.08 | 0.03 |
| | 2000 | 939.6 | 87.6 | 1,266 | 145.964 | 0.12 | 0.15 |
| | 2001 | 975.0 | 90.9 | 1,202 | 168.689 | 0.14 | 0.17 |
| | 2002 | 1,059.0 | 98.7 | 463 | 38.235 | 0.08 | 0.04 |
| | 2003 | 925.3 | 86.9 | 1,207 | 168.138 | 0.14 | 0.18 |
| | 2004 | 962.3 | 90.0 | 1,302 | 145.090 | 0.11 | 0.15 |
| | 2005 | 998.1 | 91.7 | 538 | 61.626 | 0.11 | 0.06 |
| | 2006 | 855.9 | 83.0 | 1,430 | 181.300 | 0.13 | 0.21 |
| | 2007 | 950.2 | 87.0 | 1,484 | 194.039 | 0.13 | 0.20 |
| | 2008 | 1,094.5 | 99.5 | 460 | 35.186 | 0.08 | 0.03 |
| **FITZPATRICK** | 1976 | 489.0 | 71.6 | 600 | 202 | 0.34 | 0.41 |
| Docket 50-333; DPR-59 | 1977 | 460.5 | 68.4 | 1,380 | 1,080 | 0.78 | 2.35 |
| 1st commercial operation 7/75 | 1978 | 497.0 | 72.1 | 904 | 909 | 1.01 | 1.83 |
| Type - BWR | 1979 | 349.0 | 50.8 | 850 | 859 | 1.01 | 2.46 |
| Capacity - 813 MWe | 1980 | 509.5 | 70.3 | 2,056 | 2,040 | 0.99 | 4.00 |
| | 1981 | 562.9 | 74.7 | 2,490 | 1,425 | 0.57 | 2.53 |
| | 1982 | 583.6 | 75.0 | 2,322 | 1,190 | 0.51 | 2.04 |
| | 1983 | 546.2 | 70.6 | 1,715 | 1,090 | 0.64 | 2.00 |
| | 1984 | 576.2 | 76.8 | 1,610 | 971 | 0.60 | 1.69 |
| | 1985 | 492.3 | 63.7 | 1,845 | 1,051 | 0.57 | 2.13 |
| | 1986 | 711.2 | 90.6 | 1,185 | 411 | 0.35 | 0.58 |
| | 1987 | 496.2 | 70.3 | 1,578 | 940 | 0.60 | 1.89 |
| | 1988 | 514.0 | 69.0 | 1,553 | 786 | 0.51 | 1.53 |
| | 1989 | 727.5 | 92.3 | 1,027 | 377 | 0.37 | 0.52 |
| | 1990 | 543.8 | 72.6 | 1,536 | 884 | 0.58 | 1.63 |
| | 1991 | 399.7 | 53.4 | 1,269 | 333 | 0.26 | 0.83 |
| | 1992 | 0.0 | 0.0 | 2,374 | 674 | 0.28 | --- |
| | 1993 | 559.6 | 81.7 | 1,427 | 232 | 0.16 | 0.41 |
| | 1994 | 588.4 | 83.2 | 1,595 | 322 | 0.20 | 0.55 |
| | 1995 | 569.8 | 74.5 | 1,249 | 327 | 0.26 | 0.57 |
| | 1996 | 623.3 | 83.1 | 1,384 | 357 | 0.26 | 0.57 |
| | 1997 | 756.2 | 95.9 | 662 | 91 | 0.14 | 0.12 |
| | 1998 | 562.8 | 78.0 | 1,781 | 357.826 | 0.20 | 0.64 |
| | 1999 | 749.7 | 95.5 | 558 | 68.409 | 0.12 | 0.09 |
| | 2000 | 685.9 | 88.4 | 1,267 | 300.997 | 0.24 | 0.44 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **FITZPATRICK** | 2001 | 807.2 | 98.9 | 665 | 63.229 | 0.10 | 0.08 |
| (continued) | 2002 | 751.0 | 93.3 | 1,234 | 230.523 | 0.19 | 0.31 |
| | 2003 | 793.0 | 97.9 | 298 | 51.156 | 0.17 | 0.06 |
| | 2004 | 735.0 | 92.1 | 1,091 | 186.055 | 0.17 | 0.25 |
| | 2005 | 802.9 | 96.3 | 382 | 62.697 | 0.16 | 0.08 |
| | 2006 | 771.5 | 93.0 | 1,527 | 234.425 | 0.15 | 0.30 |
| | 2007 | 790.1 | 96.0 | 526 | 58.741 | 0.11 | 0.07 |
| | 2008 | 761.7 | 92.9 | 1,430 | 184.772 | 0.13 | 0.24 |
| **FORT CALHOUN** | 1975 | 252.3 | 67.4 | 469 | 294 | 0.63 | 1.17 |
| Docket 50-285; DPR-40 | 1976 | 265.9 | 69.5 | 516 | 313 | 0.61 | 1.18 |
| 1st commercial operation 6/74 | 1977 | 351.8 | 79.4 | 535 | 297 | 0.56 | 0.84 |
| Type - PWR | 1978 | 342.3 | 75.1 | 596 | 410 | 0.69 | 1.20 |
| Capacity - 482 MWe | 1979 | 440.0 | 95.7 | 451 | 126 | 0.28 | 0.29 |
| | 1980 | 242.3 | 60.4 | 891 | 668 | 0.75 | 2.76 |
| | 1981 | 260.9 | 72.3 | 822 | 458 | 0.56 | 1.76 |
| | 1982 | 418.0 | 89.7 | 604 | 217 | 0.36 | 0.52 |
| | 1983 | 330.4 | 73.1 | 860 | 433 | 0.50 | 1.31 |
| | 1984 | 279.2 | 59.9 | 913 | 563 | 0.62 | 2.02 |
| | 1985 | 367.0 | 73.7 | 982 | 373 | 0.38 | 1.02 |
| | 1986 | 431.8 | 94.3 | 756 | 75 | 0.10 | 0.17 |
| | 1987 | 366.0 | 75.4 | 1,247 | 388 | 0.31 | 1.06 |
| | 1988 | 315.5 | 74.1 | 1,594 | 272 | 0.17 | 0.86 |
| | 1989 | 395.7 | 89.2 | 1,210 | 93 | 0.08 | 0.24 |
| | 1990 | 290.0 | 64.2 | 760 | 290 | 0.38 | 1.00 |
| | 1991 | 391.1 | 91.7 | 284 | 57 | 0.20 | 0.15 |
| | 1992 | 303.4 | 65.9 | 802 | 272 | 0.34 | 0.90 |
| | 1993 | 369.7 | 80.8 | 713 | 157 | 0.22 | 0.42 |
| | 1994 | 492.8 | 99.6 | 211 | 23 | 0.11 | 0.05 |
| | 1995 | 402.8 | 83.2 | 627 | 139 | 0.22 | 0.35 |
| | 1996 | 374.9 | 79.5 | 740 | 226 | 0.31 | 0.60 |
| | 1997 | 435.9 | 93.6 | 258 | 41 | 0.16 | 0.09 |
| | 1998 | 387.7 | 82.5 | 788 | 223.847 | 0.28 | 0.58 |
| | 1999 | 409.2 | 89.2 | 676 | 158.843 | 0.24 | 0.39 |
| | 2000 | 443.8 | 93.5 | 249 | 35.215 | 0.14 | 0.08 |
| | 2001 | 401.2 | 88.3 | 770 | 225.891 | 0.29 | 0.56 |
| | 2002 | 434.0 | 92.3 | 742 | 163.806 | 0.22 | 0.38 |
| | 2003 | 399.6 | 87.0 | 914 | 212.422 | 0.23 | 0.53 |
| | 2004 | 463.5 | 97.0 | 215 | 21.574 | 0.10 | 0.05 |
| | 2005 | 332.4 | 72.2 | 1,069 | 272.876 | 0.26 | 0.82 |
| | 2006 | 353.9 | 75.0 | 1,591 | 289.100 | 0.18 | 0.82 |
| | 2007 | 499.9 | 100.0 | 100 | 3.990 | 0.04 | 0.01 |
| | 2008 | 400.4 | 82.2 | 839 | 96.155 | 0.11 | 0.24 |
| **GINNA** | 1971 | 327.8 | | 340 | 430 | 1.26 | 1.31 |
| Docket 50-244; DPR-18 | 1972 | 293.6 | | 677 | 1,032 | 1.52 | 3.51 |
| 1st commercial operation 7/70 | 1973 | 409.5 | | 319 | 224 | 0.70 | 0.55 |
| Type - PWR | 1974 | 253.7 | 62.4 | 884 | 1,225 | 1.39 | 4.83 |
| Capacity - 560 MWe | 1975 | 365.2 | 76.7 | 685 | 538 | 0.79 | 1.47 |
| | 1976 | 248.8 | 58.2 | 758 | 636 | 0.84 | 2.56 |
| | 1977 | 365.6 | 85.5 | 530 | 401 | 0.76 | 1.10 |
| | 1978 | 386.5 | 80.6 | 657 | 450 | 0.68 | 1.16 |
| | 1979 | 355.0 | 72.8 | 878 | 592 | 0.67 | 1.67 |
| | 1980 | 370.5 | 76.0 | 1,073 | 708 | 0.66 | 1.91 |
| | 1981 | 399.0 | 82.1 | 925 | 655 | 0.71 | 1.64 |
| | 1982 | 289.0 | 58.8 | 1,117 | 1,140 | 1.02 | 3.94 |
| | 1983 | 365.0 | 74.6 | 969 | 855 | 0.88 | 2.34 |
| | 1984 | 378.1 | 77.2 | 713 | 395 | 0.55 | 1.04 |
| | 1985 | 436.7 | 87.9 | 845 | 426 | 0.50 | 0.98 |
| | 1986 | 433.3 | 87.4 | 901 | 357 | 0.40 | 0.82 |
| | 1987 | 459.0 | 91.5 | 773 | 344 | 0.45 | 0.75 |
| | 1988 | 423.1 | 87.4 | 897 | 295 | 0.33 | 0.70 |
| | 1989 | 369.2 | 75.9 | 1,254 | 605 | 0.48 | 1.64 |
| | 1990 | 414.3 | 84.4 | 991 | 347 | 0.35 | 0.84 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **GINNA** | 1991 | 418.6 | 86.7 | 947 | 328 | 0.35 | 0.78 |
| (continued) | 1992 | 417.6 | 86.9 | 832 | 261 | 0.31 | 0.63 |
| | 1993 | 419.6 | 86.3 | 856 | 193 | 0.23 | 0.46 |
| | 1994 | 405.3 | 83.2 | 679 | 138 | 0.20 | 0.34 |
| | 1995 | 437.0 | 89.6 | 738 | 136 | 0.18 | 0.31 |
| | 1996 | 347.9 | 71.1 | 976 | 168 | 0.17 | 0.48 |
| | 1997 | 444.6 | 91.8 | 533 | 81 | 0.15 | 0.18 |
| | 1998 | 491.8 | 100.0 | 161 | 14.892 | 0.09 | 0.03 |
| | 1999 | 403.4 | 85.6 | 641 | 175.173 | 0.27 | 0.43 |
| | 2000 | 434.2 | 91.6 | 429 | 76.435 | 0.18 | 0.18 |
| | 2001 | 488.0 | 100.0 | 140 | 10.156 | 0.07 | 0.02 |
| | 2002 | 438.0 | 91.3 | 535 | 80.432 | 0.15 | 0.18 |
| | 2003 | 440.4 | 91.1 | 510 | 74.533 | 0.15 | 0.17 |
| | 2004 | 490.5 | 99.5 | 111 | 7.486 | 0.07 | 0.02 |
| | 2005 | 455.0 | 93.9 | 564 | 72.841 | 0.13 | 0.16 |
| | 2006 | 470.2 | 94.0 | 514 | 44.580 | 0.09 | 0.10 |
| | 2007 | 564.4 | 99.0 | 111 | 4.412 | 0.04 | 0.01 |
| | 2008 | 540.1 | 94.5 | 976 | 101.996 | 0.10 | 0.19 |
| **GRAND GULF** | 1986 | 494.7 | 60.9 | 1,486 | 436 | 0.29 | 0.88 |
| Docket 50-416; NPF-29 | 1987 | 920.7 | 82.2 | 1,358 | 420 | 0.31 | 0.46 |
| 1st commercial operation 7/85 | 1988 | 1,136.6 | 96.7 | 692 | 147 | 0.21 | 0.13 |
| Type - BWR | 1989 | 932.6 | 80.0 | 1,972 | 498 | 0.25 | 0.53 |
| Capacity - 1,266 MWe | 1990 | 883.5 | 78.9 | 1,765 | 482 | 0.27 | 0.55 |
| | 1991 | 1,085.2 | 94.0 | 699 | 94 | 0.13 | 0.09 |
| | 1992 | 969.0 | 83.7 | 2,032 | 484 | 0.24 | 0.50 |
| | 1993 | 936.4 | 81.5 | 1,807 | 332 | 0.18 | 0.35 |
| | 1994 | 1,143.2 | 96.6 | 455 | 56 | 0.12 | 0.05 |
| | 1995 | 952.9 | 80.4 | 1,589 | 342 | 0.22 | 0.36 |
| | 1996 | 1,096.2 | 88.7 | 1,564 | 357 | 0.23 | 0.33 |
| | 1997 | 1,234.9 | 100.0 | 514 | 105 | 0.20 | 0.09 |
| | 1998 | 1,049.2 | 88.9 | 1,410 | 303.695 | 0.22 | 0.29 |
| | 1999 | 962.1 | 81.3 | 1,180 | 226.277 | 0.19 | 0.23 |
| | 2000 | 1,217.5 | 99.4 | 289 | 34.877 | 0.12 | 0.03 |
| | 2001 | 1,129.8 | 93.0 | 1,109 | 185.214 | 0.17 | 0.16 |
| | 2002 | 1,145.0 | 93.6 | 1,060 | 176.396 | 0.17 | 0.15 |
| | 2003 | 1,241.2 | 98.6 | 290 | 31.250 | 0.11 | 0.03 |
| | 2004 | 1,165.2 | 92.2 | 1,243 | 158.112 | 0.13 | 0.14 |
| | 2005 | 1,147.3 | 91.9 | 1,326 | 167.914 | 0.13 | 0.15 |
| | 2006 | 1,233.7 | 98.0 | 1,016 | 59.935 | 0.06 | 0.05 |
| | 2007 | 1,070.5 | 88.0 | 1,750 | 177.884 | 0.10 | 0.17 |
| | 2008 | 1,072.1 | 89.5 | 1,843 | 167.859 | 0.09 | 0.16 |
| **HADDAM NECK**[5] | 1969 | 438.5 | | 138 | 106 | 0.77 | 0.24 |
| Docket 50-213; DPR-61 | 1970 | 424.7 | | 734 | 689 | 0.94 | 1.62 |
| 1st commercial operation 1/68 | 1971 | 502.2 | | 289 | 342 | 1.18 | 0.68 |
| Type - PWR | 1972 | 515.6 | | 355 | 325 | 0.91 | 0.63 |
| Capacity - (560) MWe | 1973 | 293.1 | | 951 | 697 | 0.73 | 2.38 |
| | 1974 | 521.4 | 91.2 | 550 | 201 | 0.37 | 0.39 |
| | 1975 | 494.3 | 89.9 | 795 | 703 | 0.88 | 1.42 |
| | 1976 | 482.9 | 82.5 | 644 | 449 | 0.70 | 0.93 |
| | 1977 | 480.7 | 83.9 | 894 | 641 | 0.72 | 1.33 |
| | 1978 | 563.4 | 98.6 | 216 | 117 | 0.54 | 0.21 |
| | 1979 | 493.0 | 87.5 | 1,226 | 1,162 | 0.95 | 2.36 |
| | 1980 | 426.8 | 75.0 | 1,860 | 1,353 | 0.73 | 3.17 |
| | 1981 | 487.5 | 84.3 | 1,554 | 1,036 | 0.67 | 2.13 |
| | 1982 | 543.9 | 93.4 | 559 | 126 | 0.23 | 0.23 |
| | 1983 | 453.7 | 77.8 | 1,645 | 1,384 | 0.84 | 3.05 |
| | 1984 | 404.0 | 71.7 | 1,430 | 1,216 | 0.85 | 3.01 |
| | 1985 | 556.1 | 98.4 | 384 | 101 | 0.26 | 0.18 |

[5] Haddam Neck (also known as Connecticut Yankee) was shut down on December 4, 1996, and is no longer in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **HADDAM NECK**[5] | 1986 | 294.8 | 53.6 | 1,945 | 1,567 | 0.81 | 5.32 |
| (continued) | 1987 | 304.6 | 54.0 | 1,763 | 750 | 0.43 | 2.46 |
| | 1988 | 397.4 | 70.3 | 735 | 237 | 0.32 | 0.60 |
| | 1989 | 356.4 | 67.2 | 1,455 | 596 | 0.41 | 1.67 |
| | 1990 | 142.7 | 32.2 | 979 | 421 | 0.43 | 2.95 |
| | 1991 | 444.4 | 76.4 | 1,168 | 590 | 0.51 | 1.33 |
| | 1992 | 465.2 | 80.1 | 797 | 202 | 0.25 | 0.43 |
| | 1993 | 448.6 | 81.6 | 1,004 | 408 | 0.41 | 0.91 |
| | 1994 | 455.6 | 77.7 | 463 | 135 | 0.29 | 0.30 |
| | 1995 | 439.4 | 77.7 | 1,006 | 442 | 0.44 | 1.01 |
| | 1996 | 331.8 | 55.7 | 673 | 175 | 0.26 | 0.53 |
| | 1997 | -1.3 | 0.0 | 219 | 11 | 0.05 | --- |
| | 1998 | 0.0 | 0.0 | 423 | 93.743 | 0.22 | --- |
| | 1999 | 0.0 | 0.0 | 545 | 108.602 | 0.20 | --- |
| | 2000 | 0.0 | 0.0 | 555 | 262.192 | 0.47 | --- |
| | 2001 | 0.0 | 0.0 | 361 | 95.348 | 0.26 | --- |
| | 2002 | 0.0 | 0.0 | 258 | 51.668 | 0.20 | --- |
| | 2003 | 0.0 | 0.0 | 400 | 82.022 | 0.21 | --- |
| | 2004 | 0.0 | 0.0 | 564 | 91.981 | 0.16 | --- |
| | 2005 | 0.0 | 0.0 | 350 | 36.479 | 0.10 | --- |
| | 2006 | 0.0 | 0.0 | 124 | 11.883 | 0.10 | --- |
| | 2007 | 0.0 | 0.0 | 0 | 0.000 | --- | --- |
| | 2008 | 0.0 | 0.0 | 1 | 0.011 | 0.01 | --- |
| **HARRIS 1** | 1988 | 652.9 | 75.0 | 721 | 169 | 0.23 | 0.26 |
| Docket 50-400; NPF-63 | 1989 | 690.6 | 79.5 | 929 | 156 | 0.17 | 0.23 |
| 1st commercial operation 5/87 | 1990 | 776.4 | 89.6 | 453 | 85 | 0.19 | 0.11 |
| Type - PWR | 1991 | 724.8 | 81.5 | 872 | 226 | 0.26 | 0.31 |
| Capacity - 900 MWe | 1992 | 661.8 | 74.9 | 930 | 213 | 0.23 | 0.32 |
| | 1993 | 913.0 | 99.7 | 327 | 31 | 0.09 | 0.03 |
| | 1994 | 740.8 | 82.7 | 1,089 | 222 | 0.20 | 0.30 |
| | 1995 | 731.1 | 83.8 | 1,068 | 174 | 0.16 | 0.24 |
| | 1996 | 860.6 | 95.4 | 444 | 17 | 0.04 | 0.02 |
| | 1997 | 673.6 | 80.4 | 1,131 | 149 | 0.13 | 0.22 |
| | 1998 | 766.2 | 90.4 | 931 | 133.497 | 0.14 | 0.17 |
| | 1999 | 827.0 | 97.9 | 247 | 15.538 | 0.06 | 0.02 |
| | 2000 | 783.0 | 92.5 | 888 | 100.981 | 0.11 | 0.13 |
| | 2001 | 611.2 | 72.4 | 1,586 | 252.241 | 0.16 | 0.41 |
| | 2002 | 892.0 | 99.4 | 145 | 6.674 | 0.05 | 0.01 |
| | 2003 | 823.9 | 93.2 | 786 | 68.463 | 0.09 | 0.08 |
| | 2004 | 797.9 | 88.2 | 747 | 57.103 | 0.08 | 0.07 |
| | 2005 | 902.9 | 99.5 | 164 | 8.483 | 0.05 | 0.01 |
| | 2006 | 802.4 | 89.0 | 917 | 87.225 | 0.10 | 0.11 |
| | 2007 | 845.1 | 94.0 | 870 | 64.808 | 0.07 | 0.08 |
| | 2008 | 890.4 | 97.4 | 192 | 10.356 | 0.05 | 0.01 |
| **HATCH 1, 2** | 1976 | 496.3 | 83.8 | 630 | 134 | 0.21 | 0.27 |
| Docket 50-321, 50-366; | 1977 | 446.8 | 66.3 | 1,303 | 465 | 0.36 | 1.04 |
| DPR-57; NPF-05 | 1978 | 513.0 | 72.8 | 1,304 | 248 | 0.19 | 0.48 |
| 1st commercial operation | 1979 | 401.0 | 54.6 | 2,131 | 582 | 0.27 | 1.45 |
| 12/75, 9/79 | 1980 | 1,008.7 | 70.9 | 1,930 | 449 | 0.23 | 0.45 |
| Type - BWRs | 1981 | 870.9 | 64.3 | 2,899 | 1,337 | 0.46 | 1.54 |
| Capacity - 876, 883 MWe | 1982 | 768.0 | 56.6 | 3,418 | 1,460 | 0.43 | 1.90 |
| | 1983 | 934.7 | 68.6 | 3,428 | 1,299 | 0.38 | 1.39 |
| | 1984 | 658.6 | 47.3 | 4,110 | 2,218 | 0.54 | 3.37 |
| | 1985 | 1,211.0 | 79.6 | 2,841 | 818 | 0.29 | 0.68 |
| | 1986 | 872.0 | 64.8 | 3,486 | 1,497 | 0.43 | 1.72 |
| | 1987 | 1,295.4 | 89.7 | 2,202 | 816 | 0.37 | 0.63 |
| | 1988 | 1,001.4 | 70.4 | 2,509 | 1,401 | 0.56 | 1.40 |
| | 1989 | 1,271.1 | 87.1 | 1,350 | 556 | 0.41 | 0.44 |

[5] Haddam Neck (also known as Connecticut Yankee) was shut down on December 4, 1996, and is no longer in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **HATCH 1, 2** | 1990 | 1,268.0 | 83.5 | 2,902 | 1,455 | 0.50 | 1.15 |
| (continued) | 1991 | 1,152.4 | 77.4 | 2,508 | 1,161 | 0.46 | 1.01 |
| | 1992 | 1,293.8 | 88.6 | 1,615 | 550 | 0.34 | 0.43 |
| | 1993 | 1,189.6 | 85.5 | 1,733 | 669 | 0.39 | 0.56 |
| | 1994 | 1,289.0 | 87.1 | 2,243 | 864 | 0.39 | 0.67 |
| | 1995 | 1,376.3 | 90.6 | 1,458 | 488 | 0.33 | 0.35 |
| | 1996 | 1,519.6 | 94.0 | 1,495 | 441 | 0.29 | 0.29 |
| | 1997 | 1,374.7 | 88.1 | 1,945 | 722 | 0.37 | 0.53 |
| | 1998 | 1,458.4 | 91.7 | 1,610 | 320.469 | 0.20 | 0.22 |
| | 1999 | 1,487.4 | 90.0 | 1,866 | 328.583 | 0.18 | 0.22 |
| | 2000 | 1,515.0 | 88.7 | 1,913 | 401.891 | 0.21 | 0.26 |
| | 2001 | 1,603.0 | 93.5 | 1,407 | 230.242 | 0.16 | 0.14 |
| | 2002 | 1,600.0 | 94.0 | 1,299 | 214.441 | 0.17 | 0.13 |
| | 2003 | 1,606.3 | 94.5 | 1,295 | 168.281 | 0.13 | 0.10 |
| | 2004 | 1,641.3 | 95.3 | 1,209 | 180.129 | 0.15 | 0.11 |
| | 2005 | 1,562.1 | 91.3 | 1,288 | 207.295 | 0.16 | 0.13 |
| | 2006 | 1,604.9 | 94.0 | 1,405 | 259.313 | 0.18 | 0.16 |
| | 2007 | 1,626.5 | 94.0 | 1,341 | 137.273 | 0.10 | 0.08 |
| | 2008 | 1,584.0 | 92.7 | 1,397 | 189.433 | 0.14 | 0.12 |
| **HOPE CREEK 1** | 1987 | 869.2 | 86.4 | 589 | 117 | 0.20 | 0.13 |
| Docket 50-354; NPF-57 | 1988 | 832.7 | 80.7 | 1,734 | 287 | 0.17 | 0.34 |
| 1st commercial operation 12/86 | 1989 | 791.1 | 77.8 | 1,873 | 465 | 0.25 | 0.59 |
| Type - BWR | 1990 | 966.4 | 91.6 | 1,394 | 196 | 0.14 | 0.20 |
| Capacity - 1,049 MWe | 1991 | 882.5 | 84.2 | 1,700 | 373 | 0.22 | 0.42 |
| | 1992 | 841.9 | 80.8 | 1,694 | 436 | 0.26 | 0.52 |
| | 1993 | 1,049.2 | 97.8 | 688 | 98 | 0.14 | 0.09 |
| | 1994 | 852.0 | 81.2 | 1,779 | 326 | 0.18 | 0.38 |
| | 1995 | 844.5 | 79.8 | 1,571 | 196 | 0.12 | 0.23 |
| | 1996 | 806.9 | 77.4 | 1,069 | 158 | 0.15 | 0.20 |
| | 1997 | 731.8 | 77.8 | 1,747 | 350 | 0.20 | 0.48 |
| | 1998 | 993.2 | 98.0 | 620 | 54.816 | 0.09 | 0.06 |
| | 1999 | 879.1 | 86.7 | 1,111 | 279.063 | 0.25 | 0.32 |
| | 2000 | 827.8 | 87.9 | 1,236 | 188.295 | 0.15 | 0.23 |
| | 2001 | 918.2 | 91.1 | 1,532 | 156.180 | 0.10 | 0.17 |
| | 2002 | 1,007.0 | 99.2 | 220 | 25.922 | 0.12 | 0.03 |
| | 2003 | 826.6 | 84.6 | 1,597 | 139.295 | 0.09 | 0.17 |
| | 2004 | 688.6 | 71.3 | 2,440 | 239.540 | 0.10 | 0.35 |
| | 2005 | 874.9 | 88.6 | 881 | 67.063 | 0.08 | 0.08 |
| | 2006 | 983.8 | 93.0 | 2,135 | 133.570 | 0.06 | 0.14 |
| | 2007 | 929.3 | 91.0 | 2,221 | 191.068 | 0.09 | 0.21 |
| | 2008 | 1,139.1 | 100.0 | 999 | 34.510 | 0.03 | 0.03 |
| **HUMBOLDT BAY**[6] | 1969 | 44.6 | | 125 | 164 | 1.31 | 3.68 |
| Docket 50-133; DPR-7 | 1970 | 49.3 | | 115 | 209 | 1.82 | 4.24 |
| 1st commercial operation 8/63 | 1971 | 39.6 | | 140 | 292 | 2.09 | 7.37 |
| Type - BWR | 1972 | 43.1 | | 127 | 253 | 1.99 | 5.87 |
| Capacity - (63) MWe | 1973 | 50.1 | | 210 | 266 | 1.27 | 5.31 |
| | 1974 | 43.4 | 83.8 | 296 | 318 | 1.07 | 7.33 |
| | 1975 | 45.3 | 83.9 | 265 | 339 | 1.28 | 7.48 |
| | 1976 | 23.5 | 46.4 | 523 | 683 | 1.31 | 29.06 |
| | 1977 | 0.0 | 0.0 | 1,063 | 1,905 | 1.79 | --- |
| | 1978 | 0.0 | 0.0 | 320 | 335 | 1.05 | --- |
| | 1979 | 0.0 | 0.0 | 135 | 31 | 0.23 | --- |
| | 1980 | 0.0 | 0.0 | 142 | 22 | 0.15 | --- |
| | 1981 | 0.0 | 0.0 | 75 | 9 | 0.12 | --- |
| | 1982 | 0.0 | 0.0 | 71 | 19 | 0.27 | --- |
| | 1983 | 0.0 | 0.0 | 84 | 17 | 0.20 | --- |
| | 1984 | "Data not available" | | | | | |
| | 1985 | 0.0 | 0.0 | 178 | 51 | 0.29 | --- |

[6] Humboldt Bay had been shut down since 1976, and in 1984, it was decided that it would not be placed in operation again. Therefore, it is no longer included in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **HUMBOLDT BAY**[6] | 1986 | 0.0 | 0.0 | 115 | 50 | 0.43 | --- |
| (continued) | 1987 | "Data not available" | | | | | |
| | 1988 | 0.0 | 0.0 | 10 | 1 | 0.10 | --- |
| | 1989 | 0.0 | 0.0 | 0 | 0 | 0.00 | --- |
| | 1990 | 0.0 | 0.0 | 0 | 0 | 0.00 | --- |
| | 1991 | 0.0 | 0.0 | 0 | 0 | 0.00 | --- |
| | 1992 | 0.0 | 0.0 | 8 | 0 | 0.00 | --- |
| | 1993 | 0.0 | 0.0 | 24 | 1 | 0.04 | --- |
| | 1994 | 0.0 | 0.0 | 21 | 1 | 0.05 | --- |
| | 1995 | 0.0 | 0.0 | 42 | 2 | 0.05 | --- |
| | 1996 | 0.0 | 0.0 | 66 | 5 | 0.08 | --- |
| | 1997 | 0.0 | 0.0 | 105 | 16 | 0.15 | --- |
| | 1998 | 0.0 | 0.0 | 38 | 201.000 | 0.03 | --- |
| | 1999 | 0.0 | 0.0 | 28 | 0.720 | 0.04 | --- |
| | 2000 | 0.0 | 0.0 | 20 | 0.911 | 0.05 | --- |
| | 2001 | 0.0 | 0.0 | 10 | 0.360 | 0.04 | --- |
| | 2002 | 0.0 | 0.0 | 18 | 1.504 | 0.08 | --- |
| | 2003 | 0.0 | 0.0 | 14 | 0.351 | 0.03 | --- |
| | 2004 | 0.0 | 0.0 | 11 | 0.454 | 0.04 | --- |
| | 2005 | 0.0 | 0.0 | 11 | 0.547 | 0.05 | --- |
| | 2006 | 0.0 | 0.0 | 40 | 4.086 | 0.10 | --- |
| | 2007 | 0.0 | 0.0 | 45 | 3.271 | 0.07 | --- |
| | 2008 | 0.0 | 0.0 | 56 | 2.051 | 0.04 | --- |
| **INDIAN POINT 1**[7]**, 2, 3**[8] | 1969 | 206.2 | | | 298 | | 1.45 |
| Docket 50-3, 50-247, 50-286; | 1970 | 43.3 | | | 1,639 | | 37.85 |
| DPR-5, -26, -64 | 1971 | 154.0 | | | 768 | | 4.99 |
| 1st commercial operation | 1972 | 142.3 | | | 967 | | 6.80 |
| 10/62, 8/74, 8/76 | 1973 | 0.0 | | 2,998 | 5,262 | 1.76 | --- |
| Type - PWRs | 1974 | 556.1 | 59.4 | 1,019 | 910 | 0.89 | 1.64 |
| Capacity - (265), 998, 1,030 MWe | 1975 | 584.4 | 74.8 | 891 | 705 | 0.79 | 1.21 |
| | 1976 | 273.9 | 34.8 | 1,590 | 1,950 | 1.23 | 7.12 |
| | 1977 | 1,278.3 | 75.3 | 1,391 | 1,070 | 0.77 | 0.84 |
| | 1978 | 1,172.3 | 67.8 | 1,909 | 2,006 | 1.05 | 1.71 |
| **INDIAN POINT 1**[7]**, 2** | 1979 | 574.0 | 71.4 | 1,349 | 1,279 | 0.95 | 2.23 |
| Docket 50-3, 50-247; DPR-05, -26 | 1980 | 510.8 | 64.8 | 1,577 | 971 | 0.62 | 1.90 |
| 1st commercial operation | 1981 | 367.5 | 46.0 | 2,595 | 2,731 | 1.05 | 7.43 |
| 10/62, 8/74 | 1982 | 532.4 | 65.4 | 2,144 | 1,635 | 0.76 | 3.07 |
| Type - PWRs | 1983 | 702.6 | 84.0 | 1,057 | 486 | 0.46 | 0.69 |
| Capacity - (265), 998 MWe | 1984 | 416.7 | 51.9 | 2,919 | 2,644 | 0.91 | 6.35 |
| | 1985 | 791.4 | 95.7 | 708 | 192 | 0.27 | 0.24 |
| | 1986 | 457.5 | 56.2 | 1,926 | 1,250 | 0.65 | 2.73 |
| | 1987 | 611.4 | 73.4 | 1,980 | 1,217 | 0.61 | 1.99 |
| | 1988 | 719.3 | 86.9 | 890 | 235 | 0.26 | 0.33 |
| | 1989 | 532.5 | 64.6 | 2,093 | 1,436 | 0.69 | 2.70 |
| | 1990 | 618.0 | 66.6 | 1,061 | 608 | 0.57 | 0.98 |
| | 1991 | 461.2 | 55.7 | 1,810 | 1,468 | 0.81 | 3.18 |
| | 1992 | 930.9 | 99.1 | 489 | 97 | 0.20 | 0.10 |
| | 1993 | 702.1 | 75.7 | 1,514 | 675 | 0.45 | 0.96 |
| | 1994 | 903.8 | 100.0 | 381 | 48 | 0.13 | 0.05 |
| | 1995 | 582.4 | 70.8 | 1,690 | 548 | 0.32 | 0.94 |
| | 1996 | 927.8 | 94.8 | 388 | 54 | 0.14 | 0.06 |

[6] Humboldt Bay had been shut down since 1976, and, in 1984, it was decided that it would not be placed in operation again. Therefore, it is no longer included in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

[7] Indian Point 1 was defueled in 1975, and in 1984, it was decided that it would not be placed in operation again. Therefore, it is no longer included in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

[8] Indian Point 3 was purchased by a different utility in 1979 and, subsequently, reported its dose separately. Although Indian Point 1, 2, and 3 have been owned by the same utility since 2001, Indian Point 3 still reports separately.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **INDIAN POINT 1[7], 2** | 1997 | 360.6 | 45.1 | 1,340 | 367 | 0.27 | 1.02 |
| (continued) | 1998 | 282.8 | 31.5 | 1,154 | 289.600 | 0.25 | 1.03 |
| | 1999 | 831.8 | 88.2 | 350 | 40.931 | 0.12 | 0.05 |
| | 2000 | 115.4 | 13.0 | 2,003 | 567.224 | 0.28 | 4.92 |
| | 2001 | 887.2 | 97.2 | 399 | 22.067 | 0.06 | 0.02 |
| | 2002 | 860.0 | 91.3 | 1,361 | 248.487 | 0.18 | 0.29 |
| | 2003 | 953.0 | 98.9 | 241 | 11.778 | 0.05 | 0.01 |
| **INDIAN POINT 1[7]** | 2004 | 0.0 | 0.0 | 156 | 3 | 0.02 | --- |
| Docket 50-3; DPR-05 | 2005 | 0.0 | 0.0 | 151 | 6.692 | 0.04 | --- |
| 1st commercial operation 10/62 | 2006 | 0.0 | 0.0 | 193 | 7.670 | 0.04 | --- |
| Type - PWR | 2007 | 0.0 | 0.0 | 210 | 2.554 | 0.01 | --- |
| Capacity - (265) MWe | 2008 | 0.0 | 0.0 | 234 | 4.322 | 0.02 | --- |
| **INDIAN POINT 2** | 2004 | 855.3 | 91.0 | 1,136 | 195.630 | 0.17 | 0.23 |
| Docket 50-247; DPR-26 | 2005 | 1,007.2 | 100.0 | 470 | 11.418 | 0.02 | 0.01 |
| 1st commercial operation 8/74 | 2006 | 911.5 | 91.0 | 1,327 | 286.908 | 0.22 | 0.32 |
| Type - PWR | 2007 | 1,009.2 | 100.0 | 649 | 7.009 | 0.01 | 0.01 |
| Capacity - 998 MWe | 2008 | 934.1 | 92.6 | 1,013 | 139.683 | 0.14 | 0.15 |
| **INDIAN POINT 3[8]** | 1979 | 574.0 | 66.5 | 808 | 636 | 0.79 | 1.11 |
| Docket 50-286; DPR-64 | 1980 | 367.3 | 53.2 | 977 | 308 | 0.32 | 0.84 |
| 1st commercial operation 8/76 | 1981 | 367.5 | 59.8 | 677 | 364 | 0.54 | 0.99 |
| Type - PWR | 1982 | 171.5 | 22.5 | 1,477 | 1,226 | 0.83 | 7.15 |
| Capacity - 1,030 MWe | 1983 | 7.8 | 2.6 | 941 | 607 | 0.65 | 77.82 |
| | 1984 | 714.4 | 76.3 | 658 | 230 | 0.35 | 0.32 |
| | 1985 | 566.5 | 66.0 | 1,093 | 570 | 0.52 | 1.01 |
| | 1986 | 655.3 | 73.4 | 588 | 202 | 0.34 | 0.31 |
| | 1987 | 574.6 | 62.7 | 1,308 | 500 | 0.38 | 0.87 |
| | 1988 | 792.5 | 83.3 | 451 | 93 | 0.21 | 0.12 |
| | 1989 | 587.8 | 61.1 | 1,800 | 876 | 0.49 | 1.49 |
| | 1990 | 595.3 | 62.9 | 1,066 | 358 | 0.34 | 0.60 |
| | 1991 | 862.8 | 87.5 | 299 | 40 | 0.13 | 0.05 |
| | 1992 | 561.7 | 61.4 | 1,003 | 212 | 0.21 | 0.38 |
| | 1993 | 140.5 | 14.9 | 478 | 60 | 0.13 | 0.43 |
| | 1994 | 0.0 | 0.0 | 529 | 58 | 0.11 | --- |
| | 1995 | 174.8 | 21.4 | 638 | 67 | 0.11 | 0.38 |
| | 1996 | 695.3 | 74.8 | 289 | 22 | 0.08 | 0.03 |
| | 1997 | 495.1 | 54.9 | 1,608 | 234 | 0.15 | 0.47 |
| | 1998 | 874.0 | 95.3 | 213 | 14.774 | 0.07 | 0.02 |
| | 1999 | 829.8 | 88.3 | 893 | 116.920 | 0.13 | 0.14 |
| | 2000 | 960.0 | 99.3 | 143 | 8.693 | 0.06 | 0.00 |
| | 2001 | 903.9 | 93.1 | 1,014 | 118.115 | 0.12 | 0.13 |
| | 2002 | 960.0 | 98.5 | 156 | 6.797 | 0.04 | 0.01 |
| | 2003 | 866.2 | 89.8 | 902 | 96.059 | 0.11 | 0.11 |
| | 2004 | 995.8 | 100.0 | 234 | 4.232 | 0.02 | 0.00 |
| | 2005 | 915.0 | 91.7 | 893 | 73.862 | 0.08 | 0.08 |
| | 2006 | 1,024.5 | 100.0 | 307 | 2.793 | 0.01 | 0.00 |
| | 2007 | 890.1 | 88.0 | 1,322 | 102.960 | 0.08 | 0.12 |
| | 2008 | 1,043.1 | 100.0 | 443 | 3.045 | 0.01 | 0.00 |
| **KEWAUNEE** | 1975 | 401.9 | 88.2 | 104 | 28 | 0.27 | 0.07 |
| Docket 50-305; DPR-43 | 1976 | 405.9 | 78.9 | 381 | 270 | 0.71 | 0.67 |
| 1st commercial operation 6/74 | 1977 | 425.0 | 79.9 | 312 | 140 | 0.45 | 0.33 |
| Type - PWR | 1978 | 466.6 | 89.5 | 335 | 154 | 0.46 | 0.33 |
| Capacity - 556 MWe | 1979 | 412.0 | 79.0 | 343 | 127 | 0.37 | 0.31 |
| | 1980 | 433.8 | 82.1 | 401 | 165 | 0.41 | 0.38 |
| | 1981 | 451.8 | 86.7 | 383 | 141 | 0.37 | 0.31 |

[7] Indian Point 1 was defueled in 1975, and in 1984, it was decided that it would not be placed in operation again. Therefore, it is no longer included in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

[8] Indian Point 3 was purchased by a different utility in 1979 and, subsequently, reported its dose separately. Although Indian Point 1, 2, and 3 have been owned by the same utility since 2001, Indian Point 3 still reports separately.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **KEWAUNEE** | 1982 | 458.4 | 87.6 | 353 | 101 | 0.29 | 0.22 |
| (continued) | 1983 | 444.1 | 83.7 | 445 | 165 | 0.37 | 0.37 |
| | 1984 | 455.3 | 85.7 | 482 | 139 | 0.29 | 0.31 |
| | 1985 | 443.1 | 82.4 | 519 | 176 | 0.34 | 0.40 |
| | 1986 | 461.7 | 85.8 | 502 | 169 | 0.34 | 0.37 |
| | 1987 | 480.0 | 89.7 | 755 | 226 | 0.30 | 0.47 |
| | 1988 | 467.5 | 88.3 | 705 | 210 | 0.30 | 0.45 |
| | 1989 | 449.1 | 84.9 | 570 | 239 | 0.42 | 0.53 |
| | 1990 | 468.8 | 87.9 | 490 | 145 | 0.30 | 0.31 |
| | 1991 | 441.8 | 83.4 | 495 | 221 | 0.45 | 0.50 |
| | 1992 | 471.4 | 88.0 | 450 | 122 | 0.27 | 0.26 |
| | 1993 | 457.1 | 86.8 | 436 | 106 | 0.24 | 0.23 |
| | 1994 | 475.6 | 88.8 | 364 | 72 | 0.20 | 0.15 |
| | 1995 | 455.6 | 87.8 | 415 | 109 | 0.26 | 0.24 |
| | 1996 | 380.4 | 71.8 | 474 | 126 | 0.27 | 0.33 |
| | 1997 | 269.8 | 56.0 | 278 | 56 | 0.20 | 0.21 |
| | 1998 | 423.0 | 87.2 | 384 | 88.205 | 0.23 | 0.21 |
| | 1999 | 505.1 | 100.0 | 103 | 5.055 | 0.05 | 0.01 |
| | 2000 | 432.6 | 88.8 | 394 | 99.864 | 0.25 | 0.23 |
| | 2001 | 394.1 | 80.8 | 1,110 | 200.245 | 0.18 | 0.51 |
| | 2002 | 509.0 | 97.4 | 102 | 4.449 | 0.04 | 0.01 |
| | 2003 | 473.5 | 90.5 | 439 | 73.108 | 0.17 | 0.15 |
| | 2004 | 441.0 | 81.0 | 565 | 91.168 | 0.16 | 0.21 |
| | 2005 | 346.4 | 62.7 | 97 | 4.000 | 0.04 | 0.01 |
| | 2006 | 419.4 | 77.0 | 539 | 74.734 | 0.14 | 0.18 |
| | 2007 | 528.0 | 95.0 | 145 | 11.126 | 0.08 | 0.02 |
| | 2008 | 499.5 | 88.9 | 598 | 92.951 | 0.16 | 0.19 |
| **LACROSSE**[9] | 1970 | 15.3 | | | 111 | | 7.25 |
| Docket 50-409; DPR-45 | 1971 | 33.1 | | 218 | 158 | 0.72 | 0.49 |
| 1st commercial operation 11/69 | 1972 | 29.2 | | 151 | 172 | 1.14 | 5.17 |
| Type - BWR | 1973 | 24.4 | | 157 | 221 | 1.41 | 6.43 |
| Capacity - (48) MWe | 1974 | 37.9 | 81.0 | 115 | 139 | 1.21 | 3.67 |
| | 1975 | 32.0 | 69.6 | 165 | 234 | 1.42 | 7.31 |
| | 1976 | 21.2 | 47.6 | 118 | 110 | 0.93 | 5.19 |
| | 1977 | 11.3 | 33.7 | 141 | 225 | 1.60 | 19.91 |
| | 1978 | 21.6 | 62.0 | 182 | 164 | 0.90 | 7.59 |
| | 1979 | 24.0 | 71.8 | 153 | 186 | 1.22 | 7.75 |
| | 1980 | 26.4 | 68.5 | 124 | 218 | 1.76 | 8.26 |
| | 1981 | 29.6 | 76.0 | 187 | 123 | 0.66 | 4.16 |
| | 1982 | 17.2 | 44.6 | 148 | 205 | 1.39 | 11.92 |
| | 1983 | 24.8 | 59.7 | 160 | 313 | 1.96 | 12.62 |
| | 1984 | 38.5 | 80.5 | 288 | 252 | 0.88 | 6.55 |
| | 1985 | 39.2 | 86.7 | 373 | 173 | 0.46 | 4.41 |
| | 1986 | 19.6 | 46.1 | 260 | 290 | 1.12 | 14.80 |
| | 1987 | 0.0 | 0.0 | 127 | 68 | 0.54 | --- |
| | 1988 | 0.0 | 0.0 | 49 | 31 | 0.63 | --- |
| | 1989 | 0.0 | 0.0 | 60 | 15 | 0.25 | --- |
| | 1990 | 0.0 | 0.0 | 51 | 9 | 0.18 | --- |
| | 1991 | 0.0 | 0.0 | 42 | 8 | 0.19 | --- |
| | 1992 | 0.0 | 0.0 | 28 | 6 | 0.21 | --- |
| | 1993 | 0.0 | 0.0 | 48 | 8 | 0.17 | --- |
| | 1994 | 0.0 | 0.0 | 65 | 8 | 0.12 | --- |
| | 1995 | 0.0 | 0.0 | 31 | 3 | 0.10 | --- |
| | 1996 | 0.0 | 0.0 | 25 | 4 | 0.15 | --- |
| | 1997 | 0.0 | 0.0 | 23 | 2 | 0.09 | --- |
| | 1998 | 0.0 | 0.0 | 27 | 1.530 | 0.07 | --- |
| | 1999 | 0.0 | 0.0 | 66 | 3.725 | 0.06 | --- |
| | 2000 | 0.0 | 0.0 | 37 | 3.548 | 0.10 | --- |

[9] LaCrosse ended commercial operation in 1987 and will not be put in commercial operation again. Therefore, it is no longer included in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **LACROSSE**[9] | 2001 | 0.0 | 0.0 | 45 | 2.782 | 0.06 | --- |
| (continued) | 2002 | 0.0 | 0.0 | 47 | 2.314 | 0.05 | --- |
| | 2003 | 0.0 | 0.0 | 65 | 1.836 | 0.03 | --- |
| | 2004 | 0.0 | 0.0 | 56 | 0.918 | 0.02 | --- |
| | 2005 | 0.0 | 0.0 | 51 | 8.139 | 0.16 | --- |
| | 2006 | 0.0 | 0.0 | 0 | 0.000 | --- | --- |
| | 2007 | 0.0 | 0.0 | 86 | 37.092 | 0.43 | --- |
| | 2008 | 0.0 | 0.0 | 40 | 1.759 | 0.04 | --- |
| **LASALLE 1, 2** | 1984 | 677.8 | 77.8 | 1,245 | 252 | 0.20 | 0.37 |
| Docket 50-373, -374; | 1985 | 987.9 | 53.0 | 1,635 | 685 | 0.42 | 0.69 |
| NPF-11, -18 | 1986 | 929.5 | 50.6 | 1,614 | 898 | 0.56 | 0.97 |
| 1st commercial operation | 1987 | 1,030.0 | 59.3 | 1,744 | 1,396 | 0.80 | 1.36 |
| 1/84, 6/84 | 1988 | 1,317.6 | 71.6 | 2,737 | 2,471 | 0.90 | 1.88 |
| Type - BWRs | 1989 | 1,503.5 | 73.1 | 2,475 | 1,386 | 0.56 | 0.92 |
| Capacity - 1,111, 1,111 MWe | 1990 | 1,754.3 | 84.6 | 1,830 | 948 | 0.52 | 0.54 |
| | 1991 | 1,837.0 | 86.7 | 1,985 | 806 | 0.41 | 0.44 |
| | 1992 | 1,447.4 | 72.0 | 2,418 | 1,167 | 0.48 | 0.81 |
| | 1993 | 1,542.0 | 76.0 | 1,701 | 854 | 0.50 | 0.55 |
| | 1994 | 1,580.0 | 77.6 | 1,812 | 726 | 0.40 | 0.46 |
| | 1995 | 1,696.6 | 82.1 | 1,623 | 512 | 0.32 | 0.30 |
| | 1996 | 1,053.8 | 54.3 | 2,782 | 819 | 0.29 | 0.78 |
| | 1997 | 0.0 | 0.0 | 1,661 | 316 | 0.19 | --- |
| | 1998 | 380.9 | 19.3 | 2,099 | 422.249 | 0.20 | 1.11 |
| | 1999 | 1,671.9 | 81.8 | 2,689 | 576.354 | 0.21 | 0.34 |
| | 2000 | 2,138.6 | 97.1 | 1,831 | 260.320 | 0.14 | 0.12 |
| | 2001 | 2,223.8 | 98.9 | 535 | 82.721 | 0.15 | 0.04 |
| | 2002 | 2,040.0 | 92.1 | 2,012 | 449.587 | 0.22 | 0.22 |
| | 2003 | 2,100.2 | 94.8 | 2,253 | 464.427 | 0.21 | 0.22 |
| | 2004 | 2,162.1 | 96.0 | 2,366 | 359.470 | 0.15 | 0.17 |
| | 2005 | 2,130.4 | 95.0 | 2,097 | 334.558 | 0.16 | 0.16 |
| | 2006 | 2,181.3 | 97.0 | 2,006 | 248.454 | 0.12 | 0.11 |
| | 2007 | 2,166.7 | 98.0 | 1,953 | 228.373 | 0.12 | 0.11 |
| | 2008 | 2,145.8 | 96.4 | 2,402 | 217.567 | 0.09 | 0.10 |
| **LIMERICK 1, 2** | 1987 | 636.1 | 70.2 | 2,156 | 174 | 0.08 | 0.27 |
| Docket 50-352, 50-353; | 1988 | 794.9 | 96.5 | 950 | 52 | 0.05 | 0.07 |
| NPF-39, -85 | 1989 | 628.4 | 66.0 | 1,818 | 266 | 0.15 | 0.42 |
| 1st commercial operation | 1990 | 1,527.7 | 78.2 | 1,422 | 175 | 0.12 | 0.11 |
| 2/86, 1/90 | 1991 | 1,810.9 | 86.8 | 1,151 | 106 | 0.09 | 0.06 |
| Type - BWRs | 1992 | 1,741.4 | 84.8 | 1,559 | 330 | 0.21 | 0.19 |
| Capacity - 1,134, 1,134 MWe | 1993 | 1,913.2 | 91.6 | 1,287 | 217 | 0.17 | 0.11 |
| | 1994 | 1,944.4 | 94.9 | 1,543 | 275 | 0.18 | 0.14 |
| | 1995 | 1,957.1 | 93.0 | 1,581 | 260 | 0.16 | 0.13 |
| | 1996 | 2,026.2 | 93.3 | 1,654 | 234 | 0.14 | 0.12 |
| | 1997 | 2,001.7 | 95.8 | 1,463 | 234 | 0.16 | 0.12 |
| | 1998 | 1,907.2 | 89.5 | 1,854 | 357.139 | 0.19 | 0.19 |
| | 1999 | 2,089.6 | 94.2 | 1,800 | 271.547 | 0.15 | 0.13 |
| | 2000 | 2,154.9 | 95.8 | 1,279 | 260.611 | 0.20 | 0.12 |
| | 2001 | 2,205.9 | 97.3 | 1,127 | 210.336 | 0.19 | 0.10 |
| | 2002 | 2,197.0 | 97.1 | 1,248 | 160.324 | 0.13 | 0.07 |
| | 2003 | 2,213.6 | 97.2 | 1,298 | 147.047 | 0.11 | 0.07 |
| | 2004 | 2,218.9 | 97.6 | 1,265 | 149.433 | 0.12 | 0.07 |
| | 2005 | 2,168.9 | 96.3 | 1,460 | 187.609 | 0.13 | 0.09 |
| | 2006 | 2,207.2 | 97.0 | 1,509 | 193.429 | 0.13 | 0.09 |
| | 2007 | 2,185.8 | 96.0 | 1,570 | 197.104 | 0.13 | 0.09 |
| | 2008 | 2,169.2 | 96.0 | 1,393 | 176.825 | 0.13 | 0.08 |

[9] LaCrosse ended commercial operation in 1987 and will not be put in commercial operation again. Therefore, it is no longer included in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **MAINE YANKEE**[10] | 1973 | 408.7 | | 782 | 117 | 0.15 | 0.29 |
| Docket 50-309; DPR-36 | 1974 | 432.6 | 68.7 | 619 | 420 | 0.68 | 0.97 |
| 1st commercial operation 12/72 | 1975 | 542.9 | 79.9 | 440 | 319 | 0.72 | 0.59 |
| Type - PWR | 1976 | 712.2 | 95.0 | 244 | 85 | 0.35 | 0.12 |
| Capacity - (860) MWe | 1977 | 617.6 | 82.2 | 508 | 245 | 0.48 | 0.40 |
| | 1978 | 642.7 | 84.1 | 638 | 420 | 0.66 | 0.65 |
| | 1979 | 537.0 | 68.4 | 393 | 154 | 0.39 | 0.29 |
| | 1980 | 527.0 | 72.2 | 735 | 462 | 0.63 | 0.88 |
| | 1981 | 624.2 | 78.2 | 868 | 424 | 0.49 | 0.68 |
| | 1982 | 542.5 | 69.1 | 1,295 | 619 | 0.48 | 1.14 |
| | 1983 | 677.1 | 83.6 | 592 | 165 | 0.28 | 0.24 |
| | 1984 | 605.7 | 74.4 | 1,262 | 884 | 0.70 | 1.46 |
| | 1985 | 635.4 | 79.2 | 1,009 | 700 | 0.69 | 1.10 |
| | 1986 | 737.6 | 87.8 | 495 | 100 | 0.20 | 0.14 |
| | 1987 | 478.1 | 65.3 | 1,100 | 722 | 0.66 | 1.51 |
| | 1988 | 591.9 | 79.1 | 1,058 | 725 | 0.69 | 1.22 |
| | 1989 | 819.2 | 93.7 | 375 | 99 | 0.26 | 0.12 |
| | 1990 | 573.0 | 71.0 | 1,359 | 682 | 0.50 | 1.19 |
| | 1991 | 738.1 | 86.6 | 426 | 105 | 0.25 | 0.14 |
| | 1992 | 631.7 | 79.1 | 1,189 | 461 | 0.39 | 0.73 |
| | 1993 | 674.8 | 79.8 | 1,016 | 377 | 0.37 | 0.56 |
| | 1994 | 782.8 | 90.9 | 297 | 84 | 0.28 | 0.11 |
| | 1995 | 23.6 | 3.7 | 1,167 | 653 | 0.56 | 27.67 |
| | 1996 | 602.9 | 78.1 | 408 | 56 | 0.14 | 0.09 |
| | 1997 | 0.0 | 0.0 | 991 | 153 | 0.15 | --- |
| | 1998 | 0.0 | 0.0 | 438 | 163.008 | 0.37 | --- |
| | 1999 | 0.0 | 0.0 | 365 | 135.057 | 0.37 | --- |
| | 2000 | 0.0 | 0.0 | 490 | 121.133 | 0.25 | --- |
| | 2001 | 0.0 | 0.0 | 412 | 68.121 | 0.17 | --- |
| | 2002 | 0.0 | 0.0 | 452 | 66.226 | 0.15 | --- |
| | 2003 | 0.0 | 0.0 | 342 | 43.775 | 0.13 | --- |
| | 2004 | 0.0 | 0.0 | 190 | 21.313 | 0.11 | --- |
| | 2005 | 0.0 | 0.0 | 2 | 0.048 | 0.02 | --- |
| | 2006 | 0.0 | 0.0 | 0 | 0.000 | --- | --- |
| | 2007 | 0.0 | 0.0 | 0 | 0.000 | --- | --- |
| | 2008 | 0.0 | 0.0 | 1 | 0.013 | 0.01 | --- |
| **MCGUIRE 1, 2** | 1982 | 524.9 | 80.4 | 1,560 | 169 | 0.11 | 0.32 |
| Docket 50-369, -370; | 1983 | 558.3 | 55.4 | 1,751 | 521 | 0.30 | 0.93 |
| NPF-9, -17 | 1984 | 764.1 | 68.5 | 1,663 | 507 | 0.30 | 0.66 |
| 1st commercial operation | 1985 | 808.4 | 77.0 | 2,217 | 771 | 0.35 | 0.95 |
| 12/81, 3/84 | 1986 | 1,360.0 | 60.1 | 2,326 | 1,015 | 0.44 | 0.75 |
| Type - PWRs | 1987 | 1,774.7 | 79.2 | 2,865 | 1,043 | 0.36 | 0.59 |
| Capacity - 1,100, 1,100 MWe | 1988 | 1,830.7 | 80.2 | 2,808 | 1,104 | 0.39 | 0.60 |
| | 1989 | 1,810.2 | 80.8 | 1,994 | 620 | 0.31 | 0.34 |
| | 1990 | 1,340.3 | 61.3 | 2,289 | 727 | 0.32 | 0.54 |
| | 1991 | 1,945.1 | 85.0 | 1,723 | 361 | 0.21 | 0.19 |
| | 1992 | 1,696.8 | 74.4 | 1,619 | 418 | 0.26 | 0.25 |
| | 1993 | 1,470.4 | 66.2 | 1,685 | 463 | 0.27 | 0.31 |
| | 1994 | 1,848.0 | 80.2 | 1,637 | 397 | 0.24 | 0.21 |
| | 1995 | 2,132.3 | 92.9 | 1,259 | 138 | 0.11 | 0.06 |
| | 1996 | 1,881.8 | 82.8 | 1,622 | 238 | 0.15 | 0.13 |
| | 1997 | 1,558.2 | 73.0 | 2,193 | 492 | 0.22 | 0.32 |
| | 1998 | 2,139.8 | 95.1 | 1,045 | 142.245 | 0.14 | 0.07 |
| | 1999 | 1,961.7 | 88.9 | 1,274 | 256.524 | 0.20 | 0.13 |
| | 2000 | 2,100.1 | 94.2 | 940 | 132.513 | 0.14 | 0.06 |
| | 2001 | 2,113.3 | 93.9 | 963 | 136.581 | 0.14 | 0.06 |
| | 2002 | 2,051.0 | 91.7 | 1,167 | 180.618 | 0.16 | 0.09 |

[10] Maine Yankee was shut down in August 1997 and is no longer included in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **MCGUIRE 1, 2** | 2003 | 2,156.2 | 96.0 | 841 | 71.323 | 0.08 | 0.03 |
| (continued) | 2004 | 2,075.7 | 91.8 | 1,116 | 196.193 | 0.18 | 0.09 |
| | 2005 | 1,993.9 | 89.2 | 1,401 | 173.972 | 0.12 | 0.09 |
| | 2006 | 2,100.2 | 93.0 | 1,218 | 108.285 | 0.09 | 0.05 |
| | 2007 | 2,011.4 | 89.0 | 1,375 | 156.035 | 0.11 | 0.08 |
| | 2008 | 1,943.3 | 86.2 | 1,613 | 165.767 | 0.10 | 0.09 |
| **MILLSTONE 1**[11] | 1972 | 377.6 | | 612 | 596 | 0.97 | 1.58 |
| Docket 50-245; DPR-21 | 1973 | 225.1 | | 1,184 | 663 | 0.56 | 2.95 |
| 1st commercial operation 3/71 | 1974 | 430.3 | 79.1 | 2,477 | 1,430 | 0.58 | 3.32 |
| Type - BWR | 1975 | 465.4 | 75.6 | 2,587 | 2,022 | 0.78 | 4.34 |
| Capacity - (641) MWe | 1976 | 449.8 | 76.1 | 1,387 | 1,194 | 0.86 | 2.65 |
| | 1977 | 575.7 | 89.6 | 1,075 | 394 | 0.37 | 0.68 |
| | 1978 | 556.6 | 87.6 | 1,391 | 1,416 | 1.02 | 2.54 |
| | 1979 | 505.0 | 77.3 | 2,001 | 1,795 | 0.90 | 3.55 |
| | 1980 | 405.8 | 69.0 | 3,024 | 2,157 | 0.71 | 5.32 |
| | 1981 | 304.3 | 51.6 | 2,506 | 1,496 | 0.60 | 4.92 |
| | 1982 | 490.2 | 79.9 | 1,370 | 929 | 0.68 | 1.90 |
| | 1983 | 640.1 | 95.6 | 309 | 244 | 0.79 | 0.38 |
| | 1984 | 516.1 | 78.8 | 1,992 | 836 | 0.42 | 1.62 |
| | 1985 | 548.5 | 83.6 | 732 | 608 | 0.83 | 1.11 |
| | 1986 | 626.8 | 95.4 | 389 | 150 | 0.39 | 0.24 |
| | 1987 | 523.4 | 79.6 | 1,588 | 684 | 0.43 | 1.31 |
| | 1988 | 658.8 | 98.6 | 327 | 144 | 0.44 | 0.22 |
| | 1989 | 554.6 | 84.2 | 852 | 462 | 0.54 | 0.83 |
| | 1990 | 608.3 | 91.6 | 365 | 131 | 0.36 | 0.22 |
| | 1991 | 213.1 | 35.4 | 1,154 | 409 | 0.35 | 1.92 |
| | 1992 | 431.8 | 68.1 | 348 | 99 | 0.28 | 0.23 |
| | 1993 | 627.9 | 96.8 | 305 | 81 | 0.27 | 0.13 |
| | 1994 | 394.0 | 63.6 | 1,321 | 391 | 0.30 | 0.99 |
| | 1995 | 520.6 | 80.0 | 910 | 620 | 0.68 | 1.19 |
| | 1996 | 0.0 | 0.0 | 747 | 431 | 0.58 | --- |
| | 1997 | -2.9 | 0.0 | 1,053 | 195 | 0.19 | --- |
| | 1998 | -2.7 | 0.0 | 347 | 12.741 | 0.04 | --- |
| | 1999 | 0.0 | 0.0 | 397 | 9.790 | 0.02 | --- |
| | 2000 | 0.0 | 0.0 | 478 | 59.955 | 0.13 | --- |
| | 2001 | 0.0 | 0.0 | 414 | 14.946 | 0.04 | --- |
| | 2002 | 0.0 | 0.0 | 185 | 4.151 | 0.02 | --- |
| | 2003 | 0.0 | 0.0 | 195 | 10.675 | 0.05 | --- |
| | 2004 | 0.0 | 0.0 | 147 | 11.152 | 0.08 | --- |
| | 2005 | 0.0 | 0.0 | 145 | 0.897 | 0.01 | --- |
| | 2006 | 0.0 | 0.0 | 4 | 0.607 | 0.15 | --- |
| | 2007 | 0.0 | 0.0 | 33 | 0.901 | 0.03 | --- |
| | 2008 | 0.0 | 0.0 | 0 | 0.000 | --- | --- |
| **MILLSTONE 2, 3** | 1976 | 545.7 | 78.7 | 620 | 168 | 0.27 | 0.31 |
| Docket 50-336, 50-423; | 1977 | 518.7 | 65.7 | 667 | 242 | 0.36 | 0.47 |
| DPR-65; NPF-49 | 1978 | 536.6 | 67.3 | 1,420 | 1,444 | 1.02 | 2.69 |
| 1st commercial operation | 1979 | 520.0 | 62.8 | 525 | 471 | 0.90 | 0.91 |
| 12/75, 4/86 | 1980 | 579.3 | 69.2 | 893 | 637 | 0.71 | 1.10 |
| Type - PWRs | 1981 | 722.4 | 82.6 | 890 | 531 | 0.60 | 0.74 |
| Capacity - 878, 1,148 MWe | 1982 | 595.9 | 70.6 | 2,083 | 1,413 | 0.68 | 2.37 |
| | 1983 | 294.0 | 34.2 | 2,383 | 1,881 | 0.79 | 6.40 |
| | 1984 | 782.7 | 93.5 | 285 | 120 | 0.42 | 0.15 |
| | 1985 | 417.8 | 49.4 | 1,905 | 1,581 | 0.83 | 3.78 |
| | 1986 | 1,313.8 | 80.4 | 2,393 | 993 | 0.41 | 0.76 |
| | 1987 | 1,624.5 | 84.1 | 1,441 | 505 | 0.35 | 0.31 |
| | 1988 | 1,594.8 | 83.2 | 1,827 | 804 | 0.44 | 0.50 |
| | 1989 | 1,428.3 | 72.9 | 1,984 | 1,079 | 0.54 | 0.76 |
| | 1990 | 1,614.9 | 87.1 | 1,652 | 593 | 0.36 | 0.37 |

[11]Millstone 1 was shut down on June 30, 1998, and is no longer included in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **MILLSTONE 2, 3** | 1991 | 819.5 | 69.7 | 1,084 | 381 | 0.35 | 0.46 |
| (continued) | 1992 | 1,115.1 | 59.9 | 3,190 | 1,280 | 0.40 | 1.15 |
| | 1993 | 1,525.2 | 79.7 | 2,064 | 557 | 0.27 | 0.37 |
| | 1994 | 1,556.6 | 73.1 | 1,249 | 188 | 0.15 | 0.12 |
| | 1995 | 1,278.1 | 60.5 | 1,691 | 416 | 0.25 | 0.33 |
| | 1996 | 418.1 | 19.3 | 983 | 126 | 0.13 | 0.30 |
| | 1997 | 0.0 | 0.0 | 1,435 | 253 | 0.18 | --- |
| | 1998 | 374.9 | 20.9 | 1,179 | 112.543 | 0.10 | 0.30 |
| | 1999 | 1,446.3 | 73.3 | 1,688 | 252.138 | 0.15 | 0.17 |
| | 2000 | 1,865.8 | 92.4 | 1,385 | 142.664 | 0.10 | 0.08 |
| | 2001 | 1,759.3 | 92.0 | 1,327 | 174.238 | 0.13 | 0.10 |
| | 2002 | 1,703.0 | 87.5 | 1,548 | 292.197 | 0.19 | 0.17 |
| | 2003 | 1,834.6 | 91.0 | 1,274 | 322.923 | 0.25 | 0.18 |
| | 2004 | 1,887.5 | 95.0 | 803 | 136.459 | 0.17 | 0.07 |
| | 2005 | 1,777.1 | 88.8 | 1,329 | 202.490 | 0.15 | 0.11 |
| | 2006 | 1,898.5 | 93.0 | 1,160 | 174.164 | 0.15 | 0.09 |
| | 2007 | 1,875.1 | 94.0 | 1,150 | 163.780 | 0.14 | 0.09 |
| | 2008 | 1,761.1 | 87.7 | 1,467 | 272.693 | 0.18 | 0.16 |
| **MONTICELLO** | 1972 | 424.4 | | 99 | 61 | 0.62 | 0.14 |
| Docket 50-263; DPR-22 | 1973 | 389.5 | | 401 | 176 | 0.44 | 0.45 |
| 1st commercial operation 6/71 | 1974 | 349.3 | 74.9 | 842 | 349 | 0.41 | 1.00 |
| Type - BWR | 1975 | 344.8 | 72.2 | 1,353 | 1,353 | 1.00 | 3.92 |
| Capacity - 578 MWe | 1976 | 476.4 | 91.5 | 325 | 263 | 0.81 | 0.55 |
| | 1977 | 425.6 | 79.9 | 860 | 1,000 | 1.16 | 2.35 |
| | 1978 | 459.4 | 87.2 | 679 | 375 | 0.55 | 0.82 |
| | 1979 | 522.0 | 97.6 | 372 | 157 | 0.42 | 0.30 |
| | 1980 | 411.8 | 78.2 | 1,114 | 531 | 0.48 | 1.29 |
| | 1981 | 389.3 | 72.6 | 1,446 | 1,004 | 0.69 | 2.58 |
| | 1982 | 291.1 | 63.3 | 1,307 | 993 | 0.76 | 3.41 |
| | 1983 | 494.6 | 96.3 | 416 | 121 | 0.29 | 0.24 |
| | 1984 | 33.7 | 9.2 | 1,872 | 2,462 | 1.32 | 73.06 |
| | 1985 | 509.8 | 91.7 | 586 | 327 | 0.56 | 0.64 |
| | 1986 | 402.7 | 79.1 | 895 | 596 | 0.67 | 1.48 |
| | 1987 | 422.5 | 81.9 | 941 | 568 | 0.60 | 1.34 |
| | 1988 | 542.5 | 99.8 | 375 | 110 | 0.29 | 0.20 |
| | 1989 | 318.2 | 76.2 | 1,102 | 507 | 0.46 | 1.59 |
| | 1990 | 536.0 | 96.9 | 336 | 94 | 0.28 | 0.18 |
| | 1991 | 429.4 | 80.8 | 964 | 465 | 0.48 | 1.08 |
| | 1992 | 528.3 | 97.5 | 454 | 114 | 0.25 | 0.22 |
| | 1993 | 458.1 | 84.4 | 954 | 494 | 0.52 | 1.08 |
| | 1994 | 471.3 | 87.0 | 788 | 395 | 0.50 | 0.84 |
| | 1995 | 564.7 | 100.0 | 200 | 44 | 0.22 | 0.08 |
| | 1996 | 461.6 | 86.9 | 757 | 240 | 0.32 | 0.52 |
| | 1997 | 417.4 | 75.9 | 399 | 106 | 0.27 | 0.25 |
| | 1998 | 470.2 | 88.1 | 674 | 209.137 | 0.31 | 0.44 |
| | 1999 | 530.7 | 92.9 | 451 | 70.075 | 0.16 | 0.13 |
| | 2000 | 483.2 | 84.2 | 792 | 216.136 | 0.27 | 0.45 |
| | 2001 | 441.3 | 78.5 | 834 | 220.683 | 0.26 | 0.50 |
| | 2002 | 571.0 | 99.0 | 399 | 40.030 | 0.10 | 0.07 |
| | 2003 | 522.8 | 91.7 | 858 | 168.896 | 0.20 | 0.32 |
| | 2004 | 573.2 | 99.2 | 279 | 35.081 | 0.13 | 0.06 |
| | 2005 | 509.4 | 90.0 | 919 | 175.201 | 0.19 | 0.34 |
| | 2006 | 579.1 | 100.0 | 273 | 33.416 | 0.12 | 0.06 |
| | 2007 | 478.6 | 85.0 | 1,075 | 191.398 | 0.18 | 0.40 |
| | 2008 | 555.3 | 95.8 | 351 | 43.777 | 0.12 | 0.08 |
| **NINE MILE POINT 1, 2** | 1970 | 227.0 | | 821 | 44 | 0.05 | 0.19 |
| Docket 50-220, 50-410; | 1971 | 346.5 | | 1,006 | 195 | 0.19 | 0.56 |
| DPR-63; NPF-69 | 1972 | 381.8 | | 735 | 285 | 0.39 | 0.75 |
| 1st commercial operation | 1973 | 411.0 | | 550 | 567 | 1.03 | 1.38 |
| 12/69, 4/88 | 1974 | 385.9 | 70.5 | 740 | 824 | 1.11 | 2.14 |
| Type - BWRs | 1975 | 359.0 | 72.1 | 649 | 681 | 1.05 | 1.90 |
| Capacity - 565, 1,120 MWe | 1976 | 484.6 | 88.2 | 392 | 428 | 1.09 | 0.88 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **NINE MILE POINT 1, 2** (continued) | 1977 | 347.4 | 59.2 | 1,093 | 1,383 | 1.27 | 3.98 |
| | 1978 | 527.7 | 95.1 | 561 | 314 | 0.56 | 0.60 |
| | 1979 | 354.0 | 66.1 | 1,326 | 1,497 | 1.13 | 4.23 |
| | 1980 | 533.9 | 92.3 | 1,174 | 591 | 0.50 | 1.11 |
| | 1981 | 385.2 | 66.0 | 2,029 | 1,592 | 0.78 | 4.13 |
| | 1982 | 133.5 | 21.4 | 1,352 | 1,264 | 0.93 | 9.47 |
| | 1983 | 329.8 | 56.2 | 1,405 | 860 | 0.61 | 2.61 |
| | 1984 | 426.8 | 71.9 | 1,530 | 890 | 0.58 | 2.09 |
| | 1985 | 580.9 | 96.4 | 1,007 | 265 | 0.26 | 0.46 |
| | 1986 | 371.0 | 65.3 | 1,878 | 1,275 | 0.68 | 3.44 |
| | 1987 | 542.6 | 93.3 | 1,190 | 141 | 0.12 | 0.26 |
| | 1988 | 0.0 | 0.0 | 2,626 | 854 | 0.33 | --- |
| | 1989 | 527.5 | 29.7 | 2,737 | 564 | 0.21 | 1.07 |
| | 1990 | 656.2 | 46.6 | 2,405 | 699 | 0.29 | 1.07 |
| | 1991 | 1,250.8 | 79.7 | 1,543 | 292 | 0.19 | 0.23 |
| | 1992 | 965.9 | 61.8 | 1,800 | 563 | 0.31 | 0.58 |
| | 1993 | 1,380.2 | 84.6 | 2,352 | 633 | 0.27 | 0.46 |
| | 1994 | 1,589.6 | 95.9 | 800 | 149 | 0.19 | 0.09 |
| | 1995 | 1,382.2 | 82.5 | 2,304 | 759 | 0.33 | 0.55 |
| | 1996 | 1,598.6 | 91.6 | 1,596 | 290 | 0.18 | 0.18 |
| | 1997 | 1,321.5 | 74.8 | 1,425 | 429 | 0.30 | 0.32 |
| | 1998 | 1,387.3 | 87.0 | 1,744 | 378.484 | 0.22 | 0.27 |
| | 1999 | 1,409.5 | 81.3 | 1,709 | 446.699 | 0.26 | 0.32 |
| | 2000 | 1,443.9 | 88.1 | 1,783 | 282.838 | 0.16 | 0.20 |
| | 2001 | 1,506.9 | 88.9 | 1,371 | 343.197 | 0.25 | 0.23 |
| | 2002 | 1,517.0 | 90.4 | 2,449 | 516.663 | 0.21 | 0.34 |
| | 2003 | 1,585.6 | 91.4 | 1,501 | 374.775 | 0.25 | 0.24 |
| | 2004 | 1,551.9 | 92.0 | 1,362 | 448.509 | 0.33 | 0.29 |
| | 2005 | 1,656.5 | 94.5 | 1,366 | 401.719 | 0.29 | 0.24 |
| | 2006 | 1,647.1 | 96.0 | 1,130 | 229.551 | 0.20 | 0.14 |
| | 2007 | 1,598.3 | 93.0 | 1,826 | 329.307 | 0.18 | 0.21 |
| | 2008 | 1,642.1 | 95.8 | 1,391 | 301.824 | 0.22 | 0.18 |
| **NORTH ANNA 1, 2** | 1979 | 507.0 | 61.7 | 2,025 | 449 | 0.22 | 0.89 |
| Docket 50-338; NPF-04, -07 | 1980 | 681.8 | 86.5 | 2,086 | 218 | 0.10 | 0.32 |
| 1st commercial operation | 1981 | 1,241.9 | 71.5 | 2,416 | 680 | 0.28 | 0.55 |
| 6/78, 12/80 | 1982 | 777.7 | 45.8 | 2,872 | 1,915 | 0.67 | 2.46 |
| Type - PWRs | 1983 | 1,338.4 | 76.1 | 2,228 | 665 | 0.30 | 0.50 |
| Capacity - 903, 903 MWe | 1984 | 1,021.3 | 58.8 | 3,062 | 1,945 | 0.64 | 1.90 |
| | 1985 | 1,516.9 | 86.1 | 2,436 | 838 | 0.34 | 0.55 |
| | 1986 | 1,484.5 | 83.0 | 2,831 | 722 | 0.26 | 0.49 |
| | 1987 | 1,112.6 | 67.8 | 2,624 | 1,521 | 0.58 | 1.37 |
| | 1988 | 1,772.7 | 96.7 | 992 | 112 | 0.11 | 0.06 |
| | 1989 | 1,226.8 | 72.5 | 2,861 | 1,471 | 0.51 | 1.20 |
| | 1990 | 1,590.4 | 90.5 | 2,161 | 590 | 0.27 | 0.37 |
| | 1991 | 1,597.5 | 88.6 | 2,085 | 629 | 0.30 | 0.39 |
| | 1992 | 1,403.2 | 84.1 | 2,159 | 576 | 0.27 | 0.41 |
| | 1993 | 1,428.4 | 80.1 | 2,768 | 908 | 0.33 | 0.64 |
| | 1994 | 1,717.1 | 95.9 | 1,036 | 193 | 0.19 | 0.11 |
| | 1995 | 1,666.4 | 90.8 | 1,551 | 367 | 0.24 | 0.22 |
| | 1996 | 1,569.6 | 89.1 | 1,203 | 291 | 0.24 | 0.19 |
| | 1997 | 1,711.5 | 96.2 | 856 | 103 | 0.12 | 0.06 |
| | 1998 | 1,632.8 | 92.7 | 1,201 | 265.922 | 0.22 | 0.16 |
| | 1999 | 1,747.7 | 96.1 | 727 | 94.402 | 0.13 | 0.05 |
| | 2000 | 1,734.1 | 95.8 | 730 | 65.405 | 0.09 | 0.04 |
| | 2001 | 1,491.0 | 84.8 | 1,231 | 308.907 | 0.25 | 0.21 |
| | 2002 | 1,557.0 | 84.3 | 914 | 143.312 | 0.16 | 0.09 |
| | 2003 | 1,569.1 | 87.2 | 1,041 | 187.014 | 0.18 | 0.12 |
| | 2004 | 1,685.6 | 92.0 | 965 | 129.686 | 0.13 | 0.08 |
| | 2005 | 1,751.5 | 96.0 | 686 | 58.844 | 0.09 | 0.03 |
| | 2006 | 1,723.0 | 95.0 | 749 | 82.069 | 0.11 | 0.05 |
| | 2007 | 1,596.7 | 88.0 | 1,581 | 309.237 | 0.20 | 0.19 |
| | 2008 | 1,643.1 | 91.2 | 795 | 61.003 | 0.08 | 0.04 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **OCONEE 1, 2, 3** | 1974 | 650.6 | 60.1 | 844 | 517 | 0.61 | 0.79 |
| Docket 50-269, 50-270, | 1975 | 1,838.3 | 75.5 | 829 | 497 | 0.60 | 0.27 |
| 50-287; | 1976 | 1,561.4 | 63.0 | 1,215 | 1,026 | 0.84 | 0.66 |
| DPR-38, -47, -55 | 1977 | 1,566.4 | 65.9 | 1,595 | 1,329 | 0.83 | 0.85 |
| 1st commercial operation | 1978 | 1,909.0 | 75.8 | 1,636 | 1,393 | 0.85 | 0.73 |
| 7/73, 9/74, 12/74 | 1979 | 1,708.0 | 67.7 | 2,100 | 1,001 | 0.48 | 0.59 |
| Type - PWRs | 1980 | 1,703.7 | 70.1 | 2,124 | 1,055 | 0.50 | 0.62 |
| Capacity - 846, 846, 846 MWe | 1981 | 1,661.5 | 66.8 | 2,445 | 1,211 | 0.50 | 0.73 |
| | 1982 | 1,293.1 | 52.5 | 2,445 | 1,792 | 0.73 | 1.39 |
| | 1983 | 2,141.5 | 82.2 | 1,902 | 1,207 | 0.63 | 0.56 |
| | 1984 | 2,242.9 | 85.7 | 2,085 | 1,106 | 0.53 | 0.49 |
| | 1985 | 2,036.3 | 80.5 | 2,729 | 1,304 | 0.48 | 0.64 |
| | 1986 | 1,995.6 | 79.0 | 2,499 | 949 | 0.38 | 0.48 |
| | 1987 | 1,962.6 | 82.4 | 2,672 | 1,142 | 0.43 | 0.58 |
| | 1988 | 2,228.9 | 87.2 | 2,672 | 871 | 0.33 | 0.39 |
| | 1989 | 2,188.6 | 85.4 | 2,205 | 684 | 0.31 | 0.31 |
| | 1990 | 2,405.2 | 91.4 | 1,948 | 404 | 0.21 | 0.17 |
| | 1991 | 2,275.0 | 86.7 | 1,966 | 551 | 0.28 | 0.24 |
| | 1992 | 2,110.7 | 82.0 | 1,954 | 612 | 0.31 | 0.29 |
| | 1993 | 2,399.2 | 91.3 | 1,499 | 237 | 0.16 | 0.10 |
| | 1994 | 2,144.3 | 82.2 | 1,923 | 537 | 0.28 | 0.25 |
| | 1995 | 2,366.1 | 89.5 | 1,586 | 304 | 0.19 | 0.13 |
| | 1996 | 1,847.9 | 70.3 | 1,479 | 257 | 0.17 | 0.14 |
| | 1997 | 1,563.7 | 67.7 | 1,379 | 223 | 0.16 | 0.14 |
| | 1998 | 1,989.1 | 81.3 | 1,695 | 366.028 | 0.22 | 0.18 |
| | 1999 | 2,264.5 | 90.3 | 1,568 | 202.025 | 0.13 | 0.09 |
| | 2000 | 2,321.0 | 91.6 | 1,686 | 272.697 | 0.16 | 0.12 |
| | 2001 | 2,167.6 | 86.8 | 2,002 | 579.209 | 0.29 | 0.27 |
| | 2002 | 2,355.0 | 92.5 | 1,723 | 224.672 | 0.13 | 0.10 |
| | 2003 | 2,177.7 | 86.3 | 2,180 | 245.349 | 0.11 | 0.11 |
| | 2004 | 2,125.2 | 84.1 | 2,295 | 367.891 | 0.16 | 0.17 |
| | 2005 | 2,349.5 | 92.3 | 1,516 | 148.694 | 0.10 | 0.06 |
| | 2006 | 2,274.8 | 90.0 | 1,859 | 221.222 | 0.12 | 0.10 |
| | 2007 | 2,347.8 | 92.0 | 1,915 | 252.936 | 0.13 | 0.11 |
| | 2008 | 2298.5 | 90.9 | 1,924 | 186.335 | 0.10 | 0.08 |
| **OYSTER CREEK** | 1970 | 413.6 | | 95 | 63 | 0.66 | 0.15 |
| Docket 50-219; DPR-16 | 1971 | 448.9 | | 249 | 240 | 0.96 | 0.53 |
| 1st commercial operation 12/69 | 1972 | 515.0 | | 339 | 582 | 1.72 | 1.13 |
| Type - BWR | 1973 | 424.6 | | 782 | 1,236 | 1.58 | 2.91 |
| Capacity - 619 MWe | 1974 | 434.5 | 70.4 | 935 | 984 | 1.05 | 2.26 |
| | 1975 | 373.6 | 73.3 | 1,210 | 1,140 | 0.94 | 3.05 |
| | 1976 | 456.5 | 79.3 | 1,582 | 1,078 | 0.68 | 2.36 |
| | 1977 | 385.7 | 70.1 | 1,673 | 1,614 | 0.96 | 4.18 |
| | 1978 | 431.8 | 74.3 | 1,411 | 1,279 | 0.91 | 2.96 |
| | 1979 | 541.0 | 85.9 | 842 | 467 | 0.55 | 0.86 |
| | 1980 | 232.9 | 41.4 | 1,966 | 1,733 | 0.88 | 7.44 |
| | 1981 | 314.8 | 59.8 | 1,689 | 917 | 0.54 | 2.91 |
| | 1982 | 242.7 | 62.5 | 1,270 | 865 | 0.68 | 3.56 |
| | 1983 | 27.9 | 11.5 | 2,303 | 2,257 | 0.98 | 80.90 |
| | 1984 | 37.1 | 9.6 | 2,369 | 2,054 | 0.87 | 55.36 |
| | 1985 | 446.1 | 89.4 | 2,342 | 748 | 0.32 | 1.68 |
| | 1986 | 157.3 | 31.5 | 3,740 | 2,436 | 0.65 | 15.49 |
| | 1987 | 371.0 | 64.2 | 1,932 | 522 | 0.27 | 1.41 |
| | 1988 | 419.6 | 65.9 | 2,875 | 1,504 | 0.52 | 3.58 |
| | 1989 | 287.5 | 57.3 | 2,395 | 910 | 0.38 | 3.17 |
| | 1990 | 511.8 | 89.1 | 1,941 | 310 | 0.16 | 0.61 |
| | 1991 | 351.6 | 60.5 | 3,089 | 1,185 | 0.38 | 3.37 |
| | 1992 | 536.3 | 85.9 | 2,771 | 657 | 0.24 | 1.23 |
| | 1993 | 551.9 | 87.8 | 2,560 | 416 | 0.16 | 0.75 |
| | 1994 | 431.7 | 70.8 | 2,382 | 844 | 0.35 | 1.96 |
| | 1995 | 615.4 | 97.4 | 761 | 90 | 0.12 | 0.15 |
| | 1996 | 515.0 | 82.6 | 1,833 | 449 | 0.24 | 0.87 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **OYSTER CREEK** | 1997 | 579.1 | 94.3 | 509 | 50 | 0.10 | 0.09 |
| (continued) | 1998 | 490.8 | 82.4 | 1,408 | 308.323 | 0.22 | 0.63 |
| | 1999 | 615.1 | 100.0 | 466 | 41.664 | 0.09 | 0.07 |
| | 2000 | 444.9 | 83.3 | 2,044 | 614.379 | 0.30 | 1.38 |
| | 2001 | 595.0 | 97.6 | 442 | 45.817 | 0.10 | 0.08 |
| | 2002 | 573.0 | 94.0 | 1,468 | 265.810 | 0.18 | 0.46 |
| | 2003 | 598.4 | 97.2 | 416 | 43.363 | 0.10 | 0.07 |
| | 2004 | 551.8 | 91.6 | 1,346 | 226.880 | 0.17 | 0.41 |
| | 2005 | 611.9 | 99.5 | 316 | 27.813 | 0.09 | 0.05 |
| | 2006 | 530.2 | 90.0 | 1,443 | 189.950 | 0.13 | 0.36 |
| | 2007 | 579.7 | 97.0 | 464 | 46.590 | 0.10 | 0.08 |
| | 2008 | 531.0 | 91.0 | 1,511 | 211.932 | 0.14 | 0.40 |
| **PALISADES** | 1972 | 216.8 | | | 78 | | 0.36 |
| Docket 50-255; DPR-20 | 1973 | 286.8 | | 975 | 1,133 | 1.16 | 3.95 |
| 1st commercial operation 12/71 | 1974 | 10.7 | 5.5 | 774 | 627 | 0.81 | 58.60 |
| Type - PWR | 1975 | 302.0 | 64.5 | 495 | 306 | 0.62 | 1.01 |
| Capacity - 730 MWe | 1976 | 346.9 | 55.2 | 742 | 696 | 0.94 | 2.01 |
| | 1977 | 616.6 | 91.4 | 332 | 100 | 0.30 | 0.16 |
| | 1978 | 320.2 | 49.7 | 849 | 764 | 0.90 | 2.39 |
| | 1979 | 415.0 | 59.9 | 1,599 | 854 | 0.53 | 2.06 |
| | 1980 | 288.3 | 42.9 | 1,307 | 424 | 0.32 | 1.47 |
| | 1981 | 418.2 | 57.2 | 2,151 | 902 | 0.42 | 2.16 |
| | 1982 | 404.3 | 54.7 | 1,554 | 330 | 0.21 | 0.82 |
| | 1983 | 454.4 | 60.3 | 2,167 | 977 | 0.45 | 2.15 |
| | 1984 | 98.7 | 15.2 | 1,344 | 573 | 0.43 | 5.81 |
| | 1985 | 639.2 | 83.8 | 1,355 | 507 | 0.37 | 0.79 |
| | 1986 | 102.3 | 15.1 | 1,438 | 672 | 0.47 | 6.57 |
| | 1987 | 319.2 | 48.2 | 1,122 | 456 | 0.41 | 1.43 |
| | 1988 | 413.4 | 56.8 | 1,472 | 730 | 0.50 | 1.77 |
| | 1989 | 442.8 | 69.1 | 1,026 | 314 | 0.31 | 0.71 |
| | 1990 | 366.7 | 58.7 | 2,414 | 766 | 0.32 | 2.09 |
| | 1991 | 587.0 | 78.1 | 1,315 | 211 | 0.16 | 0.36 |
| | 1992 | 581.9 | 76.1 | 1,267 | 295 | 0.23 | 0.51 |
| | 1993 | 424.4 | 53.7 | 908 | 289 | 0.32 | 0.68 |
| | 1994 | 541.8 | 67.0 | 397 | 60 | 0.15 | 0.11 |
| | 1995 | 583.5 | 75.8 | 1,230 | 462 | 0.38 | 0.79 |
| | 1996 | 638.2 | 81.4 | 1,109 | 318 | 0.29 | 0.50 |
| | 1997 | 662.5 | 89.9 | 338 | 48 | 0.14 | 0.07 |
| | 1998 | 615.4 | 83.5 | 895 | 216.563 | 0.24 | 0.35 |
| | 1999 | 585.4 | 80.2 | 939 | 218.451 | 0.23 | 0.37 |
| | 2000 | 654.4 | 88.0 | 255 | 26.305 | 0.10 | 0.04 |
| | 2001 | 268.2 | 36.3 | 1,032 | 362.723 | 0.35 | 1.35 |
| | 2002 | 725.0 | 94.8 | 224 | 24.380 | 0.11 | 0.03 |
| | 2003 | 701.1 | 90.7 | 822 | 202.571 | 0.25 | 0.29 |
| | 2004 | 608.6 | 82.3 | 974 | 370.895 | 0.38 | 0.61 |
| | 2005 | 756.6 | 98.0 | 156 | 10.459 | 0.07 | 0.01 |
| | 2006 | 675.5 | 86.0 | 882 | 239.652 | 0.27 | 0.36 |
| | 2007 | 665.6 | 85.0 | 1,065 | 256.632 | 0.24 | 0.39 |
| | 2008 | 778.4 | 98.2 | 272 | 23.478 | 0.09 | 0.03 |
| **PALO VERDE 1, 2, 3** | 1987 | 1,638.1 | 66.1 | 1,792 | 669 | 0.37 | 0.41 |
| Docket 50-528, 50-529, 50-530; | 1988 | 1,700.9 | 65.5 | 2,173 | 688 | 0.32 | 0.40 |
| NPF-41, -51, -74 | 1989 | 965.3 | 26.5 | 2,615 | 720 | 0.28 | 0.75 |
| 1st commercial operation | 1990 | 2,500.9 | 67.5 | 2,236 | 499 | 0.22 | 0.20 |
| 1/86, 9/86, 1/88 | 1991 | 3,043.9 | 78.9 | 2,242 | 605 | 0.27 | 0.20 |
| Type - PWRs | 1992 | 3,102.3 | 82.0 | 1,981 | 541 | 0.27 | 0.17 |
| Capacity - 1,311, 1,314, | 1993 | 2,677.1 | 74.3 | 2,124 | 592 | 0.28 | 0.22 |
| 1,317 MWe | 1994 | 2,827.6 | 79.1 | 2,048 | 462 | 0.23 | 0.16 |
| | 1995 | 3,265.2 | 85.6 | 1,875 | 482 | 0.26 | 0.15 |
| | 1996 | 3,482.7 | 90.0 | 1,717 | 302 | 0.18 | 0.09 |
| | 1997 | 3,369.2 | 92.2 | 1,585 | 246 | 0.16 | 0.07 |
| | 1998 | 3,454.4 | 93.2 | 1,410 | 192.425 | 0.14 | 0.06 |
| | 1999 | 3,471.2 | 93.2 | 1,275 | 146.328 | 0.11 | 0.04 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **PALO VERDE 1, 2, 3** | 2000 | 3,458.6 | 93.0 | 1,279 | 158.105 | 0.12 | 0.05 |
| (continued) | 2001 | 3,280.2 | 88.6 | 1,361 | 182.043 | 0.13 | 0.06 |
| | 2002 | 3,513.0 | 94.0 | 1,343 | 140.057 | 0.10 | 0.04 |
| | 2003 | 3,254.4 | 88.6 | 1,943 | 210.842 | 0.11 | 0.06 |
| | 2004 | 3,201.4 | 86.3 | 1,324 | 199.016 | 0.15 | 0.06 |
| | 2005 | 2,937.6 | 80.4 | 2,014 | 200.300 | 0.10 | 0.07 |
| | 2006 | 2,741.1 | 79.0 | 1,585 | 151.516 | 0.10 | 0.06 |
| | 2007 | 3,058.5 | 81.0 | 2,372 | 148.660 | 0.06 | 0.05 |
| | 2008 | 3,330.0 | 86.1 | 1,706 | 159.913 | 0.09 | 0.05 |
| **PEACH BOTTOM 2, 3** | 1975 | 1,234.3 | 80.9 | 971 | 228 | 0.23 | 0.18 |
| Docket 50-277, 50-278; | 1976 | 1,379.2 | 73.0 | 2,136 | 840 | 0.39 | 0.61 |
| DPR-44, -56 | 1977 | 1,052.4 | 58.7 | 2,827 | 2,036 | 0.72 | 1.93 |
| 1st commercial operation | 1978 | 1,636.3 | 84.0 | 2,244 | 1,317 | 0.59 | 0.80 |
| 7/74, 12/74 | 1979 | 1,740.0 | 84.5 | 2,276 | 1,388 | 0.61 | 0.80 |
| Type - BWRs | 1980 | 1,374.2 | 66.3 | 2,774 | 2,302 | 0.83 | 1.68 |
| Capacity - 1,112, 1,112 MWe | 1981 | 1,161.8 | 58.0 | 2,857 | 2,506 | 0.88 | 2.16 |
| | 1982 | 1,583.3 | 76.9 | 2,734 | 1,977 | 0.72 | 1.25 |
| | 1983 | 824.7 | 41.0 | 3,107 | 2,963 | 0.95 | 3.59 |
| | 1984 | 1,165.8 | 57.5 | 3,313 | 2,450 | 0.74 | 2.10 |
| | 1985 | 682.7 | 37.5 | 4,209 | 3,354 | 0.80 | 4.91 |
| | 1986 | 1,395.0 | 71.7 | 2,454 | 1,080 | 0.44 | 0.77 |
| | 1987 | 365.7 | 20.3 | 4,363 | 2,195 | 0.50 | 6.00 |
| | 1988 | 0.0 | 0.0 | 4,204 | 2,327 | 0.55 | --- |
| | 1989 | 491.0 | 35.0 | 2,301 | 728 | 0.32 | 1.48 |
| | 1990 | 1,684.0 | 85.7 | 1,585 | 377 | 0.24 | 0.22 |
| | 1991 | 1,210.9 | 62.3 | 2,702 | 934 | 0.35 | 0.77 |
| | 1992 | 1,516.6 | 78.7 | 1,911 | 502 | 0.26 | 0.33 |
| | 1993 | 1,654.0 | 81.9 | 1,757 | 552 | 0.31 | 0.33 |
| | 1994 | 1,927.4 | 93.8 | 2,133 | 579 | 0.27 | 0.30 |
| | 1995 | 1,955.9 | 95.1 | 1,940 | 398 | 0.21 | 0.20 |
| | 1996 | 2,012.4 | 96.9 | 1,657 | 282 | 0.17 | 0.14 |
| | 1997 | 1,956.3 | 95.0 | 1,872 | 490 | 0.26 | 0.25 |
| | 1998 | 1,881.2 | 93.2 | 1,903 | 366.040 | 0.19 | 0.19 |
| | 1999 | 2,057.2 | 96.0 | 1,630 | 319.307 | 0.20 | 0.16 |
| | 2000 | 2,058.3 | 96.7 | 1,729 | 330.928 | 0.19 | 0.16 |
| | 2001 | 2,037.1 | 95.8 | 1,445 | 344.283 | 0.24 | 0.17 |
| | 2002 | 2,105.0 | 96.7 | 1,915 | 333.056 | 0.17 | 0.16 |
| | 2003 | 2,072.4 | 94.9 | 1,641 | 355.969 | 0.22 | 0.17 |
| | 2004 | 2,148.8 | 96.4 | 1,422 | 264.727 | 0.19 | 0.12 |
| | 2005 | 2,102.0 | 95.6 | 1,801 | 306.201 | 0.17 | 0.15 |
| | 2006 | 2,169.1 | 97.0 | 1,513 | 247.676 | 0.16 | 0.11 |
| | 2007 | 2,163.8 | 97.0 | 1,906 | 384.795 | 0.20 | 0.18 |
| | 2008 | 2,115.3 | 95.1 | 1,816 | 212.741 | 0.12 | 0.10 |
| **PERRY** | 1988 | 869.3 | 79.0 | 782 | 105 | 0.13 | 0.12 |
| Docket 50-440; NPF-58 | 1989 | 642.2 | 57.0 | 1,883 | 767 | 0.41 | 1.19 |
| 1st commercial operation 11/87 | 1990 | 792.7 | 67.1 | 1,537 | 638 | 0.42 | 0.80 |
| Type - BWR | 1991 | 1,074.2 | 91.9 | 600 | 146 | 0.24 | 0.14 |
| Capacity - 1,245 MWe | 1992 | 856.2 | 75.5 | 1,487 | 571 | 0.38 | 0.67 |
| | 1993 | 479.2 | 48.2 | 1,235 | 278 | 0.23 | 0.58 |
| | 1994 | 550.8 | 50.2 | 2,098 | 691 | 0.33 | 1.25 |
| | 1995 | 1,090.9 | 95.6 | 587 | 64 | 0.11 | 0.06 |
| | 1996 | 895.6 | 77.2 | 1,622 | 307 | 0.19 | 0.34 |
| | 1997 | 930.6 | 84.7 | 1,524 | 272 | 0.18 | 0.29 |
| | 1998 | 1,163.1 | 99.3 | 385 | 41.945 | 0.11 | 0.04 |
| | 1999 | 1,041.7 | 89.9 | 1,758 | 326.014 | 0.19 | 0.31 |
| | 2000 | 1,148.2 | 97.1 | 501 | 55.827 | 0.11 | 0.05 |
| | 2001 | 885.9 | 79.6 | 1,392 | 258.268 | 0.19 | 0.29 |
| | 2002 | 1,136.0 | 95.0 | 436 | 70.258 | 0.16 | 0.06 |
| | 2003 | 973.7 | 83.8 | 1,880 | 607.384 | 0.32 | 0.62 |
| | 2004 | 1,164.3 | 95.9 | 496 | 73.481 | 0.15 | 0.06 |
| | 2005 | 872.9 | 73.8 | 1,734 | 416.608 | 0.24 | 0.48 |
| | 2006 | 1,195.8 | 99.0 | 488 | 65.152 | 0.13 | 0.05 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **PERRY** | 2007 | 919.7 | 79.0 | 1,650 | 505.121 | 0.31 | 0.55 |
| (continued) | 2008 | 1,215.9 | 97.9 | 528 | 52.058 | 0.10 | 0.04 |
| **PILGRIM 1** | 1973 | 484.0 | | 230 | 126 | 0.55 | 0.26 |
| Docket 50-293; DPR-35 | 1974 | 234.1 | 39.2 | 454 | 415 | 0.91 | 1.77 |
| 1st commercial operation 12/72 | 1975 | 308.1 | 71.3 | 473 | 798 | 1.69 | 2.59 |
| Type - BWR | 1976 | 287.8 | 60.7 | 1,317 | 2,648 | 2.01 | 9.20 |
| Capacity - 685 MWe | 1977 | 316.6 | 61.4 | 1,875 | 3,142 | 1.68 | 9.92 |
| | 1978 | 519.5 | 83.1 | 1,667 | 1,327 | 0.80 | 2.55 |
| | 1979 | 574.0 | 89.4 | 2,458 | 1,015 | 0.41 | 1.77 |
| | 1980 | 360.3 | 56.2 | 3,549 | 3,626 | 1.02 | 10.06 |
| | 1981 | 408.9 | 65.9 | 2,803 | 1,836 | 0.66 | 4.49 |
| | 1982 | 389.9 | 63.9 | 2,854 | 1,539 | 0.54 | 3.95 |
| | 1983 | 559.5 | 87.2 | 2,326 | 1,162 | 0.50 | 2.08 |
| | 1984 | 1.4 | 0.4 | 4,542 | 4,082 | 0.90 | 2,915.71 |
| | 1985 | 587.3 | 91.5 | 2,209 | 893 | 0.40 | 1.52 |
| | 1986 | 121.9 | 18.8 | 2,635 | 874 | 0.33 | 7.17 |
| | 1987 | 0.0 | 0.0 | 4,710 | 1,579 | 0.34 | --- |
| | 1988 | 0.0 | 0.0 | 2,073 | 392 | 0.19 | --- |
| | 1989 | 204.6 | 64.1 | 1,797 | 207 | 0.12 | 1.01 |
| | 1990 | 503.5 | 82.1 | 1,898 | 225 | 0.12 | 0.45 |
| | 1991 | 406.3 | 65.8 | 2,836 | 605 | 0.21 | 1.49 |
| | 1992 | 561.0 | 85.4 | 1,332 | 281 | 0.21 | 0.50 |
| | 1993 | 513.7 | 80.9 | 1,328 | 435 | 0.33 | 0.85 |
| | 1994 | 453.6 | 71.4 | 758 | 200 | 0.26 | 0.44 |
| | 1995 | 531.7 | 80.7 | 1,294 | 482 | 0.37 | 0.91 |
| | 1996 | 631.3 | 95.4 | 517 | 116 | 0.22 | 0.18 |
| | 1997 | 492.1 | 80.7 | 1,655 | 588 | 0.36 | 1.19 |
| | 1998 | 650.5 | 100.0 | 530 | 71.446 | 0.13 | 0.11 |
| | 1999 | 510.7 | 84.4 | 1,222 | 344.270 | 0.28 | 0.67 |
| | 2000 | 627.5 | 98.3 | 422 | 50.797 | 0.12 | 0.08 |
| | 2001 | 585.6 | 91.0 | 1,113 | 179.585 | 0.16 | 0.31 |
| | 2002 | 657.0 | 100.0 | 463 | 38.280 | 0.08 | 0.06 |
| | 2003 | 566.6 | 87.5 | 1,437 | 250.192 | 0.17 | 0.44 |
| | 2004 | 676.1 | 99.5 | 427 | 41.109 | 0.10 | 0.06 |
| | 2005 | 623.2 | 93.7 | 1,212 | 206.089 | 0.17 | 0.33 |
| | 2006 | 665.4 | 100.0 | 654 | 43.531 | 0.07 | 0.07 |
| | 2007 | 584.5 | 90.0 | 1,407 | 240.526 | 0.17 | 0.41 |
| | 2008 | 668.1 | 99.0 | 377 | 22.568 | 0.06 | 0.03 |
| **POINT BEACH 1, 2** | 1971 | 393.4 | | | 164 | | 0.42 |
| Docket 50-266, 50-301; | 1972 | 378.3 | | | 580 | | 1.53 |
| DPR-24, -27 | 1973 | 693.7 | | 501 | 588 | 1.17 | 0.85 |
| 1st commercial operation | 1974 | 760.2 | 81.3 | 400 | 295 | 0.74 | 0.39 |
| 12/70, 10/72 | 1975 | 801.2 | 82.9 | 339 | 459 | 1.35 | 0.57 |
| Type - PWRs | 1976 | 857.3 | 86.7 | 313 | 370 | 1.18 | 0.43 |
| Capacity - 516, 518 MWe | 1977 | 873.9 | 87.3 | 417 | 430 | 1.03 | 0.49 |
| | 1978 | 914.4 | 90.9 | 336 | 320 | 0.95 | 0.35 |
| | 1979 | 808.0 | 80.8 | 610 | 644 | 1.06 | 0.80 |
| | 1980 | 727.2 | 82.5 | 561 | 598 | 1.07 | 0.82 |
| | 1981 | 760.4 | 83.6 | 773 | 596 | 0.77 | 0.78 |
| | 1982 | 757.2 | 84.3 | 767 | 609 | 0.79 | 0.80 |
| | 1983 | 648.2 | 72.7 | 1,702 | 1,403 | 0.82 | 2.16 |
| | 1984 | 788.9 | 78.6 | 1,372 | 789 | 0.58 | 1.00 |
| | 1985 | 831.3 | 82.5 | 671 | 482 | 0.72 | 0.58 |
| | 1986 | 858.9 | 85.7 | 664 | 402 | 0.61 | 0.47 |
| | 1987 | 857.5 | 85.5 | 720 | 554 | 0.77 | 0.65 |
| | 1988 | 899.3 | 88.6 | 734 | 410 | 0.56 | 0.46 |
| | 1989 | 847.8 | 85.5 | 736 | 504 | 0.68 | 0.59 |
| | 1990 | 875.5 | 86.5 | 617 | 378 | 0.61 | 0.43 |
| | 1991 | 874.8 | 87.1 | 724 | 265 | 0.37 | 0.30 |
| | 1992 | 866.7 | 85.8 | 617 | 256 | 0.41 | 0.30 |
| | 1993 | 911.0 | 90.0 | 559 | 186 | 0.33 | 0.20 |
| | 1994 | 914.5 | 91.2 | 548 | 170 | 0.31 | 0.19 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **POINT BEACH 1, 2** | 1995 | 858.4 | 86.1 | 548 | 190 | 0.35 | 0.22 |
| (continued) | 1996 | 831.6 | 84.7 | 1,029 | 276 | 0.27 | 0.33 |
| | 1997 | 186.8 | 21.8 | 670 | 92 | 0.14 | 0.49 |
| | 1998 | 649.7 | 69.7 | 881 | 169.253 | 0.19 | 0.26 |
| | 1999 | 806.0 | 83.1 | 962 | 194.489 | 0.20 | 0.24 |
| | 2000 | 872.0 | 88.7 | 765 | 138.989 | 0.18 | 0.16 |
| | 2001 | 915.9 | 93.4 | 740 | 131.667 | 0.18 | 0.14 |
| | 2002 | 909.0 | 91.1 | 945 | 180.654 | 0.19 | 0.20 |
| | 2003 | 917.2 | 92.1 | 627 | 84.965 | 0.14 | 0.09 |
| | 2004 | 912.3 | 90.1 | 627 | 109.515 | 0.17 | 0.12 |
| | 2005 | 782.5 | 78.1 | 851 | 128.646 | 0.15 | 0.16 |
| | 2006 | 977.2 | 96.0 | 453 | 39.597 | 0.09 | 0.04 |
| | 2007 | 958.5 | 94.0 | 535 | 52.023 | 0.10 | 0.05 |
| | 2008 | 889.4 | 87.8 | 958 | 144.021 | 0.15 | 0.16 |
| **PRAIRIE ISLAND 1, 2** | 1974 | 181.9 | 43.9 | 150 | 18 | 0.12 | 0.10 |
| Docket 50-282, 50-306; | 1975 | 836.0 | 83.3 | 477 | 123 | 0.26 | 0.15 |
| DPR-42, -60 | 1976 | 725.2 | 76.6 | 818 | 447 | 0.55 | 0.62 |
| 1st commercial operation | 1977 | 922.9 | 87.2 | 718 | 300 | 0.42 | 0.33 |
| 12/73, 12/74 | 1978 | 941.1 | 92.2 | 546 | 221 | 0.40 | 0.23 |
| Type - PWRs | 1979 | 865.0 | 86.0 | 594 | 180 | 0.30 | 0.21 |
| Capacity - 522, 522 MWe | 1980 | 800.7 | 79.9 | 983 | 353 | 0.36 | 0.44 |
| | 1981 | 844.9 | 80.5 | 836 | 329 | 0.39 | 0.39 |
| | 1982 | 944.9 | 90.4 | 645 | 229 | 0.36 | 0.24 |
| | 1983 | 921.1 | 86.8 | 654 | 233 | 0.36 | 0.25 |
| | 1984 | 972.4 | 91.7 | 546 | 147 | 0.27 | 0.15 |
| | 1985 | 882.6 | 84.0 | 1,082 | 416 | 0.38 | 0.47 |
| | 1986 | 930.6 | 90.3 | 818 | 255 | 0.31 | 0.27 |
| | 1987 | 969.6 | 91.6 | 593 | 135 | 0.23 | 0.14 |
| | 1988 | 932.0 | 89.1 | 732 | 199 | 0.27 | 0.21 |
| | 1989 | 1,001.8 | 94.7 | 476 | 99 | 0.21 | 0.10 |
| | 1990 | 925.4 | 89.2 | 737 | 188 | 0.26 | 0.20 |
| | 1991 | 1,023.3 | 95.6 | 586 | 98 | 0.17 | 0.10 |
| | 1992 | 811.6 | 76.2 | 845 | 211 | 0.25 | 0.26 |
| | 1993 | 978.3 | 90.7 | 532 | 106 | 0.20 | 0.11 |
| | 1994 | 996.9 | 91.5 | 478 | 109 | 0.10 | 0.11 |
| | 1995 | 1,023.2 | 93.9 | 499 | 107 | 0.21 | 0.10 |
| | 1996 | 992.1 | 91.4 | 558 | 112 | 0.20 | 0.11 |
| | 1997 | 817.6 | 81.4 | 753 | 174 | 0.23 | 0.21 |
| | 1998 | 860.3 | 83.4 | 582 | 116.649 | 0.20 | 0.14 |
| | 1999 | 989.3 | 93.8 | 542 | 72.496 | 0.13 | 0.07 |
| | 2000 | 992.2 | 93.1 | 632 | 106.091 | 0.17 | 0.11 |
| | 2001 | 900.8 | 85.8 | 691 | 124.708 | 0.18 | 0.14 |
| | 2002 | 987.0 | 93.6 | 969 | 127.713 | 0.13 | 0.13 |
| | 2003 | 1,006.1 | 96.4 | 594 | 61.137 | 0.10 | 0.06 |
| | 2004 | 940.4 | 89.9 | 1,186 | 143.806 | 0.12 | 0.15 |
| | 2005 | 952.5 | 90.8 | 782 | 84.337 | 0.11 | 0.09 |
| | 2006 | 926.4 | 89.0 | 1,103 | 137.352 | 0.12 | 0.15 |
| | 2007 | 1,014.8 | 98.0 | 130 | 6.276 | 0.05 | 0.01 |
| | 2008 | 924.3 | 88.9 | 1,060 | 126.723 | 0.12 | 0.14 |
| **QUAD CITIES 1, 2** | 1974 | 958.1 | 72.3 | 678 | 482 | 0.71 | 0.50 |
| Docket 50-254, 50-265; | 1975 | 833.6 | 68.4 | 1,083 | 1,618 | 1.49 | 1.94 |
| DPR-29, -30 | 1976 | 951.2 | 73.1 | 1,225 | 1,651 | 1.35 | 1.74 |
| 1st commercial operation | 1977 | 970.1 | 84.0 | 907 | 1,031 | 1.14 | 1.06 |
| 2/73, 3/73 | 1978 | 1,124.5 | 88.6 | 1,207 | 1,618 | 1.34 | 1.44 |
| Type - BWRs | 1979 | 1,075.0 | 84.6 | 1,688 | 2,158 | 1.28 | 2.01 |
| Capacity - 866, 871 MWe | 1980 | 866.9 | 64.4 | 3,089 | 4,838 | 1.57 | 5.58 |
| | 1981 | 1,156.9 | 81.1 | 2,246 | 3,146 | 1.40 | 2.72 |
| | 1982 | 1,018.7 | 76.0 | 2,314 | 3,757 | 1.62 | 3.69 |
| | 1983 | 1,088.5 | 79.2 | 1,802 | 2,491 | 1.38 | 2.29 |
| | 1984 | 994.6 | 65.7 | 1,678 | 1,579 | 0.94 | 1.59 |
| | 1985 | 1,268.0 | 82.7 | 1,184 | 990 | 0.84 | 0.78 |
| | 1986 | 1,093.2 | 71.0 | 1,451 | 950 | 0.65 | 0.87 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **QUAD CITIES 1, 2** (continued) | 1987 | 1,126.6 | 75.3 | 1,429 | 720 | 0.50 | 0.64 |
| | 1988 | 1,173.7 | 84.1 | 1,486 | 827 | 0.56 | 0.70 |
| | 1989 | 1,196.3 | 85.9 | 1,721 | 900 | 0.52 | 0.75 |
| | 1990 | 1,148.9 | 77.8 | 2,186 | 1,028 | 0.47 | 0.89 |
| | 1991 | 1,044.5 | 73.2 | 1,722 | 509 | 0.30 | 0.49 |
| | 1992 | 960.8 | 68.0 | 2,413 | 1,157 | 0.48 | 1.20 |
| | 1993 | 974.9 | 67.0 | 2,150 | 849 | 0.39 | 0.87 |
| | 1994 | 681.5 | 48.7 | 2,163 | 1,128 | 0.52 | 1.66 |
| | 1995 | 1,002.5 | 70.4 | 2,041 | 736 | 0.36 | 0.73 |
| | 1996 | 876.6 | 60.1 | 2,248 | 1,025 | 0.46 | 1.17 |
| | 1997 | 935.3 | 66.5 | 2,474 | 654 | 0.26 | 0.70 |
| | 1998 | 794.8 | 55.1 | 2,177 | 760.596 | 0.35 | 0.96 |
| | 1999 | 1,476.5 | 95.9 | 1,000 | 200.556 | 0.20 | 0.14 |
| | 2000 | 1,410.4 | 93.9 | 2,840 | 893.766 | 0.32 | 0.63 |
| | 2001 | 1,478.2 | 95.9 | 736 | 143.849 | 0.20 | 0.10 |
| | 2002 | 1,396.0 | 89.0 | 3,818 | 1,786.021 | 0.47 | 1.28 |
| | 2003 | 1,569.4 | 93.1 | 998 | 438.144 | 0.44 | 0.28 |
| | 2004 | 1,443.8 | 95.5 | 2,334 | 510.521 | 0.22 | 0.35 |
| | 2005 | 1,516.2 | 94.2 | 2,869 | 961.026 | 0.33 | 0.63 |
| | 2006 | 1,524.9 | 93.0 | 2,329 | 559.362 | 0.24 | 0.37 |
| | 2007 | 1,650.3 | 97.0 | 1,945 | 249.927 | 0.13 | 0.15 |
| | 2008 | 1,619.4 | 95.2 | 2,065 | 274.444 | 0.13 | 0.17 |
| **RANCHO SECO**[12] Docket 50-312; DPR-54 1st commercial operation 4/75 Type - PWR Capacity - (873) MWe | 1976 | 268.1 | 30.4 | 297 | 58 | 0.20 | 0.22 |
| | 1977 | 706.4 | 77.1 | 515 | 391 | 0.76 | 0.55 |
| | 1978 | 607.7 | 80.5 | 508 | 323 | 0.64 | 0.53 |
| | 1979 | 687.0 | 91.1 | 287 | 126 | 0.44 | 0.18 |
| | 1980 | 530.9 | 60.4 | 890 | 412 | 0.46 | 0.78 |
| | 1981 | 321.2 | 40.2 | 772 | 402 | 0.52 | 1.25 |
| | 1982 | 409.5 | 53.3 | 766 | 337 | 0.44 | 0.82 |
| | 1983 | 347.9 | 46.8 | 1,338 | 787 | 0.59 | 2.26 |
| | 1984 | 460.0 | 58.3 | 802 | 222 | 0.28 | 0.48 |
| | 1985 | 238.7 | 30.8 | 1,764 | 756 | 0.43 | 3.17 |
| | 1986 | 0.0 | 0.0 | 1,513 | 402 | 0.27 | --- |
| | 1987 | 0.0 | 0.0 | 1,533 | 300 | 0.20 | --- |
| | 1988 | 355.8 | 63.1 | 693 | 78 | 0.11 | 0.22 |
| | 1989 | 179.9 | 54.7 | 603 | 81 | 0.13 | 0.45 |
| | 1990 | 0.0 | 0.0 | 111 | 13 | 0.12 | --- |
| | 1991 | 0.0 | 0.0 | 101 | 9 | 0.09 | --- |
| | 1992 | 0.0 | 0.0 | 70 | 7 | 0.10 | --- |
| | 1993 | 0.0 | 0.0 | 35 | 4 | 0.11 | --- |
| | 1994 | 0.0 | 0.0 | 18 | 1 | 0.23 | --- |
| | 1995 | 0.0 | 0.0 | 16 | 1 | 0.06 | --- |
| | 1996 | 0.0 | 0.0 | 16 | 1 | 0.04 | --- |
| | 1997 | 0.0 | 0.0 | 16 | 0 | 0.00 | --- |
| | 1998 | 0.0 | 0.0 | 61 | 2.661 | 0.05 | --- |
| | 1999 | 0.0 | 0.0 | 302 | 11.191 | 0.04 | --- |
| | 2000 | 0.0 | 0.0 | 219 | 25.795 | 0.12 | --- |
| | 2001 | 0.0 | 0.0 | 210 | 18.432 | 0.09 | --- |
| | 2002 | 0.0 | 0.0 | 193 | 27.346 | 0.14 | --- |
| | 2003 | 0.0 | 0.0 | 121 | 18.300 | 0.15 | --- |
| | 2004 | 0.0 | 0.0 | 122 | 14.890 | 0.12 | --- |
| | 2005 | 0.0 | 0.0 | 157 | 33.444 | 0.21 | --- |
| | 2006 | 0.0 | 0.0 | 143 | 31.793 | 0.22 | --- |
| | 2007 | 0.0 | 0.0 | 129 | 12.524 | 0.10 | --- |
| | 2008 | 0.0 | 0.0 | 84 | 2.434 | 0.03 | --- |

[12] Rancho Seco was shut down in June 1989 and is no longer in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **RIVER BEND 1** | 1987 | 605.2 | 68.4 | 1,268 | 378 | 0.30 | 0.62 |
| Docket 50-458; NPF-47 | 1988 | 880.7 | 94.3 | 513 | 107 | 0.21 | 0.12 |
| 1st commercial operation 6/86 | 1989 | 584.5 | 69.1 | 1,566 | 558 | 0.36 | 0.95 |
| Type - BWR | 1990 | 682.2 | 78.0 | 1,616 | 489 | 0.30 | 0.72 |
| Capacity - 967 MWe | 1991 | 814.7 | 87.2 | 780 | 144 | 0.18 | 0.18 |
| | 1992 | 336.1 | 39.7 | 2,022 | 710 | 0.35 | 2.11 |
| | 1993 | 640.0 | 71.6 | 847 | 180 | 0.21 | 0.28 |
| | 1994 | 595.7 | 64.9 | 2,209 | 519 | 0.23 | 0.87 |
| | 1995 | 967.1 | 99.6 | 667 | 85 | 0.13 | 0.09 |
| | 1996 | 836.1 | 85.3 | 2,093 | 473 | 0.23 | 0.57 |
| | 1997 | 778.8 | 86.3 | 1,671 | 347 | 0.21 | 0.45 |
| | 1998 | 894.2 | 96.2 | 466 | 57.749 | 0.12 | 0.06 |
| | 1999 | 651.2 | 75.2 | 1,327 | 343.858 | 0.26 | 0.53 |
| | 2000 | 837.1 | 89.7 | 1,104 | 216.053 | 0.20 | 0.26 |
| | 2001 | 889.3 | 93.6 | 1,249 | 207.614 | 0.17 | 0.23 |
| | 2002 | 965.0 | 98.5 | 373 | 35.145 | 0.09 | 0.04 |
| | 2003 | 871.3 | 92.7 | 1,296 | 216.950 | 0.17 | 0.25 |
| | 2004 | 845.6 | 90.1 | 1,378 | 235.749 | 0.17 | 0.28 |
| | 2005 | 890.5 | 94.4 | 498 | 55.816 | 0.11 | 0.06 |
| | 2006 | 853.7 | 92.0 | 1,494 | 214.409 | 0.14 | 0.25 |
| | 2007 | 823.0 | 92.0 | 1,131 | 131.373 | 0.12 | 0.16 |
| | 2008 | 724.8 | 78.7 | 1,809 | 311.697 | 0.17 | 0.43 |
| **ROBINSON 2** | 1972 | 580.0 | | 245 | 215 | 0.88 | 0.37 |
| Docket 50-261; DPR-23 | 1973 | 455.1 | | 831 | 695 | 0.84 | 1.53 |
| 1st commercial operation 3/71 | 1974 | 578.1 | 83.3 | 853 | 672 | 0.79 | 1.16 |
| Type - PWR | 1975 | 501.8 | 72.7 | 849 | 1,142 | 1.35 | 2.28 |
| Capacity - 710 MWe | 1976 | 585.5 | 84.7 | 597 | 715 | 1.20 | 1.22 |
| | 1977 | 511.5 | 85.2 | 634 | 455 | 0.72 | 0.89 |
| | 1978 | 480.5 | 72.0 | 943 | 963 | 1.02 | 2.00 |
| | 1979 | 482.0 | 70.8 | 1,454 | 1,188 | 0.82 | 2.46 |
| | 1980 | 387.3 | 62.2 | 2,009 | 1,852 | 0.92 | 4.78 |
| | 1981 | 426.6 | 73.0 | 1,462 | 733 | 0.50 | 1.72 |
| | 1982 | 277.5 | 48.9 | 2,011 | 1,426 | 0.71 | 5.14 |
| | 1983 | 409.8 | 75.5 | 2,244 | 923 | 0.41 | 2.25 |
| | 1984 | 28.0 | 7.0 | 4,127 | 2,880 | 0.70 | 102.86 |
| | 1985 | 629.5 | 87.9 | 1,378 | 311 | 0.23 | 0.49 |
| | 1986 | 577.1 | 80.3 | 1,571 | 539 | 0.34 | 0.93 |
| | 1987 | 510.1 | 72.5 | 1,379 | 499 | 0.36 | 0.98 |
| | 1988 | 385.0 | 65.9 | 1,351 | 564 | 0.42 | 1.46 |
| | 1989 | 336.6 | 48.7 | 1,098 | 195 | 0.18 | 0.58 |
| | 1990 | 400.3 | 64.8 | 1,626 | 437 | 0.27 | 1.09 |
| | 1991 | 575.1 | 81.4 | 885 | 193 | 0.22 | 0.34 |
| | 1992 | 487.2 | 66.8 | 1,267 | 352 | 0.28 | 0.72 |
| | 1993 | 502.7 | 70.7 | 1,221 | 337 | 0.28 | 0.67 |
| | 1994 | 560.3 | 79.5 | 420 | 63 | 0.15 | 0.11 |
| | 1995 | 618.7 | 84.7 | 1,058 | 215 | 0.20 | 0.35 |
| | 1996 | 654.8 | 88.6 | 1,031 | 167 | 0.16 | 0.26 |
| | 1997 | 707.5 | 99.0 | 304 | 13 | 0.04 | 0.02 |
| | 1998 | 628.5 | 88.9 | 978 | 170.476 | 0.17 | 0.27 |
| | 1999 | 648.9 | 91.8 | 807 | 123.952 | 0.15 | 0.19 |
| | 2000 | 710.0 | 99.7 | 138 | 8.396 | 0.06 | 0.01 |
| | 2001 | 627.9 | 90.6 | 827 | 124.750 | 0.15 | 0.20 |
| | 2002 | 638.0 | 91.2 | 830 | 110.631 | 0.13 | 0.17 |
| | 2003 | 733.1 | 100.0 | 109 | 4.838 | 0.04 | 0.01 |
| | 2004 | 653.7 | 89.3 | 952 | 118.159 | 0.12 | 0.18 |
| | 2005 | 656.9 | 89.7 | 791 | 64.662 | 0.08 | 0.10 |
| | 2006 | 735.5 | 100.0 | 86 | 3.320 | 0.04 | 0.01 |
| | 2007 | 655.0 | 90.0 | 890 | 80.752 | 0.09 | 0.12 |
| | 2008 | 618.1 | 84.6 | 788 | 68.381 | 0.09 | 0.11 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **SALEM 1, 2** | 1978 | 546.4 | 55.6 | 574 | 122 | 0.21 | 0.22 |
| Docket 50-272, -311; | 1979 | 250.0 | 25.5 | 1,488 | 584 | 0.39 | 2.34 |
| DPR-70, -75 | 1980 | 680.6 | 69.2 | 1,704 | 449 | 0.26 | 0.66 |
| 1st commercial operation | 1981 | 743.0 | 78.1 | 1,652 | 254 | 0.15 | 0.34 |
| 6/77, 10/81 | 1982 | 1,440.4 | 72.6 | 3,228 | 1,203 | 0.37 | 0.84 |
| Type - PWRs | 1983 | 742.0 | 30.5 | 2,383 | 581 | 0.24 | 0.78 |
| Capacity - 1,116, 1,134 MWe | 1984 | 650.1 | 31.8 | 1,395 | 681 | 0.49 | 1.05 |
| | 1985 | 1,657.7 | 75.8 | 1,112 | 204 | 0.18 | 0.12 |
| | 1986 | 1,484.3 | 70.4 | 3,554 | 599 | 0.17 | 0.40 |
| | 1987 | 1,478.2 | 73.3 | 2,543 | 600 | 0.24 | 0.41 |
| | 1988 | 1,591.6 | 73.6 | 1,609 | 503 | 0.31 | 0.32 |
| | 1989 | 1,675.4 | 79.5 | 2,944 | 338 | 0.11 | 0.20 |
| | 1990 | 1,362.6 | 65.1 | 3,636 | 272 | 0.07 | 0.20 |
| | 1991 | 1,726.4 | 79.3 | 4,201 | 458 | 0.11 | 0.27 |
| | 1992 | 1,200.9 | 61.1 | 4,376 | 431 | 0.10 | 0.36 |
| | 1993 | 1,366.3 | 65.4 | 3,559 | 408 | 0.11 | 0.30 |
| | 1994 | 1,367.4 | 73.8 | 950 | 188 | 0.20 | 0.14 |
| | 1995 | 558.1 | 29.3 | 1,195 | 218 | 0.18 | 0.39 |
| | 1996 | 0.0 | 0.0 | 1,671 | 300 | 0.18 | --- |
| | 1997 | 279.3 | 17.8 | 894 | 175 | 0.20 | 0.63 |
| | 1998 | 1,629.3 | 79.1 | 408 | 41.100 | 0.10 | 0.03 |
| | 1999 | 1,821.8 | 86.8 | 1,200 | 317.545 | 0.27 | 0.17 |
| | 2000 | 1,973.4 | 93.0 | 1,191 | 198.068 | 0.17 | 0.10 |
| | 2001 | 1,961.2 | 91.1 | 1,274 | 153.088 | 0.12 | 0.08 |
| | 2002 | 1,934.0 | 89.4 | 2,460 | 292.692 | 0.12 | 0.15 |
| | 2003 | 1,957.2 | 90.7 | 1,301 | 124.042 | 0.10 | 0.06 |
| | 2004 | 1,850.2 | 85.8 | 1,496 | 148.694 | 0.10 | 0.08 |
| | 2005 | 2,086.4 | 91.7 | 3,162 | 240.567 | 0.08 | 0.12 |
| | 2006 | 2,211.8 | 97.0 | 1,446 | 90.541 | 0.06 | 0.04 |
| | 2007 | 2,158.2 | 96.0 | 1,365 | 117.604 | 0.09 | 0.05 |
| | 2008 | 1,998.6 | 87.8 | 3,362 | 328.761 | 0.10 | 0.16 |
| **SAN ONOFRE 1[13], 2, 3** | 1969 | 314.1 | | 123 | 42 | 0.34 | 0.13 |
| Docket 50-206, -361, -362; | 1970 | 365.9 | | 251 | 155 | 0.62 | 0.42 |
| DPR-13; NPF-10, -15 | 1971 | 362.1 | | 121 | 50 | 0.41 | 0.14 |
| 1st commercial operation | 1972 | 338.5 | | 326 | 256 | 0.79 | 0.76 |
| 1/68, 8/83, 4/84 | 1973 | 273.7 | | 570 | 353 | 0.62 | 1.29 |
| Type - PWRs | 1974 | 377.8 | 86.1 | 219 | 71 | 0.32 | 0.19 |
| Capacity - (436), 1,070, | 1975 | 389.0 | 87.4 | 424 | 292 | 0.69 | 0.75 |
| 1,080 MWe | 1976 | 297.9 | 70.2 | 1,330 | 880 | 0.66 | 2.95 |
| | 1977 | 281.2 | 63.7 | 985 | 847 | 0.86 | 3.01 |
| | 1978 | 323.2 | 80.2 | 764 | 401 | 0.52 | 1.24 |
| | 1979 | 401.0 | 90.2 | 521 | 139 | 0.27 | 0.35 |
| | 1980 | 97.3 | 22.3 | 3,063 | 2,386 | 0.78 | 24.52 |
| | 1981 | 95.9 | 26.7 | 2,902 | 3,223 | 1.11 | 33.61 |
| | 1982 | 61.6 | 15.7 | 3,055 | 832 | 0.27 | 13.51 |
| | 1983 | 0.0 | 0.0 | 1,701 | 155 | 0.09 | --- |
| | 1984 | 670.4 | 68.3 | 7,514 | 986 | 0.13 | 1.47 |
| | 1985 | 1,381.8 | 132.9 | 5,742 | 722 | 0.13 | 0.52 |
| | 1986 | 1,698.2 | 61.1 | 3,594 | 824 | 0.23 | 0.49 |
| | 1987 | 1,983.0 | 78.8 | 2,138 | 696 | 0.33 | 0.35 |
| | 1988 | 1,982.3 | 68.4 | 2,324 | 781 | 0.34 | 0.39 |
| | 1989 | 1,840.8 | 64.9 | 2,237 | 567 | 0.25 | 0.31 |
| | 1990 | 1,980.5 | 69.1 | 2,224 | 885 | 0.40 | 0.45 |
| | 1991 | 1,987.6 | 75.3 | 1,814 | 412 | 0.23 | 0.21 |
| | 1992 | 2,228.6 | 87.1 | 1,651 | 324 | 0.20 | 0.15 |
| | 1993 | 1,771.3 | 79.9 | 2,193 | 767 | 0.35 | 0.43 |
| | 1994 | 2,220.7 | 100.0 | 528 | 32 | 0.06 | 0.01 |
| | 1995 | 1,686.9 | 79.1 | 1,914 | 455 | 0.24 | 0.27 |

[13] San Onofre 1 was shut down in November 1992 and is no longer in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **SAN ONOFRE 1[13], 2, 3** | 1996 | 2,089.3 | 93.2 | 1,272 | 129 | 0.10 | 0.06 |
| (continued) | 1997 | 1,533.9 | 72.9 | 1,652 | 341 | 0.21 | 0.22 |
| | 1998 | 1,996.4 | 92.0 | 1,091 | 195.600 | 0.18 | 0.10 |
| **SAN ONOFRE 1[13]** | 1999 | 0.0 | 0.0 | 241 | 15.863 | 0.07 | --- |
| Docket 50-206; | 2000 | 0.0 | 0.0 | 416 | 71.214 | 0.17 | --- |
| DPR-13 | 2001 | 0.0 | 0.0 | 338 | 57.785 | 0.17 | --- |
| 1st commercial operation 1/68 | 2002 | 0.0 | 0.0 | 308 | 61.214 | 0.20 | --- |
| Type - PWR | 2003 | 0.0 | 0.0 | 226 | 35.596 | 0.16 | --- |
| Capacity - (436) MWe | 2004 | 0.0 | 0.0 | 169 | 14.899 | 0.09 | --- |
| | 2005 | 0.0 | 0.0 | 198 | 20.624 | 0.10 | --- |
| | 2006 | 0.0 | 0.0 | 183 | 22.490 | 0.12 | --- |
| | 2007 | 0.0 | 0.0 | 20 | 0.417 | 0.02 | --- |
| | 2008 | 0.0 | 0.0 | 2 | 0.043 | 0.02 | --- |
| **SAN ONOFRE 2, 3** | 1999 | 1,901.4 | 86.9 | 1,477 | 353.765 | 0.24 | 0.19 |
| Docket 50-361, -362; | 2000 | 2,067.2 | 94.7 | 1,073 | 115.499 | 0.11 | 0.06 |
| NPF-10, -15 | 2001 | 1,727.2 | 78.9 | 1,083 | 131.384 | 0.12 | 0.08 |
| 1st commercial operation | 2002 | 2,056.0 | 93.4 | 1,140 | 136.443 | 0.12 | 0.07 |
| 8/83, 4/84 | 2003 | 2,084.3 | 94.0 | 1,275 | 163.804 | 0.13 | 0.08 |
| Type - PWRs | 2004 | 1,713.8 | 79.1 | 1,761 | 407.063 | 0.23 | 0.24 |
| Capacity - 1,070, 1,080 MWe | 2005 | 2,094.7 | 96.0 | 305 | 11.332 | 0.04 | 0.01 |
| | 2006 | 1,552.2 | 73.0 | 1,632 | 315.087 | 0.19 | 0.20 |
| | 2007 | 1,964.6 | 89.0 | 1,065 | 91.545 | 0.09 | 0.05 |
| | 2008 | 1,753.0 | 82.7 | 1,014 | 125.320 | 0.12 | 0.07 |
| **SEABROOK** | 1991 | 810.4 | 75.9 | 699 | 92 | 0.13 | 0.11 |
| Docket 50-443; NPF-86 | 1992 | 932.4 | 81.3 | 806 | 147 | 0.18 | 0.16 |
| 1st commercial operation 8/90 | 1993 | 1,071.5 | 93.6 | 110 | 6 | 0.05 | 0.01 |
| Type - PWR | 1994 | 736.4 | 63.5 | 852 | 113 | 0.13 | 0.15 |
| Capacity - 1,243 MWe | 1995 | 995.5 | 87.5 | 800 | 102 | 0.13 | 0.10 |
| | 1996 | 1,168.6 | 99.6 | 206 | 10 | 0.05 | 0.01 |
| | 1997 | 907.0 | 79.8 | 1,571 | 186 | 0.12 | 0.21 |
| | 1998 | 957.6 | 84.5 | 559 | 18.509 | 0.03 | 0.02 |
| | 1999 | 991.5 | 87.5 | 1,339 | 105.723 | 0.08 | 0.11 |
| | 2000 | 901.8 | 79.3 | 1,158 | 70.091 | 0.06 | 0.08 |
| | 2001 | 989.6 | 89.1 | 423 | 8.672 | 0.02 | 0.01 |
| | 2002 | 1,058.0 | 92.8 | 1,095 | 66.583 | 0.06 | 0.06 |
| | 2003 | 1,055.9 | 93.6 | 981 | 70.953 | 0.07 | 0.07 |
| | 2004 | 1,158.6 | 100.0 | 291 | 5.858 | 0.02 | 0.01 |
| | 2005 | 1,076.4 | 91.5 | 1,034 | 52.216 | 0.05 | 0.05 |
| | 2006 | 1,072.8 | 89.0 | 1,246 | 76.583 | 0.06 | 0.07 |
| | 2007 | 1,228.7 | 100.0 | 349 | 4.332 | 0.01 | 0.00 |
| | 2008 | 1,064.4 | 86.9 | 1,297 | 74.992 | 0.06 | 0.07 |
| **SEQUOYAH 1, 2** | 1982 | 583.5 | 52.8 | 1,968 | 570 | 0.29 | 0.98 |
| Docket 50-327, -328; | 1983 | 1,663.7 | 75.1 | 1,769 | 491 | 0.28 | 0.30 |
| DPR-77, -79 | 1984 | 1,481.9 | 69.0 | 2,373 | 1,119 | 0.47 | 0.76 |
| 1st commercial operation | 1985 | 1,151.3 | 51.3 | 1,853 | 1,072 | 0.58 | 0.93 |
| 7/81, 6/82 | 1986 | 0.0 | 0.0 | 1,738 | 527 | 0.30 | --- |
| Type - PWR | 1987 | 0.0 | 0.0 | 2,080 | 420 | 0.20 | --- |
| Capacity - 1,148, 1,126 MWe | 1988 | 490.8 | 31.8 | 2,441 | 678 | 0.28 | 1.38 |
| | 1989 | 1,851.7 | 85.7 | 2,007 | 657 | 0.33 | 0.35 |
| | 1990 | 1,662.6 | 77.2 | 2,935 | 1,687 | 0.57 | 1.01 |
| | 1991 | 1,965.4 | 88.0 | 1,933 | 700 | 0.36 | 0.36 |
| | 1992 | 1,849.0 | 85.4 | 1,714 | 465 | 0.27 | 0.25 |
| | 1993 | 405.7 | 21.8 | 1,631 | 373 | 0.23 | 0.92 |
| | 1994 | 1,418.7 | 66.3 | 1,702 | 295 | 0.17 | 0.21 |
| | 1995 | 1,864.2 | 86.1 | 1,650 | 368 | 0.22 | 0.20 |
| | 1996 | 2,003.9 | 87.9 | 1,444 | 269 | 0.19 | 0.13 |
| | 1997 | 1,946.1 | 89.0 | 1,962 | 420 | 0.21 | 0.22 |
| | 1998 | 2,135.3 | 95.3 | 1,530 | 265.980 | 0.17 | 0.12 |

[13] San Onofre 1 was shut down in November 1992 and is no longer in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **SEQUOYAH 1, 2** | 1999 | 2,165.1 | 97.0 | 1,346 | 164.569 | 0.12 | 0.08 |
| (continued) | 2000 | 1,910.0 | 86.8 | 2,039 | 357.220 | 0.18 | 0.19 |
| | 2001 | 2,158.3 | 95.7 | 1,292 | 145.066 | 0.11 | 0.07 |
| | 2002 | 2,106.0 | 94.1 | 1,257 | 108.252 | 0.09 | 0.05 |
| | 2003 | 1,776.4 | 80.0 | 2,484 | 430.889 | 0.17 | 0.24 |
| | 2004 | 2,135.2 | 93.9 | 1,161 | 85.941 | 0.07 | 0.04 |
| | 2005 | 2,162.9 | 94.9 | 1,125 | 95.133 | 0.08 | 0.04 |
| | 2006 | 2,054.9 | 91.0 | 1,752 | 242.016 | 0.14 | 0.12 |
| | 2007 | 2,129.1 | 94.0 | 1,197 | 123.540 | 0.10 | 0.06 |
| | 2008 | 2,153.6 | 94.3 | 960 | 83.730 | 0.09 | 0.04 |
| **SOUTH TEXAS 1, 2** | 1989 | 769.3 | 65.6 | 989 | 161 | 0.16 | 0.21 |
| Docket 50-498, 50-499; | 1990 | 1,504.1 | 65.9 | 1,136 | 206 | 0.18 | 0.14 |
| NPF -76, -80 | 1991 | 1,741.5 | 72.4 | 1,144 | 257 | 0.22 | 0.15 |
| 1st commercial operation | 1992 | 2,096.0 | 83.8 | 923 | 147 | 0.16 | 0.07 |
| 8/88, 6/89 | 1993 | 163.1 | 8.3 | 1,138 | 251 | 0.22 | 1.54 |
| Type - PWRs | 1994 | 1,700.2 | 70.6 | 661 | 47 | 0.07 | 0.03 |
| Capacity - 1,251, 1,251 MWe | 1995 | 2,294.2 | 89.9 | 1,485 | 291 | 0.20 | 0.13 |
| | 1996 | 2,465.9 | 95.0 | 1,145 | 137 | 0.12 | 0.06 |
| | 1997 | 2,265.5 | 93.6 | 1,583 | 273 | 0.17 | 0.12 |
| | 1998 | 2,379.4 | 96.9 | 1,171 | 183.977 | 0.16 | 0.08 |
| | 1999 | 2,219.7 | 91.6 | 1,328 | 259.770 | 0.20 | 0.12 |
| | 2000 | 2,180.0 | 89.7 | 1,372 | 231.634 | 0.17 | 0.11 |
| | 2001 | 2,262.7 | 92.2 | 1,325 | 237.645 | 0.18 | 0.11 |
| | 2002 | 2,173.0 | 87.5 | 1,510 | 329.091 | 0.22 | 0.15 |
| | 2003 | 1,796.3 | 72.1 | 909 | 143.495 | 0.16 | 0.08 |
| | 2004 | 2,437.1 | 96.0 | 842 | 119.834 | 0.14 | 0.05 |
| | 2005 | 2,258.5 | 90.0 | 1,268 | 247.655 | 0.20 | 0.11 |
| | 2006 | 2,439.6 | 95.0 | 1,078 | 150.323 | 0.14 | 0.06 |
| | 2007 | 2,527.3 | 96.0 | 881 | 91.613 | 0.10 | 0.04 |
| | 2008 | 2,452.1 | 92.3 | 1,181 | 187.295 | 0.16 | 0.08 |
| **ST. LUCIE 1, 2** | 1977 | 649.1 | 84.7 | 445 | 152 | 0.34 | 0.23 |
| Docket 50-335, -389; | 1978 | 606.4 | 76.5 | 797 | 337 | 0.42 | 0.56 |
| DPR-67; NPF-16 | 1979 | 592.0 | 74.0 | 907 | 438 | 0.48 | 0.74 |
| 1st commercial operation | 1980 | 627.9 | 77.5 | 1,074 | 532 | 0.50 | 0.85 |
| 12/76, 8/83 | 1981 | 599.1 | 72.7 | 1,473 | 929 | 0.63 | 1.55 |
| Type - PWRs | 1982 | 816.8 | 94.0 | 1,045 | 272 | 0.26 | 0.33 |
| Capacity - 839, 839 MWe | 1983 | 290.3 | 15.4 | 2,211 | 1,204 | 0.54 | 4.15 |
| | 1984 | 1,183.0 | 69.6 | 2,090 | 1,263 | 0.60 | 1.07 |
| | 1985 | 1,445.8 | 82.5 | 1,971 | 1,344 | 0.68 | 0.93 |
| | 1986 | 1,588.6 | 89.1 | 1,279 | 491 | 0.38 | 0.31 |
| | 1987 | 1,407.9 | 81.9 | 2,012 | 951 | 0.47 | 0.68 |
| | 1988 | 1,639.7 | 93.0 | 1,448 | 611 | 0.42 | 0.37 |
| | 1989 | 1,493.1 | 85.1 | 1,414 | 495 | 0.35 | 0.33 |
| | 1990 | 1,188.4 | 70.0 | 1,876 | 777 | 0.41 | 0.65 |
| | 1991 | 1,592.8 | 90.8 | 1,282 | 479 | 0.37 | 0.30 |
| | 1992 | 1,511.9 | 87.3 | 1,251 | 264 | 0.21 | 0.17 |
| | 1993 | 1,227.6 | 77.7 | 1,462 | 492 | 0.34 | 0.40 |
| | 1994 | 1,424.8 | 85.0 | 1,896 | 505 | 0.27 | 0.35 |
| | 1995 | 1,306.6 | 76.0 | 1,498 | 413 | 0.28 | 0.32 |
| | 1996 | 1,473.4 | 86.5 | 1,433 | 385 | 0.27 | 0.26 |
| | 1997 | 1,394.6 | 83.6 | 2,314 | 646 | 0.28 | 0.46 |
| | 1998 | 1,572.5 | 94.2 | 1,170 | 134.459 | 0.11 | 0.09 |
| | 1999 | 1,569.1 | 93.8 | 1,107 | 176.878 | 0.16 | 0.11 |
| | 2000 | 1,630.0 | 96.0 | 990 | 98.691 | 0.10 | 0.06 |
| | 2001 | 1,527.5 | 91.6 | 1,375 | 228.071 | 0.17 | 0.15 |
| | 2002 | 1,633.0 | 96.6 | 992 | 155.946 | 0.16 | 0.10 |
| | 2003 | 1,524.7 | 91.5 | 937 | 141.734 | 0.15 | 0.09 |
| | 2004 | 1,492.0 | 89.3 | 1,157 | 159.436 | 0.14 | 0.11 |
| | 2005 | 1,408.4 | 85.1 | 2,262 | 406.171 | 0.18 | 0.29 |
| | 2006 | 1,542.4 | 93.0 | 1,226 | 119.963 | 0.10 | 0.08 |
| | 2007 | 1,302.1 | 78.0 | 2,447 | 409.958 | 0.17 | 0.32 |
| | 2008 | 1,566.5 | 92.7 | 1,127 | 112.234 | 0.10 | 0.07 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **SUMMER 1** | 1984 | 504.6 | 61.1 | 1,120 | 295 | 0.26 | 0.58 |
| Docket 50-395; NPF-12 | 1985 | 627.7 | 71.6 | 1,201 | 379 | 0.32 | 0.60 |
| 1st commercial operation 1/84 | 1986 | 853.7 | 95.3 | 392 | 23 | 0.06 | 0.03 |
| Type - PWR | 1987 | 618.7 | 71.0 | 1,075 | 560 | 0.52 | 0.91 |
| Capacity - 966 MWe | 1988 | 605.3 | 69.1 | 1,127 | 511 | 0.45 | 0.84 |
| | 1989 | 652.4 | 83.1 | 374 | 52 | 0.14 | 0.08 |
| | 1990 | 730.0 | 83.9 | 1,090 | 376 | 0.34 | 0.52 |
| | 1991 | 642.5 | 82.9 | 984 | 291 | 0.30 | 0.45 |
| | 1992 | 892.6 | 97.4 | 249 | 27 | 0.11 | 0.03 |
| | 1993 | 728.3 | 84.0 | 1,121 | 297 | 0.26 | 0.41 |
| | 1994 | 536.7 | 69.5 | 1,549 | 374 | 0.24 | 0.70 |
| | 1995 | 899.8 | 97.2 | 257 | 13 | 0.05 | 0.01 |
| | 1996 | 850.4 | 90.3 | 701 | 97 | 0.14 | 0.11 |
| | 1997 | 829.7 | 89.8 | 820 | 163 | 0.20 | 0.20 |
| | 1998 | 934.8 | 98.8 | 285 | 13.513 | 0.05 | 0.01 |
| | 1999 | 842.0 | 89.4 | 827 | 120.172 | 0.15 | 0.14 |
| | 2000 | 723.9 | 76.6 | 933 | 166.561 | 0.18 | 0.23 |
| | 2001 | 769.3 | 83.3 | 486 | 69.398 | 0.14 | 0.09 |
| | 2002 | 840.0 | 87.9 | 685 | 59.644 | 0.09 | 0.07 |
| | 2003 | 837.0 | 87.4 | 745 | 70.828 | 0.10 | 0.08 |
| | 2004 | 938.4 | 96.8 | 200 | 10.085 | 0.05 | 0.01 |
| | 2005 | 850.3 | 88.9 | 734 | 72.454 | 0.10 | 0.09 |
| | 2006 | 858.6 | 90.0 | 676 | 61.333 | 0.09 | 0.07 |
| | 2007 | 967.9 | 100.0 | 75 | 2.691 | 0.04 | 0.00 |
| | 2008 | 817.2 | 84.8 | 623 | 49.091 | 0.08 | 0.06 |
| **SURRY 1, 2** | 1973 | 420.6 | | 936 | 152 | 0.16 | 0.36 |
| Docket 50-280, 50-281; | 1974 | 717.4 | 49.8 | 1,715 | 884 | 0.52 | 1.23 |
| DPR-32, -37 | 1975 | 1,079.0 | 70.8 | 1,948 | 1,649 | 0.85 | 1.53 |
| 1st commercial operation | 1976 | 930.7 | 60.4 | 2,753 | 3,165 | 1.15 | 3.40 |
| 12/72, 5/73 | 1977 | 1,139.0 | 72.2 | 1,860 | 2,307 | 1.24 | 2.03 |
| Type - PWRs | 1978 | 1,210.6 | 77.2 | 2,203 | 1,837 | 0.83 | 1.52 |
| Capacity - 799, 799 MWe | 1979 | 343.0 | 42.3 | 5,065 | 3,584 | 0.71 | 10.45 |
| | 1980 | 568.2 | 40.3 | 5,317 | 3,836 | 0.72 | 6.75 |
| | 1981 | 907.6 | 59.3 | 3,753 | 4,244 | 1.13 | 4.68 |
| | 1982 | 1,323.3 | 88.5 | 1,878 | 1,490 | 0.79 | 1.13 |
| | 1983 | 916.2 | 61.3 | 2,754 | 3,220 | 1.17 | 3.51 |
| | 1984 | 1,026.7 | 71.0 | 3,198 | 2,247 | 0.70 | 2.19 |
| | 1985 | 1,166.4 | 78.2 | 3,206 | 1,815 | 0.57 | 1.56 |
| | 1986 | 1,080.5 | 69.0 | 3,763 | 2,356 | 0.63 | 2.18 |
| | 1987 | 1,132.7 | 72.7 | 2,675 | 712 | 0.27 | 0.63 |
| | 1988 | 750.4 | 50.0 | 3,184 | 1,542 | 0.48 | 2.05 |
| | 1989 | 489.3 | 33.0 | 3,100 | 836 | 0.27 | 1.71 |
| | 1990 | 1,276.4 | 83.9 | 1,947 | 575 | 0.30 | 0.45 |
| | 1991 | 1,271.9 | 84.5 | 1,547 | 510 | 0.33 | 0.40 |
| | 1992 | 1,396.3 | 88.9 | 1,660 | 539 | 0.32 | 0.39 |
| | 1993 | 1,283.1 | 84.6 | 1,402 | 383 | 0.27 | 0.30 |
| | 1994 | 1,320.9 | 85.2 | 1,530 | 378 | 0.25 | 0.29 |
| | 1995 | 1,333.0 | 84.2 | 1,883 | 406 | 0.22 | 0.30 |
| | 1996 | 1,562.9 | 93.1 | 983 | 209 | 0.21 | 0.13 |
| | 1997 | 1,380.3 | 87.1 | 1,335 | 320 | 0.24 | 0.23 |
| | 1998 | 1,476.2 | 91.6 | 1,165 | 188.831 | 0.16 | 0.13 |
| | 1999 | 1,483.0 | 93.5 | 995 | 137.891 | 0.14 | 0.09 |
| | 2000 | 1,490.0 | 92.7 | 1,197 | 193.169 | 0.16 | 0.13 |
| | 2001 | 1,441.5 | 89.5 | 1,243 | 328.650 | 0.26 | 0.23 |
| | 2002 | 1,557.0 | 96.0 | 799 | 87.778 | 0.11 | 0.06 |
| | 2003 | 1,255.9 | 79.7 | 1,628 | 325.729 | 0.20 | 0.26 |
| | 2004 | 1,537.9 | 94.6 | 1,028 | 119.654 | 0.12 | 0.08 |
| | 2005 | 1,506.7 | 94.2 | 877 | 87.717 | 0.10 | 0.06 |
| | 2006 | 1,427.0 | 90.0 | 1,227 | 234.978 | 0.19 | 0.17 |
| | 2007 | 1,516.2 | 94.0 | 1,111 | 207.130 | 0.19 | 0.14 |
| | 2008 | 1,536.6 | 95.7 | 1,069 | 150.269 | 0.14 | 0.10 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **SUSQUEHANNA 1, 2** | 1984 | 719.9 | 72.6 | 2,827 | 308 | 0.11 | 0.43 |
| Docket 50-387, 50-388; | 1985 | 1,452.2 | 76.4 | 3,669 | 1,106 | 0.30 | 0.76 |
| NPF-14; -22 | 1986 | 1,344.8 | 67.0 | 2,996 | 828 | 0.28 | 0.62 |
| 1st commercial operation | 1987 | 1,749.5 | 85.3 | 2,548 | 621 | 0.24 | 0.35 |
| 6/83, 2/85 | 1988 | 1,691.0 | 83.5 | 1,904 | 516 | 0.27 | 0.31 |
| Type - BWRs | 1989 | 1,572.5 | 77.1 | 2,063 | 704 | 0.34 | 0.45 |
| Capacity - 1,185, 1,140 MWe | 1990 | 1,746.9 | 85.4 | 1,691 | 440 | 0.26 | 0.25 |
| | 1991 | 1,878.0 | 89.8 | 1,844 | 507 | 0.27 | 0.27 |
| | 1992 | 1,604.2 | 79.7 | 1,885 | 724 | 0.38 | 0.45 |
| | 1993 | 1,602.1 | 77.3 | 1,488 | 335 | 0.23 | 0.21 |
| | 1994 | 1,814.4 | 85.4 | 1,580 | 442 | 0.28 | 0.24 |
| | 1995 | 1,850.8 | 85.3 | 1,773 | 476 | 0.27 | 0.26 |
| | 1996 | 1,998.7 | 90.7 | 1,430 | 289 | 0.20 | 0.14 |
| | 1997 | 1,918.9 | 89.6 | 1,646 | 433 | 0.26 | 0.23 |
| | 1998 | 1,879.6 | 88.3 | 1,575 | 360.778 | 0.23 | 0.19 |
| | 1999 | 1,896.0 | 89.6 | 1,787 | 431.397 | 0.24 | 0.23 |
| | 2000 | 1,994.6 | 92.6 | 1,812 | 331.163 | 0.18 | 0.17 |
| | 2001 | 2,027.6 | 94.2 | 1,807 | 288.413 | 0.16 | 0.14 |
| | 2002 | 1,973.0 | 91.6 | 1,890 | 259.968 | 0.14 | 0.13 |
| | 2003 | 2,050.8 | 93.4 | 1,934 | 250.096 | 0.13 | 0.12 |
| | 2004 | 2,058.8 | 92.7 | 2,144 | 272.202 | 0.13 | 0.13 |
| | 2005 | 2,086.6 | 93.5 | 1,898 | 181.360 | 0.10 | 0.09 |
| | 2006 | 2,040.4 | 91.0 | 1,873 | 184.901 | 0.10 | 0.09 |
| | 2007 | 2,089.2 | 93.0 | 2,303 | 263.021 | 0.11 | 0.13 |
| | 2008 | 2,174.1 | 94.2 | 1,895 | 192.892 | 0.10 | 0.09 |
| **THREE MILE ISLAND 1[14], 2[15]** | 1975 | 675.9 | 82.2 | 131 | 73 | 0.56 | 0.11 |
| Docket 50-289, -320; | 1976 | 530.0 | 65.4 | 819 | 286 | 0.35 | 0.54 |
| DPR-50, -73 | 1977 | 664.5 | 80.9 | 1,122 | 360 | 0.32 | 0.54 |
| 1st commercial operation | 1978 | 690.0 | 85.1 | 1,929 | 504 | 0.26 | 0.73 |
| 9/74, 12/78 | 1979 | 266.0 | 21.9 | 3,975 | 1,392 | 0.35 | 5.23 |
| Type - PWRs | 1980 | 0.0 | 0.0 | 2,328 | 394 | 0.17 | --- |
| Capacity - 802, (880) MWe | 1981 | 0.0 | 0.0 | 2,103 | 376 | 0.18 | --- |
| | 1982 | 0.0 | 0.0 | 2,123 | 1,004 | 0.47 | --- |
| | 1983 | 0.0 | 0.0 | 1,592 | 1,159 | 0.73 | --- |
| | 1984 | 0.0 | 0.0 | 1,079 | 688 | 0.64 | --- |
| | 1985 | 103.6 | 10.6 | 1,890 | 857 | 0.45 | 8.27 |
| **THREE MILE ISLAND 1[14]** | 1986 | 585.2 | 70.9 | 1,360 | 213 | 0.16 | 0.36 |
| Docket 50-289; DPR-50 | 1987 | 610.7 | 73.6 | 1,259 | 149 | 0.12 | 0.24 |
| 1st commercial operation 9/74 | 1988 | 661.0 | 77.8 | 1,012 | 210 | 0.21 | 0.32 |
| Type - PWR | 1989 | 871.3 | 100.0 | 670 | 54 | 0.08 | 0.06 |
| Capacity - 802 MWe | 1990 | 645.5 | 84.6 | 1,319 | 264 | 0.20 | 0.41 |
| | 1991 | 688.7 | 86.4 | 1,542 | 198 | 0.13 | 0.29 |
| | 1992 | 836.8 | 100.0 | 558 | 34 | 0.06 | 0.04 |
| | 1993 | 722.0 | 88.5 | 1,835 | 206 | 0.11 | 0.29 |
| | 1994 | 798.7 | 95.5 | 434 | 40 | 0.09 | 0.05 |
| | 1995 | 772.9 | 90.8 | 1,220 | 213 | 0.17 | 0.28 |
| | 1996 | 857.4 | 100.0 | 267 | 16 | 0.06 | 0.02 |
| | 1997 | 675.7 | 84.3 | 1,049 | 204 | 0.19 | 0.30 |
| | 1998 | 805.8 | 100.0 | 280 | 16.722 | 0.06 | 0.02 |
| | 1999 | 722.4 | 89.7 | 1,171 | 154.936 | 0.13 | 0.21 |
| | 2000 | 813.4 | 100.0 | 183 | 8.689 | 0.05 | 0.01 |
| | 2001 | 616.7 | 84.2 | 1,196 | 196.699 | 0.16 | 0.32 |
| | 2002 | 833.0 | 100.0 | 172 | 6.533 | 0.04 | 0.01 |
| | 2003 | 706.4 | 87.1 | 1,230 | 155.101 | 0.13 | 0.22 |

[14] Three Mile Island 1 resumed commercial power generation in October 1985 after being under regulatory restraint since 1979.

[15] Three Mile Island 2 has been shut down since the 1979 accident but was still included in the count of reactors through 1988 since dose was still being accumulated to defuel and decontaminate the unit during this time period. Parentheses indicate plant capacity when plant was operational. Since 2001, the dose breakdowns for Three Mile Island 2 have been reported with those for Unit 1.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **THREE MILE ISLAND 1**[14] | 2004 | 828.0 | 100.0 | 105 | 3.573 | 0.03 | 0.00 |
| (continued) | 2005 | 769.1 | 93.2 | 955 | 65.576 | 0.07 | 0.09 |
| | 2006 | 825.0 | 99.0 | 125 | 5.155 | 0.04 | 0.01 |
| | 2007 | 758.6 | 92.0 | 1,266 | 114.203 | 0.09 | 0.15 |
| | 2008 | 838.5 | 100.0 | 64 | 2.219 | 0.03 | 0.00 |
| **THREE MILE ISLAND 2**[15] | 1986 | 0.0 | 0.0 | 1,497 | 915 | 0.61 | --- |
| Docket 50-320; DPR-73 | 1987 | 0.0 | 0.0 | 1,378 | 977 | 0.71 | --- |
| 1st commercial operation 12/78 | 1988 | 0.0 | 0.0 | 1,247 | 917 | 0.74 | --- |
| Type - PWR | 1989 | 0.0 | 0.0 | 1,014 | 639 | 0.63 | --- |
| Capacity - (880) MWe | 1990 | 0.0 | 0.0 | 484 | 136 | 0.28 | --- |
| | 1991 | 0.0 | 0.0 | 153 | 37 | 0.24 | --- |
| | 1992 | 0.0 | 0.0 | 315 | 157 | 0.50 | --- |
| | 1993 | 0.0 | 0.0 | 167 | 33 | 0.20 | --- |
| | 1994 | 0.0 | 0.0 | 259 | 7 | 0.03 | --- |
| | 1995 | 0.0 | 0.0 | 191 | 2 | 0.01 | --- |
| | 1996 | 0.0 | 0.0 | 122 | 2 | 0.02 | --- |
| | 1997 | 0.0 | 0.0 | 232 | 1 | 0.00 | --- |
| | 1998 | 0.0 | 0.0 | 105 | 0.697 | 0.01 | --- |
| | 1999 | 0.0 | 0.0 | 203 | 0.512 | 0.00 | --- |
| | 2000 | 0.0 | 0.0 | 70 | 0.401 | 0.01 | --- |
| | 2001 | 0.0 | 0.0 | 0 | 0.228 | --- | --- |
| | 2002 | 0.0 | 0.0 | 0 | | --- | --- |
| | 2003 | 0.0 | 0.0 | 0 | 0.260 | --- | --- |
| | 2004 | 0.0 | 0.0 | 0 | 0.216 | --- | --- |
| | 2005 | 0.0 | 0.0 | 0 | | --- | --- |
| | 2006 | 0.0 | 0.0 | 0 | 0.372 | --- | --- |
| | 2007 | 0.0 | 0.0 | 0 | 0.082 | --- | --- |
| | 2008 | 0.0 | 0.0 | 0 | 0.138 | --- | --- |
| **TROJAN**[16] | 1977 | 792.0 | 92.6 | 591 | 174 | 0.29 | 0.22 |
| Docket 50-344; NPF-1 | 1978 | 205.5 | 20.6 | 711 | 319 | 0.45 | 1.55 |
| 1st commercial operation 5/76 | 1979 | 631.0 | 58.1 | 736 | 258 | 0.35 | 0.41 |
| Type - PWR | 1980 | 727.5 | 72.5 | 1,159 | 421 | 0.36 | 0.58 |
| Capacity - (1,080) MWe | 1981 | 775.6 | 74.1 | 1,311 | 609 | 0.46 | 0.79 |
| | 1982 | 579.5 | 60.8 | 977 | 419 | 0.43 | 0.72 |
| | 1983 | 494.2 | 62.4 | 969 | 307 | 0.32 | 0.62 |
| | 1984 | 567.0 | 54.4 | 1,042 | 433 | 0.42 | 0.76 |
| | 1985 | 829.1 | 76.7 | 852 | 363 | 0.43 | 0.44 |
| | 1986 | 852.4 | 79.7 | 1,321 | 381 | 0.29 | 0.45 |
| | 1987 | 525.5 | 54.0 | 1,209 | 363 | 0.30 | 0.69 |
| | 1988 | 758.6 | 67.5 | 1,408 | 401 | 0.28 | 0.53 |
| | 1989 | 666.8 | 61.9 | 1,360 | 421 | 0.31 | 0.63 |
| | 1990 | 732.4 | 66.3 | 1,169 | 258 | 0.22 | 0.35 |
| | 1991 | 181.6 | 16.1 | 1,496 | 567 | 0.38 | 3.12 |
| | 1992 | 553.9 | 68.4 | 567 | 84 | 0.15 | 0.15 |
| | 1993 | 0.0 | 68.4 | 54 | 21 | 0.39 | --- |
| | 1994 | 0.0 | 0.0 | 51 | 9 | 0.18 | --- |
| | 1995 | 0.0 | 0.0 | 141 | 44 | 0.31 | --- |
| | 1996 | 0.0 | 0.0 | 112 | 41 | 0.37 | --- |
| | 1997 | 0.0 | 0.0 | 227 | 41 | 0.18 | --- |
| | 1998 | 0.0 | 0.0 | 283 | 46.417 | 0.16 | --- |
| | 1999 | 0.0 | 0.0 | 274 | 51.504 | 0.19 | --- |

[14] Three Mile Island 1 resumed commercial power generation in October 1985 after being under regulatory restraint since 1979.

[15] Three Mile Island 2 has been shut down since the 1979 accident but was still included in the count of reactors through 1988 since dose was still being accumulated to defuel and decontaminate the unit during this time period. Parentheses indicate plant capacity when plant was operational. Since 2001, the dose breakdowns for Three Mile Island 2 have been reported with those for Unit 1.

[16] Trojan ended commercial operation as of January 1993 and will not be put in commercial operation again. It is no longer in the count of operating reactors. Parentheses indicate plant capacity when plant was operational. As of 2005, Trojan no longer reports under its reactor license but does report under its ISFSI license (see Appendix A).

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **TROJAN**[16] | 2000 | 0.0 | 0.0 | 127 | 17.631 | 0.14 | --- |
| (continued) | 2001 | 0.0 | 0.0 | 14 | 1.091 | 0.08 | --- |
| | 2002 | 0.0 | 0.0 | 13 | 0.536 | 0.04 | --- |
| | 2003 | 0.0 | 0.0 | 105 | 23.996 | 0.23 | --- |
| | 2004 | 0.0 | 0.0 | 5 | 0.079 | 0.02 | --- |
| | 2005 | 0.0 | 0.0 | 0 | 0.000 | --- | --- |
| | 2006 | 0.0 | 0.0 | 0 | 0.000 | --- | --- |
| | 2007 | 0.0 | 0.0 | 0 | 0.000 | --- | --- |
| | 2008 | 0.0 | 0.0 | 0 | 0.000 | --- | --- |
| **TURKEY POINT 3, 4** | 1973 | 401.9 | | 444 | 78 | 0.18 | 0.19 |
| Docket 50-250, 50-251; | 1974 | 953.6 | | 794 | 454 | 0.57 | 0.48 |
| DPR-31, -41 | 1975 | 1,003.7 | 74.9 | 1,176 | 876 | 0.74 | 0.87 |
| 1st commercial operation | 1976 | 974.2 | 71.2 | 1,647 | 1,184 | 0.72 | 1.22 |
| 12/72, 9/73 | 1977 | 979.5 | 72.1 | 1,319 | 1,036 | 0.79 | 1.06 |
| Type - PWRs | 1978 | 1,000.2 | 78.8 | 1,336 | 1,032 | 0.77 | 1.03 |
| Capacity - 693, 693 MWe | 1979 | 811.0 | 62.4 | 2,002 | 1,680 | 0.84 | 2.07 |
| | 1980 | 990.6 | 73.6 | 1,803 | 1,651 | 0.92 | 1.67 |
| | 1981 | 654.0 | 46.8 | 2,932 | 2,251 | 0.77 | 3.44 |
| | 1982 | 915.7 | 65.2 | 2,956 | 2,119 | 0.72 | 2.31 |
| | 1983 | 878.4 | 62.8 | 2,930 | 2,681 | 0.92 | 3.05 |
| | 1984 | 946.7 | 68.5 | 2,010 | 1,255 | 0.62 | 1.33 |
| | 1985 | 1,034.9 | 74.7 | 1,905 | 1,253 | 0.66 | 1.21 |
| | 1986 | 754.1 | 54.9 | 1,808 | 946 | 0.52 | 1.25 |
| | 1987 | 431.3 | 36.6 | 1,980 | 1,371 | 0.69 | 3.18 |
| | 1988 | 809.8 | 59.5 | 1,841 | 738 | 0.40 | 0.91 |
| | 1989 | 689.9 | 56.8 | 1,625 | 433 | 0.27 | 0.63 |
| | 1990 | 933.1 | 69.0 | 2,099 | 730 | 0.35 | 0.78 |
| | 1991 | 258.2 | 21.0 | 2,087 | 939 | 0.45 | 3.64 |
| | 1992 | 968.9 | 75.5 | 1,374 | 325 | 0.24 | 0.34 |
| | 1993 | 1,244.8 | 91.0 | 1,271 | 275 | 0.22 | 0.22 |
| | 1994 | 1,172.9 | 87.2 | 1,489 | 476 | 0.32 | 0.41 |
| | 1995 | 1,320.3 | 94.6 | 1,142 | 215 | 0.19 | 0.16 |
| | 1996 | 1,307.8 | 94.0 | 1,157 | 187 | 0.16 | 0.14 |
| | 1997 | 1,220.9 | 88.6 | 1,581 | 414 | 0.26 | 0.34 |
| | 1998 | 1,323.0 | 94.5 | 1,045 | 156.415 | 0.15 | 0.12 |
| | 1999 | 1,352.5 | 96.5 | 919 | 127.567 | 0.14 | 0.09 |
| | 2000 | 1,283.7 | 92.2 | 1,292 | 219.852 | 0.17 | 0.17 |
| | 2001 | 1,324.1 | 95.0 | 827 | 101.575 | 0.12 | 0.08 |
| | 2002 | 1,374.0 | 97.9 | 793 | 73.764 | 0.09 | 0.05 |
| | 2003 | 1,253.2 | 91.6 | 1,442 | 247.053 | 0.17 | 0.20 |
| | 2004 | 1,231.0 | 89.9 | 1,089 | 117.404 | 0.11 | 0.10 |
| | 2005 | 1,143.0 | 84.9 | 1,136 | 109.996 | 0.10 | 0.10 |
| | 2006 | 1,251.8 | 90.0 | 1,321 | 149.208 | 0.11 | 0.12 |
| | 2007 | 1,281.5 | 91.0 | 1,085 | 107.601 | 0.10 | 0.08 |
| | 2008 | 1,294.9 | 92.0 | 1,067 | 97.357 | 0.09 | 0.08 |
| **VERMONT YANKEE** | 1973 | 222.1 | | 244 | 85 | 0.35 | 0.38 |
| Docket 50-271; DPR-28 | 1974 | 303.5 | | 357 | 216 | 0.61 | 0.71 |
| 1st commercial operation 11/72 | 1975 | 429.0 | 87.8 | 282 | 153 | 0.54 | 0.36 |
| Type - BWR | 1976 | 389.6 | 77.1 | 815 | 411 | 0.50 | 1.05 |
| Capacity - 605 MWe | 1977 | 423.5 | 85.1 | 641 | 258 | 0.40 | 0.61 |
| | 1978 | 387.5 | 75.9 | 934 | 339 | 0.36 | 0.87 |
| | 1979 | 414.0 | 82.1 | 1,220 | 1,170 | 0.96 | 2.83 |
| | 1980 | 357.8 | 71.5 | 1,443 | 1,338 | 0.93 | 3.74 |
| | 1981 | 429.1 | 84.6 | 1,264 | 731 | 0.58 | 1.70 |
| | 1982 | 501.0 | 96.0 | 481 | 205 | 0.43 | 0.41 |
| | 1983 | 346.1 | 69.3 | 1,316 | 1,527 | 1.16 | 4.41 |
| | 1984 | 398.1 | 79.0 | 954 | 626 | 0.66 | 1.57 |
| | 1985 | 361.4 | 71.8 | 1,392 | 1,051 | 0.76 | 2.91 |

[16] Trojan ended commercial operation as of January 1993 and will not be put in commercial operation again. It is no longer in the count of operating reactors. Parentheses indicate plant capacity when plant was operational. As of 2005, Trojan no longer reports under its reactor license but does report under its ISFSI license (see Appendix A).

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **VERMONT YANKEE** | 1986 | 248.1 | 48.9 | 1,389 | 1,188 | 0.86 | 4.79 |
| (continued) | 1987 | 423.6 | 84.2 | 827 | 303 | 0.37 | 0.72 |
| | 1988 | 492.1 | 95.7 | 379 | 124 | 0.33 | 0.25 |
| | 1989 | 432.8 | 84.7 | 832 | 288 | 0.35 | 0.67 |
| | 1990 | 433.1 | 85.9 | 849 | 307 | 0.36 | 0.71 |
| | 1991 | 492.3 | 94.3 | 310 | 118 | 0.38 | 0.24 |
| | 1992 | 446.8 | 88.1 | 921 | 381 | 0.41 | 0.85 |
| | 1993 | 402.3 | 80.1 | 833 | 217 | 0.26 | 0.54 |
| | 1994 | 515.8 | 98.7 | 220 | 38 | 0.17 | 0.07 |
| | 1995 | 462.1 | 87.0 | 737 | 182 | 0.25 | 0.39 |
| | 1996 | 452.7 | 85.2 | 951 | 231 | 0.24 | 0.51 |
| | 1997 | 487.1 | 96.0 | 260 | 57 | 0.22 | 0.12 |
| | 1998 | 383.4 | 77.9 | 944 | 199.399 | 0.21 | 0.52 |
| | 1999 | 463.4 | 91.0 | 854 | 175.795 | 0.21 | 0.38 |
| | 2000 | 517.8 | 99.6 | 198 | 37.846 | 0.19 | 0.07 |
| | 2001 | 474.9 | 93.5 | 863 | 143.010 | 0.17 | 0.30 |
| | 2002 | 451.0 | 91.7 | 946 | 150.446 | 0.16 | 0.33 |
| | 2003 | 505.9 | 98.8 | 359 | 54.348 | 0.15 | 0.11 |
| | 2004 | 439.2 | 87.2 | 1,379 | 211.529 | 0.15 | 0.48 |
| | 2005 | 467.5 | 94.2 | 1,105 | 198.003 | 0.18 | 0.42 |
| | 2006 | 582.9 | 100.0 | 380 | 49.537 | 0.13 | 0.09 |
| | 2007 | 537.0 | 93.0 | 1,191 | 171.200 | 0.14 | 0.32 |
| | 2008 | 557.3 | 94.1 | 1,402 | 213.680 | 0.15 | 0.38 |
| **VOGTLE 1, 2** | 1988 | 820.4 | 77.7 | 1,108 | 138 | 0.12 | 0.17 |
| Docket 50-424; 50-425; | 1989 | 1,045.8 | 96.0 | 427 | 32 | 0.07 | 0.03 |
| NPF-68, -81 | 1990 | 1,710.9 | 82.7 | 1,602 | 466 | 0.29 | 0.27 |
| 1st commercial operation | 1991 | 1,966.5 | 89.2 | 1,357 | 362 | 0.27 | 0.18 |
| 6/87, 5/89 | 1992 | 2,047.9 | 90.0 | 1,262 | 426 | 0.34 | 0.21 |
| Type - PWRs | 1993 | 2,060.4 | 88.3 | 1,338 | 367 | 0.27 | 0.18 |
| Capacity - 1,143, 1,140 MWe | 1994 | 2,170.1 | 91.3 | 1,048 | 217 | 0.21 | 0.10 |
| | 1995 | 2,285.4 | 95.2 | 953 | 199 | 0.21 | 0.09 |
| | 1996 | 2,056.8 | 86.5 | 1,395 | 452 | 0.32 | 0.22 |
| | 1997 | 2,121.1 | 91.4 | 994 | 158 | 0.16 | 0.07 |
| | 1998 | 2,123.9 | 92.3 | 994 | 162.210 | 0.16 | 0.08 |
| | 1999 | 2,106.0 | 91.5 | 1,359 | 228.942 | 0.17 | 0.11 |
| | 2000 | 2,223.9 | 95.6 | 899 | 121.312 | 0.14 | 0.05 |
| | 2001 | 2,231.5 | 96.2 | 870 | 129.270 | 0.15 | 0.06 |
| | 2002 | 1,942.0 | 85.3 | 1,152 | 243.957 | 0.21 | 0.13 |
| | 2003 | 2,179.9 | 94.8 | 806 | 84.344 | 0.10 | 0.04 |
| | 2004 | 2,200.7 | 95.7 | 765 | 80.763 | 0.11 | 0.04 |
| | 2005 | 2,027.9 | 88.6 | 1,099 | 151.096 | 0.14 | 0.08 |
| | 2006 | 2,048.8 | 89.0 | 892 | 115.509 | 0.13 | 0.06 |
| | 2007 | 2,089.9 | 92.0 | 951 | 120.515 | 0.13 | 0.06 |
| | 2008 | 2,023.9 | 89.3 | 1,185 | 137.620 | 0.12 | 0.07 |
| **WATERFORD 3** | 1986 | 875.7 | 79.1 | 1,244 | 223 | 0.18 | 0.25 |
| Docket 50-382; NPF-38 | 1987 | 891.8 | 82.5 | 959 | 156 | 0.16 | 0.17 |
| 1st commercial operation 9/85 | 1988 | 784.3 | 75.4 | 1,246 | 259 | 0.21 | 0.33 |
| Type - PWR | 1989 | 909.8 | 82.6 | 1,306 | 265 | 0.20 | 0.29 |
| Capacity - 1,152 MWe | 1990 | 1,027.9 | 92.8 | 432 | 47 | 0.11 | 0.05 |
| | 1991 | 870.6 | 79.8 | 1,301 | 364 | 0.28 | 0.42 |
| | 1992 | 909.6 | 83.2 | 1,213 | 226 | 0.19 | 0.25 |
| | 1993 | 1,088.3 | 99.4 | 195 | 15 | 0.08 | 0.01 |
| | 1994 | 949.1 | 87.0 | 1,167 | 191 | 0.16 | 0.20 |
| | 1995 | 927.4 | 83.4 | 1,092 | 153 | 0.14 | 0.16 |
| | 1996 | 1,064.8 | 94.2 | 342 | 27 | 0.08 | 0.03 |
| | 1997 | 767.2 | 71.2 | 1,186 | 148 | 0.13 | 0.19 |
| | 1998 | 984.1 | 91.9 | 282 | 24.032 | 0.09 | 0.02 |
| | 1999 | 849.5 | 79.6 | 833 | 123.198 | 0.15 | 0.14 |
| | 2000 | 965.1 | 88.8 | 825 | 131.701 | 0.16 | 0.14 |
| | 2001 | 1,086.0 | 99.6 | 91 | 4.677 | 0.05 | 0.00 |
| | 2002 | 1,007.0 | 93.2 | 811 | 109.439 | 0.13 | 0.11 |

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **WATERFORD 3** | 2003 | 968.0 | 90.9 | 710 | 95.332 | 0.13 | 0.10 |
| (continued) | 2004 | 1,099.1 | 100.0 | 60 | 2.517 | 0.04 | 0.00 |
| | 2005 | 900.9 | 80.2 | 902 | 136.318 | 0.15 | 0.15 |
| | 2006 | 1,059.3 | 92.0 | 1,190 | 109.682 | 0.09 | 0.10 |
| | 2007 | 1,130.2 | 96.0 | 469 | 20.125 | 0.04 | 0.02 |
| | 2008 | 1,030.7 | 88.0 | 1,268 | 134.221 | 0.11 | 0.13 |
| **WATTS BAR 1** | 1997 | 867.6 | 83.8 | 1,103 | 113 | 0.10 | 0.13 |
| Docket 50-390; NPF-90 | 1998 | 1,105.1 | 99.1 | 96 | 3.106 | 0.03 | 0.00 |
| 1st commercial operation 5/96 | 1999 | 943.1 | 87.2 | 975 | 98.946 | 0.10 | 0.10 |
| Type - PWR | 2000 | 1,033.3 | 92.8 | 1,053 | 122.453 | 0.12 | 0.12 |
| Capacity - 1,121 MWe | 2001 | 1,095.9 | 96.5 | 197 | 5.912 | 0.03 | 0.01 |
| | 2002 | 1,034.0 | 92.1 | 909 | 93.598 | 0.10 | 0.09 |
| | 2003 | 973.3 | 86.7 | 1,392 | 165.741 | 0.12 | 0.17 |
| | 2004 | 1,122.1 | 99.1 | 220 | 5.893 | 0.03 | 0.01 |
| | 2005 | 1,003.7 | 90.0 | 1,244 | 143.506 | 0.12 | 0.14 |
| | 2006 | 764.5 | 70.0 | 2,070 | 322.682 | 0.16 | 0.42 |
| | 2007 | 1,150.6 | 100.0 | 128 | 4.414 | 0.03 | 0.00 |
| | 2008 | 923.5 | 83.2 | 887 | 70.648 | 0.08 | 0.08 |
| **WOLF CREEK 1** | 1986 | 832.8 | 73.3 | 682 | 143 | 0.21 | 0.17 |
| Docket 50-482; NPF-42 | 1987 | 778.8 | 71.1 | 675 | 138 | 0.20 | 0.18 |
| 1st commercial operation 9/85 | 1988 | 794.7 | 70.7 | 1,010 | 297 | 0.29 | 0.37 |
| Type - PWR | 1989 | 1,108.4 | 99.5 | 186 | 18 | 0.10 | 0.02 |
| Capacity - 1,160 MWe | 1990 | 940.2 | 81.0 | 798 | 195 | 0.24 | 0.21 |
| | 1991 | 707.6 | 71.9 | 1,010 | 331 | 0.33 | 0.47 |
| | 1992 | 1,010.8 | 86.7 | 446 | 78 | 0.17 | 0.08 |
| | 1993 | 940.5 | 80.6 | 975 | 183 | 0.19 | 0.19 |
| | 1994 | 1,017.2 | 86.8 | 1,082 | 235 | 0.22 | 0.23 |
| | 1995 | 1,198.0 | 98.7 | 242 | 14 | 0.06 | 0.01 |
| | 1996 | 980.6 | 81.2 | 986 | 171 | 0.17 | 0.17 |
| | 1997 | 964.3 | 83.8 | 989 | 265 | 0.27 | 0.27 |
| | 1998 | 1,187.3 | 100.0 | 184 | 10.382 | 0.05 | 0.01 |
| | 1999 | 1,045.3 | 90.1 | 812 | 147.704 | 0.18 | 0.14 |
| | 2000 | 1,032.7 | 89.5 | 861 | 143.417 | 0.17 | 0.14 |
| | 2001 | 1,177.9 | 100.0 | 105 | 5.176 | 0.05 | 0.00 |
| | 2002 | 1,029.0 | 88.7 | 816 | 99.987 | 0.12 | 0.10 |
| | 2003 | 1,013.5 | 87.2 | 820 | 88.941 | 0.11 | 0.09 |
| | 2004 | 1,153.5 | 98.8 | 93 | 3.388 | 0.04 | 0.00 |
| | 2005 | 1,004.2 | 86.7 | 856 | 106.870 | 0.12 | 0.11 |
| | 2006 | 1,067.4 | 91.0 | 789 | 96.788 | 0.12 | 0.09 |
| | 2007 | 1,183.7 | 100.0 | 91 | 4.307 | 0.05 | 0.00 |
| | 2008 | 968.3 | 83.1 | 911 | 94.997 | 0.10 | 0.10 |
| **YANKEE ROWE**[17] | 1969 | 138.3 | | 193 | 215 | 1.11 | 1.55 |
| Docket 50-29; DPR-3 | 1970 | 146.1 | | 355 | 255 | 0.72 | 1.75 |
| 1st commercial operation 7/61 | 1971 | 173.5 | | 155 | 90 | 0.58 | 0.52 |
| Type - PWR | 1972 | 78.7 | | 282 | 255 | 0.90 | 3.24 |
| Capacity - (175) MWe | 1973 | 127.1 | | 133 | 99 | 0.74 | 0.78 |
| | 1974 | 111.3 | | 243 | 205 | 0.84 | 1.84 |
| | 1975 | 145.1 | 82.4 | 249 | 116 | 0.47 | 0.80 |
| | 1976 | 152.2 | 89.8 | 152 | 59 | 0.39 | 0.39 |
| | 1977 | 124.6 | 73.9 | 725 | 356 | 0.49 | 2.86 |
| | 1978 | 145.0 | 81.0 | 565 | 282 | 0.50 | 1.94 |
| | 1979 | 149.0 | 81.6 | 441 | 127 | 0.29 | 0.85 |
| | 1980 | 35.6 | 22.0 | 502 | 213 | 0.42 | 5.98 |
| | 1981 | 109.0 | 74.4 | 515 | 302 | 0.59 | 2.77 |
| | 1982 | 108.6 | 73.4 | 814 | 474 | 0.58 | 4.36 |
| | 1983 | 163.5 | 91.4 | 395 | 68 | 0.17 | 0.42 |
| | 1984 | 124.8 | 71.4 | 654 | 348 | 0.53 | 2.79 |
| | 1985 | 144.3 | 85.3 | 653 | 211 | 0.32 | 1.46 |

[17] Yankee Rowe ended commercial operation as of October 1991 and will not be put in commercial operation again. It is no longer in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **YANKEE ROWE**[17] | 1986 | 169.7 | 95.0 | 384 | 45 | 0.12 | 0.27 |
| (continued) | 1987 | 138.7 | 82.7 | 593 | 217 | 0.37 | 1.56 |
| | 1988 | 136.4 | 85.2 | 738 | 227 | 0.31 | 1.66 |
| | 1989 | 159.4 | 92.9 | 496 | 62 | 0.13 | 0.39 |
| | 1990 | 101.1 | 61.5 | 702 | 246 | 0.35 | 2.43 |
| | 1991 | 121.2 | 72.3 | 162 | 40 | 0.25 | 0.33 |
| | 1992 | 0.0 | 0.0 | 324 | 94 | 0.29 | --- |
| | 1993 | 0.0 | 0.0 | 313 | 163 | 0.52 | --- |
| | 1994 | 0.0 | 0.0 | 222 | 156 | 0.70 | --- |
| | 1995 | 0.0 | 0.0 | 191 | 78 | 0.41 | --- |
| | 1996 | 0.0 | 0.0 | 239 | 95 | 0.40 | --- |
| | 1997 | 0.0 | 0.0 | 323 | 65 | 0.20 | --- |
| | 1998 | 0.0 | 0.0 | 125 | 4.603 | 0.04 | --- |
| | 1999 | 0.0 | 0.0 | 83 | 2.291 | 0.02 | --- |
| | 2000 | 0.0 | 0.0 | 38 | 2.406 | 0.06 | --- |
| | 2001 | 0.0 | 0.0 | 48 | 3.969 | 0.08 | --- |
| | 2002 | 0.0 | 0.0 | 128 | 20.024 | 0.16 | --- |
| | 2003 | 0.0 | 0.0 | 136 | 30.934 | 0.23 | --- |
| | 2004 | 0.0 | 0.0 | 70 | 6.502 | 0.09 | --- |
| | 2005 | 0.0 | 0.0 | 63 | 1.456 | 0.02 | --- |
| | 2006 | 0.0 | 0.0 | 45 | 0.975 | 0.02 | --- |
| | 2007 | 0.0 | 0.0 | 0 | 0.000 | --- | --- |
| | 2008 | 0.0 | 0.0 | 1 | 0.019 | 0.02 | --- |
| **ZION 1**[18]**, 2** | 1974 | 425.3 | 71.1 | 306 | 56 | 0.18 | 0.13 |
| Docket 50-295; 50-304; | 1975 | 1,181.5 | 74.9 | 436 | 127 | 0.29 | 0.11 |
| DPR-39, -48 | 1976 | 1,134.9 | 61.9 | 774 | 571 | 0.74 | 0.50 |
| 1st commercial operation | 1977 | 1,358.6 | 75.0 | 784 | 1,003 | 1.28 | 0.74 |
| 12/73, 9/74 | 1978 | 1,613.5 | 80.2 | 1,104 | 1,017 | 0.92 | 0.63 |
| Type - PWRs | 1979 | 1,238.0 | 67.6 | 1,472 | 1,274 | 0.87 | 1.03 |
| Capacity - (1,040), (1,040) MWe | 1980 | 1,411.2 | 74.1 | 1,363 | 920 | 0.67 | 0.65 |
| | 1981 | 1,366.9 | 72.3 | 1,754 | 1,720 | 0.98 | 1.26 |
| | 1982 | 1,186.4 | 64.3 | 1,575 | 2,103 | 1.34 | 1.77 |
| | 1983 | 1,222.3 | 69.4 | 1,285 | 1,311 | 1.02 | 1.07 |
| | 1984 | 1,389.9 | 69.6 | 1,110 | 786 | 0.71 | 0.57 |
| | 1985 | 1,187.9 | 62.9 | 1,498 | 1,166 | 0.78 | 0.98 |
| | 1986 | 1,462.0 | 73.2 | 967 | 474 | 0.49 | 0.32 |
| | 1987 | 1,337.0 | 71.0 | 1,046 | 653 | 0.62 | 0.49 |
| | 1988 | 1,549.1 | 78.3 | 1,926 | 1,260 | 0.65 | 0.81 |
| | 1989 | 1,514.1 | 77.6 | 1,282 | 624 | 0.49 | 0.41 |
| | 1990 | 860.4 | 46.9 | 1,385 | 696 | 0.50 | 0.81 |
| | 1991 | 1,125.7 | 58.2 | 902 | 173 | 0.19 | 0.15 |
| | 1992 | 1,128.8 | 59.0 | 1,732 | 1,043 | 0.60 | 0.92 |
| | 1993 | 1,458.2 | 70.9 | 1,772 | 643 | 0.36 | 0.44 |
| | 1994 | 1,224.9 | 59.9 | 1,176 | 306 | 0.26 | 0.25 |
| | 1995 | 1,471.6 | 72.4 | 1,807 | 797 | 0.44 | 0.54 |
| | 1996 | 1,538.4 | 75.8 | 1,567 | 437 | 0.28 | 0.28 |
| | 1997 | 123.2 | 7.1 | 924 | 119 | 0.13 | 0.97 |
| | 1998 | 0.0 | 0.0 | 246 | 12.417 | 0.05 | --- |
| | 1999 | 0.0 | 0.0 | 67 | 4.194 | 0.06 | --- |
| | 2000 | 0.0 | 0.0 | 26 | 3.015 | 0.12 | --- |
| | 2001 | 0.0 | 0.0 | 6 | 0.274 | 0.05 | --- |
| | 2002 | 0.0 | 0.0 | 12 | 0.276 | 0.02 | --- |
| | 2003 | 0.0 | 0.0 | 2 | 0.049 | 0.02 | --- |
| | 2004 | 0.0 | 0.0 | 6 | 0.167 | 0.03 | --- |

[17] Yankee Rowe ended commercial operation as of October 1991 and will not be put in commercial operation again. It is no longer in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

[18] Zion 1, 2 were shut down in December 1997 and are no longer included in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

| Reporting Organization | Year | Megawatt Years (MW-yr) | Unit Availability Factor | Total Personnel with Measurable Doses | Collective Dose (person-rem) | Average Measurable Dose (rem) | Collective Dose/ MW-yr |
|---|---|---|---|---|---|---|---|
| **ZION 1[18], 2** (continued) | 2005 | 0.0 | 0.0 | 5 | 0.109 | 0.02 | --- |
| | 2006 | 0.0 | 0.0 | 7 | 0.109 | 0.02 | --- |
| | 2007 | 0.0 | 0.0 | 8 | 0.224 | 0.03 | --- |
| | 2008 | 0.0 | 0.0 | 7 | 0.147 | 0.02 | --- |

[18] Zion 1, 2 were shut down in December 1997 and are no longer included in the count of operating reactors. Parentheses indicate plant capacity when plant was operational.

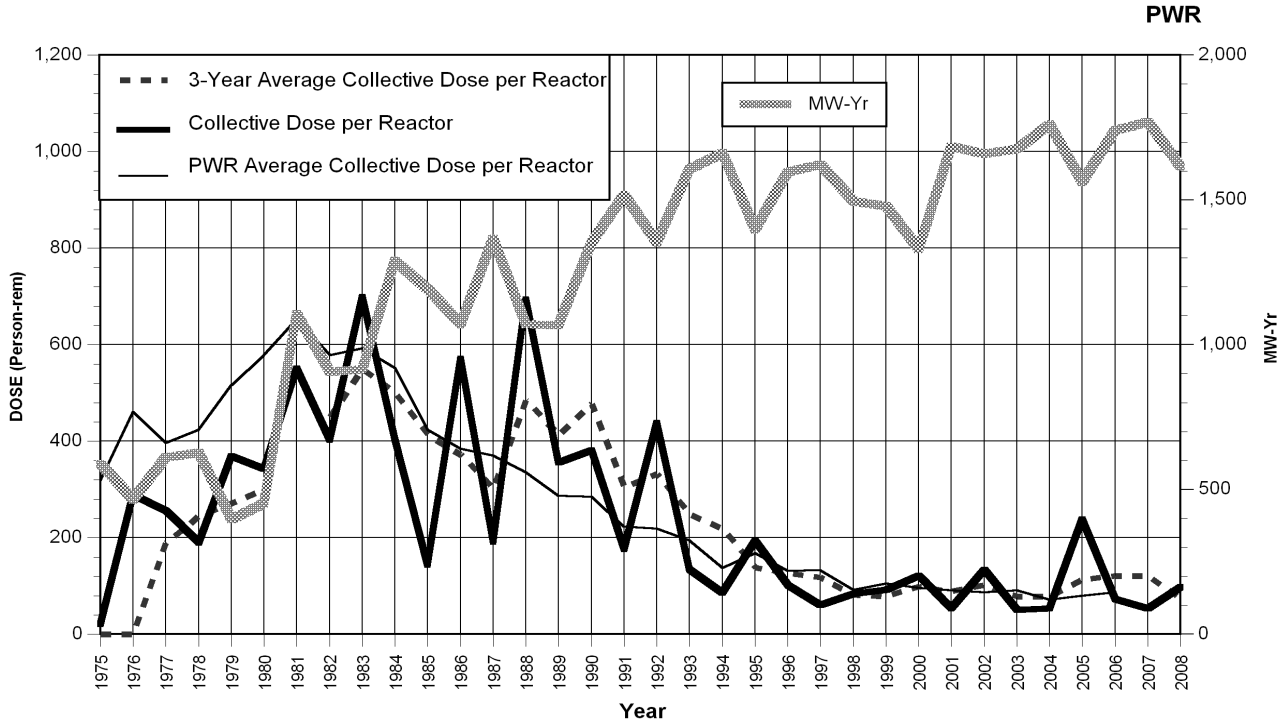
# Appendix D*

# DOSE PERFORMANCE INDICATORS BY REACTOR SITE

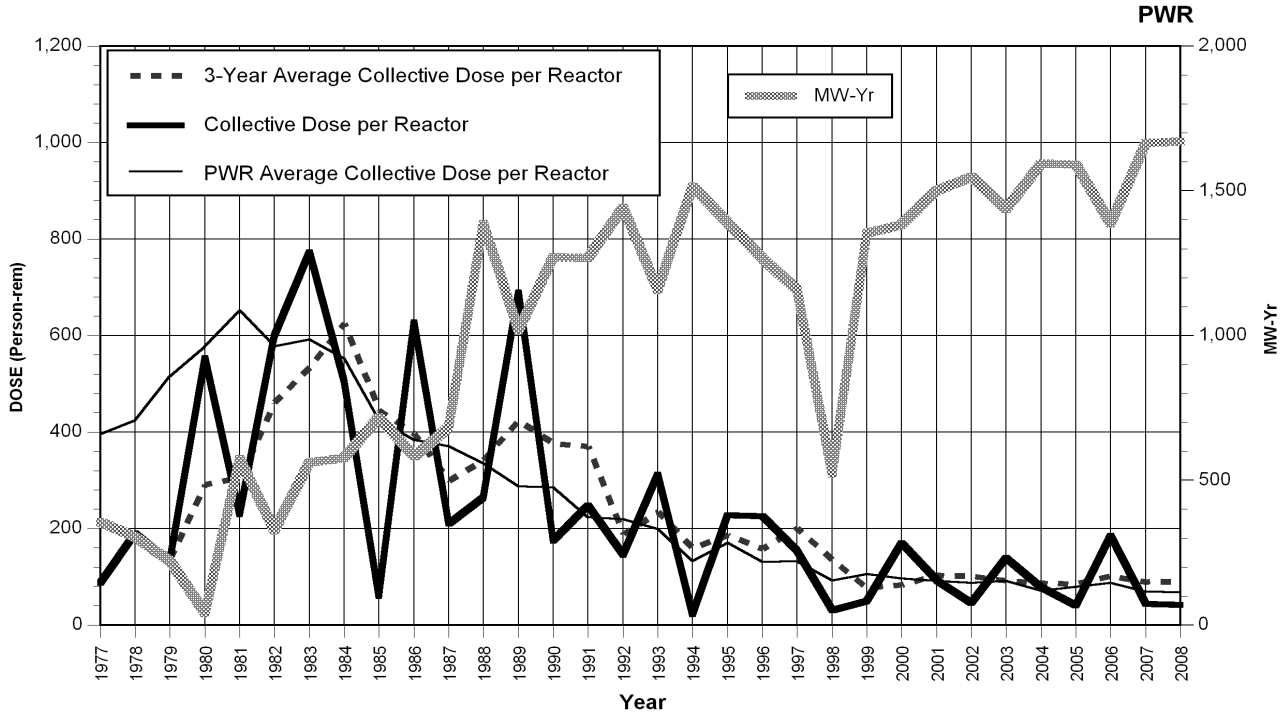
# 1973–2008

* Appendix D only contains data on plants in operation during 2008.

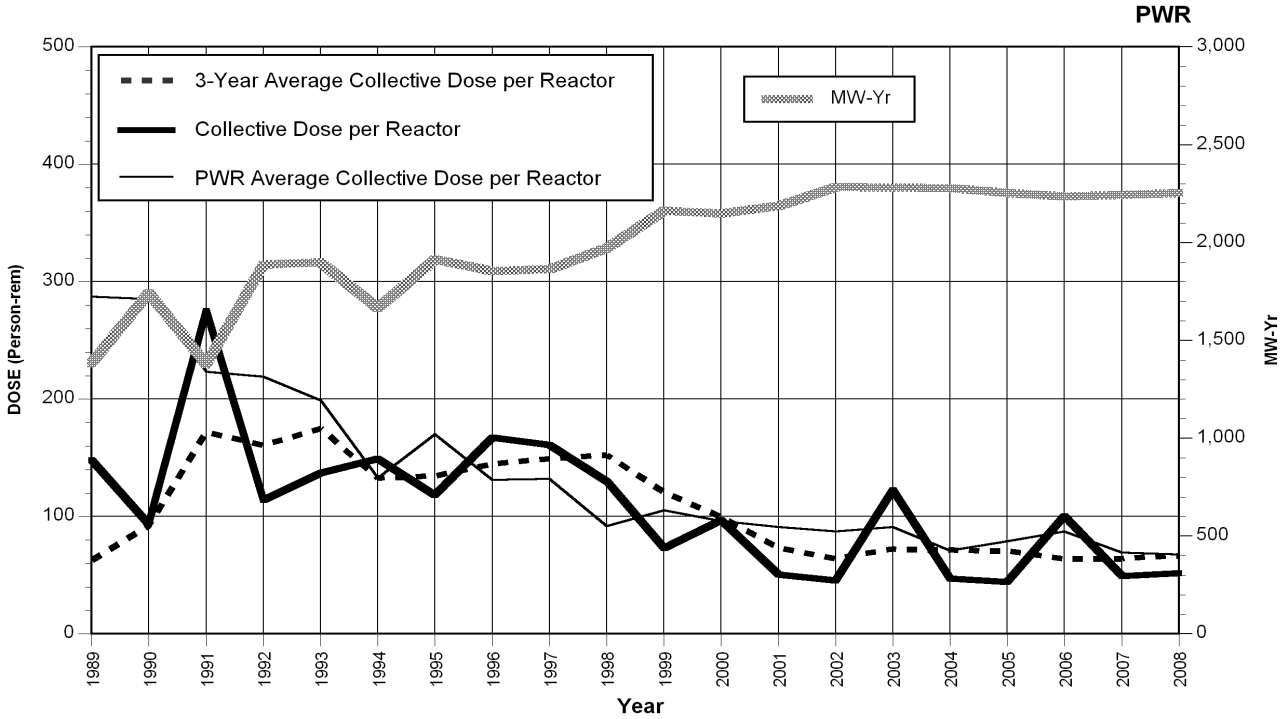
## ARKANSAS 1, 2
Dose Performance Indicators



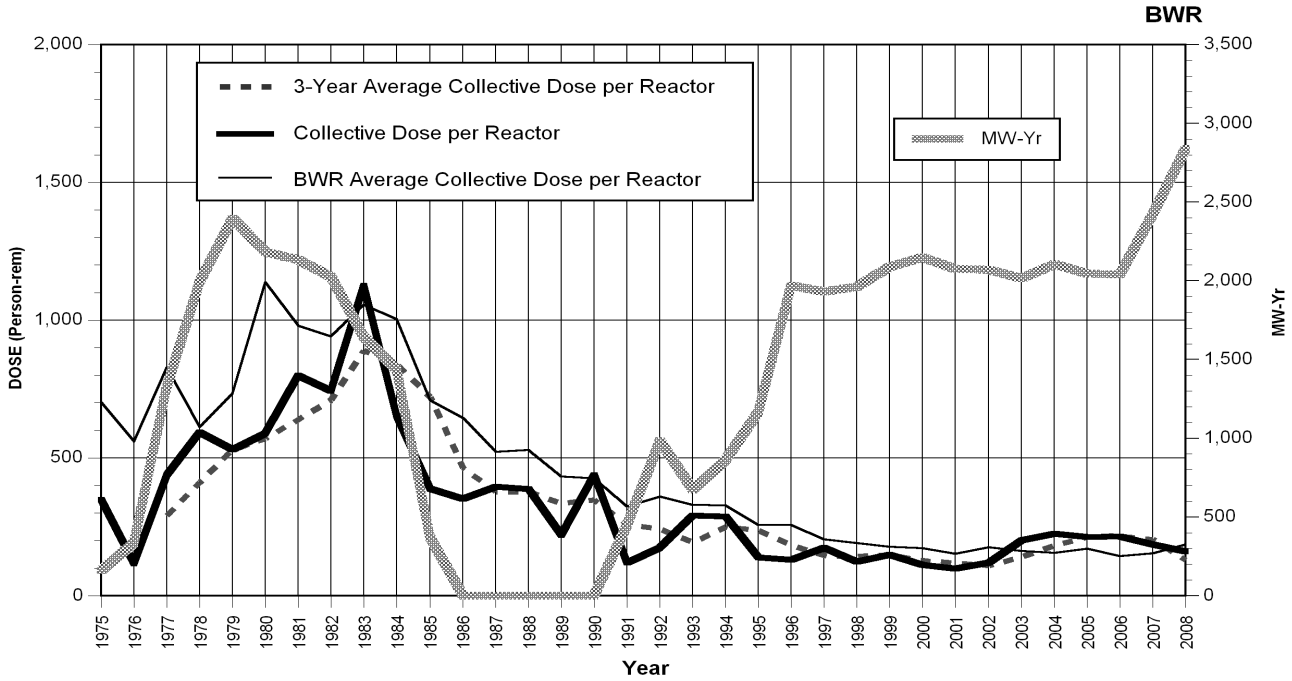

## BEAVER VALLEY 1, 2
Dose Performance Indicators



## BRAIDWOOD 1, 2
Dose Performance Indicators

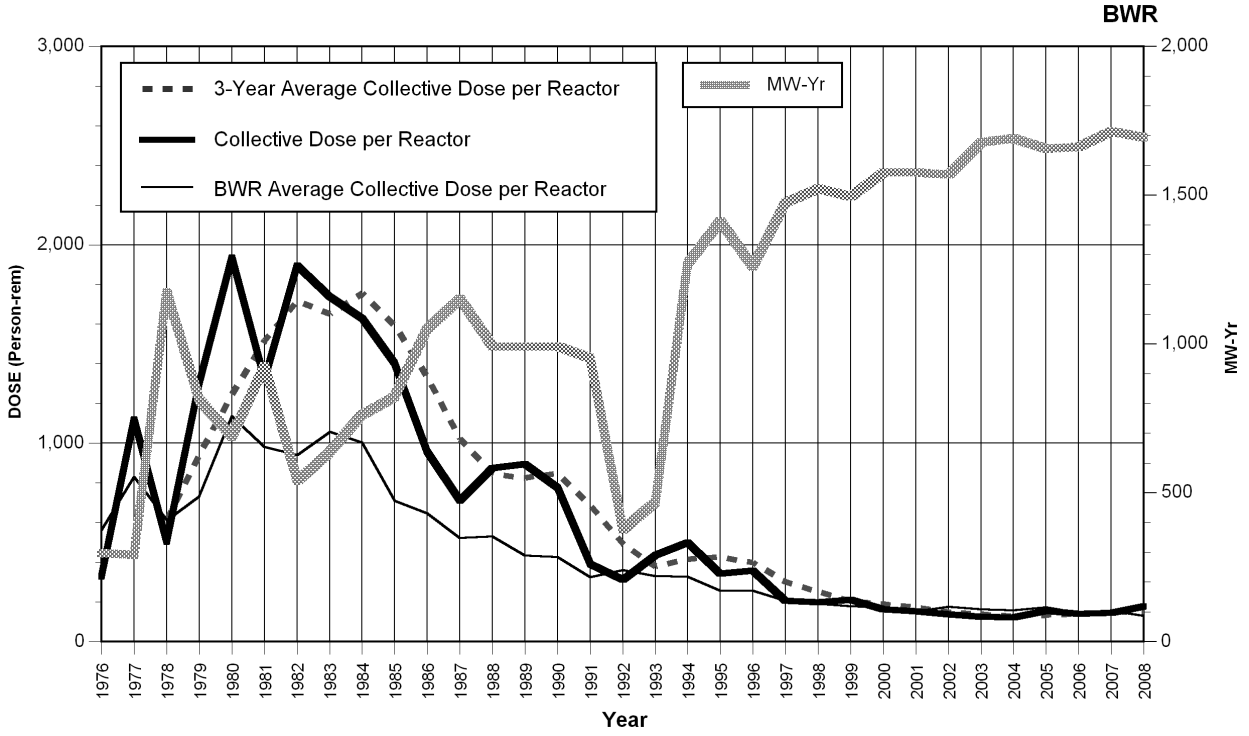



## BROWNS FERRY 1, 2, 3
Dose Performance Indicators

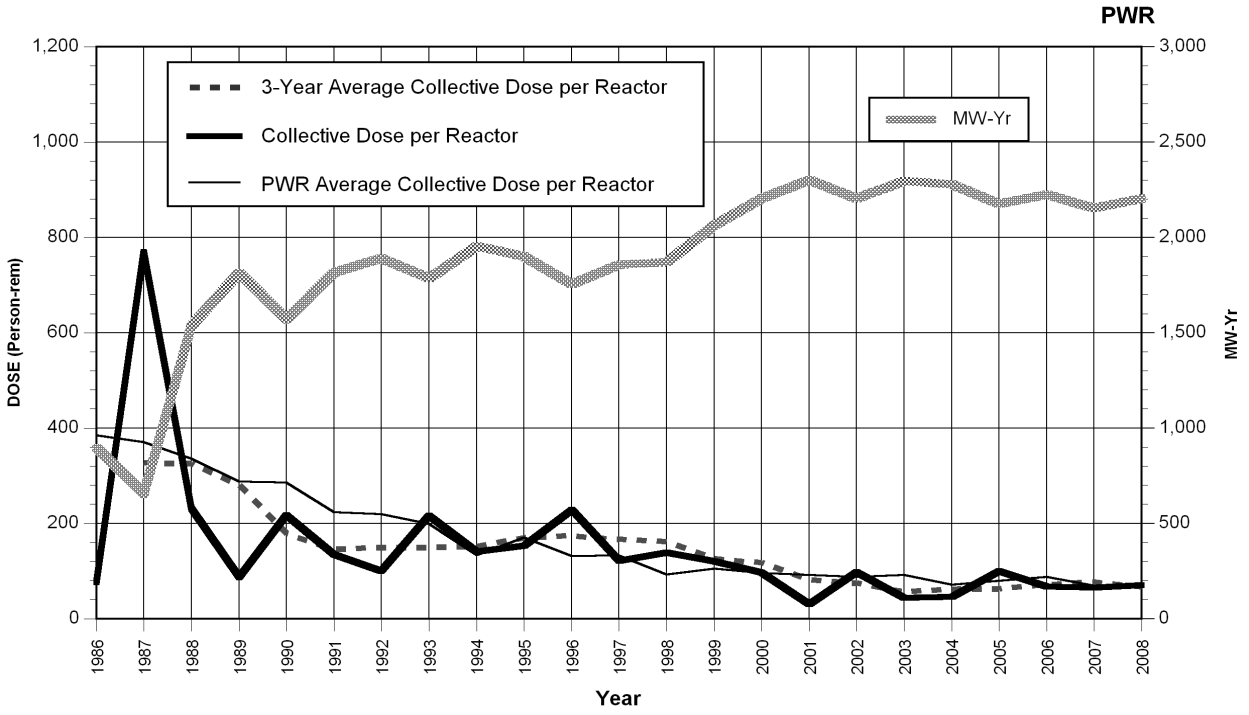



NOTE: Browns Ferry resumed power generation in 2007.

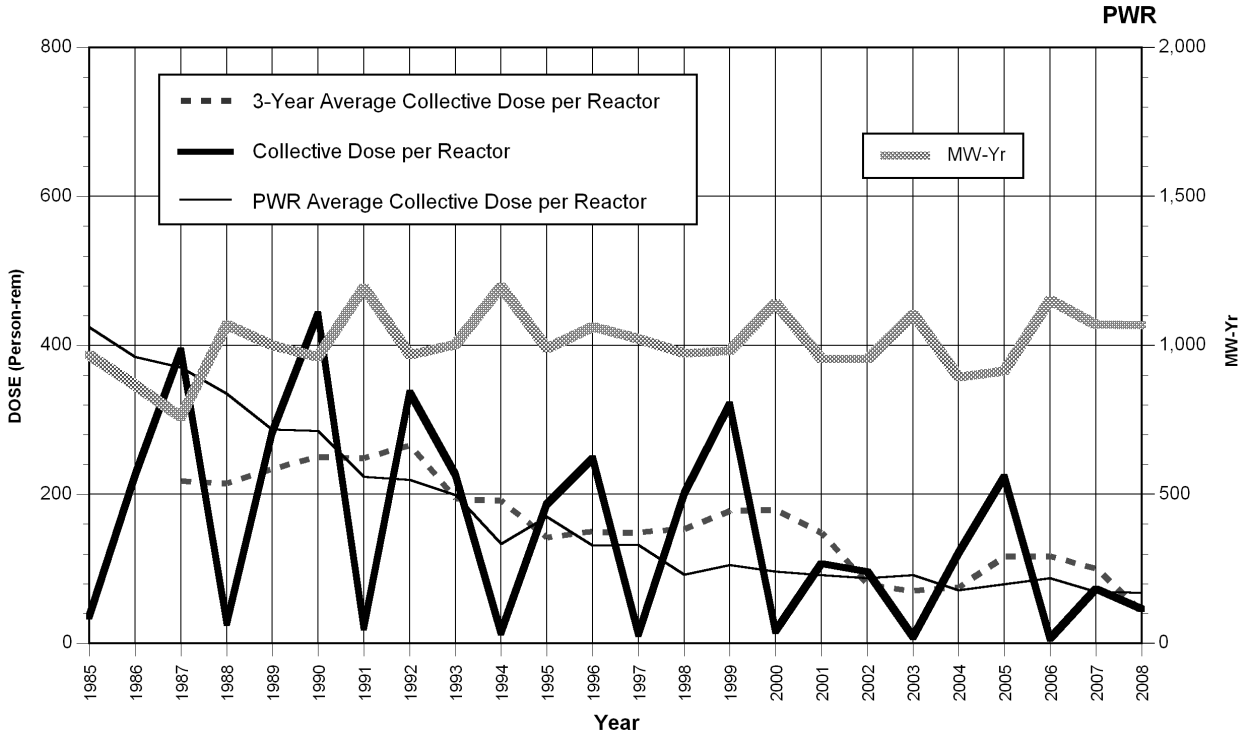
## BRUNSWICK 1, 2
Dose Performance Indicators



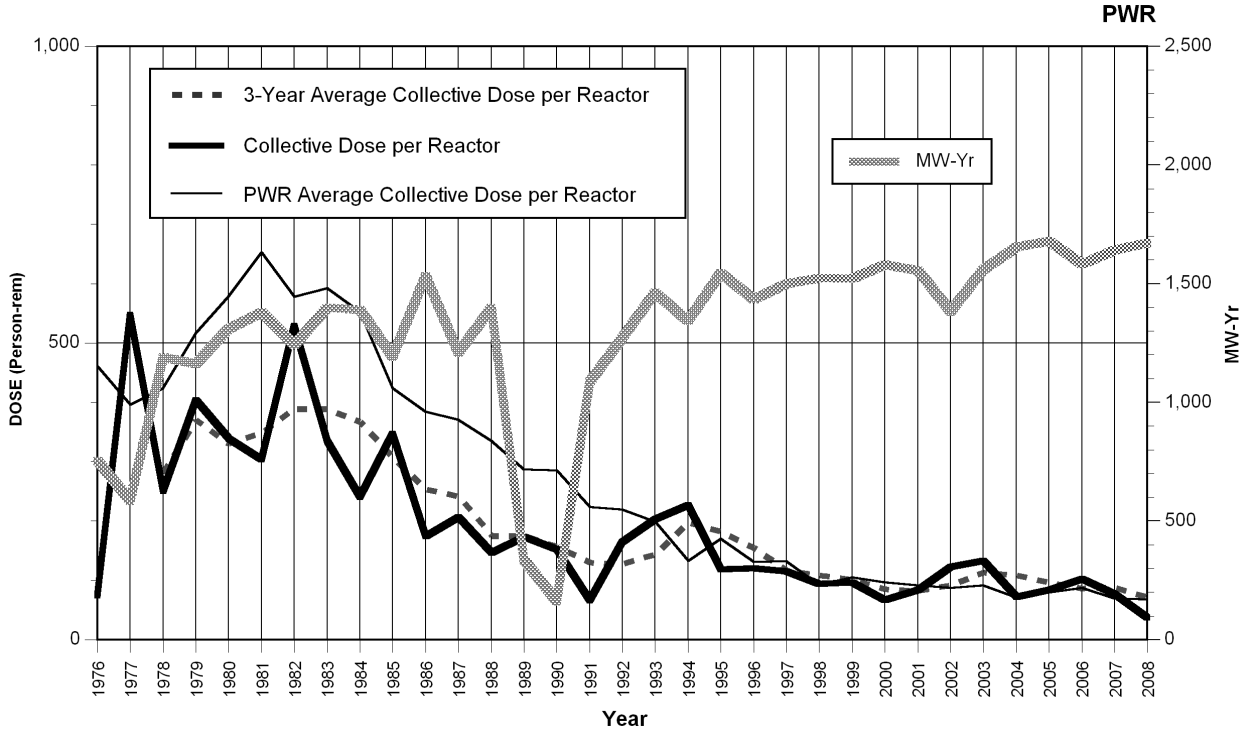

## BYRON 1, 2
Dose Performance Indicators



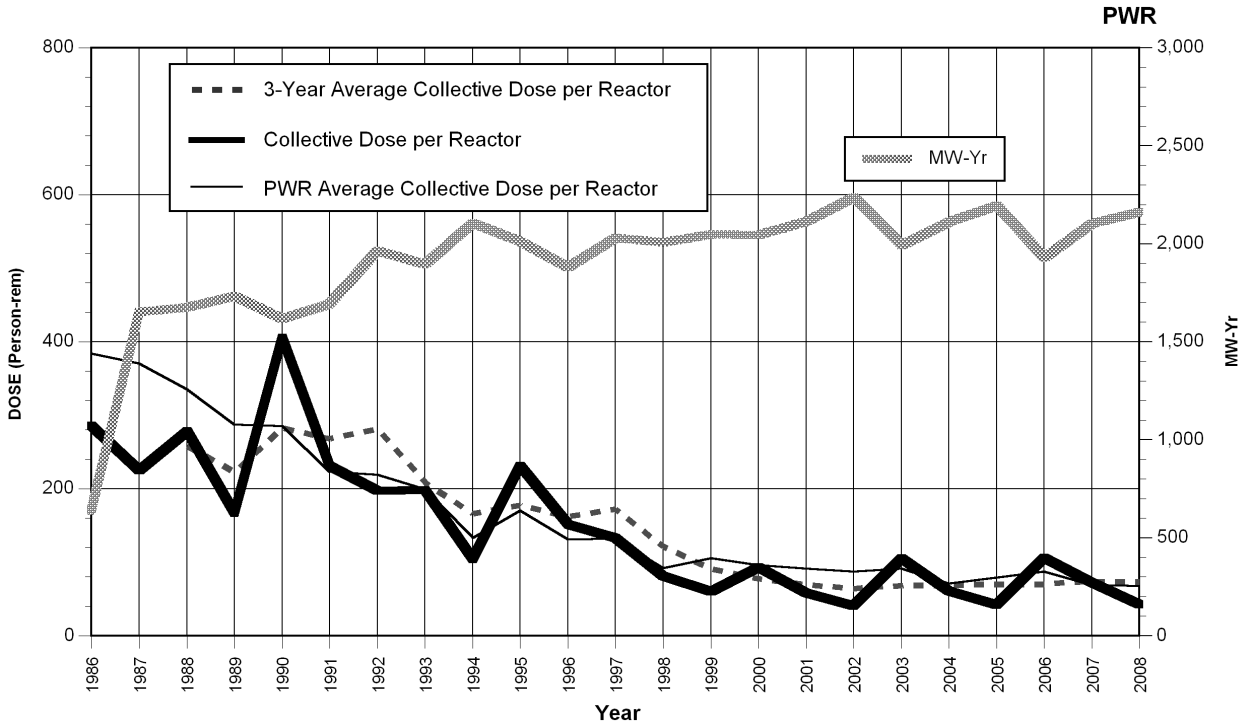
## CALLAWAY 1
Dose Performance Indicators



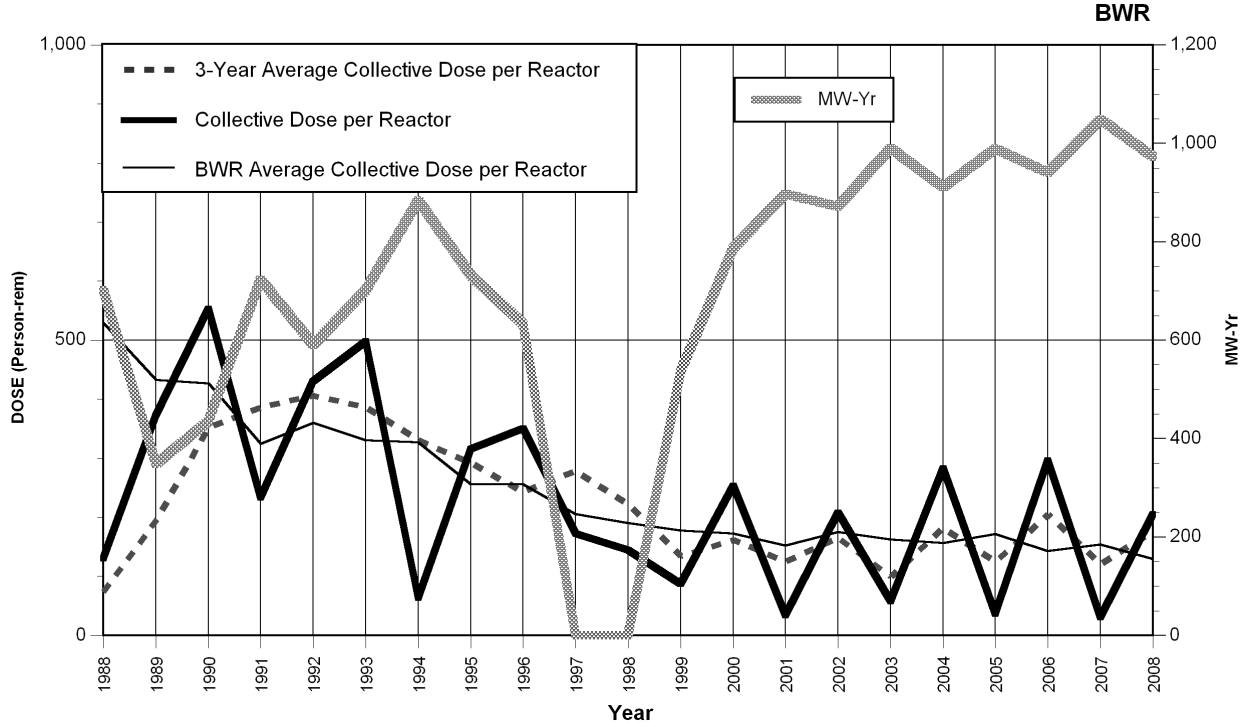

## CALVERT CLIFFS 1, 2
Dose Performance Indicators



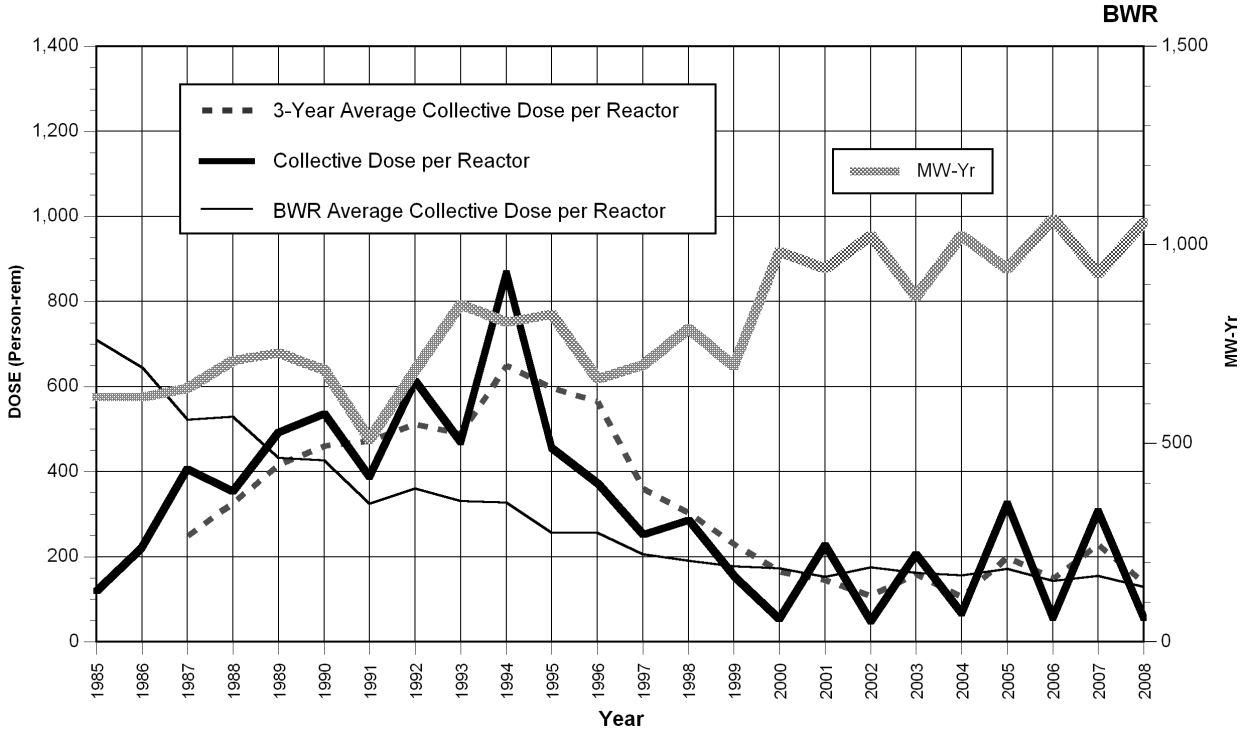
## CATAWBA 1, 2
Dose Performance Indicators



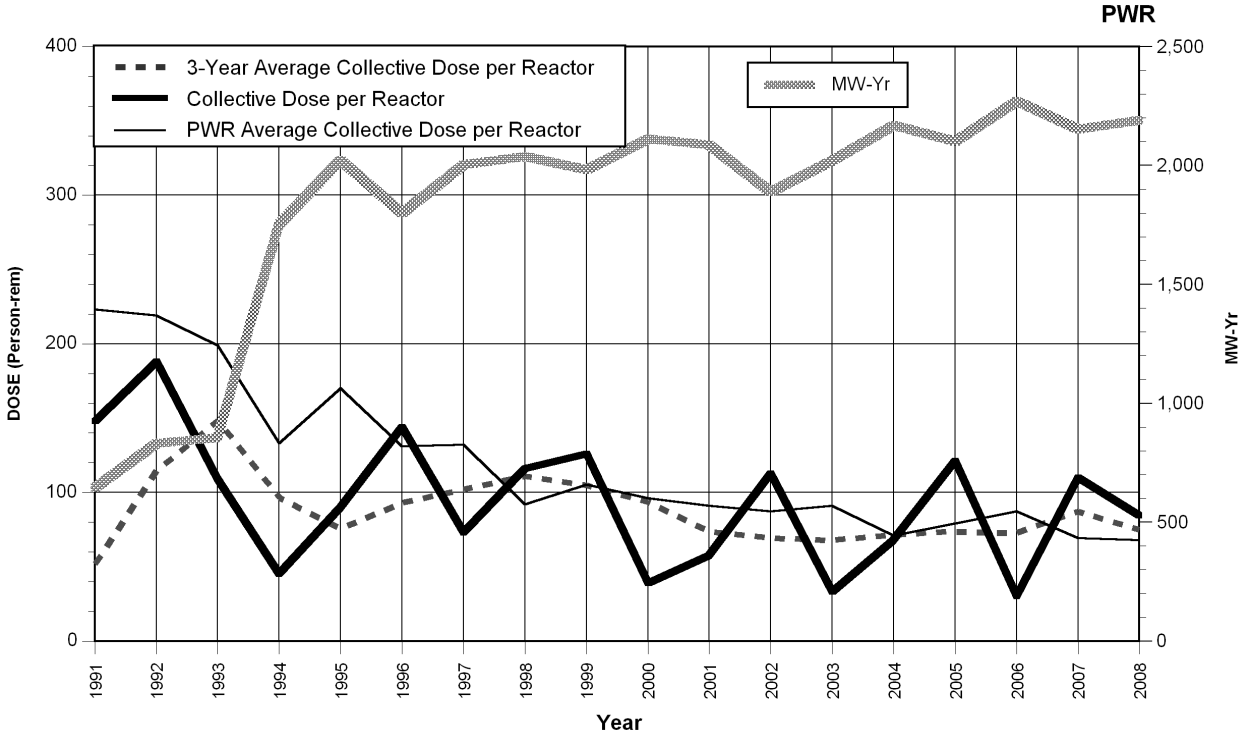

## CLINTON
Dose Performance Indicators



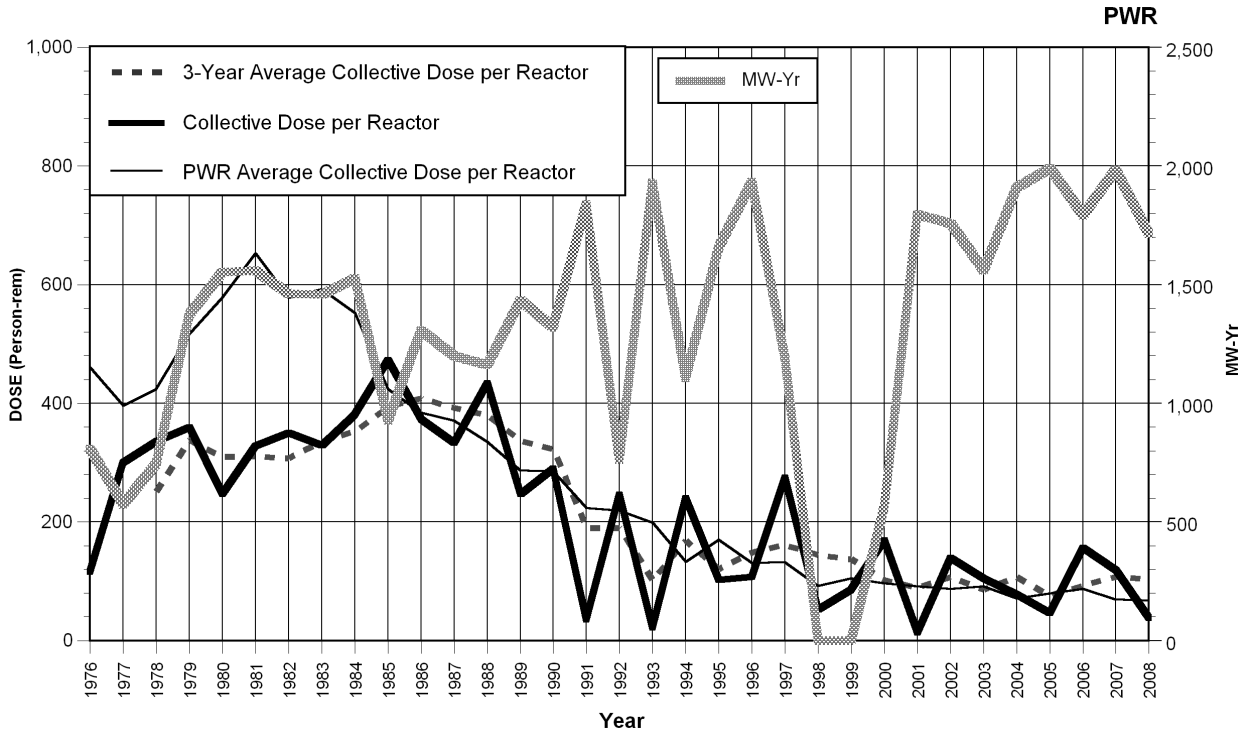
## COLUMBIA GENERATING
Dose Performance Indicators



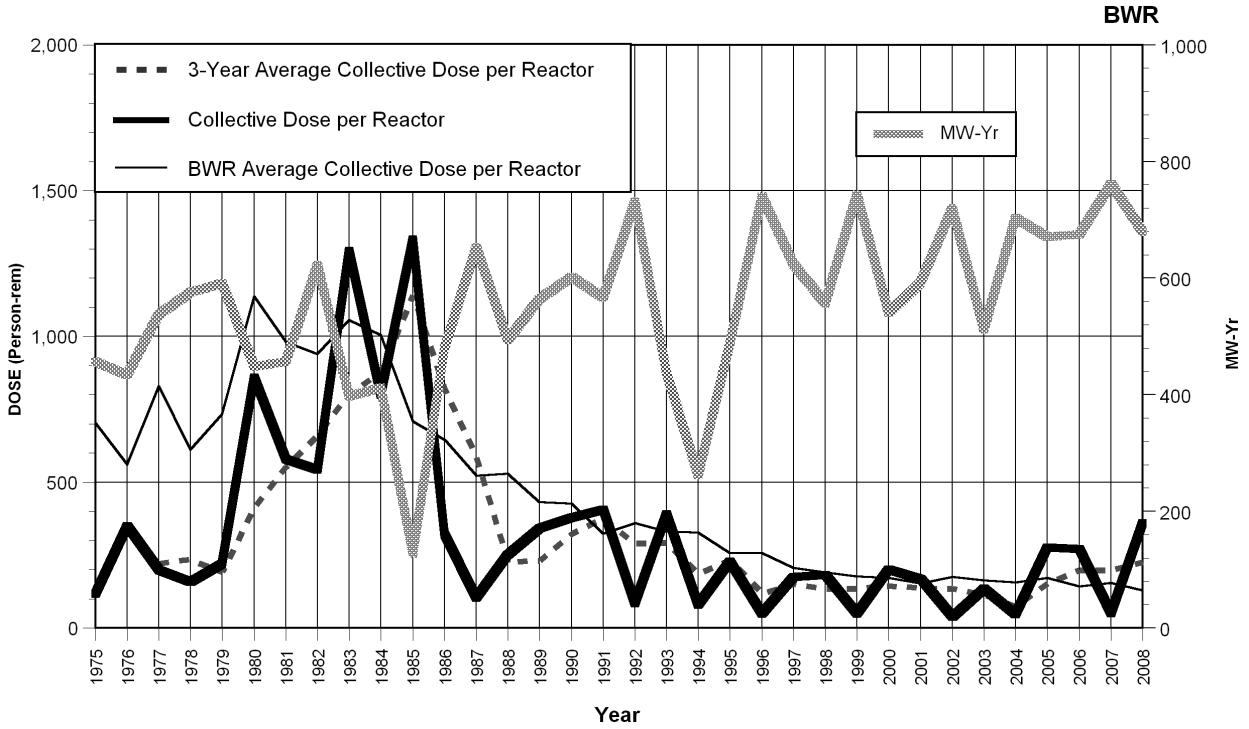

## COMANCHE PEAK 1, 2
Dose Performance Indicators



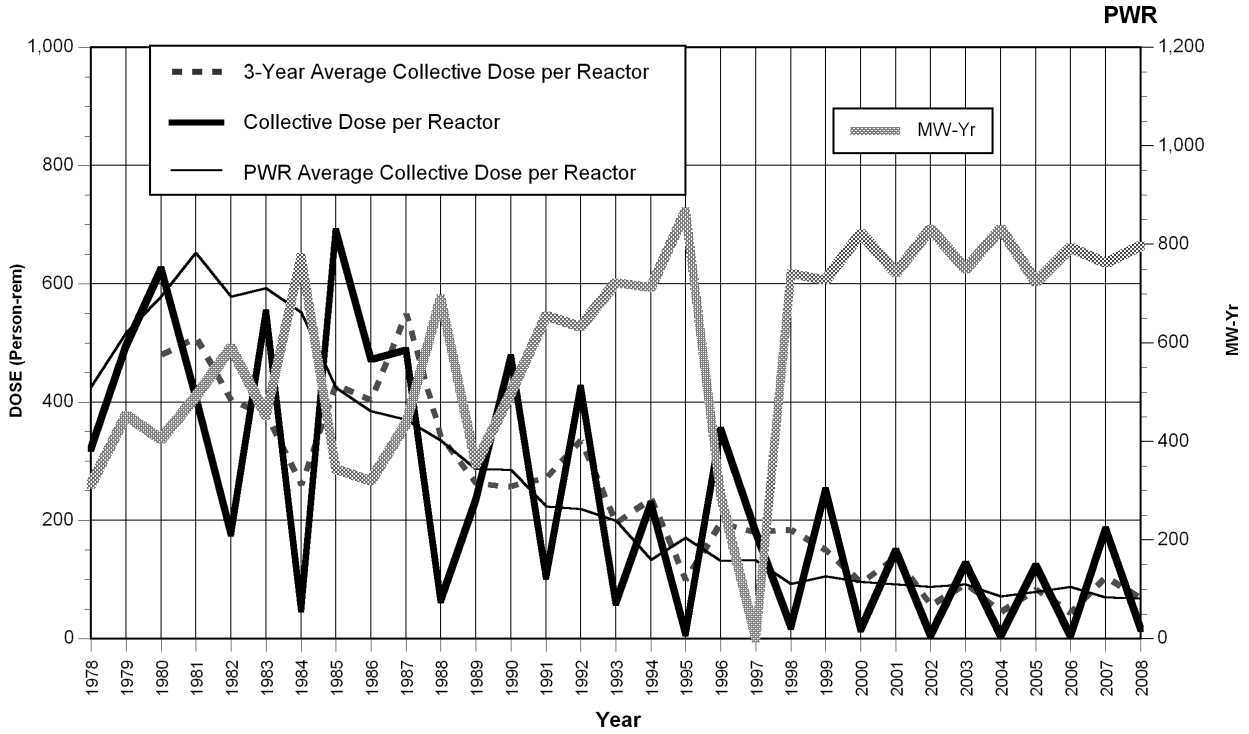
## COOK 1, 2
Dose Performance Indicators



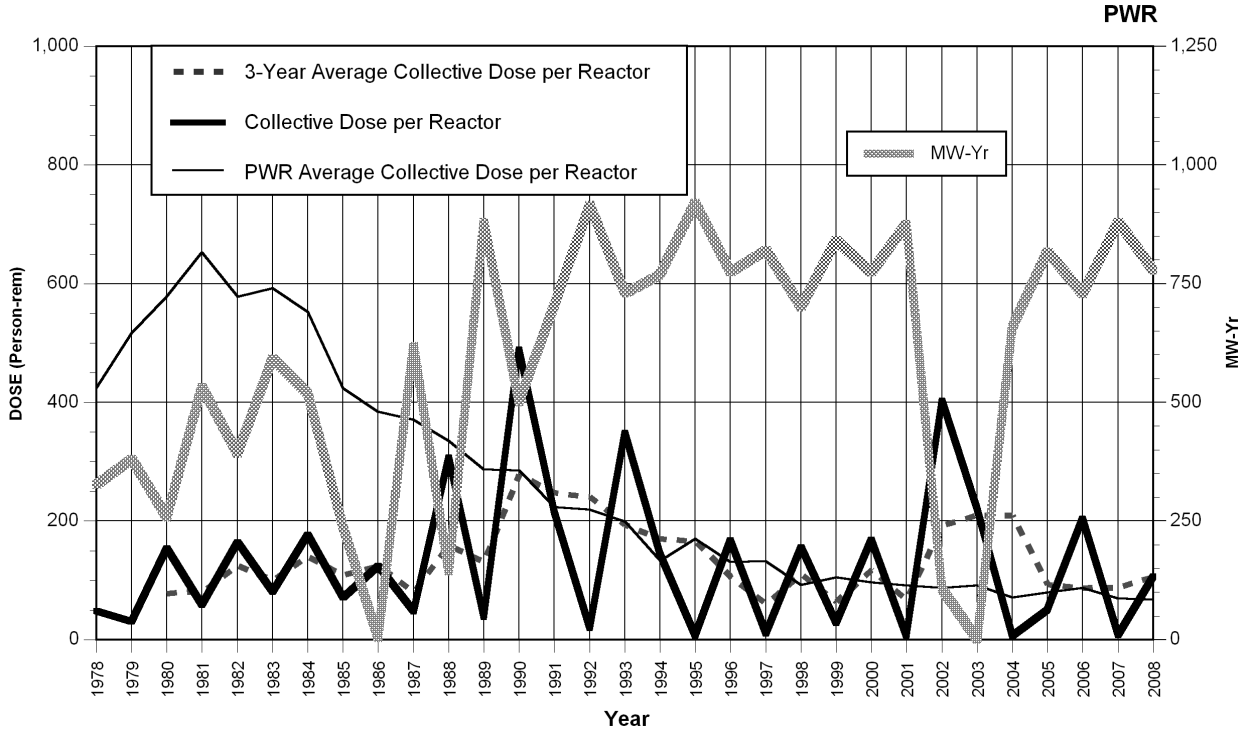

## COOPER STATION
Dose Performance Indicators



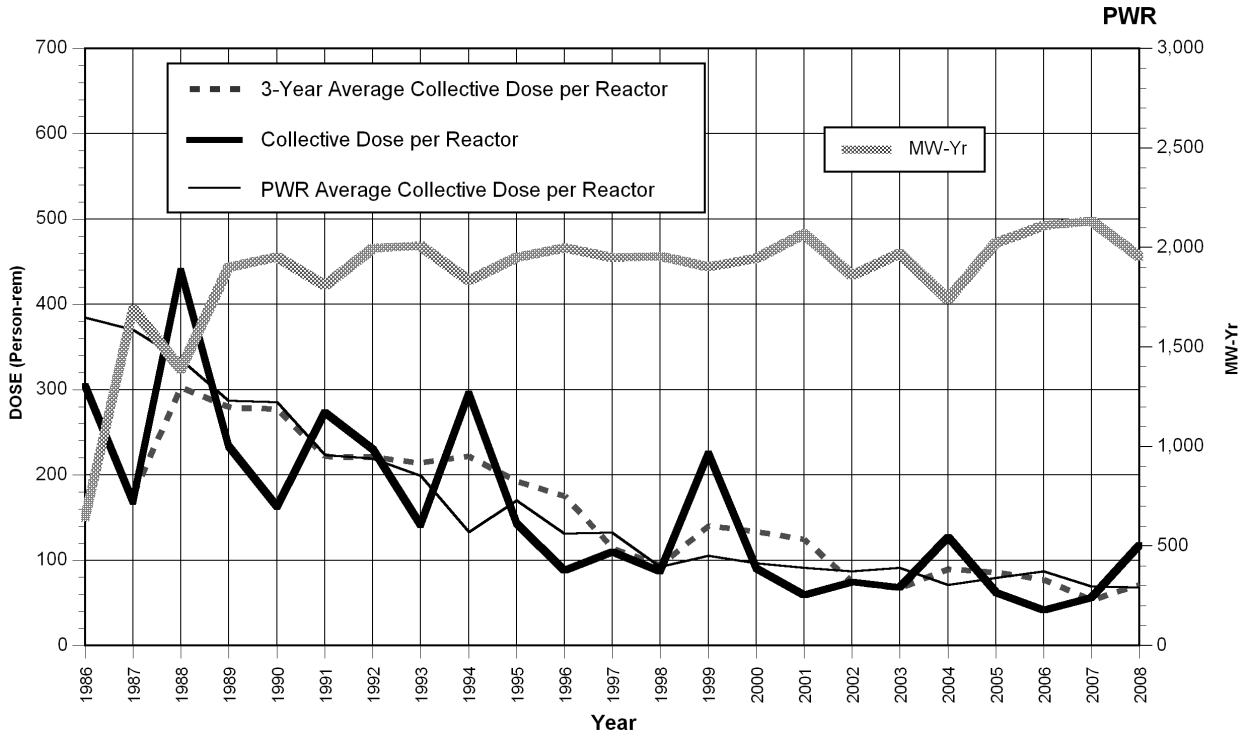
## CRYSTAL RIVER 3
Dose Performance Indicators



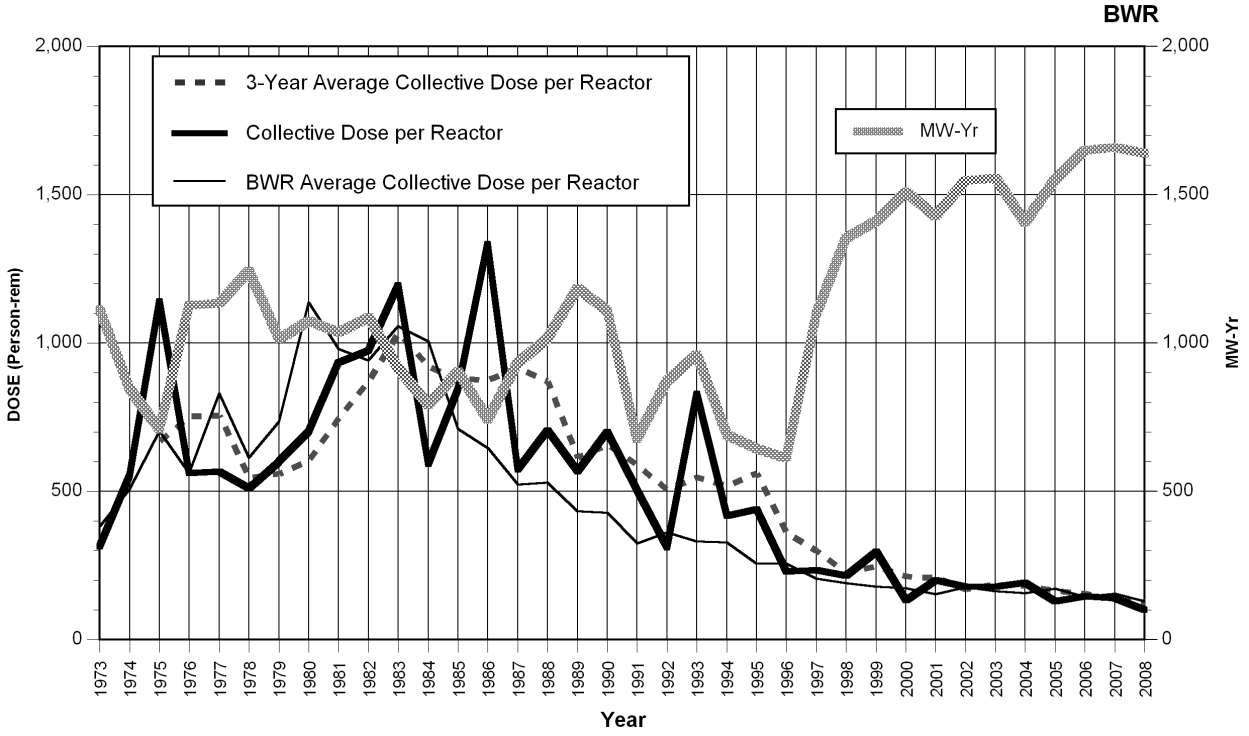

## DAVIS-BESSE 1
Dose Performance Indicators



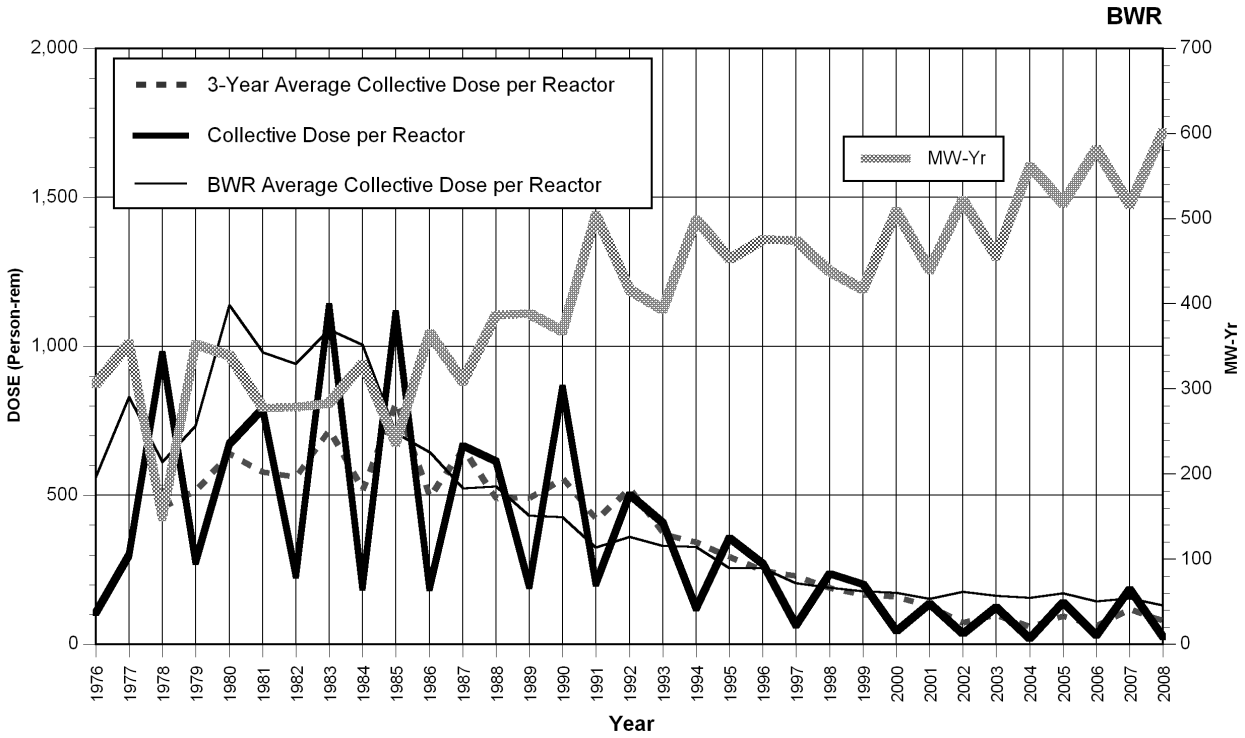
## DIABLO CANYON 1, 2
Dose Performance Indicators



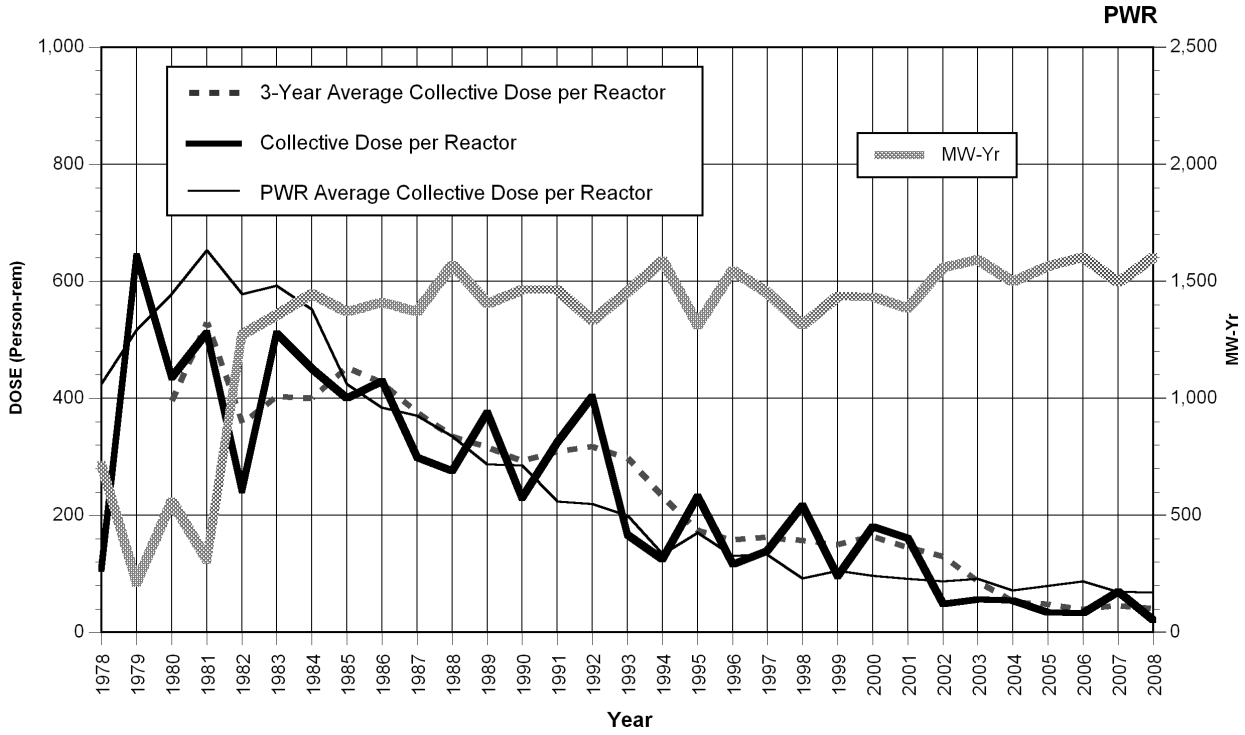

## DRESDEN 2, 3
Dose Performance Indicators



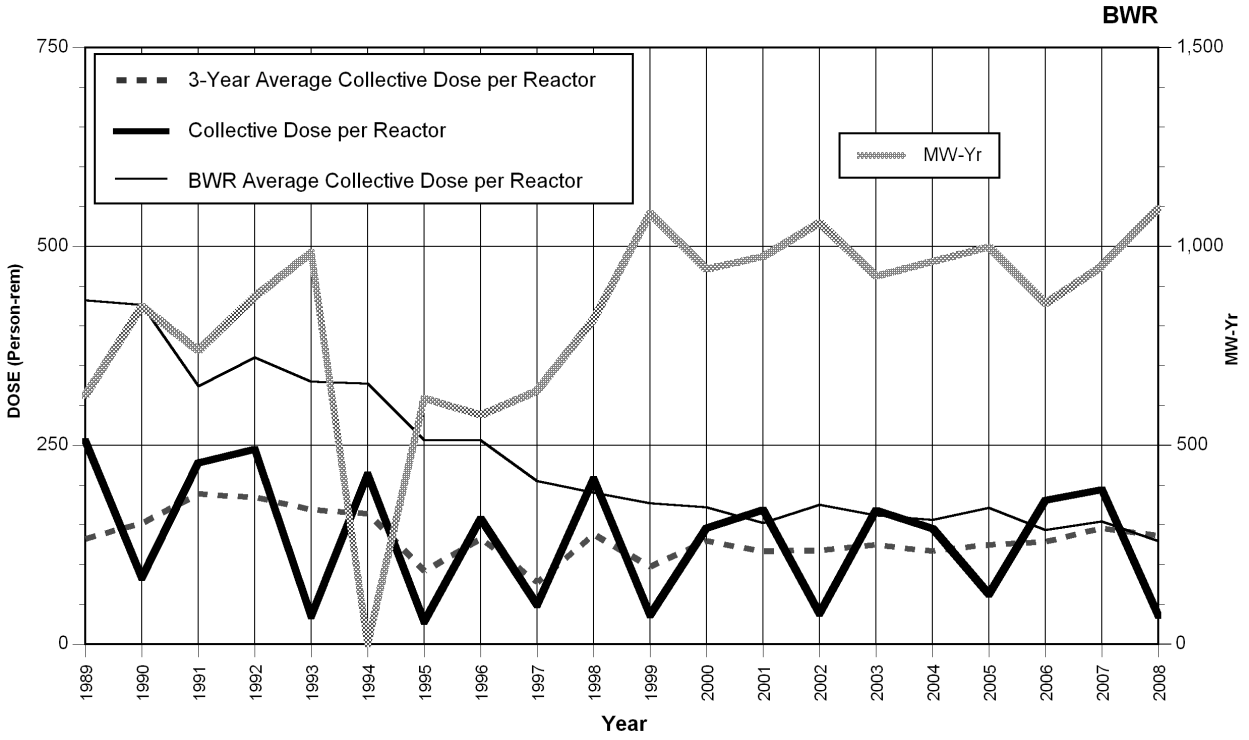
## DUANE ARNOLD
Dose Performance Indicators



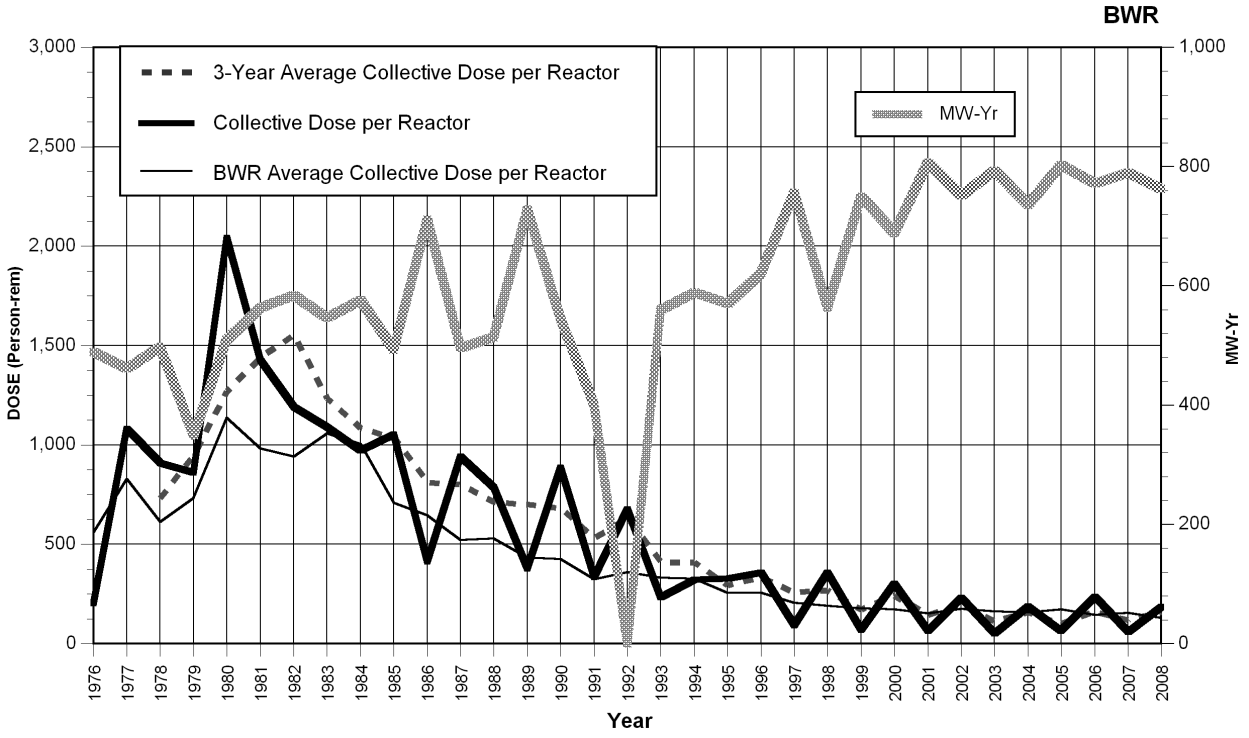

## FARLEY 1, 2
Dose Performance Indicators



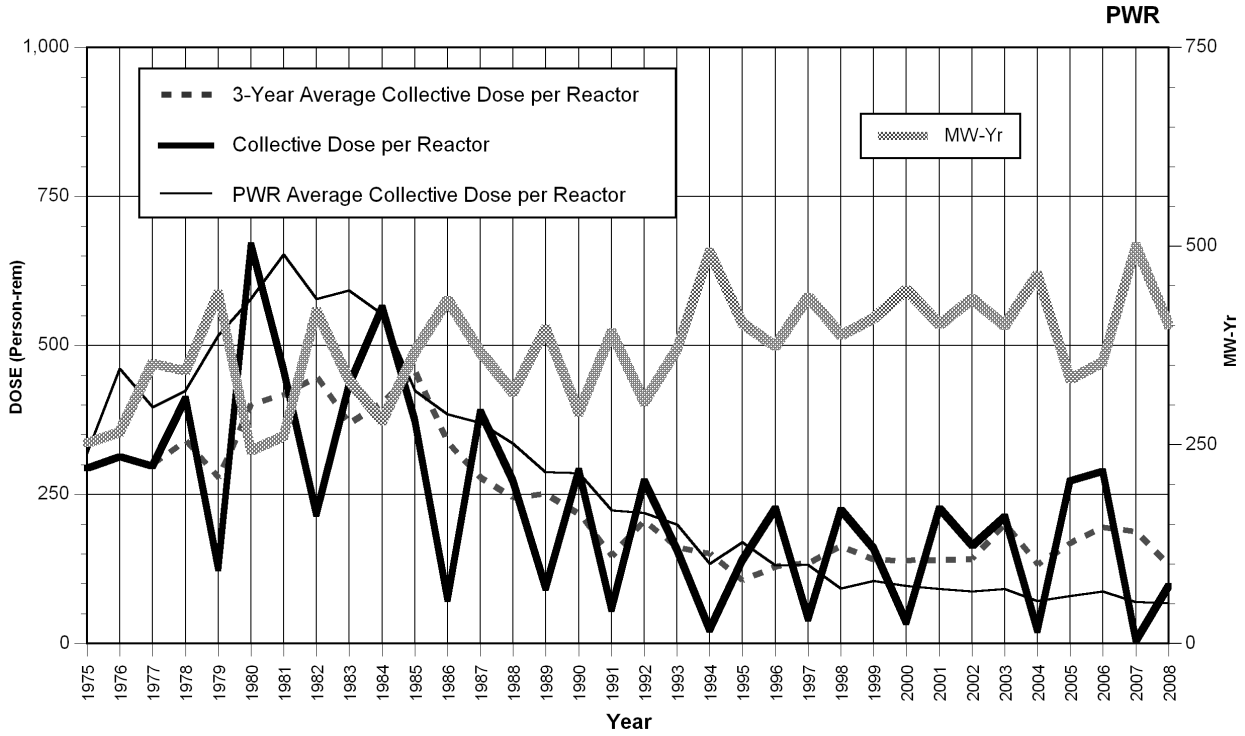
## FERMI 2
Dose Performance Indicators



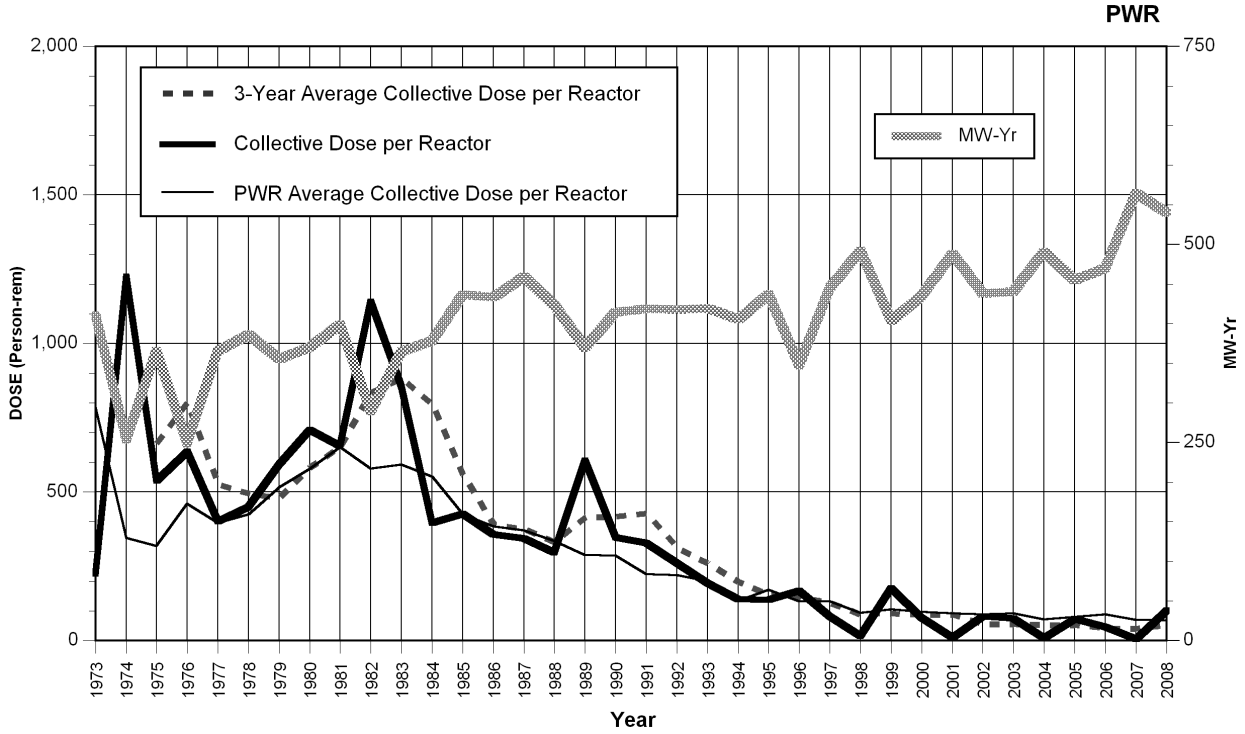

## FITZPATRICK
Dose Performance Indicators



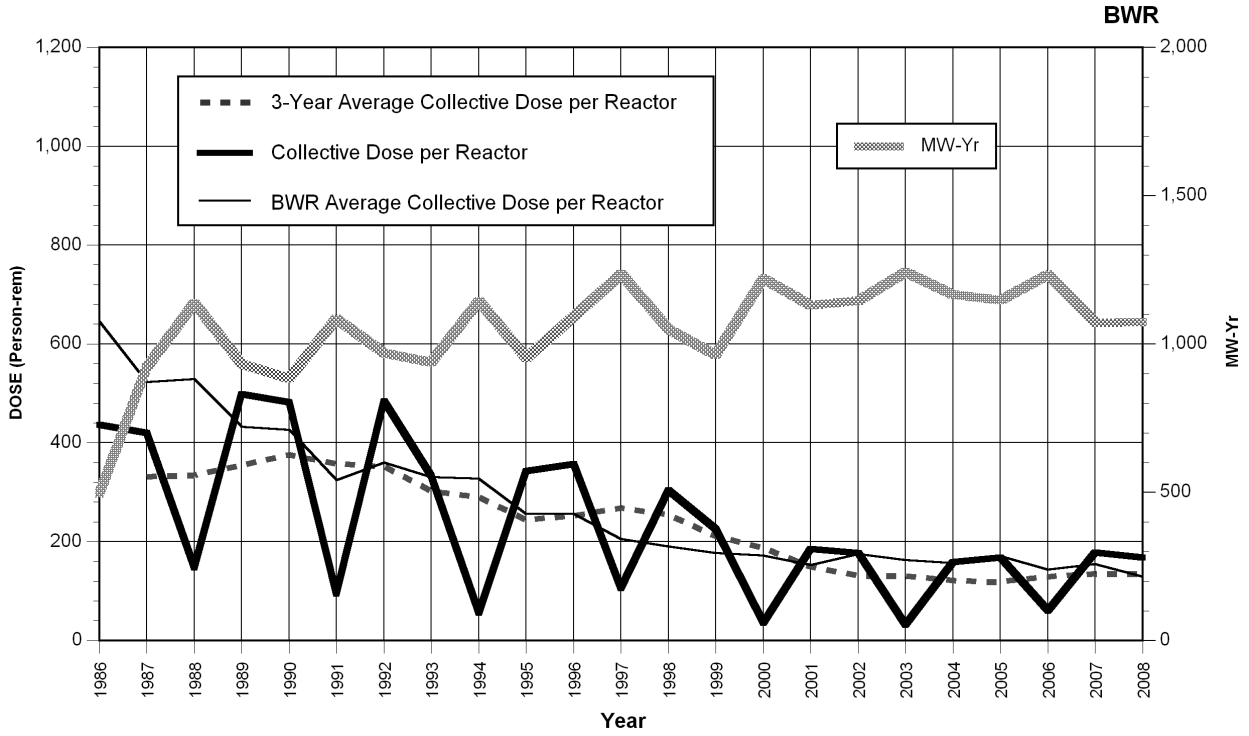
## FORT CALHOUN
Dose Performance Indicators



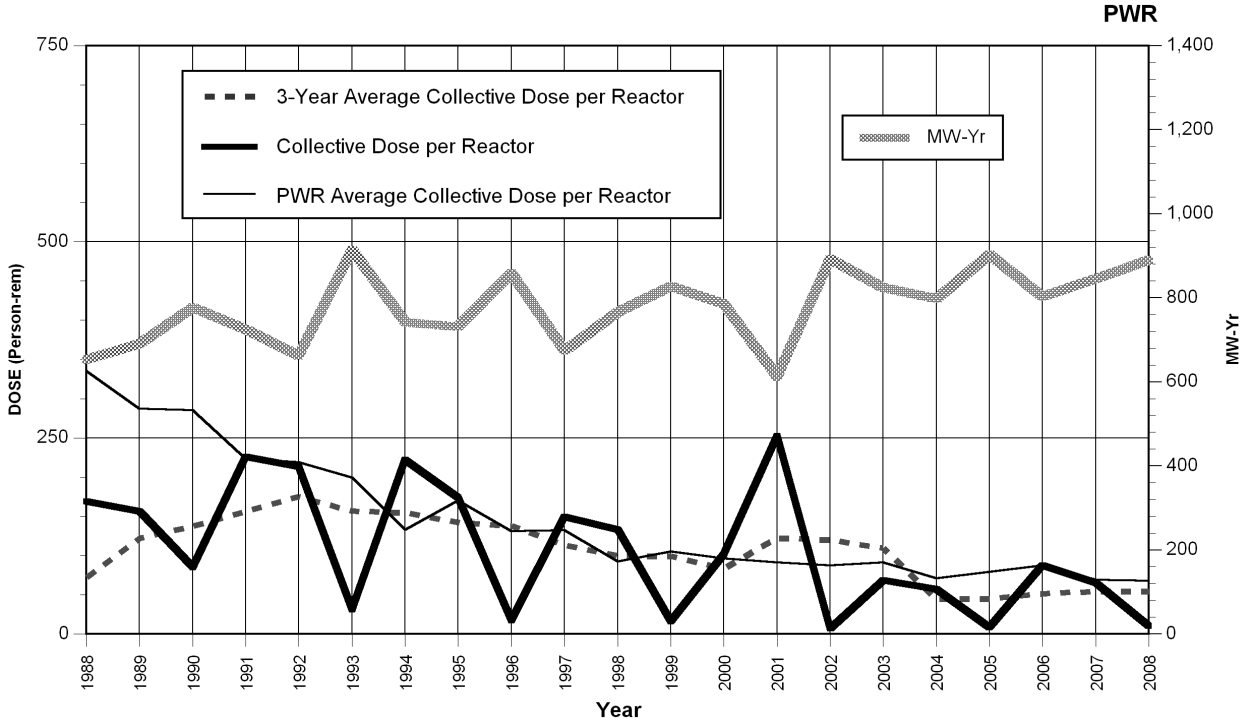

## GINNA
Dose Performance Indicators



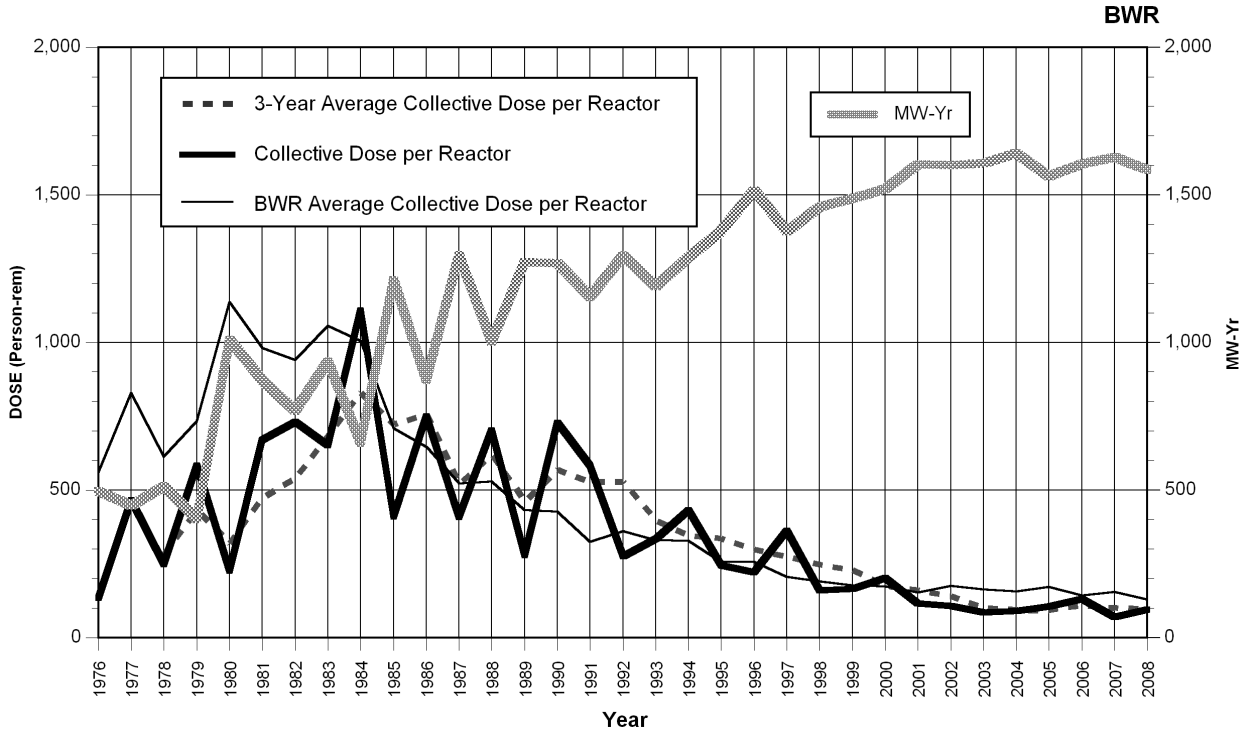
## GRAND GULF
Dose Performance Indicators



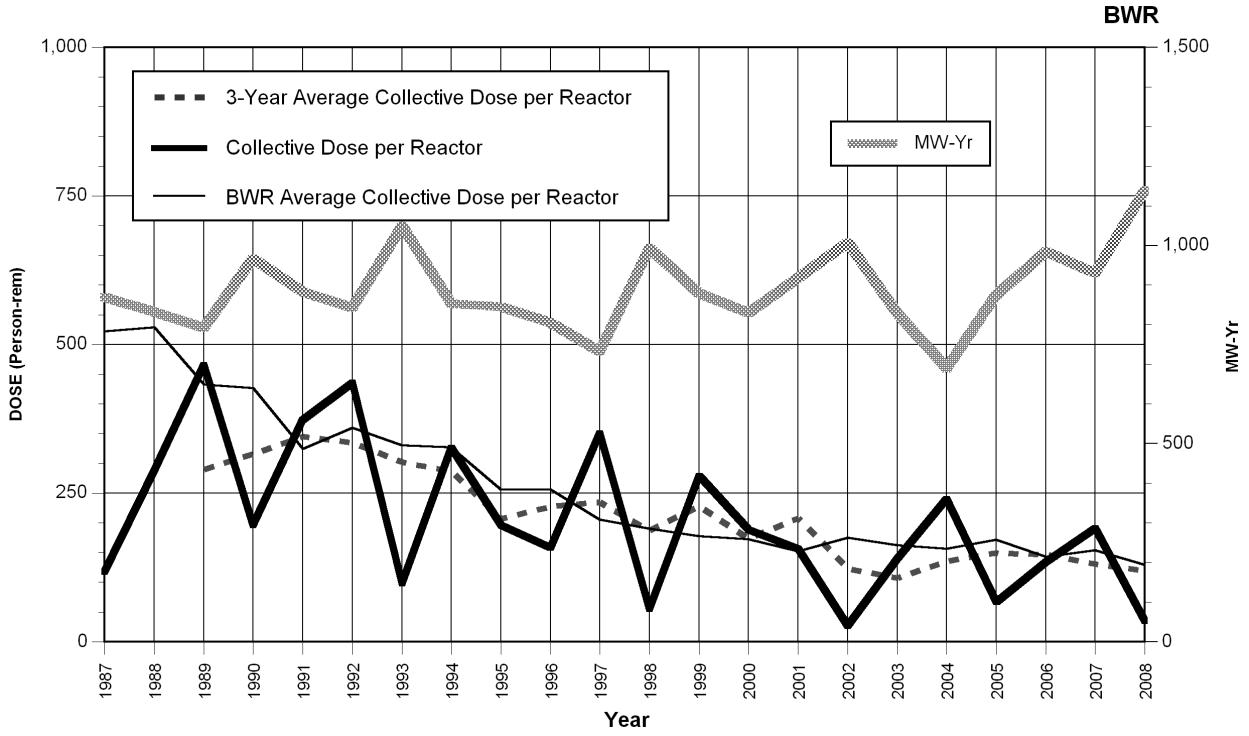

## HARRIS 1
Dose Performance Indicators



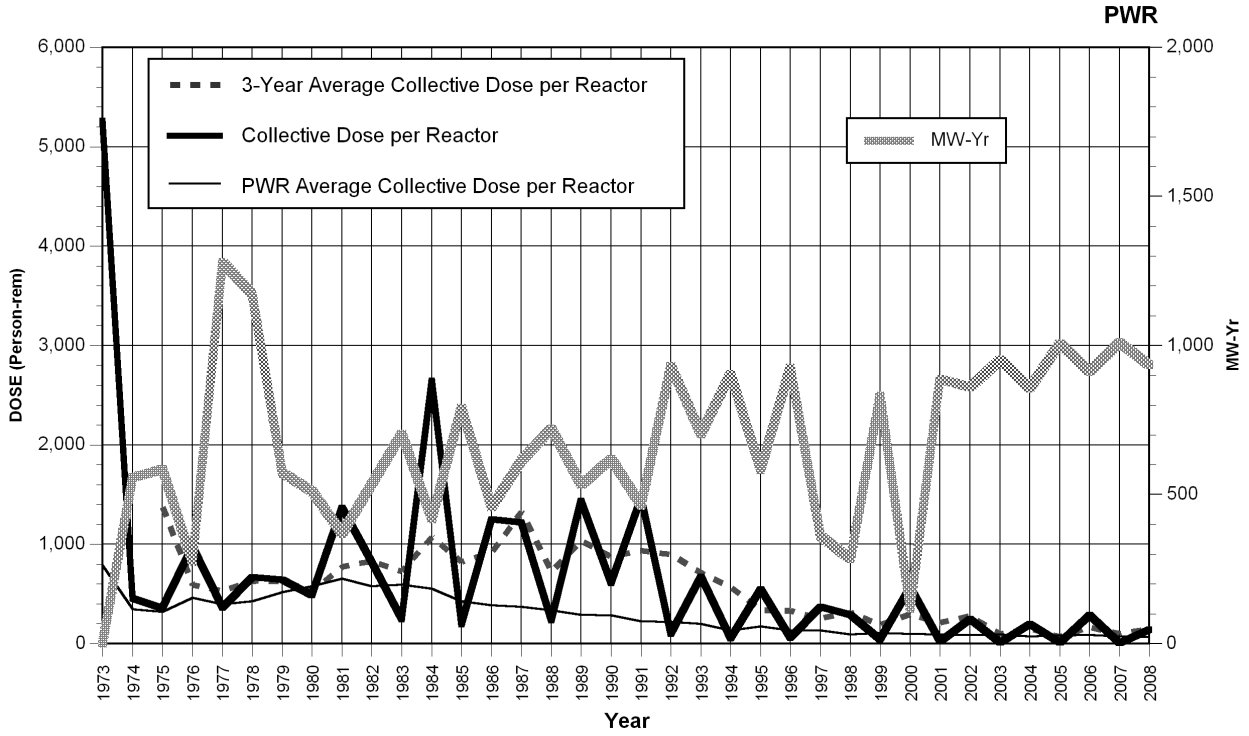
## HATCH 1, 2
Dose Performance Indicators



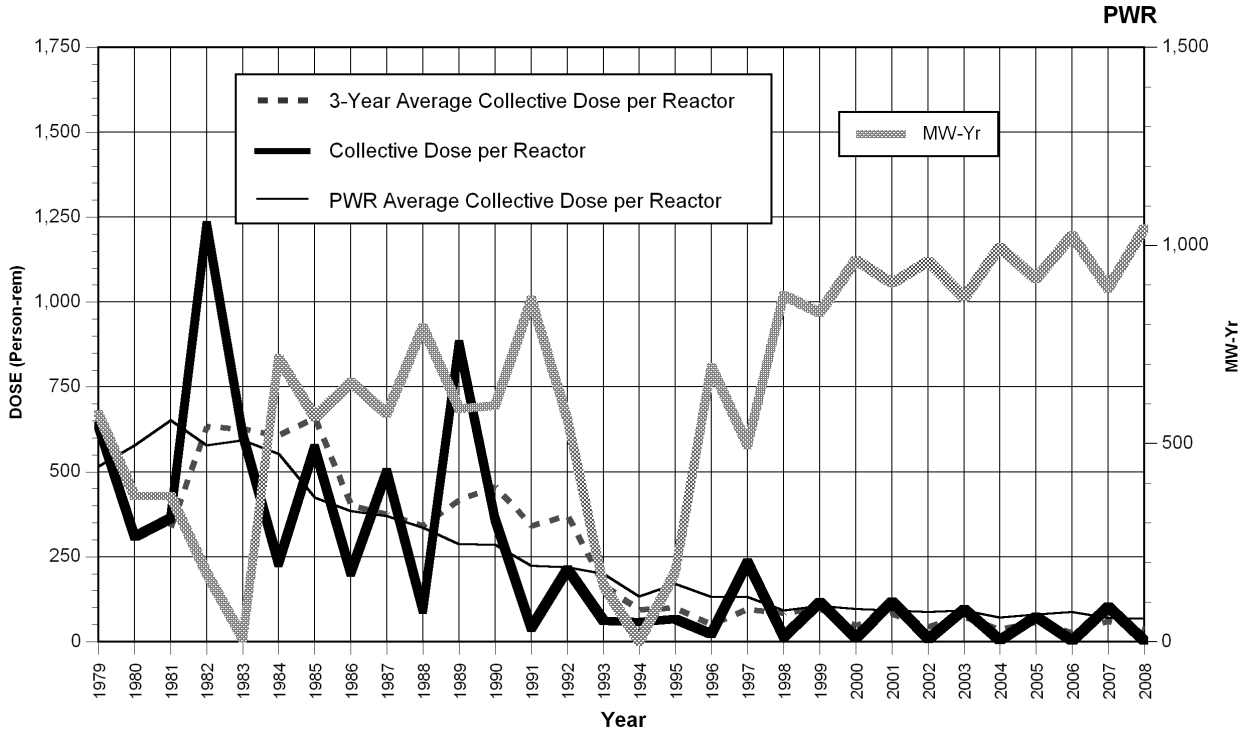

## HOPE CREEK 1
Dose Performance Indicators



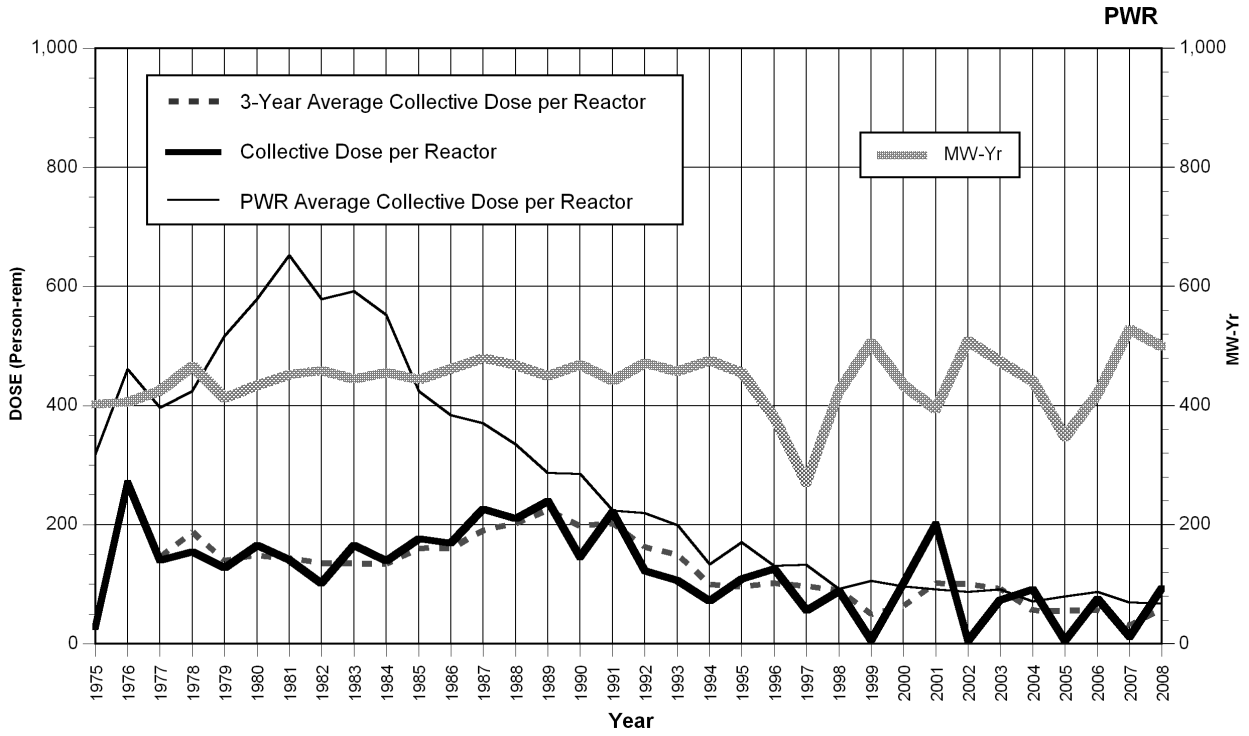
## INDIAN POINT 2
Dose Performance Indicators



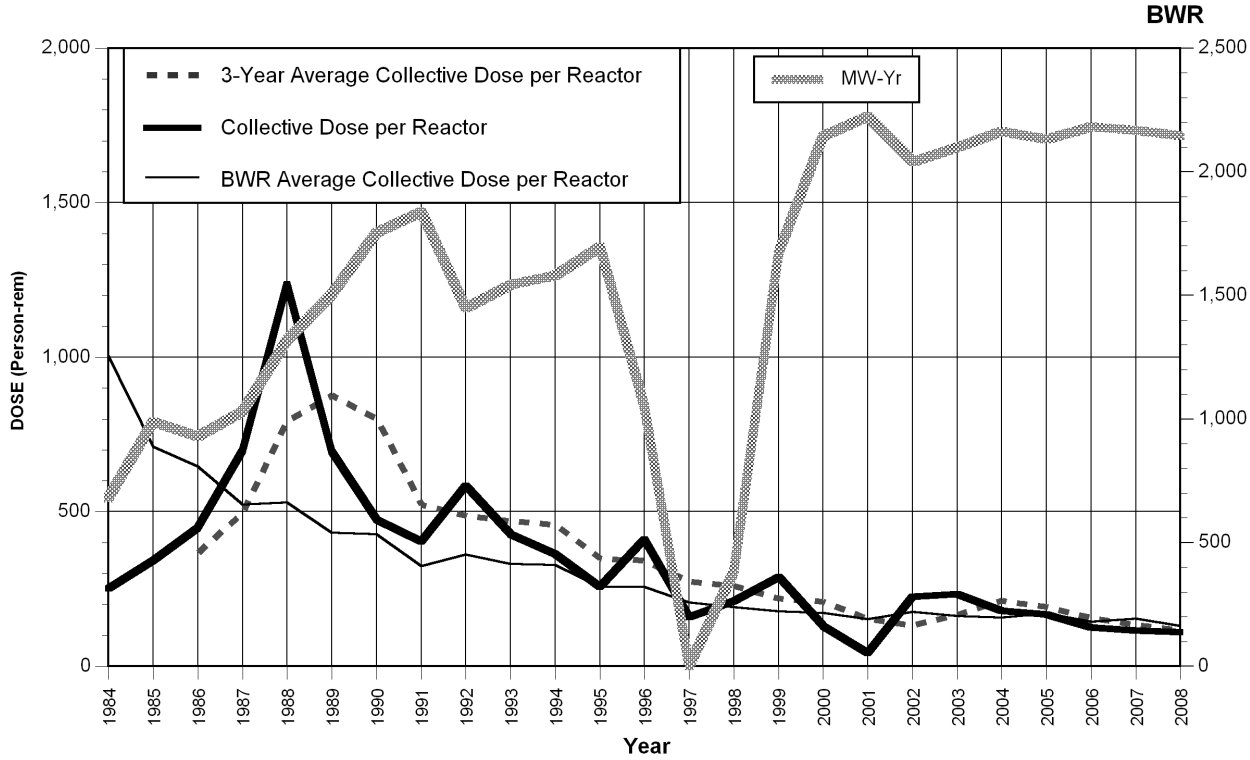

## INDIAN POINT 3
Dose Performance Indicators



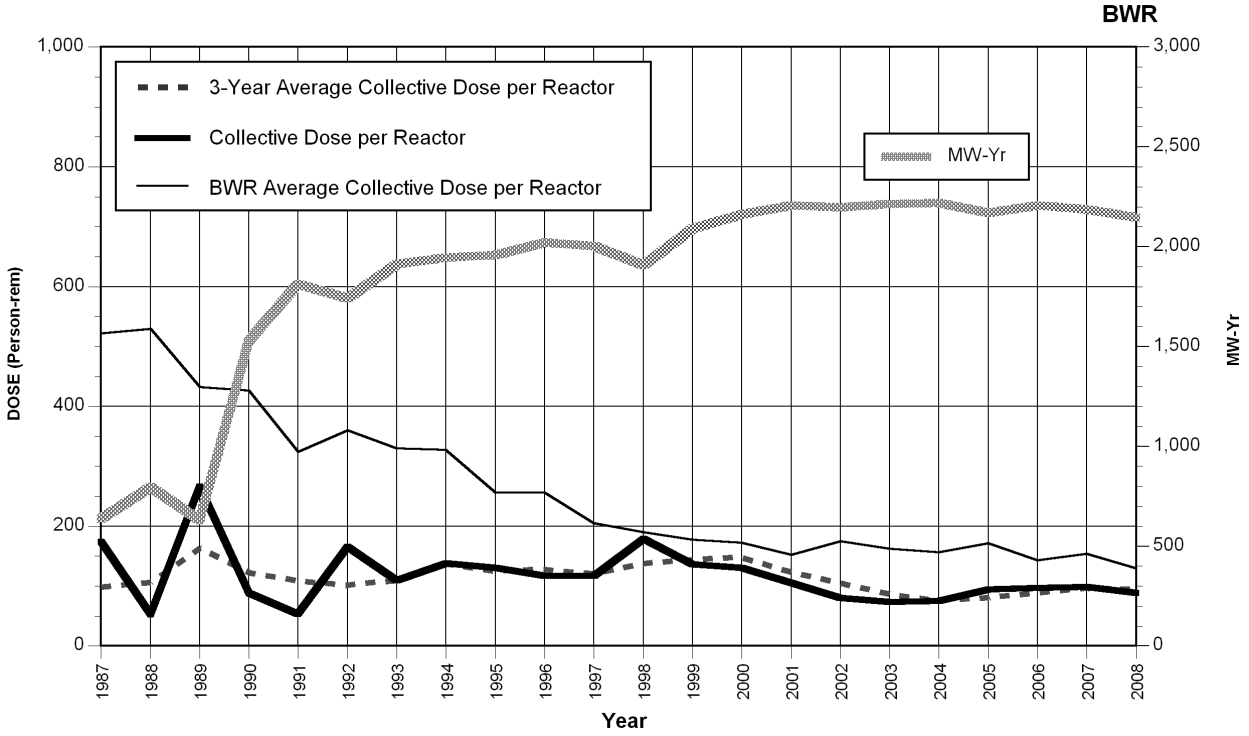
## KEWAUNEE
Dose Performance Indicators



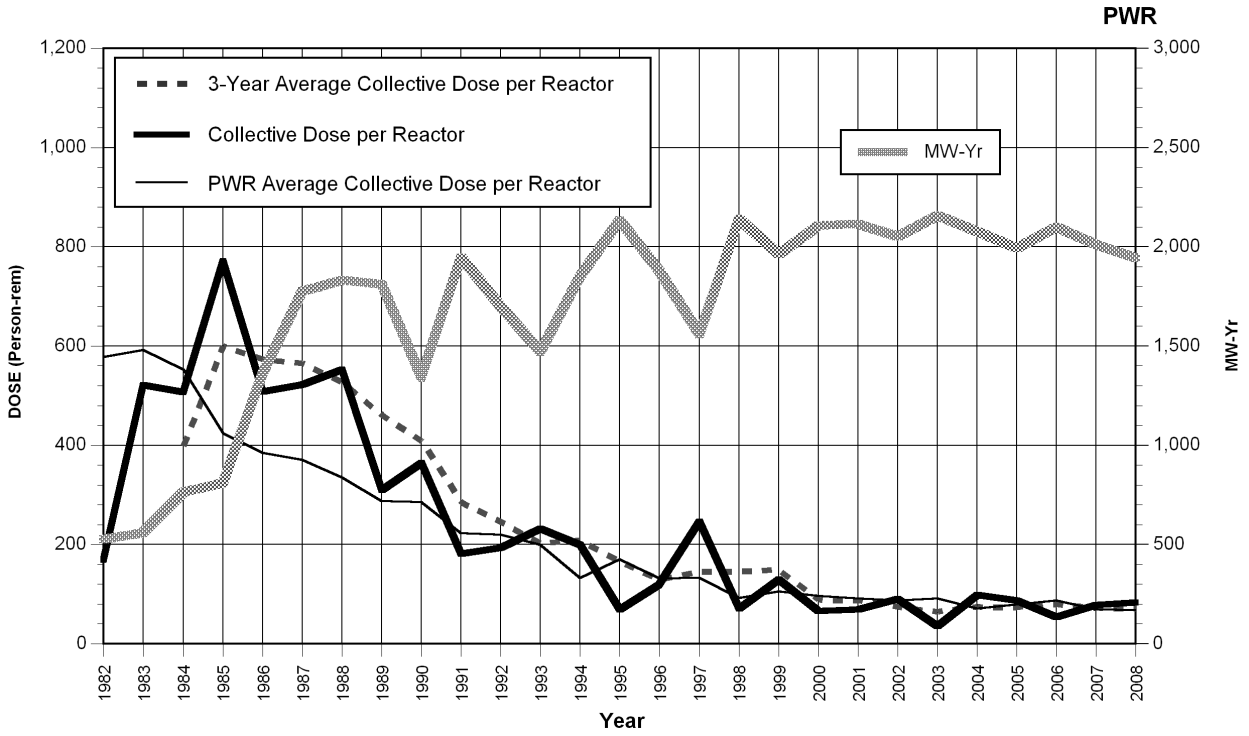

## LASALLE 1, 2
Dose Performance Indicators



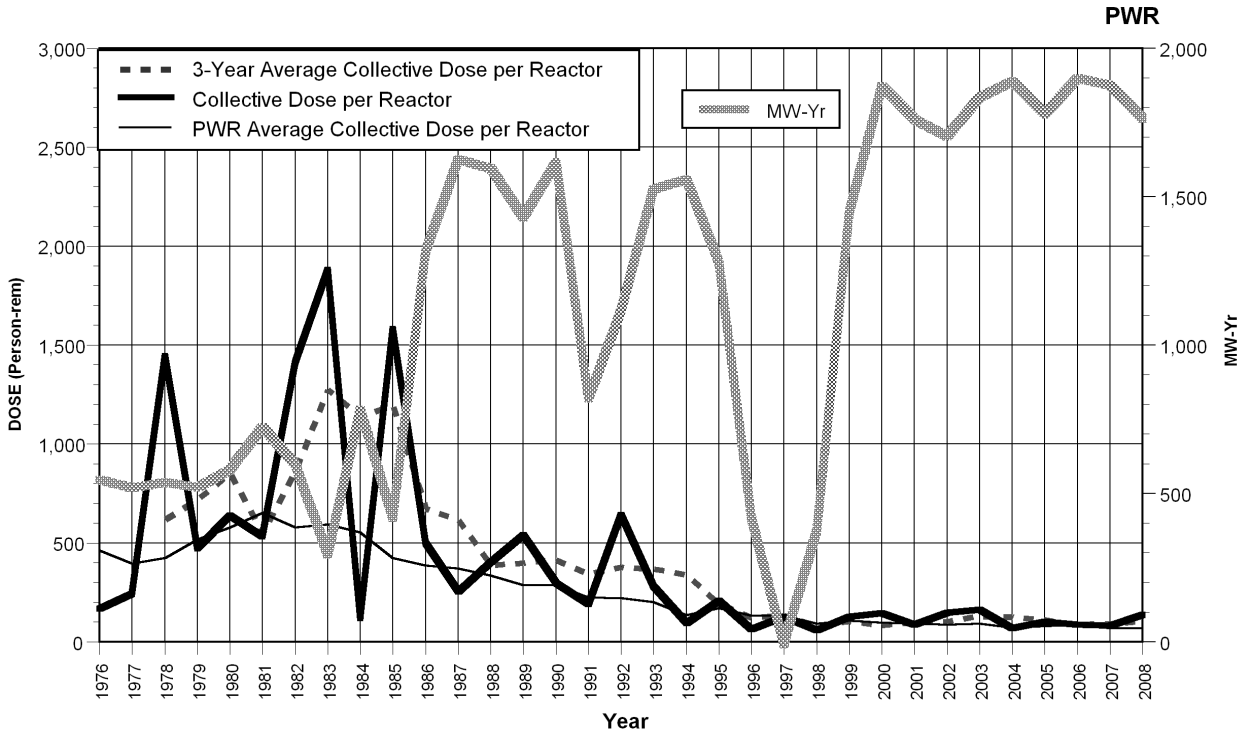
## LIMERICK 1, 2
Dose Performance Indicators



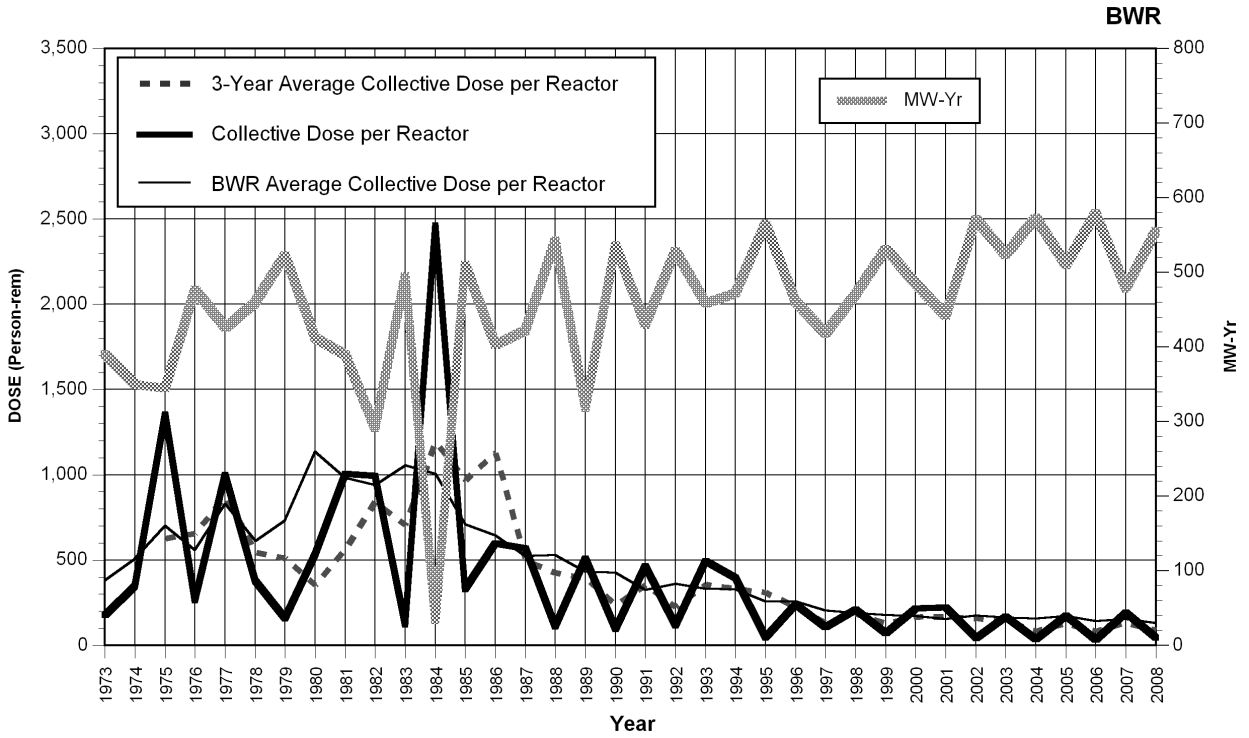

## MCGUIRE 1, 2
Dose Performance Indicators



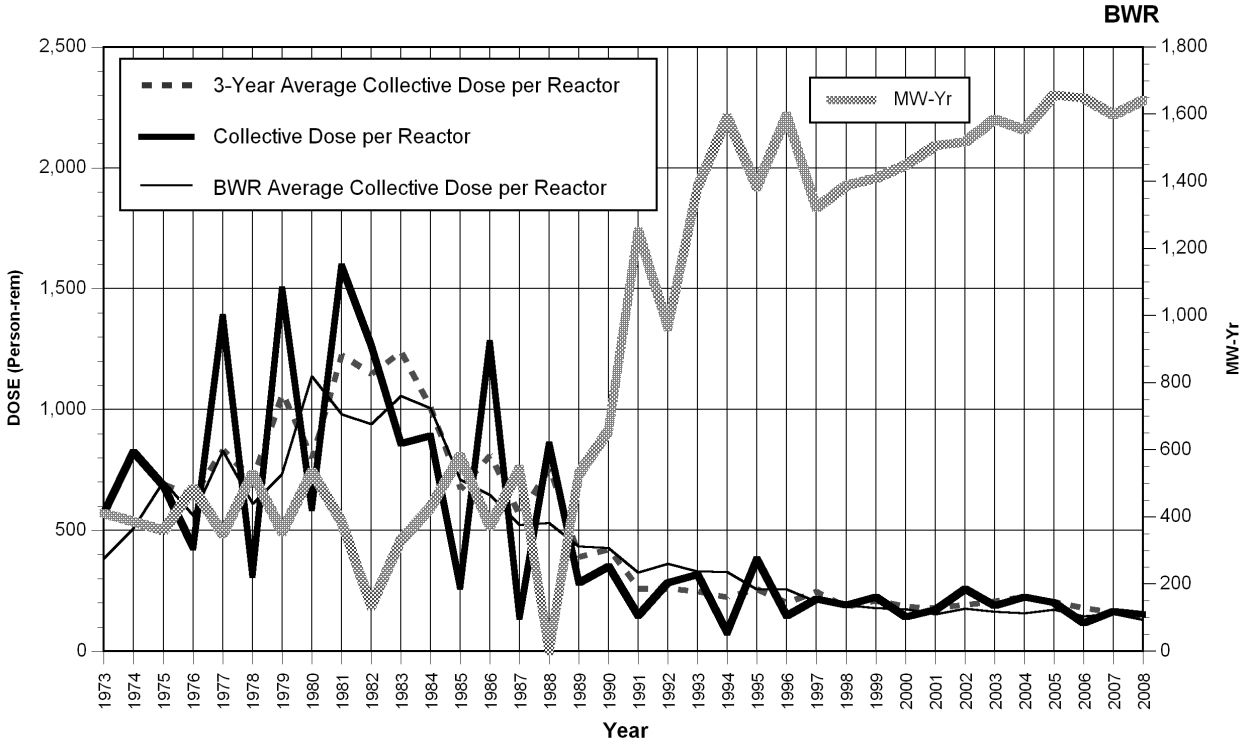
## MILLSTONE 2, 3
Dose Performance Indicators



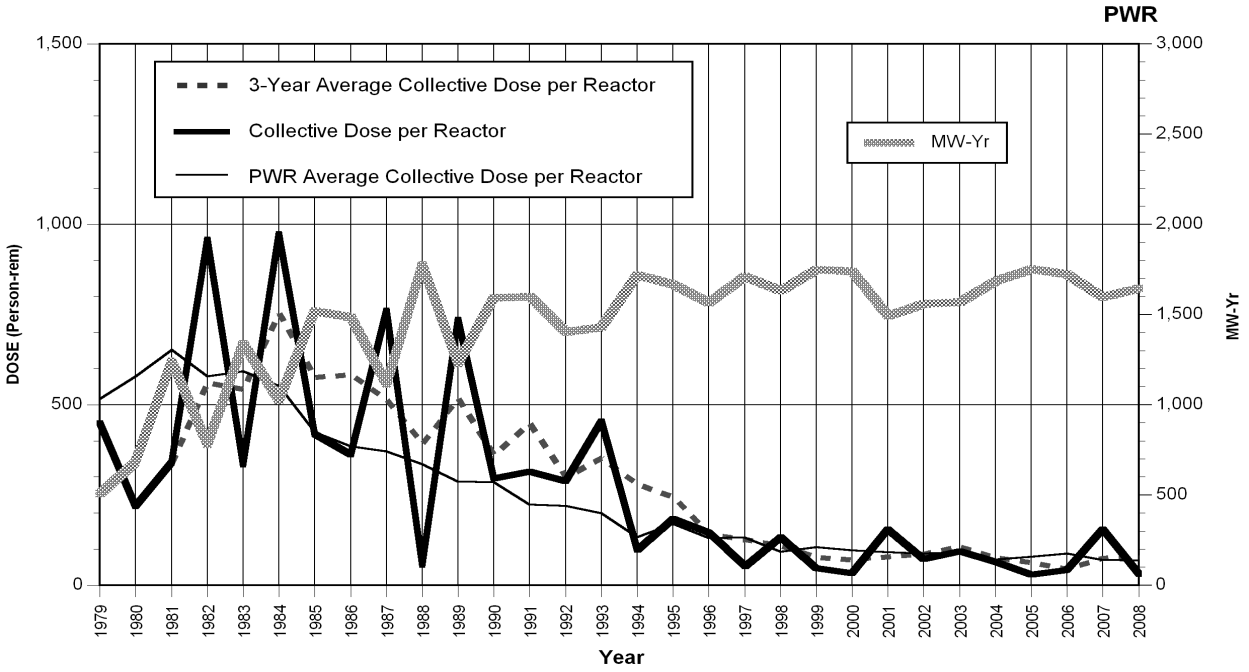

## MONTICELLO
Dose Performance Indicators



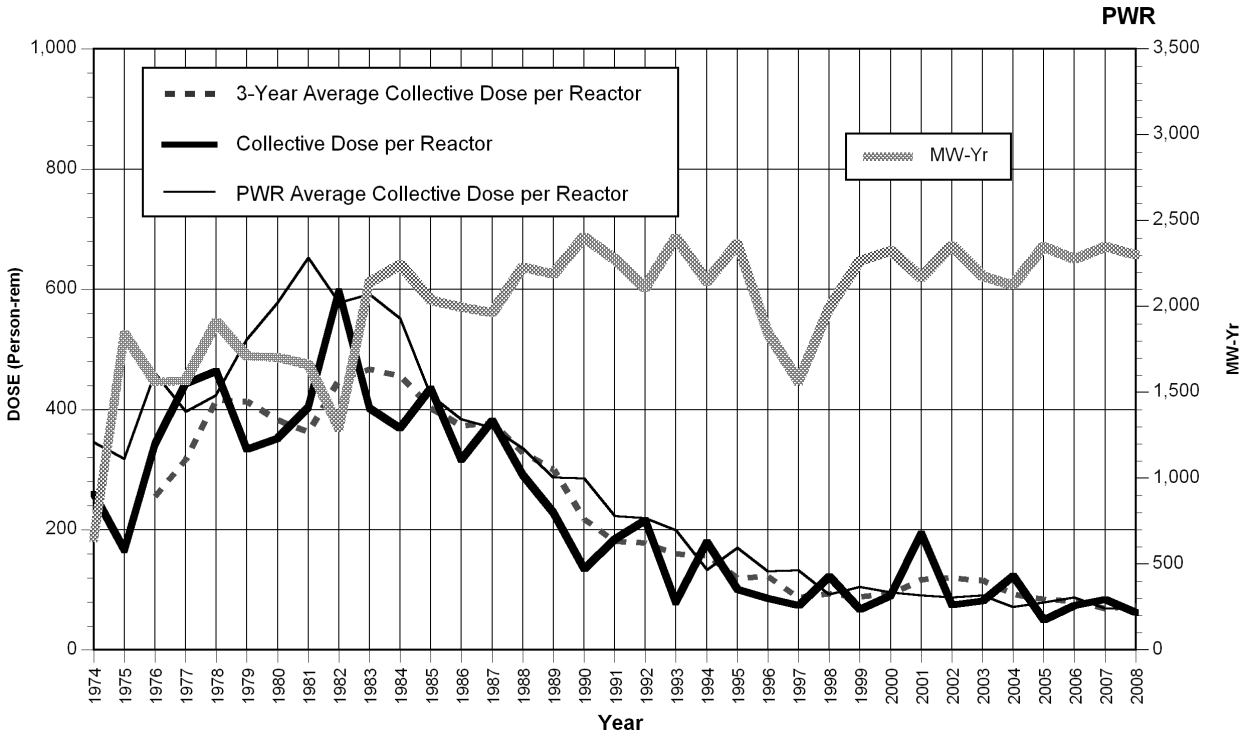
## NINE MILE POINT 1, 2
Dose Performance Indicators



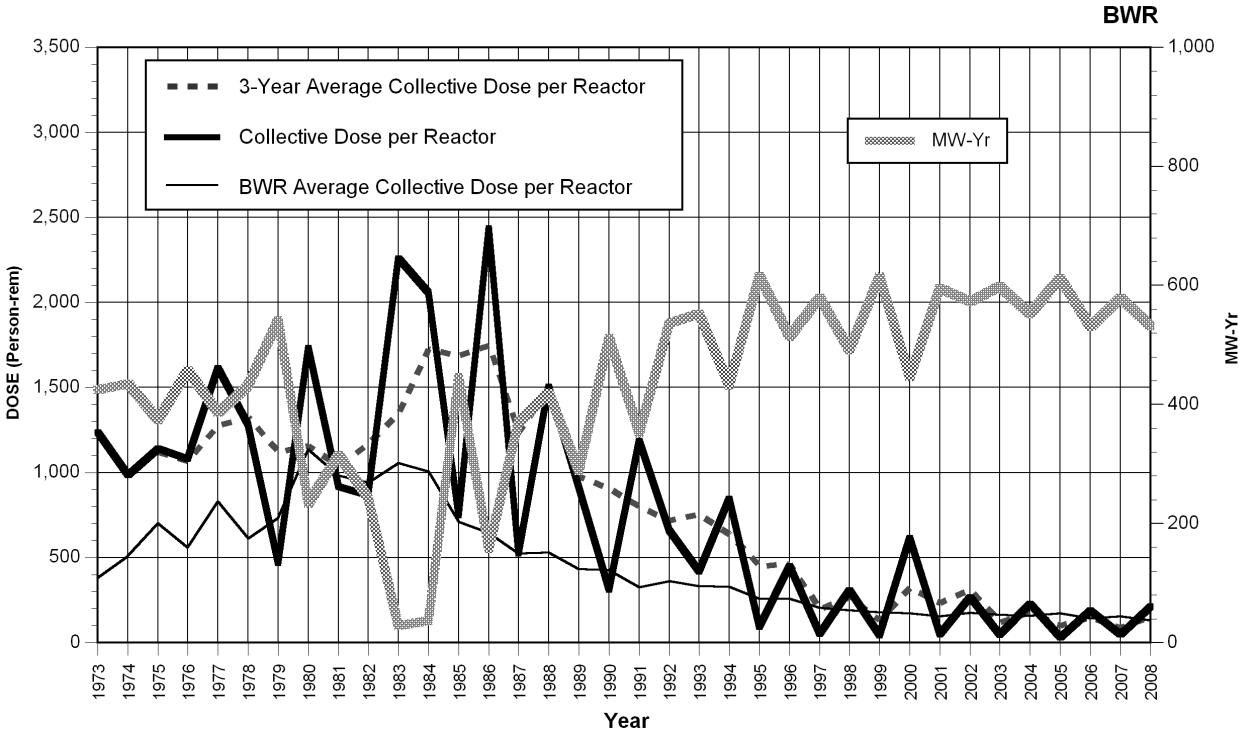

## NORTH ANNA 1, 2
Dose Performance Indicators



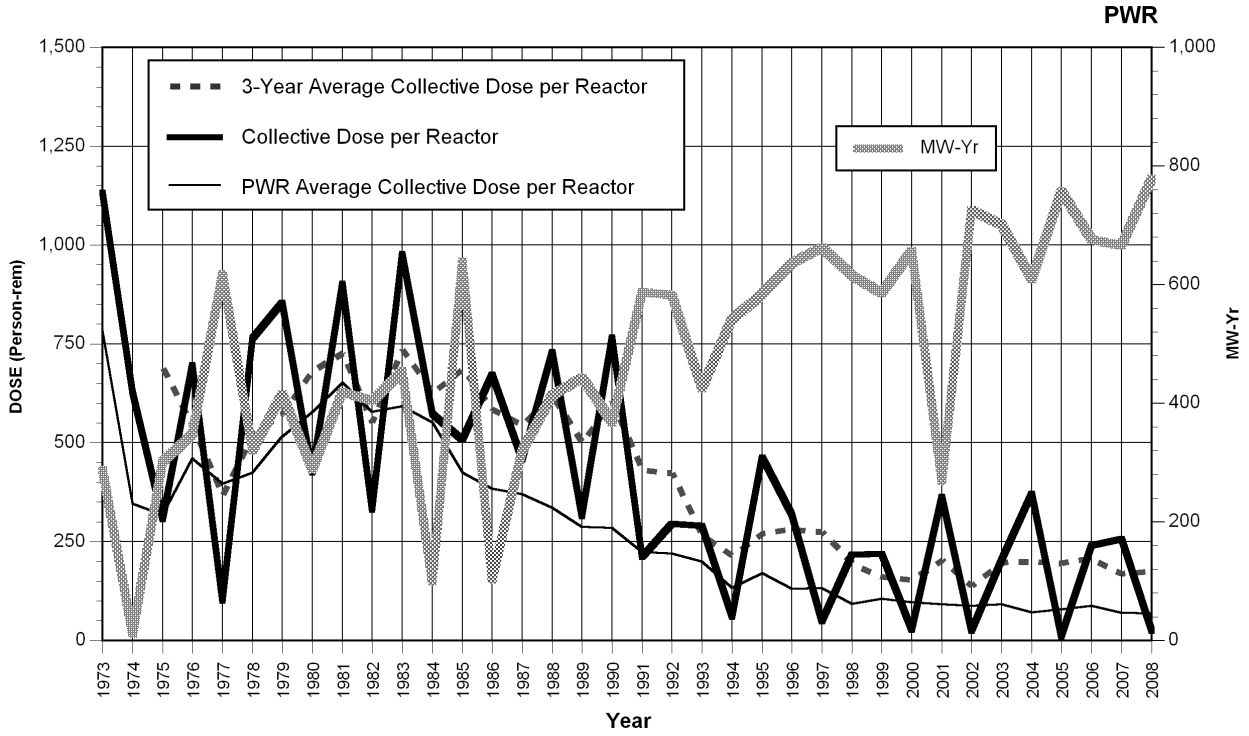
## OCONEE 1, 2, 3
Dose Performance Indicators



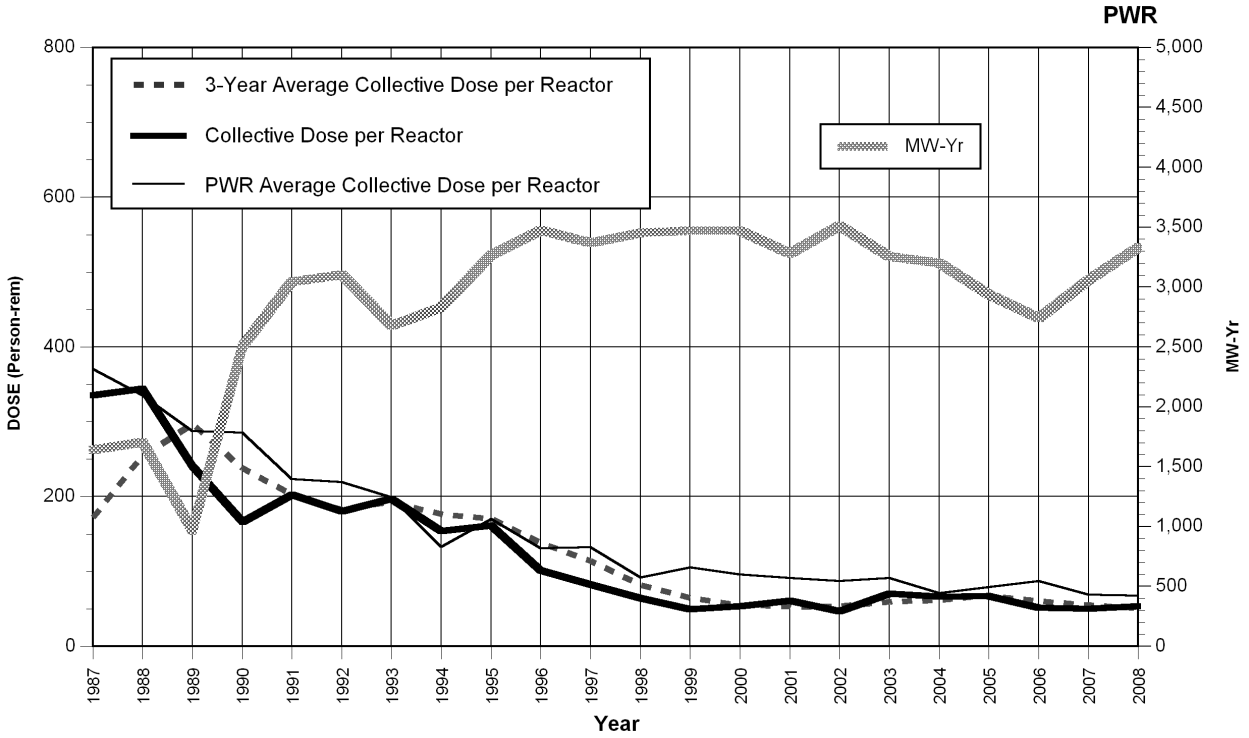

## OYSTER CREEK
Dose Performance Indicators



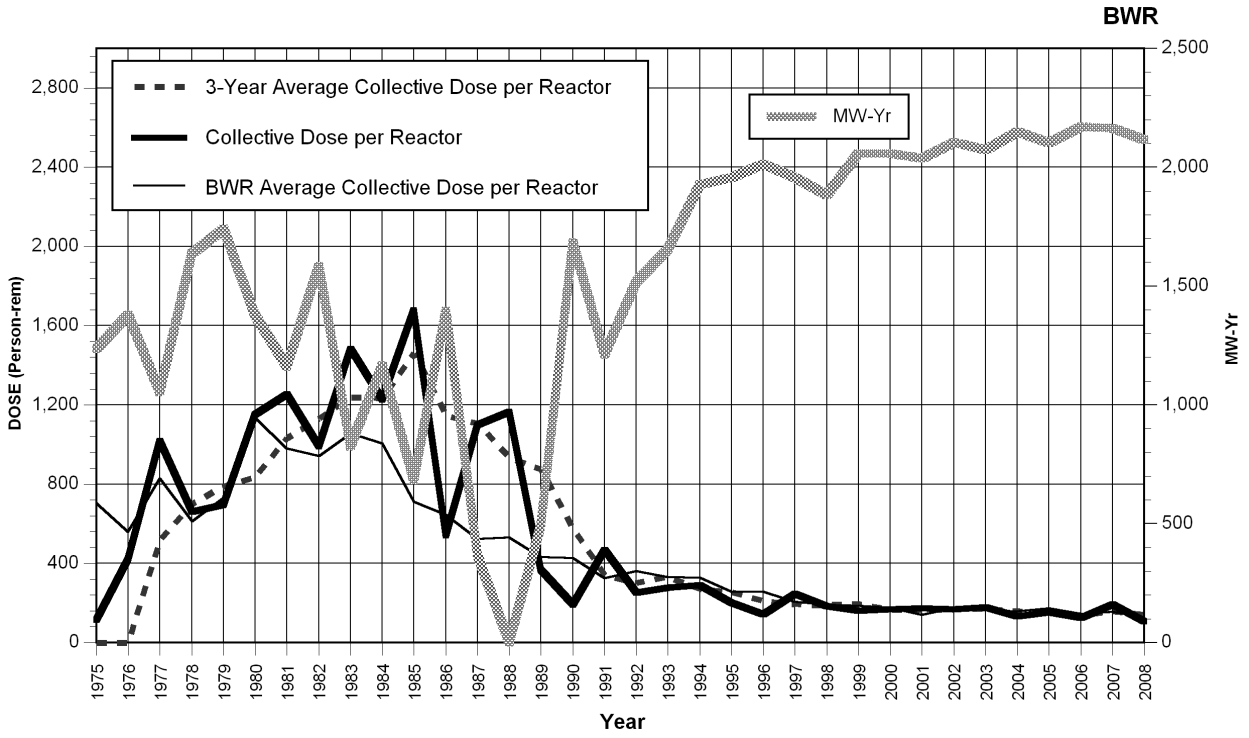
## PALISADES
Dose Performance Indicators



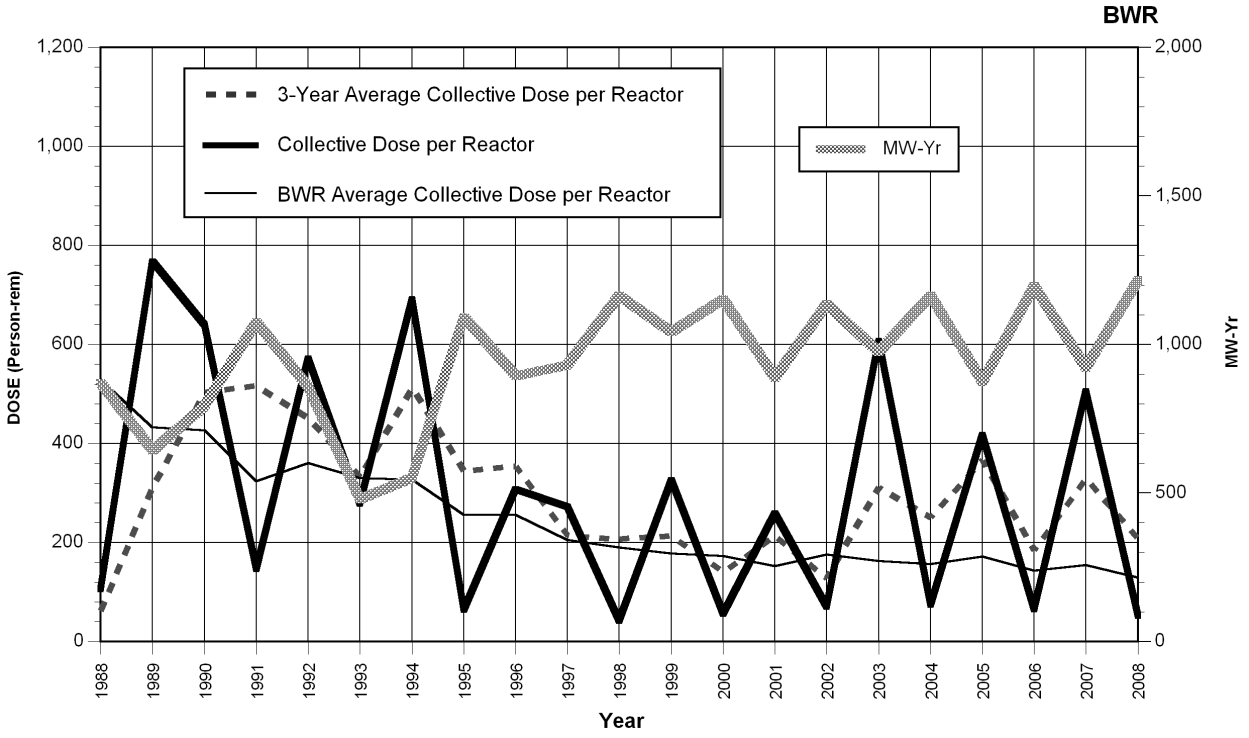

## PALO VERDE 1, 2, 3
Dose Performance Indicators



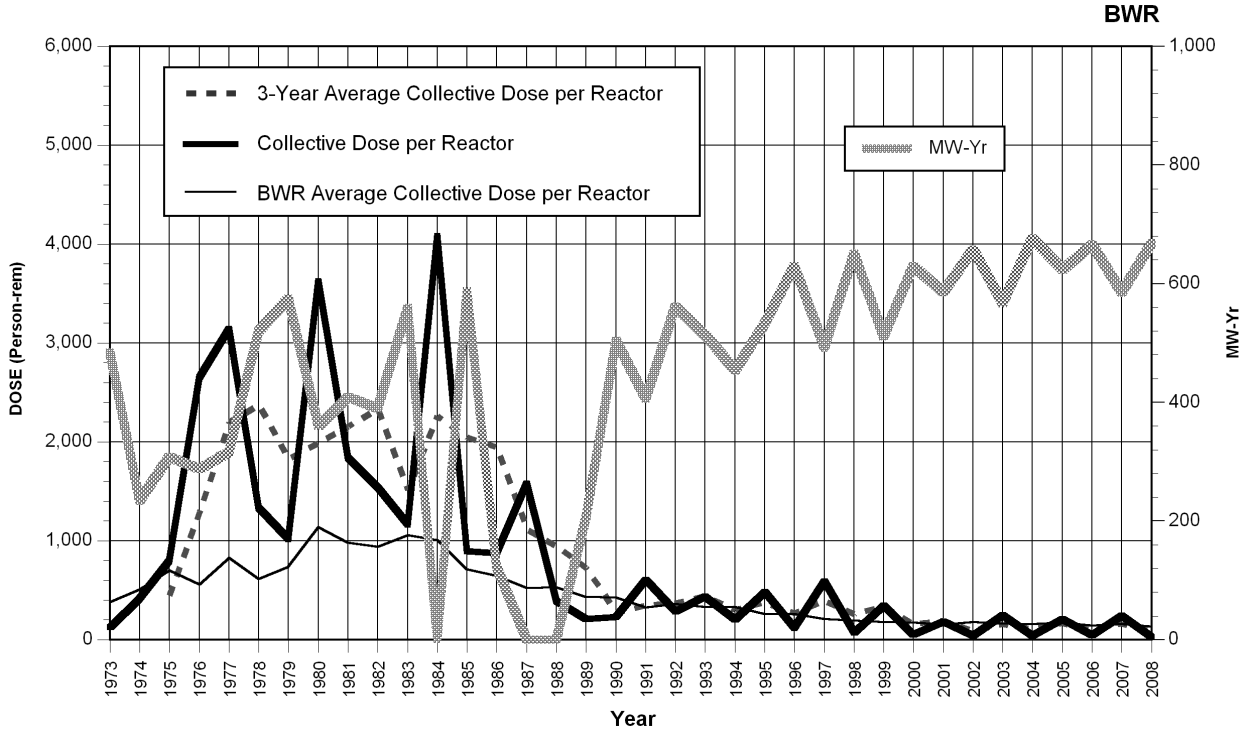
## PEACH BOTTOM 2, 3
Dose Performance Indicators



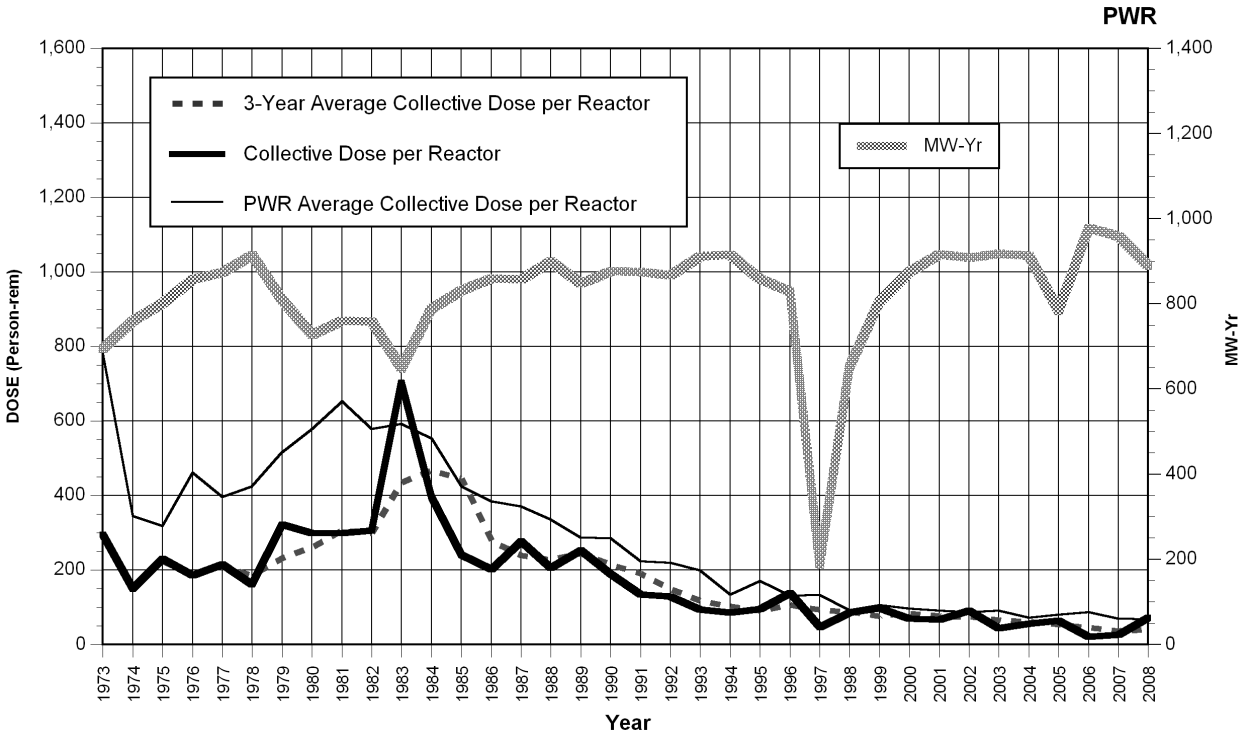

## PERRY 1
Dose Performance Indicators



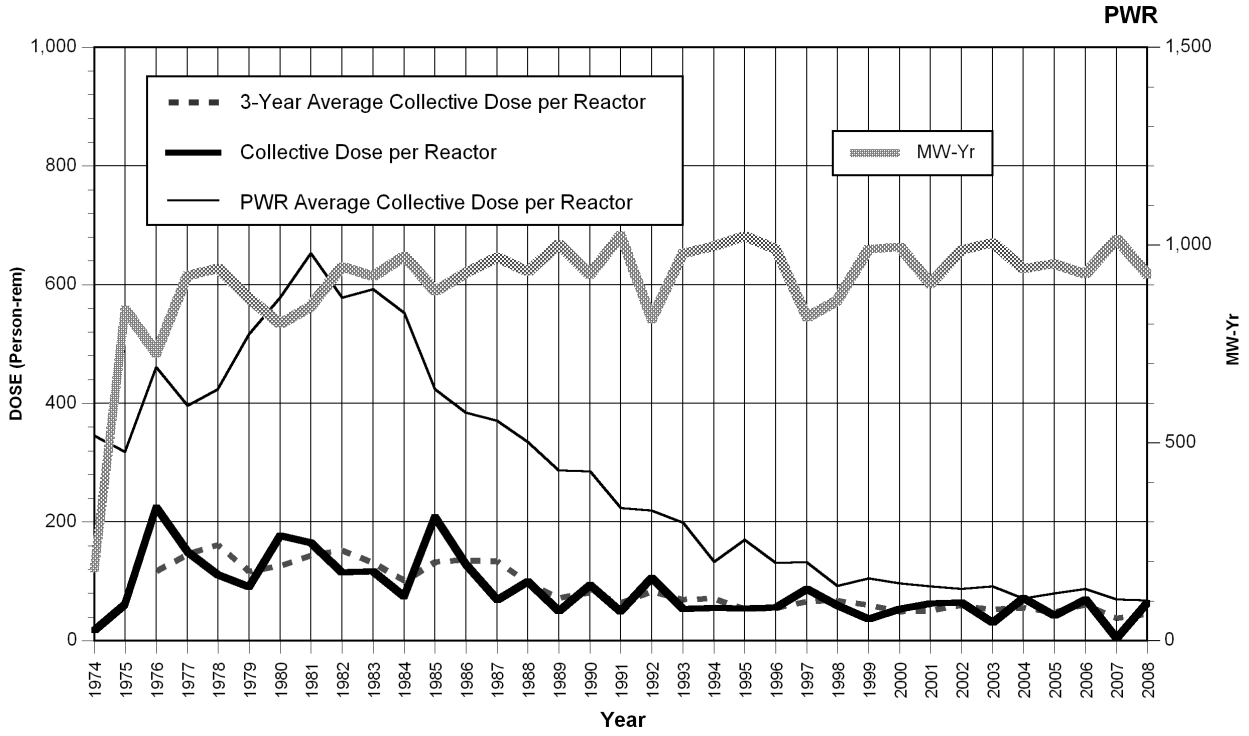
## PILGRIM 1
Dose Performance Indicators



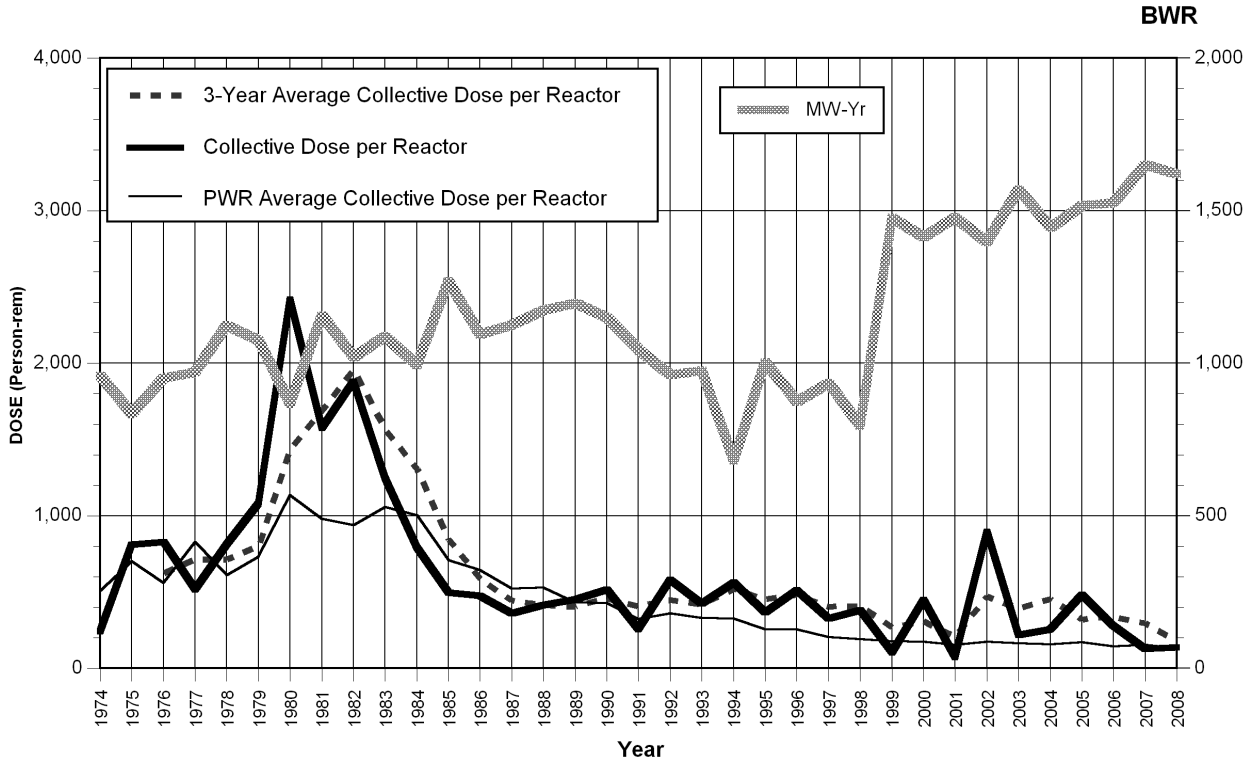

## POINT BEACH 1, 2
Dose Performance Indicators



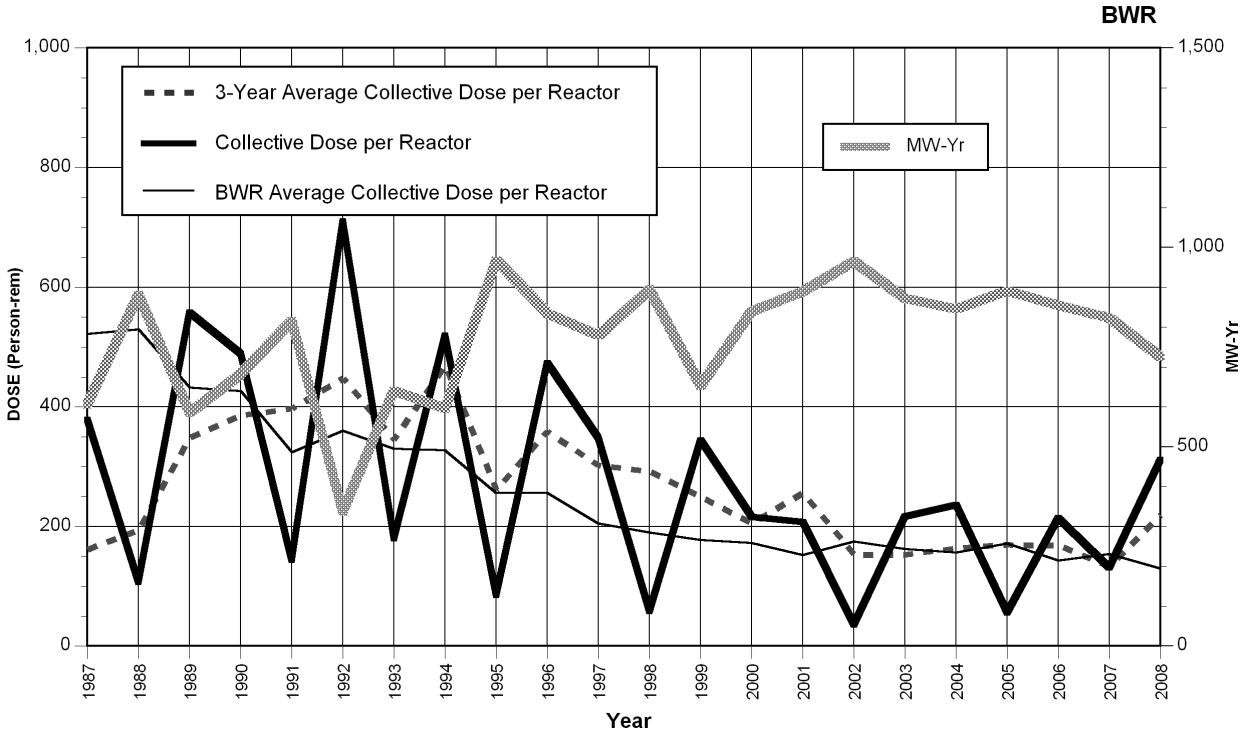
## PRAIRIE ISLAND 1, 2
Dose Performance Indicators



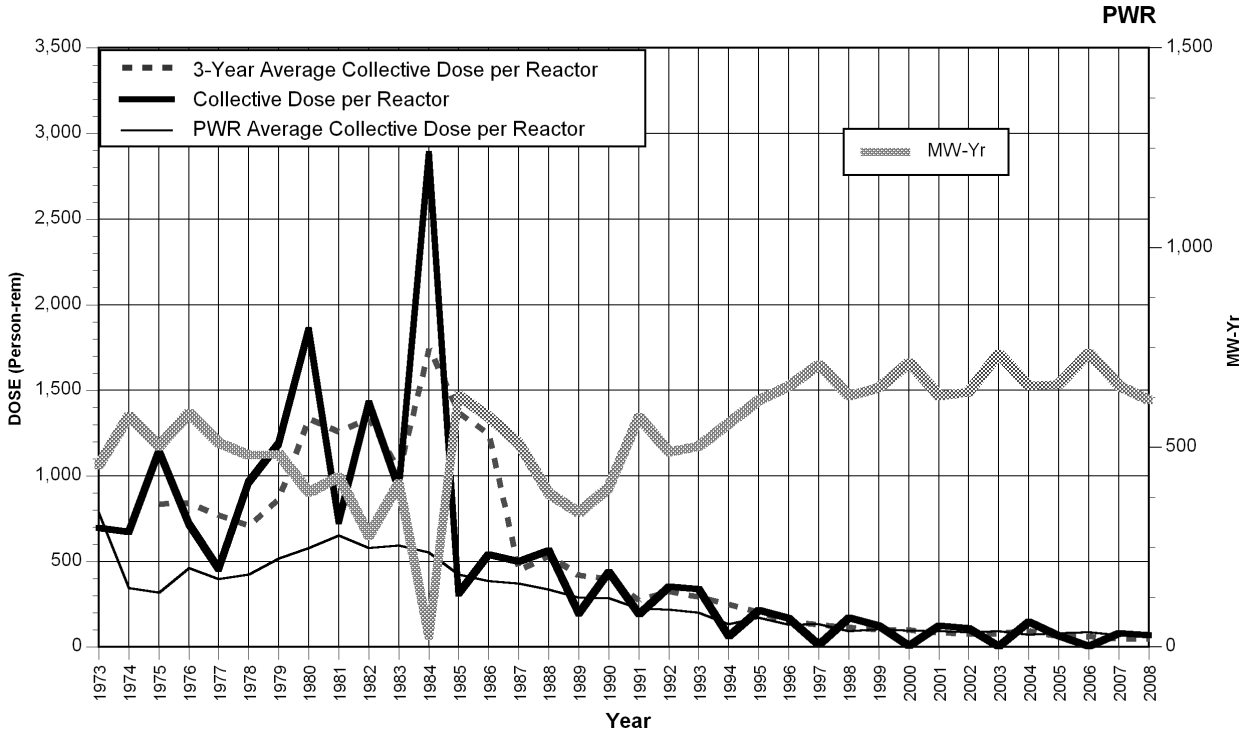

## QUAD CITIES 1, 2
Dose Performance Indicators



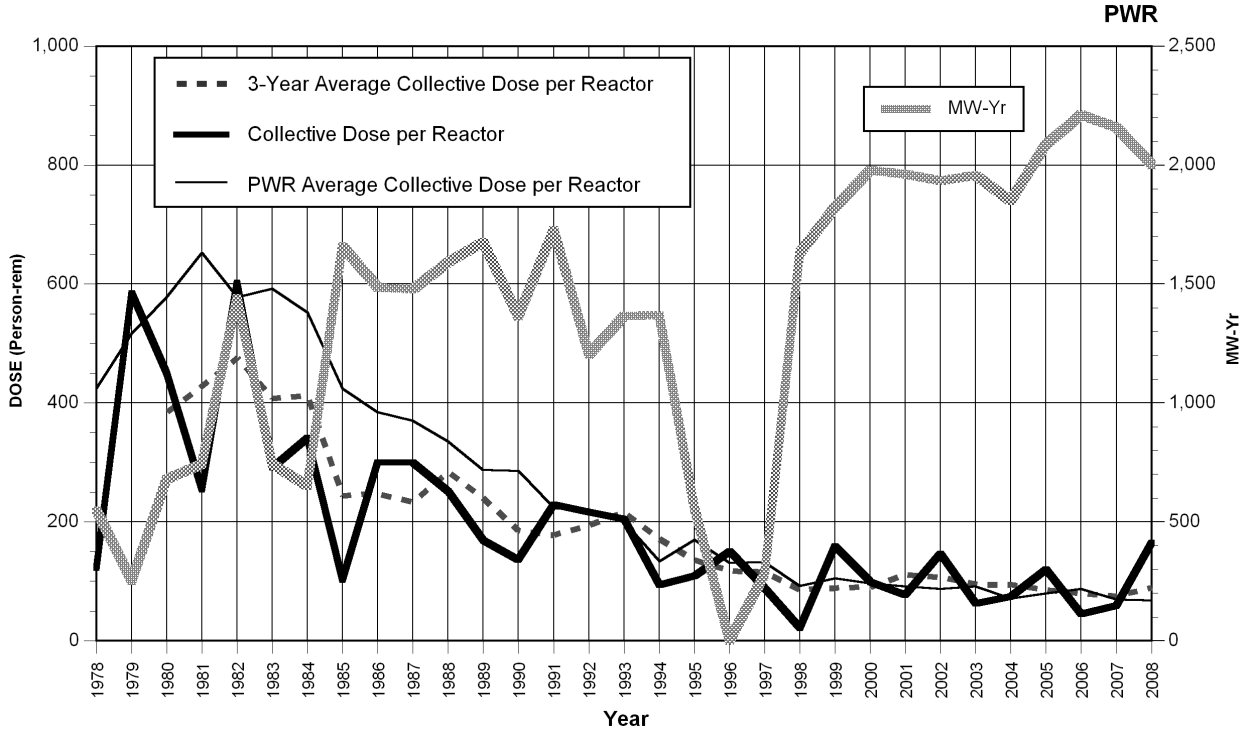
## RIVER BEND 1
Dose Performance Indicators



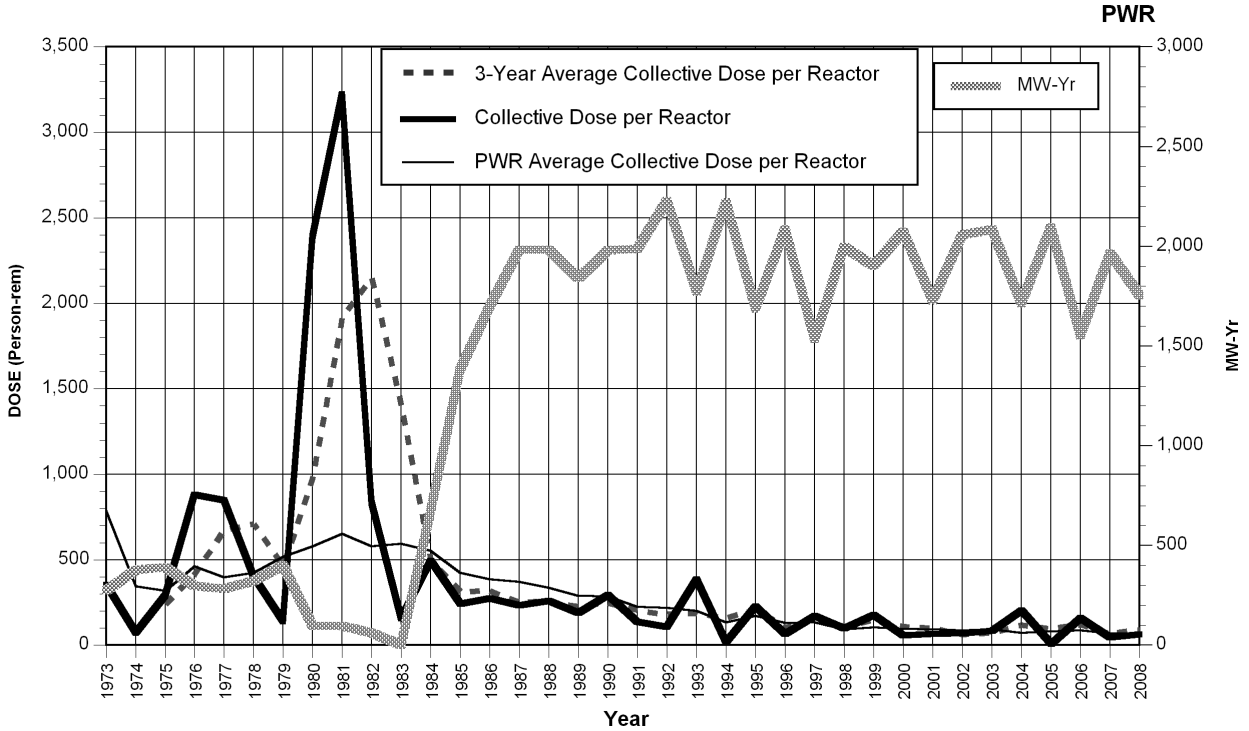

## ROBINSON 2
Dose Performance Indicators



## SALEM 1, 2
Dose Performance Indicators

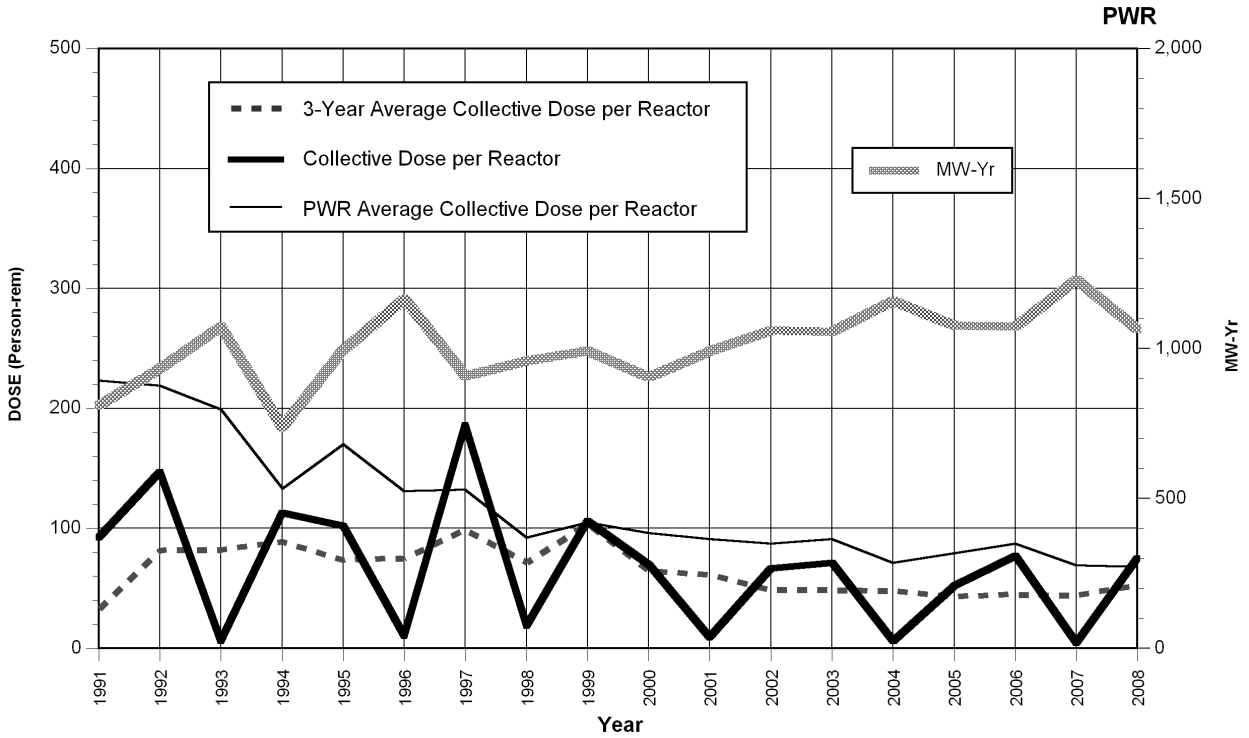



## SAN ONOFRE 1, 2, 3
Dose Performance Indicators

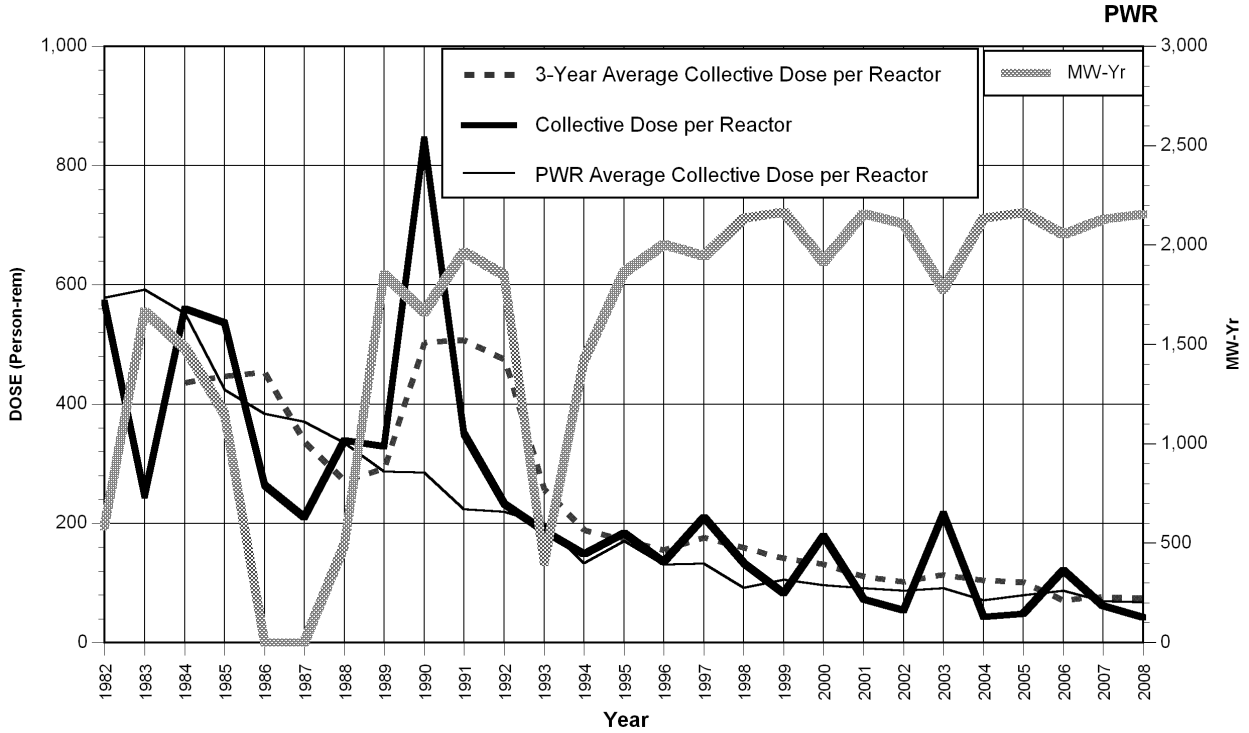



NOTE: Since 2001, data only includes San Onofre units 2 and 3.

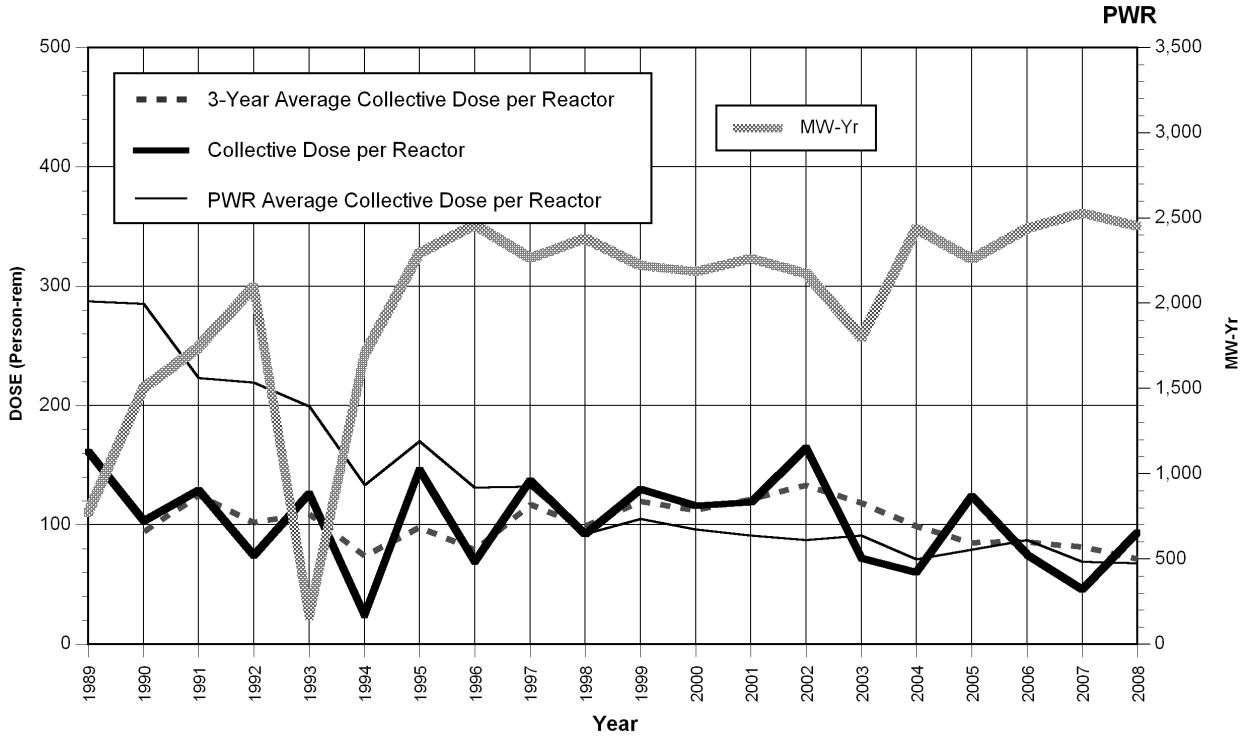
## SEABROOK
Dose Performance Indicators



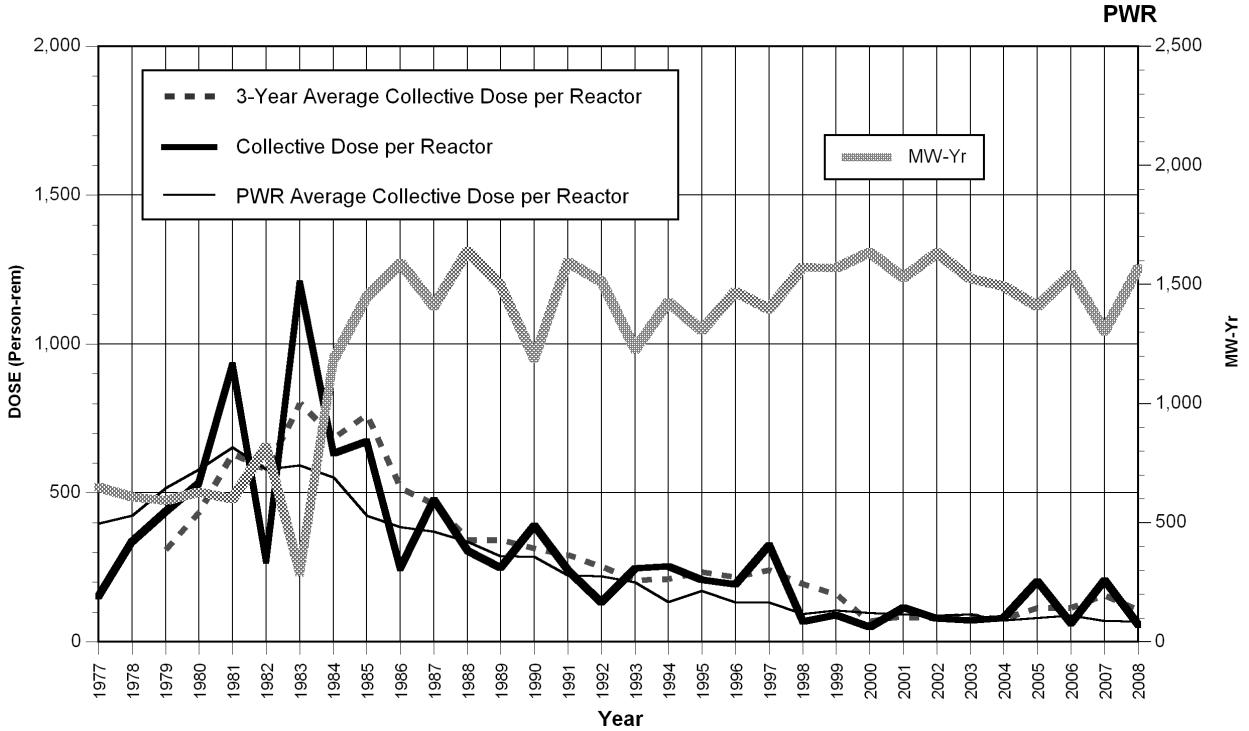

## SEQUOYAH 1, 2
Dose Performance Indicators



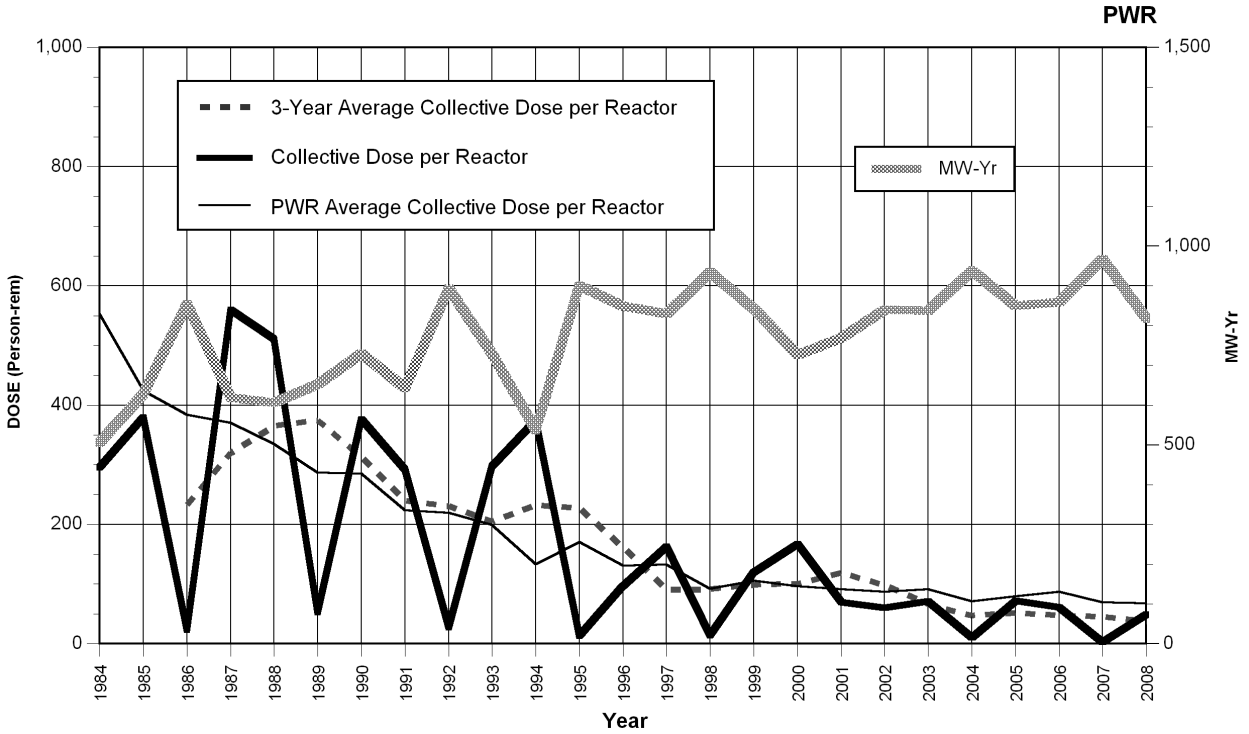
## SOUTH TEXAS 1, 2
Dose Performance Indicators



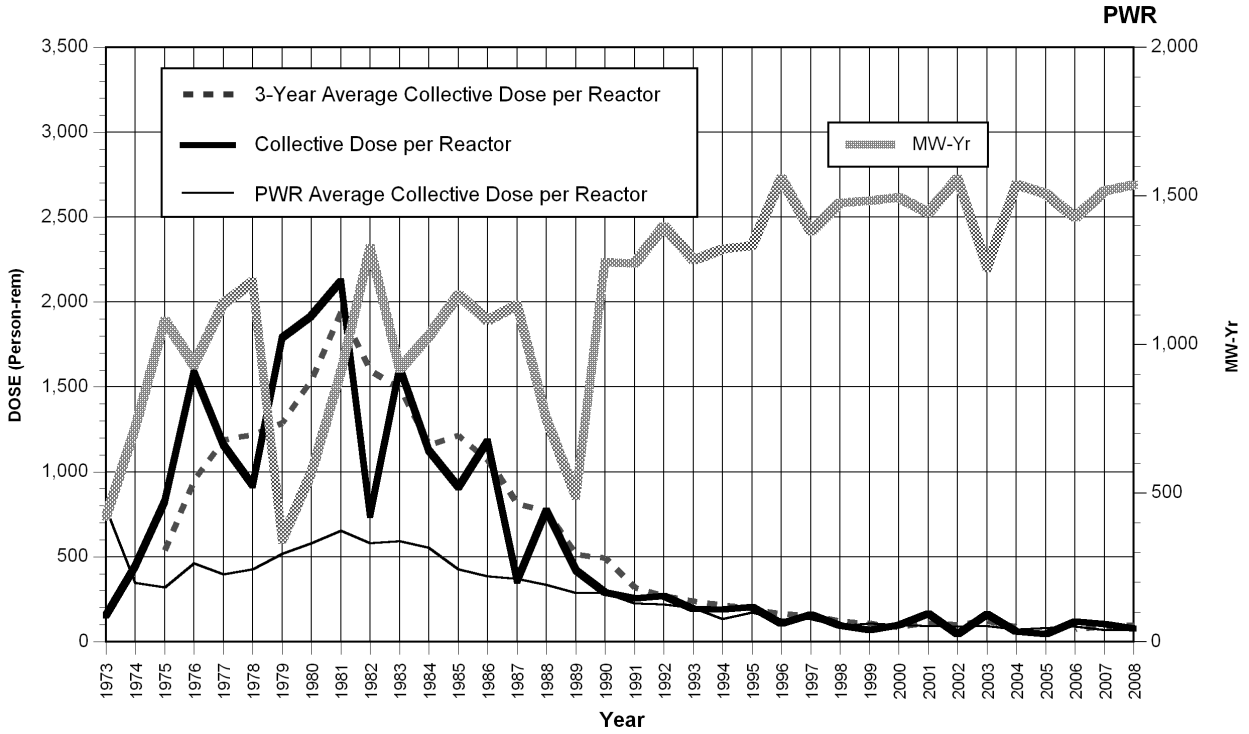

## ST. LUCIE 1, 2
Dose Performance Indicators



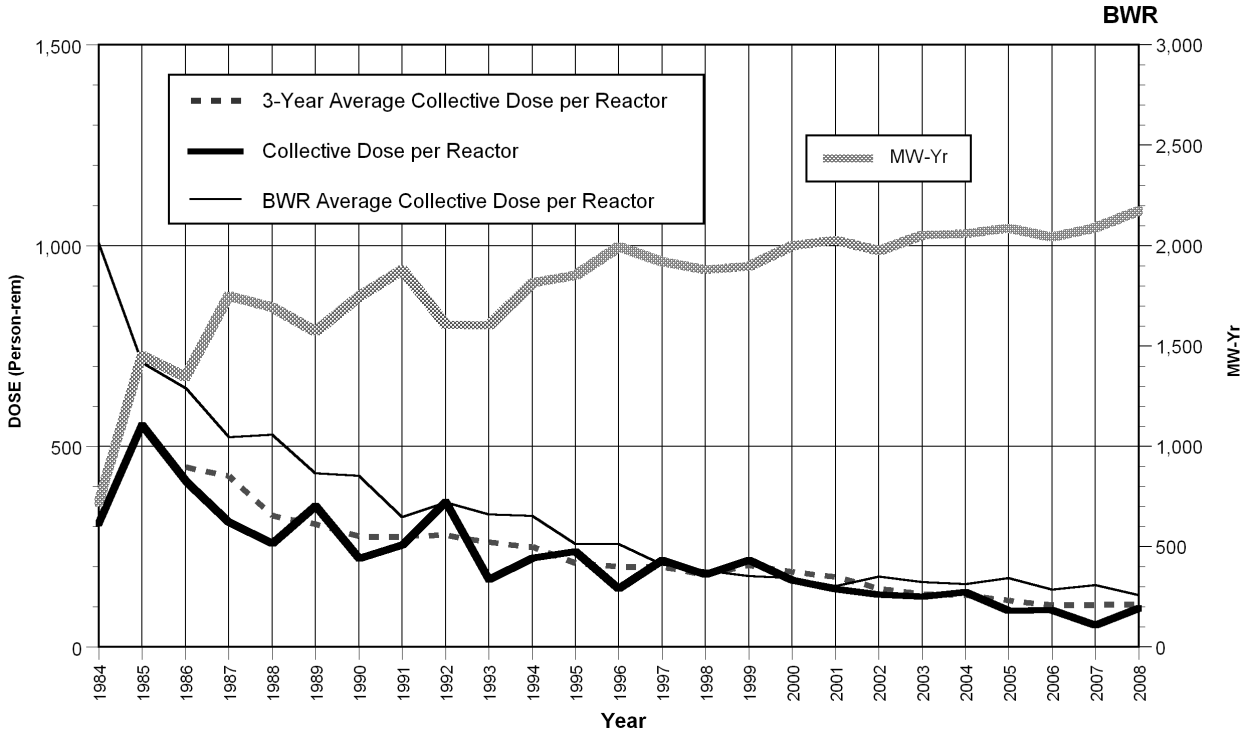
## SUMMER
Dose Performance Indicators



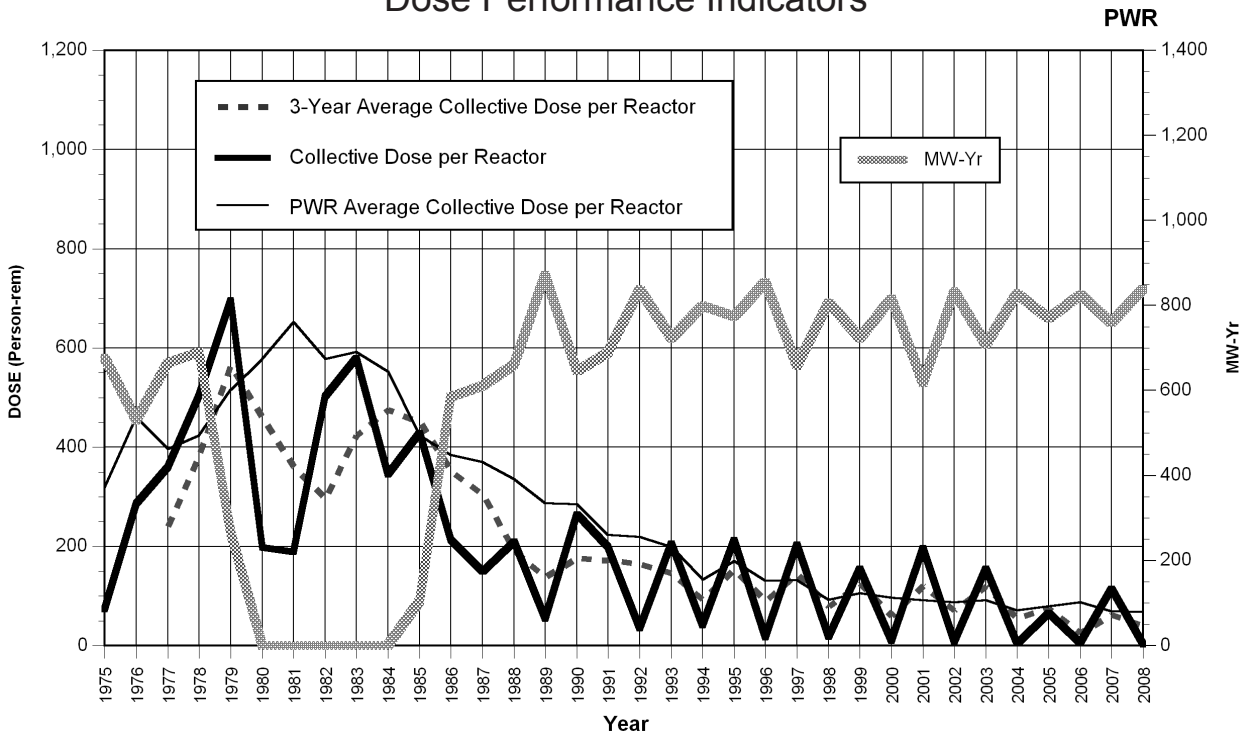

## SURRY 1, 2
Dose Performance Indicators



## SUSQUEHANNA 1, 2
Dose Performance Indicators

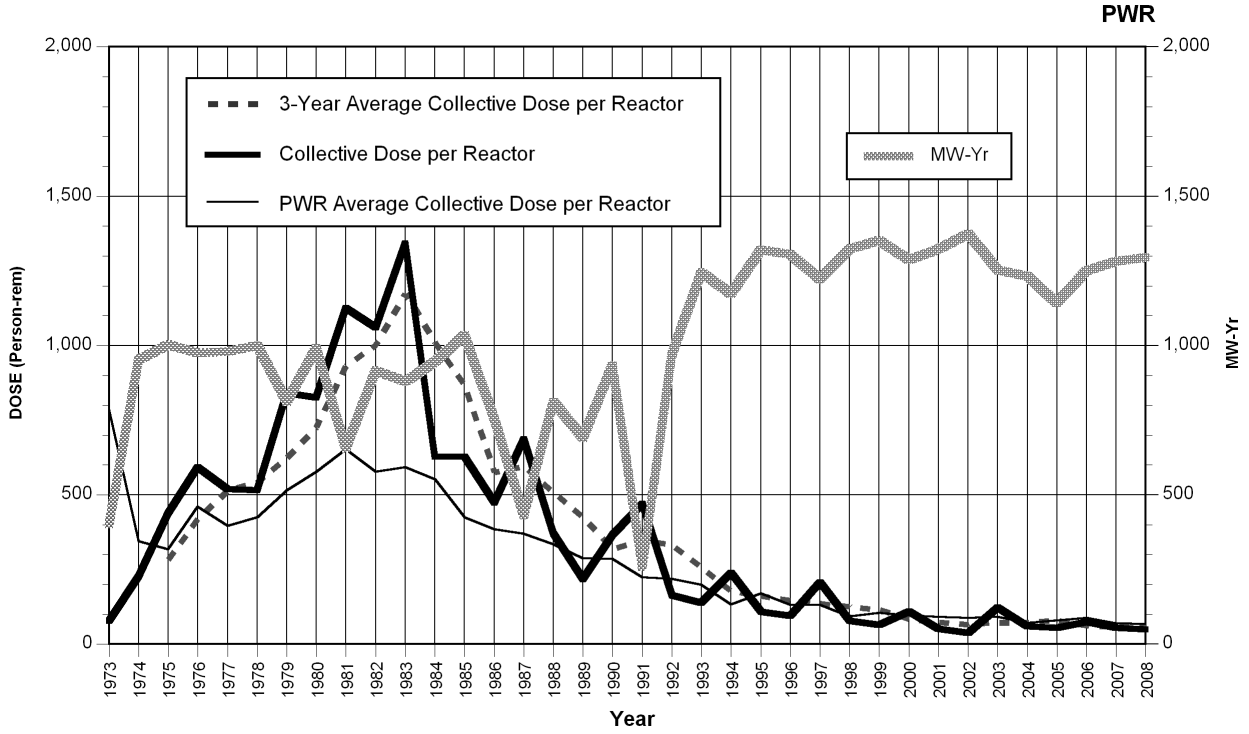



## THREE MILE ISLAND 1*
Dose Performance Indicators

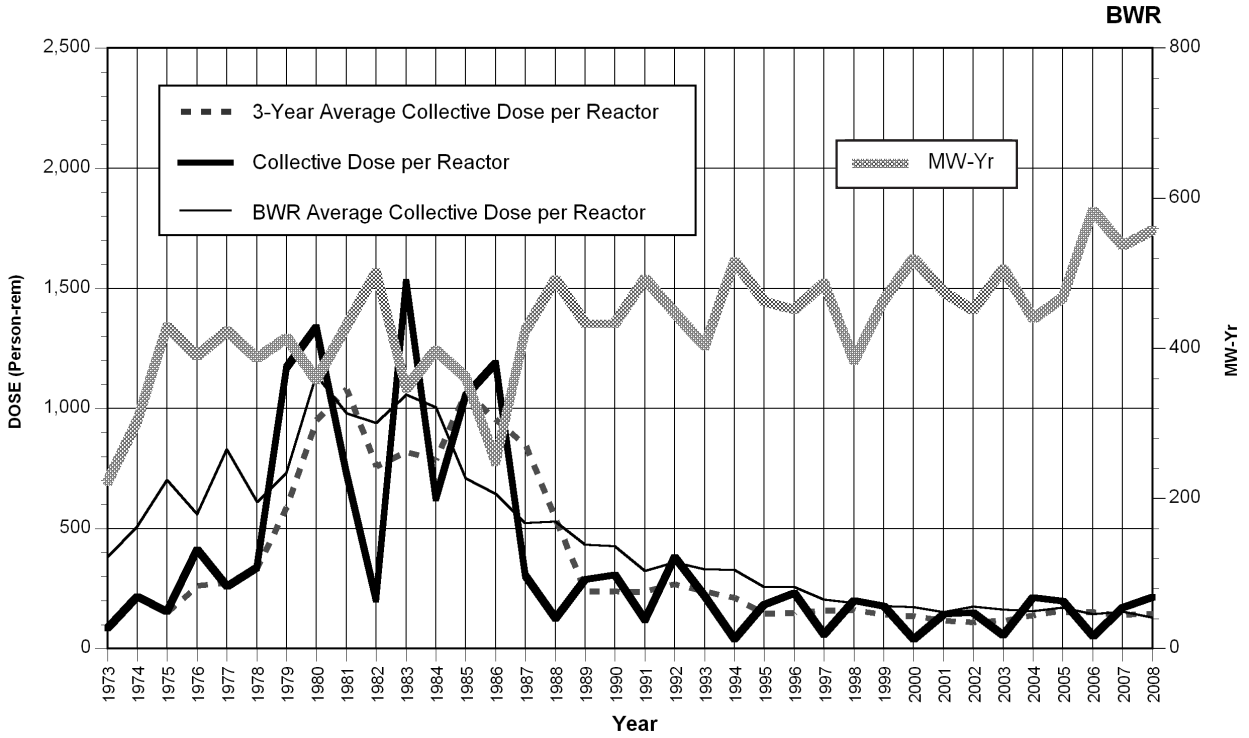



*Graph includes data for Three Mile Island 2 for the years 1975 – 1985.

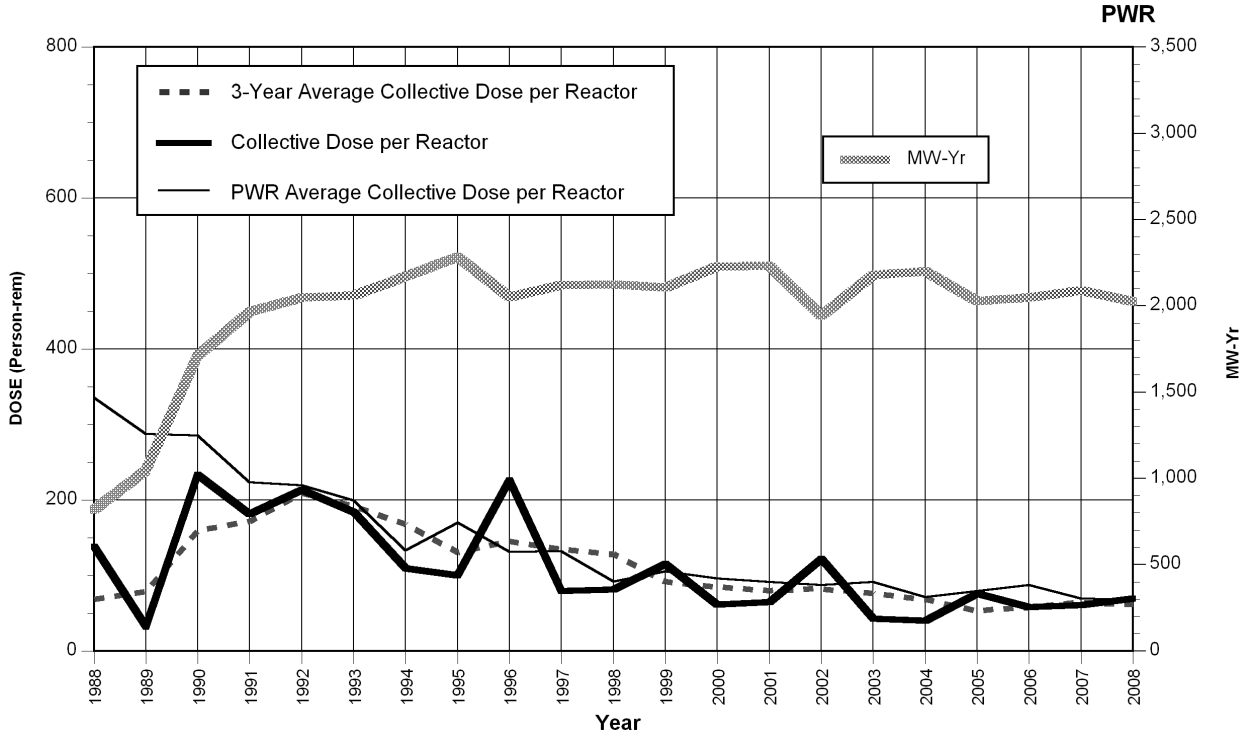
## TURKEY POINT 3, 4
Dose Performance Indicators



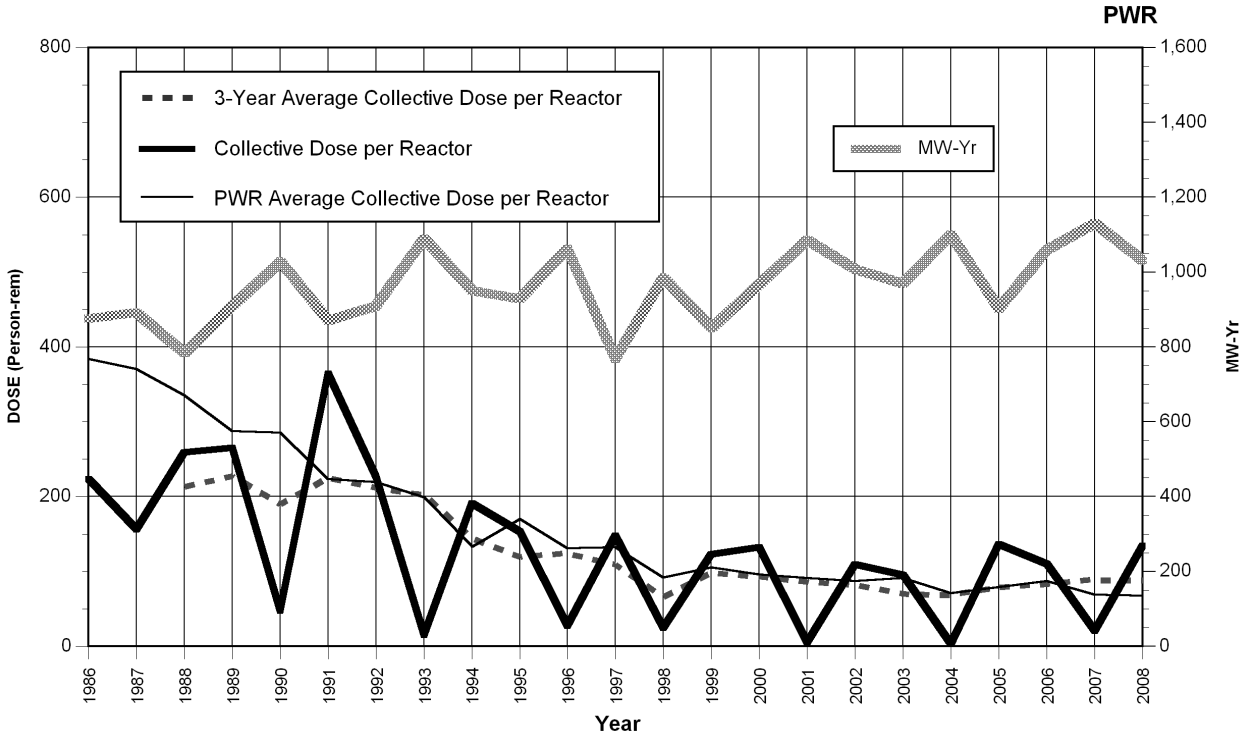

## VERMONT YANKEE
Dose Performance Indicators



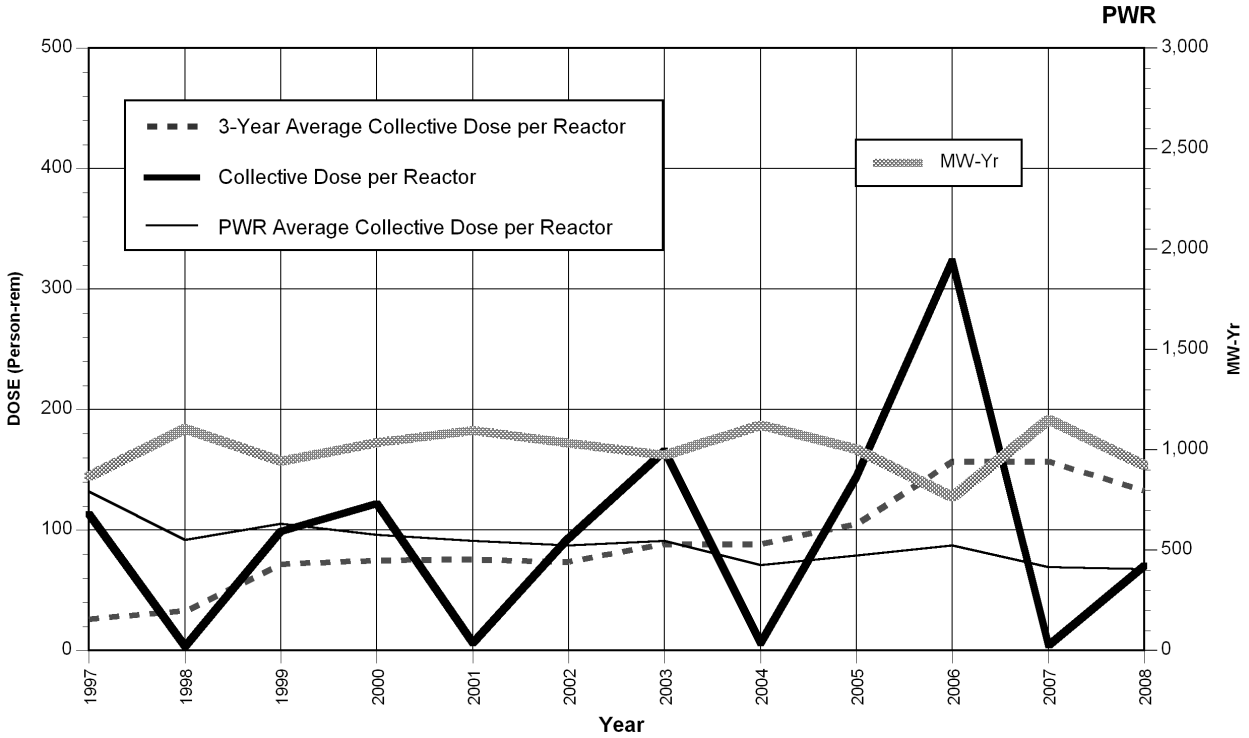
## VOGTLE 1, 2
Dose Performance Indicators



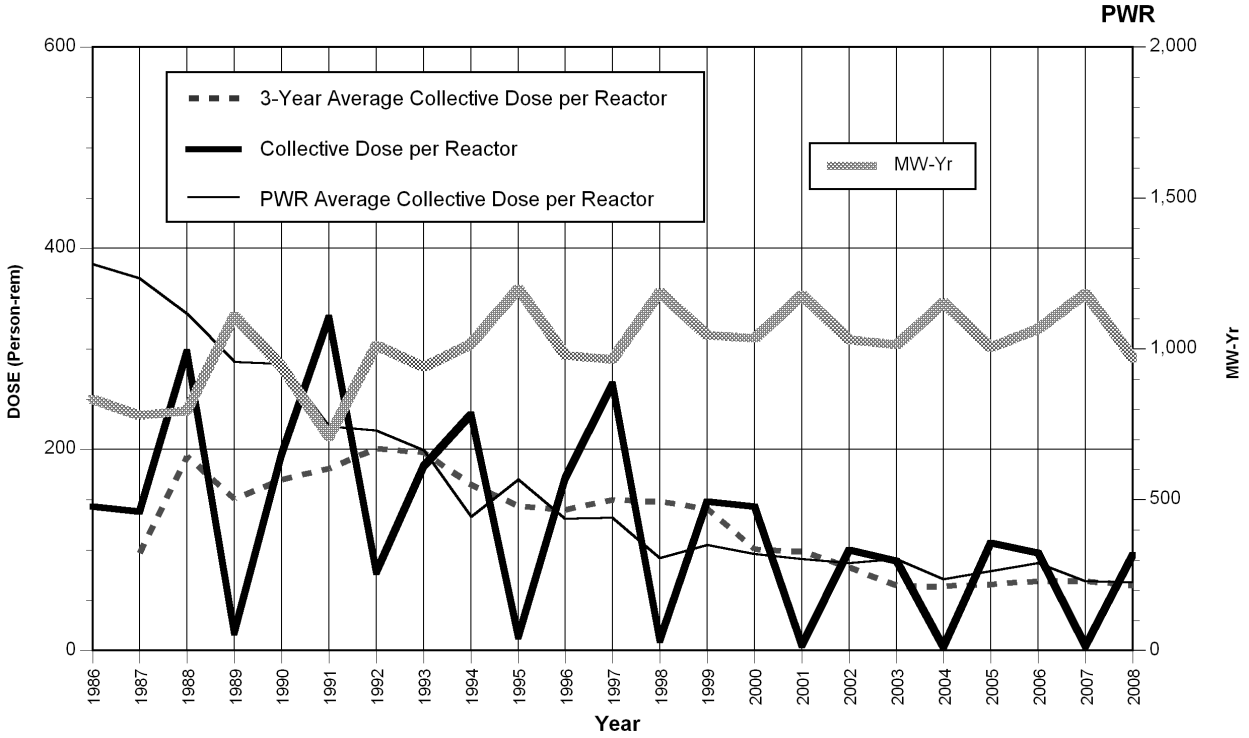

## WATERFORD 3
Dose Performance Indicators



## WATTS BAR 1
Dose Performance Indicators




## WOLF CREEK 1
Dose Performance Indicators



Appendix E

# GLOSSARY

# 2008

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# GLOSSARY

*Agreement State:* as defined in 10 CFR 20.1003, means any state with which the Atomic Energy Commission or the Nuclear Regulatory Commission has entered into an effective agreement under subsection 274b. of the [Atomic Energy] Act [of 1954, including any amendments thereto]. To simplify subsection 274b., an Agreement State is a state that has signed an agreement with the NRC under which the state regulates the use of byproduct, source, and small quantities of special nuclear material in that state.

*As low as reasonably achievable (ALARA):* as defined in 10 CFR 20.1003, means making every reasonable effort to maintain exposures to radiation as far below the dose limits in 10 CFR 20 as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to the state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

A*verage measurable dose:* the dose obtained by dividing the collective dose by the number of individuals who received a measurable dose. This is the average most commonly used in this and other reports when examining trends and comparing doses received by workers, because it excludes those individuals receiving a less than measurable dose.

*Boiling water reactor (BWR):* reactor in which the water, used as both coolant and moderator, is allowed to boil in the core. The resulting steam can be used directly to drive a turbine and electrical generator, thereby producing electricity.

*Byproduct material:* as partially defined in 10 CFR 20.1003, means any radioactive material (except special nuclear material) yielded in, or made radioactive by, exposure to the radiation incident to the process of producing or using special nuclear material; and the tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content.

*Class (or lung class or inhalation class):* as defined in 10 CFR 20.1003, means a classification scheme for inhaled material according to its rate of clearance from the pulmonary region of the lung. Materials are classified as D, W, or Y, which applies to a range of clearance half-times: for Class D (Days) of less than 10 days, for Class W (Weeks) from 10 to 100 days, and for Y (Years) of greater than 100 days.

*Collective dose:* as defined in 10 CFR 20.1003, is the sum of the individual doses received in a given period of time by a specified population from exposure to a specified source of radiation.

*Committed dose equivalent:* as defined in 10 CFR 20.1003, means the dose equivalent to organs or tissues of reference that will be received from an intake of radioactive material by an individual during the 50-year period following the intake. The acronym CDE is an NRC acronym used for this term.

*Committed effective dose equivalent:* as defined in 10 CFR 20.1003, is the sum of the products of the weighting factors applicable to each of the body organs or tissues that are irradiated and the committed dose equivalent to these organs or tissues. The acronym CEDE is an NRC acronym used for this term.

*Exposure:* as defined in 10 CFR 20.1003, means being exposed to ionizing radiation or to radioactive material.

*Independent Spent Fuel Storage Installation (ISFSI):* as defined in 10 CFR 72.3 means a complex designed and constructed for the interim storage of spent nuclear fuel, solid reactor-related GTCC waste, and other radioactive materials associated with spent fuel and reactor-related GTCC waste storage. An ISFSI which is located on the site of another facility licensed under 10 CFR 72 or a facility licensed under 10 CFR 50 of [Title 10 of the Code of Federal Regulations] and which shares common utilities and services with that facility or is physically connected with that other facility may still be considered independent.

*Lens dose equivalent (LDE):* as defined in 10 CFR 20.1003, applies to the external exposure of the lens of the eye and is taken as the dose equivalent at a tissue depth of 0.3 centimeter (300 mg/cm2).

*License:* as defined in 10 CFR 20.1003, means a license issued under the regulations in 10 CFR parts 30 through 36, 39, 40, 50, 60, 61, 63, 70, or 72 of [Title 10 of the Code of Federal Regulations].

*Licensee:* as defined in 10 CFR 20.1003, means the holder of the NRC license.

*Licensed material:* as defined in 10 CFR 20.1003, means source material, special nuclear material, or byproduct material received, possessed, used, transferred, or disposed of under a general or specific license issued by the [Nuclear Regulatory] Commission.

*Light water reactor (LWR):* the term used in this report to describe commercial nuclear reactors that use ordinary water as a coolant and are operated for the purposes of generating electricity. Light water reactors include boiling water reactors (BWRs) and pressurized water reactors (PWRs).

*Measurable dose:* a dose greater than zero rem (not including doses reported as “not detectable”).

*Megawatt-year:* unit of electric energy, equal to the energy from a power of 1,000,000 watts over a period of one year.

*Mode of Intake:* the manner of intake into the body: inhalation (H), absorption through the skin (B), oral ingestion (G), and injection (J).

*Monitoring year:* interval during which the radiation exposure monitoring was performed.

*Non-reactor licensees:* NRC licensees that are not commercial nuclear power reactors. These licensees are industrial radiographers, fuel processors, fabricators, and reprocessors; manufacturers and distributors of byproduct material; independent spent fuel storage installations; facilities for land disposal of low-level waste; and geologic repositories for high-level waste.

*Number of individuals with measurable dose:* the count of unique individuals who received measurable dose during the monitoring year. In some instances in this report, the number of individuals with measurable dose may include individuals who are counted more than once since they may be monitored at more than one licensee during the year. (See Section 5 on the effect of transient individuals.) Tables that have been adjusted for transient workers are noted in the appropriate footnotes to the tables.

*Occupational dose:* as defined in 10 CFR 20.1003, means the dose received by an individual in the course of employment in which the individual's assigned duties involve exposure to radiation and to radioactive material from licensed and unlicensed sources of radiation, whether in the possession of the licensee or other person. Occupational dose does not include doses received from background radiation, from any medical administration the individual has received, from exposure to individuals administered radioactive material and released under [10 CFR] 35.75, from voluntary participation in medical research programs, or as a member of the public.

*Pressurized water reactor (PWR):* power reactor in which heat is transferred from the core to an exchanger by high temperature water kept under high pressure in the primary system. Steam used to turn a turbine and electrical generator is generated in a secondary circuit. The majority of reactors producing electric power in the United States are pressurized water reactors.

*Radionuclide:* a radioisotope.

*REM:* as defined in 10 CFR 20.1004, is the special unit of any of the quantities expressed as dose equivalent. The dose equivalent in rems is equal to the absorbed dose in rads multiplied by the quality factor (1 rem = 0.01 sievert).

*Shallow dose equivalent, maximum extremity (SDE-ME):* the external exposure of an extremity, taken as the dose equivalent at a tissue depth of 0.007 centimeter.

*Shallow dose equivalent, whole body (SDE-WB):* the external exposure of the skin, taken as the dose equivalent at a tissue depth of 0.007 centimeter.

*Sievert:* as defined in 10 CFR 20.1004, is the SI unit of any of the quantities expressed as dose equivalent. The dose equivalent in sieverts is equal to the absorbed dose in grays multiplied by the quality factor (1 Sv = 100 rems).

*Special nuclear material (SNM):* as defined in 10 CFR 20.1003, means plutonium, uranium-233, uranium enriched in the isotope 233 or in the isotope 235, and any other material that the [Nuclear Regulatory] Commission, pursuant to the provisions of section 51 of the [Atomic Energy] Act [of 1954, as amended], determines to be special nuclear material, but does not include source material. Any material artificially enriched by any of the foregoing but does not include source material.

*Total effective dose equivalent (TEDE):* as defined in 10 CFR 20.1003, means the sum of the effective dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).

*Transient individual:* one who is monitored at more than one licensed site during the calendar year.

*Unit availability factor:* the unit available hours (the total clock hours in the report period during which the unit operated online or was capable of such operation) times 100 divided by the period hours.

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