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Vol. 7

# Occupational Radiation Exposure at Commercial Nuclear Power Reactors And Other Facilities 1985

Eighteenth Annual Report

**U.S. Nuclear Regulatory Commission**

**Office of Nuclear Regulatory Research**

B.G. Brooks

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# Occupational Radiation Exposure at Commercial Nuclear Power Reactors And Other Facilities 1985

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B.G. Brooks

**Division of Regulatory Applications**
**Office of Nuclear Regulatory Research**
**U.S. Nuclear Regulatory Commission**
**Washington, DC 20555**

PREVIOUS REPORTS IN SERIES

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.

NUREG-0109 Occupational Radiation Exposure at Light Water Cooled Power Reactors, 1969-1975, U.S. Nuclear Regulatory Commission, August 1976.

NUREG-0323 Occupational Radiation Exposure at Light Water Cooled Power Reactors, 1969-1976, U.S. Nuclear Regulatory Commission, March 1978.

NUREG-0482 Occupational Radiation Exposure at Light Water Cooled Power Reactors, 1977, U.S. Nuclear Regulatory Commission, May 1979.

NUREG-0594 Occupational Radiation Exposure at Commercial Nuclear Power Reactors, 1978, U.S. Nuclear Regulatory Commission, November 1979.

NUREG-0713 Occupational Radiation Exposure at Commercial Nuclear Power Reactors 1979, Vol. 1, U.S. Nuclear Regulatory Commission, March 1981.

NUREG-0713 Occupational Radiation Exposure at Commercial Nuclear Power Reactors 1980, Vol. 2, U.S. Nuclear Regulatory Commission, December 1981.

NUREG-0713 Occupational Radiation Exposure at Commercial Nuclear Power Reactors 1981, Vol. 3, U.S. Nuclear Regulatory Commission, November 1982.

NUREG-0713 Occupational Radiation Exposure at Commercial Nuclear Power Reactors 1982, Vol. 4, U.S. Nuclear Regulatory Commission, December 1983.

NUREG-0713 Occupational Radiation Exposure at Commercial Nuclear Power Reactors 1983, Vol. 5, U.S. Nuclear Regulatory Commission, March 1985.

NUREG-0713 Occupational Radiation Exposure At Commercial Nuclear Power Reactors and Other Facilities 1984, Vol. 6, U.S. Nuclear Regulatory Commission, October 1986.

Previous reports in the NUREG-0714 series, which will are now combined with NUREG-0713 are as follows:

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.

NUREG-0463 Tenth Annual Occupational Radiation Exposure Report for 1977, U.S. Nuclear Regulatory Commission, October 1978.

NUREG-0593 Eleventh Annual Occupational Radiation Exposure Report for 1978, U.S. Nuclear Regulatory Commission, January 1981.

NUREG-0714 Twelfth Annual Occupational Radiation Exposure Report for 1979, Vol. 1, U.S. Nuclear Regulatory Commission, August 1982.

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's Radiation Exposure Information and Reporting System (REIRS). The bulk of the information contained in the report was extracted from the 1985 annual statistical reports submitted by six of the seven categories* of NRC licensees subject to the reporting requirements of 10 CFR § 20.407. Since there are no geologic repositories for high level waste currently licensed, only six categories will be considered in this report. These six categories of licensees also submit personal identification and exposure information for terminating employees pursuant to 10 CFR § 20.408, and some analysis of this "termination" data is also presented in this report.

Annual reports for 1985 were received from a total of 480 NRC licensees, 93 of whom were licensed nuclear power reactors. Compilations of the 480 reports indicated that some 215,800 individuals were monitored, 113,300 of whom received a measurable dose (Table 3.2). The collective dose incurred by these individuals was calculated to be 47,500 person-rems (person-cSv)** which represents a decrease of 20% from the 1984 value. Since the number of workers receiving a measurable dose remained about the same, the average measurable dose decreased from 0.55 rem (cSv) to 0.43 rem (cSv). About 13% of the monitored individuals were found to have received doses greater than 0.50 rem (cSv), down from the approximately 20% found for the previous four years. The number of individuals receiving doses greater than five rems (cSv) also continued to decrease.

Some 290,000 termination reports (Table 5.1) were submitted to the NRC which contained personal identification and exposure information for about 77,250 individuals who had completed their work assignment or employment with a covered category of NRC licensees during 1984. This number is approximately the same as reported for 1982 and 1983. Due to such a large number of records, the termination data for 1985 is not yet available. It should be noted that the data presented herein are revised from last year's report as additional termination data for 1983 and 1984 have now been entered into REIRS. The total number of monitored individuals for whom personal identification and exposure information has been incorporated into REIRS during the 17 years that it has been operating is now about 390,000, more than 300,000 of whom terminated from nuclear power facilities.

Analyses of these termination data indicate that about 7,400 individuals completed work assignments at two or more nuclear reactor facilities during calendar year 1984 and received an average dose of 1.05 rems (cSv). Approximately 3,000 of these individuals worked at two or more reactor facilities during one calendar quarter and received an average dose of 0.34 rem (cSv).


* Commercial nuclear power reactors; 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.

** In the International System of Units the sievert (Sv) is the name given to the units for dose equivalent. One centisievert (cSv) equals one rem; therefore, person-rem becomes person-cSv.

## EDITOR'S NOTE

In the fall of 1987, Science Applications International Corporation (SAIC) was selected to assist the NRC Staff in the preparation of the NUREG-0713 series. In the months and years ahead, SAIC will be suggesting periodic changes in the presentation of certain data by the NRC in these reports. Readers should be alert to these changes, and the NRC welcomes responses, especially where these changes can be improved upon. Comments should be directed to B. G. Brooks, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555 (301)492-3738.

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## PREFACE

A number of NRC Licensees have inquired as to how occupational radiation exposure data (from reports required by the NRC) are used by the NRC staff. This is a very appropriate inquiry that may be of importance to many affected licensees. 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, including individual and collective radiation doses from external sources as well as pertinent information on the inhalation of radioactive material (nuclides involved, bioassay results, exposure magnitude, etc.). These facts are used by the NRC staff as indicated below:

1. The data permit evaluation, from the viewpoint of trends, of the effectiveness of the overall NRC/licensee radiation protection and ALARA efforts by certain licensees. They also provide for the identification (and subsequent correction) of unfavorable trends.

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: US/foreign, BWRs/PWRs, civilian/military, plant/plant, nuclear industry/other industries, etc.

3. The data provide for governmental monitoring of the potential transient-worker problem.

4. 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?).

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

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

7. The data are considered in reviews of inspection frequencies that are programmed for various categories of licensees and may influence licensing actions.

8. The data provide facts for answering Congressional and Administration inquiries and for responding to questions raised by public interest groups, special interest groups, labor unions, etc.

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

With regard to routine workplace conditions, the annual statistical summary reports required by § 20.407, the termination reports required by § 20.408,

and the annual dose data reported by work function in accordance with Subsection 6.9.1.5 of the standard technical specifications for nuclear power plants provide the only centralized data base available to assist the staff in the performance of its duties as listed above. It is to everyone's advantage if these duties are performed by a well-informed staff in the light of factual information.

Robert E. Alexander, Chief
Radiation Protection and Health Effects Branch

Occupational Radiation Exposure
at Commercial Nuclear Power Reactors and Other Facilities
Eighteenth Annual Report, 1985

# 1 INTRODUCTION

One of the basic purposes of the Atomic Energy Act and the implementing regulations in Title 10, Code of Federal Regulations, 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 Part 20 are met, is a requirement that licensees provide individuals likely to be exposed to radiation with devices to monitor their exposure. 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 Part 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* 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 Commission's Radiation Exposure Information Reporting System (REIRS), a computer system maintained at the Oak Ridge National Laboratory Computer Technology Center in Oak Ridge, Tennessee. The computerization of these data ensured that they would be kept indefinitely and facilitated 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 the 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 the 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 Department of Energy (DOE), is collected and published by DOE's Division of Operational Safety at Germantown, Maryland.

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* Commercial nuclear power reactors; industrial radiographers; fuel processors, fabricators, and reprocessors; manufacturers and distributors of specified quantities of byproduct material.

In 1982 and 1983, paragraph 20.408(a) was amended to require three additional categories of NRC licensees to submit annual statistical exposure reports and individual termination exposure reports. The new categories are (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. Therefore, this document presents the exposure information that was reported by NRC licensees representing two of these new categories. (There are no geologic repositories for high-level waste currently licensed.)

This report and each of the predecessors summarizes information reported during previous years. However, more licensee-specific data, such as the annual reports submitted by each commercial power reactor pursuant to 10 CFR § 20.407 and their technical specifications, may be found in those documents listed on the inside of the front cover of this report. Additional operating data and statistics for each 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, or they may be purchased from the National Technical Information Services, as shown in the Reference section.

## 2 LIMITATIONS OF THE DATA

All of the figures compiled in this report relating to exposures and 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 environment in which individuals work and is used in evaluating the radiation protection program.

Monitoring requirements are based, in general, on 10 CFR § 20.202, which requires licensees to monitor individuals who receive or are likely to receive a dose in any calendar quarter in excess of 25% of the applicable quarterly limits. For most adults the quarterly limit for the whole body is 1.25 rems (cSv), so 0.312 rem (cSv) per quarter is the level above which monitoring is required. Depending on the administrative policy of each licensee, persons such as visitors and clerical workers may also be provided with monitoring devices for identification or convenience, although the probability of their being exposed to measurable levels of radiation is extremely small. Licensees are given the option of reporting the dose distribution of only those individuals for whom monitoring is required, or the dose distribution of all those for whom monitoring is provided. Many licensees elect to report the latter; however, this may increase the number of individuals that one could consider to be radiation workers. In an effort to account for this, the number of individuals reported as having "no measurable exposure" 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.

One source of error that is present in the calculation of the annual collective dose (i.e., the summation of each monitored person's whole body dose) incurred by workers is the assumption that the midpoint of the dose range is the mean dose of the individuals reported in each dose range. This allows the collective dose to be calculated without knowing each person's actual annual dose. Past experience has shown that the actual mean dose of the individuals reported in each range is usually less than the midpoint. Thus, the collective doses presented for categories of licenses shown in this report may be 10% higher than the sum of the actual individual doses. However, nearly half of the nuclear power reactors reported the actual collective dose so the figure shown for this category is more accurate.

The average dose per individual, as well as the dose distributions shown for groups of licensees, also could have been affected by the multiple reporting of individuals who were monitored by two or more licensees during the year. Since individuals are not identified in the annual reports, an individual who was monitored by five different licensees would have been counted once on each report. Therefore, when the data were summed to determine the total number of individuals monitored by a group of licensees, this person would be counted as five individuals rather than as one. This could also affect the distribution of doses because the individual has been counted five times in the lower dose ranges rather than one time in the higher range in which his actual accumulated dose (the sum of his doses incurred at each facility) would have placed him. This source of error has the greatest potential impact on the data reported by power reactor facilities since they employ

many short-term workers. Further discussion of this point is provided in Section 5.

Another fact that should be kept in mind when examining the annual statistical data is that all of the personnel included in the report may not have been monitored throughout the entire year. Many licensees such as radiography firms and nuclear power facilities 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 would receive if he were involved in that activity for the full year.

Also, it should be again pointed out that this report contains information reported by NRC licensees only. Since the NRC licenses all commercial nuclear power reactors, fuel processors, fabricators and reprocessors, and independent spent fuel storage facilities, information shown for these categories reflects the U.S. experience. 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. Companies that conduct these types of activities in Agreement States* are licensed by the state and are not required to submit occupational exposure reports to the NRC. Therefore, information shown for these categories does not reflect the total U.S. experience.

* States that have entered into an agreement with the NRC that allows each state to license organizations using radioactive materials for certain purposes. There are now 29 Agreement States.

# 3 ANNUAL PERSONNEL MONITORING REPORTS - 10 CFR § 20.407

## 3.1 Definition of Terms and Sources of Data

### 3.1.1 Statistical Summary Reports

On February 4, 1974, 10 CFR § 20.407 was amended to require certain categories* of licensees to submit an annual statistical report indicating the distribution of the whole body doses incurred by individuals whom they monitored for exposure to radiation. Table 3.2 shows the dose ranges specified by 10 CFR § 20.407(b) among which the doses are distributed. In prior years, the annual report was formatted differently and was not very useful as a basis for estimating the collective dose.

### 3.1.2 Number of Monitored Individuals

This is the total number of individuals that the NRC licensees covered by 10 CFR § 20.407 reported as being monitored for exposure to external radiation during the year. This number must include all individuals for whom monitoring is required, and may include visitors, service representatives, contract workers, clerical workers and any other individuals for whom the licensee feels that monitoring devices should be provided. Most licensees submit the dose distribution of the total number of persons for whom monitoring was provided in their annual § 20.407 reports, but a few report only those for whom monitoring was required.

### 3.1.3 Number of Workers with Measurable Doses

The number of workers with measurable doses is obtained from the annual dose distribution reports submitted by NRC licensees pursuant to 10 CFR § 20.407 by subtracting the number of individuals having less than measurable doses from the total number of monitored individuals. This figure is used to calculate an individual's average measurable dose because it deletes those individuals who received exposures too small to be detected by personnel monitoring devices, many of whom probably did not routinely work in radiation areas (and were monitored for convenience or for identification purposes).

### 3.1.4 Collective Dose

The concept of collective dose is used in this report to denote the summation of the whole body external dose received by each monitored individual and has the units person-rems (person-cSv)**. The collective dose is not usually provided in the annual dose distribution reports

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* Commercial nuclear power reactors; industrial radiographers; fuel processors, fabricators and reprocessors; manufacturers and distributors of byproduct material; independent spent fuel storage installations; and facilities for land disposal of low-level radioactive waste.

** In the International Systems of Units, the sievert (Sv) is the name given to the units for dose equivalent. One centisievert (cSv) equals one rem; therefore person-rem becomes person-cSv.

submitted pursuant to 10 CFR § 20.407, but NRC staff calculated it from the reports by summing the products obtained by multiplying the number of individuals reported in each of the dose ranges (shown in Table 1) by the midpoint of the corresponding range. This assumes that the midpoint of the range is equal to the arithmetic mean of the individual doses in the range. Past experience has shown that the actual mean dose of individuals reported in each dose range is less than the midpoint of the range, and the collective doses shown in this report for these may be about 10% too high. In 1981, a few power reactor licensees began reporting the actual collective dose (as determined from official personnel dosimetry results) on the § 20.407 annual reports, and the NRC staff used these doses when provided, instead of the above-described calculations. The staff would prefer to use the actual collective dose and encourages more licensees to make it available.

### 3.1.5 Average Individual Dose

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

### 3.1.6 Average Measurable Dose

The average measurable dose is obtained by dividing the collective dose by the number of workers that 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 reflects the deletion of those individuals receiving zero or minimal doses, many of whom were monitored by convenience.

### 3.1.7 Number of Licensees Reporting

This is the number of NRC licenses issued to companies to use radioactive material for certain activities that would place them in one of the six categories that are required to report pursuant to 10 CFR § 20.407. The third column in Table 3.1 shows the number of licensees that have filed such reports during the last several years. State licensees do not submit such reports to the NRC.

### 3.1.8 CR

One of the parameters that the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) recommends be calculated for occupational dose distributions to aid in the comparison of exposure data is a ratio "CR." CR is defined to be the ratio of the annual collective dose incurred by individuals whose annual doses exceed 1.5 rems to the total annual collective dose. One UNSCEAR report [Ref. 10] states that normal values of CR should be between 0.05 and 0.50. This means that, usually, no more than 50% of the collective dose should be due to individual doses that exceed 1.5 rems. The last column in Table 3.1 shows the values of CR for the different types of licensees; one can see that CR is close to 0.50 for three of the categories and is much less than 0.50 for the remaining three categories for 1985. It should be noted that 1985 is the first year the CR

# TABLE 3.1
## ANNUAL EXPOSURE DATA FOR CERTAIN CATEGORIES OF LICENSEES
## 1976-1985

| License Category+ | Calendar Year | Number of Licensees Reporting | Number of Monitored Individuals | Number of Workers With Measurable Doses | Collective Dose (person-rems or person-cSv) | Average Individual Dose (rems or cSv) | Average Measurable Dose per Worker (rems or cSv) | CR* |
|---|---|---|---|---|---|---|---|---|
| Industrial Radiography | 1985 | 340 | 8,476 | 5,550 | 2,374 | 0.28 | 0.43 | 0.45 |
| | 1984 | 361 | 8,458 | 5,446 | 2,490 | 0.30 | 0.46 | 0.46 |
| | 1983 | 340 | 8,624 | 5,131 | 2,384 | 0.28 | 0.46 | 0.45 |
| | 1982 | 353 | 9,235 | 6,160 | 2,998 | 0.32 | 0.49 | 0.46 |
| | 1981 | 266 | 9,938 | 5,486 | 2,652 | 0.27 | 0.48 | 0.48 |
| | 1980 | 292 | 11,102 | 6,556 | 2,979 | 0.27 | 0.45 | 0.45 |
| | 1979 | 341 | 11,969 | 6,904 | 3,461 | 0.29 | 0.50 | 0.47 |
| | 1978 | 337 | 13,093 | 6,685 | 2,950 | 0.23 | 0.44 | 0.43 |
| | 1977 | 339 | 10,569 | 6,197 | 3,159 | 0.30 | 0.51 | 0.45 |
| | 1976 | 321 | 11,245 | 6,222 | 3,629 | 0.32 | 0.58 | 0.51 |
| Manufacturing and Distribution | 1985 | 33 | 3,958 | 2,250 | 755 | 0.19 | 0.34 | 0.50 |
| | 1984 | 40 | 5,076 | 1,977 | 671 | 0.13 | 0.34 | 0.46 |
| | 1983 | 33 | 5,051 | 2,003 | 824 | 0.16 | 0.41 | 0.54 |
| | 1982 | 34 | 5,453 | 2,199 | 890 | 0.16 | 0.40 | 0.51 |
| | 1981 | 29 | 4,846 | 2,395 | 904 | 0.19 | 0.38 | 0.52 |
| | 1980 | 29 | 5,119 | 2,460 | 1,033 | 0.20 | 0.42 | 0.61 |
| | 1979 | 28 | 3,937 | 2,219 | 888 | 0.23 | 0.40 | 0.55 |
| | 1978 | 27 | 3,973 | 1,886 | 851 | 0.21 | 0.45 | 0.61 |
| | 1977 | 30 | 4,243 | 2,459 | 1,329 | 0.31 | 0.54 | 0.63 |
| | 1976 | 24 | 3,501 | 1,976 | 1,226 | 0.35 | 0.62 | 0.67 |
| Low-Level Waste Disposal | 1985 | 2 | 1,240 | 252 | 70 | 0.06 | 0.28 | 0.24 |
| | 1984 | 2 | 925 | 297 | 72 | 0.08 | 0.24 | 0.16 |
| | 1983 | 1 | 612 | 358 | 71 | 0.12 | 0.20 | 0.14 |
| | 1982 | 1 | 680 | 251 | 53 | 0.08 | 0.21 | 0.20 |
| Independent Spent Fuel Storage | 1985 | 1 | 32 | 32 | 34 | 1.06 | 1.06 | 0.51 |
| | 1984 | 1 | 32 | 32 | 13 | 0.41 | 0.41 | 0.06 |
| | 1983 | 1 | 33 | 27 | 8 | 0.24 | 0.30 | 0.00 |
| | 1982 | 1 | 35 | 32 | 9 | 0.26 | 0.28 | 0.00 |
| Fuel Fabrication and Processing | 1985 | 11 | 7,987 | 4,701 | 617 | 0.08 | 0.13 | 0.05 |
| | 1984 | 14 | 9,488 | 5,772 | 818 | 0.09 | 0.14 | 0.04 |
| | 1983 | 15 | 9,023 | 5,013 | 835 | 0.09 | 0.17 | 0.19 |
| | 1982 | 16 | 9,808 | 5,433 | 831 | 0.08 | 0.15 | 0.20 |
| | 1981 | 18 | 10,552 | 5,942 | 940 | 0.09 | 0.16 | 0.09 |
| | 1980 | 18 | 10,204 | 5,900 | 1,111 | 0.11 | 0.19 | 0.12 |
| | 1979 | 21 | 9,946 | 5,365 | 1,268 | 0.13 | 0.24 | 0.16 |
| | 1978 | 20 | 11,305 | 6,100 | 1,525 | 0.13 | 0.25 | 0.24 |
| | 1977 | 21 | 11,496 | 7,004 | 1,725 | 0.15 | 0.25 | 0.34 |
| | 1976 | 24 | 11,227 | 5,285 | 1,830 | 0.16 | 0.35 | 0.41 |
| Commercial Light Water Reactors*** | 1985 | 93 | 191,132 | 97,978 | 43,624 | 0.23 | 0.44 | 0.44 |
| | 1984 | 88 | 169,242** | 94,996** | 55,353 | 0.32 | 0.58 | 0.55 |
| | 1983 | 80 | 139,885** | 83,546** | 56,758 | 0.41 | 0.68 | 0.60 |
| | 1982 | 79 | 127,904** | 80,871** | 52,227 | 0.41 | 0.65 | 0.57 |
| | 1981 | 73 | 123,978** | 80,664** | 54,271 | 0.44 | 0.67 | 0.58 |
| | 1980 | 70 | 124,250** | 77,903** | 53,810 | 0.43 | 0.69 | 0.59 |
| | 1979 | 69 | 99,463** | 62,316** | 39,759 | 0.40 | 0.64 | 0.57 |
| | 1978 | 68 | 72,448** | 45,474** | 31,910 | 0.44 | 0.70 | 0.61 |
| | 1977 | 65 | 67,130** | 42,867** | 32,731 | 0.49 | 0.76 | 0.64 |
| | 1976 | 62 | 66,800 | 36,715 | 26,555 | 0.40 | 0.72 | 0.62 |
| Grand Totals and Averages | 1985 | 480 | 212,825 | 110,763 | 47,474 | 0.22 | 0.43 | 0.44 |
| | 1984 | 506 | 193,221** | 108,520** | 59,421 | 0.31 | 0.55 | 0.54 |
| | 1983 | 470 | 163,238** | 96,878** | 60,880 | 0.37 | 0.63 | 0.59 |
| | 1982 | 482 | 153,118** | 94,946** | 57,008 | 0.37 | 0.60 | 0.56 |
| | 1981 | 385 | 149,314** | 94,490** | 58,767 | 0.39 | 0.62 | 0.56 |
| | 1980 | 410 | 150,675** | 92,819** | 58,933 | 0.39 | 0.63 | 0.57 |
| | 1979 | 459 | 125,316** | 76,804** | 45,376 | 0.36 | 0.59 | 0.55 |
| | 1978 | 453 | 100,819** | 60,145** | 37,236 | 0.37 | 0.62 | 0.59 |
| | 1977 | 455 | 93,438** | 58,527** | 38,944 | 0.42 | 0.67 | 0.62 |
| | 1976 | 428 | 92,773 | 50,198 | 33,240 | 0.36 | 0.66 | 0.60 |

+These categories consist only of NRC licensees. Agreement States license organizations conducting industrial radiography, manufacturing and distribution, and low-level waste disposal in those states do not report occupational exposure data to the NRC.

*CR is the ratio of the annual collective dose delivered at annual doses exceeding 1.5 rems to the total annual collective dose. (see Section 3.1)

**These figures are adjusted to account for the multiple counting of transient reactor workers (see Section 5).

***Includes all LWRs that reported, although all of them may not have been in commercial operation for a full year, and excludes the gas-cooled reactor.

for commercial LWRs (and the grand total for all licensees) has dropped below 0.50.

## 3.2 Annual Whole Body Dose Distributions

Table 3.2 is a compilation of the statistical summary reports currently being submitted by six categories of licensees. In nearly every category some 40%-70% of the doses are less than measurable. About 90% of the reported individuals continue to be monitored by nuclear power facilities where they receive about 90% of the total collective dose.

It should be pointed out that annual exposures that exceed five rems (cSv) are not necessarily classified as personnel overexposures. Although 1.25 rems (cSv) is the quarterly limit set forth in paragraph (a) of 10 CFR § 20.101, paragraph (b) permits licensees, under certain conditions, to allow a worker to receive a whole body dose of three rems (cSv) per calendar quarter (up to 12 rems (cSv) annually.) The conditions are that the licensee must have determined and recorded the worker's prior accumulated occupational dose to the whole body and that the worker's whole body dose when added to his accumulated occupational dose does not exceed 5(N - 18) rems (cSv), where N equals the individual's age in years. Although there is no annual limit, annual exposures that exceed 12 rems (cSv) indicate that an over exposure has occurred. Any quarterly exposure in excess of the applicable quarterly limits must be reported. A discussion of various types of occurrences in which the limits have been exceeded is given in Section 6.

A summary of the annual whole body exposures reported to the Commission by certain categories of NRC Licensees required to submit reports pursuant to 10 CFR § 20.407 is presented in Table 3.3, which shows that about 95% of the exposures have consistently remained less than two rems (cSv) since 1967. The number of individuals receiving an annual exposure in excess of five rems (cSv) has declined to remain at about one-tenth of one percent of the total number of individuals monitored each year for the period 1982 through 1984, and in 1985 this figure dropped to less than 0.01%.

## 3.3 Summary of Occupational Exposure Data by License Category

### 3.3.1 Industrial Radiography Licenses, Single and Multiple Locations

These 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, air craft 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 which was designed and shielded for radiography, and others perform radiography at multiple, temporary 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 340 radiography licensees in 1985, which is about the same number as reported since 1982.

Table 3.4 summarizes the reported data for the two types of radiography licenses for 1985 and for the previous two years for comparison purposes. The table shows that the number of workers receiving measurable doses (635) decreased by about 9%, while the collective dose (124) of workers at the

# TABLE 3.2
## DISTRIBUTION OF ANNUAL WHOLE BODY DOSES BY LICENSE CATEGORY
## 1985

| LICENSE CATEGORY | Number of Individuals with Whole Body Doses in the Ranges (rems or cSv)* | | | | | | | | | | | | | | | | TOTAL NUMBER MONI-TORED | NUMBER WITH MEAS. DOSE | TOTAL COLLECTIVE DOSE (PERSON-cSv) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No Meas-urable | 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 | 7.00-8.00 | 8.00-9.00 | 9.00-12.00 | >12.0 | | | |
| INDUSTRIAL RADIOGRAPHY | | | | | | | | | | | | | | | | | | | |
| Single Location | 1,068 | 469 | 74 | 46 | 11 | 11 | 15 | 6 | 1 | 1 | | | | 1 | | | 1,703 | 635 | 124 |
| Multiple Locations | 1,858 | 2,318 | 728 | 619 | 368 | 269 | 383 | 137 | 61 | 21 | 3 | 5 | 1 | | | 2 | 6,773 | 4,915 | 2,250 |
| Total | 2,926 | 2,787 | 802 | 665 | 379 | 280 | 398 | 143 | 62 | 22 | 3 | 5 | 1 | 1 | 0 | 2 | 8,476 | 5,550 | 2,374 |
| MANUFACTURING AND DISTRIBUTION | | | | | | | | | | | | | | | | | | | |
| Broad | 1,493 | 1,269 | 239 | 127 | 77 | 63 | 102 | 58 | 31 | 1 | | | | | | | 3,460 | 1,967 | 668 |
| Other | 215 | 158 | 58 | 31 | 8 | 7 | 11 | 6 | 1 | 1 | 2 | | | | | | 498 | 283 | 87 |
| Total | 1,708 | 1,427 | 297 | 158 | 85 | 70 | 113 | 64 | 32 | 2 | 2 | | | | | | 3,958 | 2,250 | 755 |
| LOW-LEVEL WASTE DISPOSAL | | | | | | | | | | | | | | | | | | | |
| Total | 988 | 151 | 38 | 23 | 9 | 9 | 22 | | | | | | | | | | 1,240 | 252 | 70 |
| INDEPENDENT SPENT FUEL STORAGE | | | | | | | | | | | | | | | | | | | |
| Total | 0 | 2 | 1 | 5 | 7 | 4 | 9 | 4 | | | | | | | | | 32 | 32 | 33 |
| FUEL FABRICATION | | | | | | | | | | | | | | | | | | | |
| Uranium Fuel Process. | 3,045 | 3,140 | 947 | 518 | 101 | 13 | 11 | 2 | | | | | | | | | 7,777 | 4,372 | 575 |
| Decommiss. of U and Pu Fuel Facilities | 519 | 242 | 9 | 4 | 7 | 13 | 25 | | | | | | | | | | 819 | 300 | 68 |
| Total | 3,564 | 3,382 | 956 | 522 | 108 | 26 | 36 | 2 | | | | | | | | | 8,596 | 5,032 | 643 |
| **COMMERCIAL POWER REACT. | | | | | | | | | | | | | | | | | | | |
| Boiling Water Reactors | 35,705 | 16,583 | 6,227 | 5,347 | 3,165 | 2,310 | 4,993 | 1,731 | 468 | 42 | | | | | | | 76,571 | 40,866 | 20,855 |
| Press. Water Reactors | 55,718 | 29,136 | 8,615 | 6,898 | 4,125 | 2,606 | 5,587 | 1,586 | 248 | 42 | | | | | | | 114,561 | 58,843 | 22,769 |
| High Temp. Gas Reactors | 1,929 | 370 | 40 | 15 | 7 | 4 | 7 | | | | | | | | | | 2,372 | 443 | 35 |
| Total | 93,352 | 46,089 | 14,882 | 12,260 | 7,297 | 4,920 | 10,587 | 3,317 | 716 | 84 | | | | | | | 193,504 | 100,152 | 43,659 |
| +GRAND TOTALS | 102,538 | 53,838 | 16,976 | 13,633 | 7,885 | 5,309 | 11,165 | 3,530 | 810 | 108 | 5 | 5 | 1 | 1 | 0 | 2 | 215,806 | 113,268 | 47,534 |

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

**Includes all reactors that reported although all of them may not have been in commercial operation for a full year.

+These values have not been adjusted for the multiple counting of transient reactor workers.

TABLE 3.3
SUMMARY OF ANNUAL DOSE DISTRIBUTIONS FOR CERTAIN NRC LICENSEES

1968-1985

| Year | Total Number of Monitored Persons: Reported Number | (Corrected Number) | Percent of Individuals With Doses <2 rems | Percent of Individuals With Doses >5 rems | Number of Individuals With Doses >12 rems |
|---|---|---|---|---|---|
| 1968 | 36,836 | | 97.2% | 0.5% | 3 |
| 1969 | 31,176 | | 96.5% | 0.5% | 7 |
| 1970 | 36,164 | | 96.1% | 0.6% | 0 |
| 1971 | 36,311 | | 96.3% | 0.7% | 1 |
| 1972 | 44,690 | | 95.7% | 0.5% | 8 |
| 1973 | 67,862 | | 95.0% | 0.5% | 1 |
| 1974 | 85,097 | | 96.4% | 0.3% | 1 |
| 1975 | 78,713 | | 94.8% | 0.5% | 1 |
| 1976 | 92,773 | | 95.0% | 0.4% | 3 |
| 1977 | 98,212 | (93,438) | 93.8%* | 0.4%* | 1 |
| 1978 | 105,893 | (100,818) | 94.6%* | 0.2%* | 3 |
| 1979 | 131,027 | (125,316) | 95.2%* | 0.2%* | 1 |
| 1980 | 159,177 | (150,675) | 94.6%* | 0.3%* | 0 |
| 1981 | 157,874 | (149,314) | 94.6%* | 0.2%* | 1 |
| 1982 | 162,456 | (154,117) | 94.9%* | 0.1%* | 0 |
| 1983 | 172,927 | (164,239) | 94.6%* | 0.1%* | 0 |
| 1984 | 204,136 | (194,840) | 95.9%* | 0.1%* | 0 |
| 1985 | 215,197 | | 97.9% | <0.01% | 2 |

* Based on the distribution of individual doses after adjusting for the multiple counting of transient reactor works (see Section 5).

single-location facilities decreased by about 37% from the 1984 values. This resulted in the average measurable dose falling to 0.20 rem (cSv) in 1985. The number of monitored workers at firms having multiple-location licenses increased by about 1% but the collective dose decreased by about 2%. This resulted in the average measurable dose decreasing slightly to 0.46 rem (cSv). Overall, the average measurable dose for radiography workers continues to remain at a little less than one-half rem (cSv), as it has for the last several years, while the average dose for workers performing radiography at a single location is usually about half this amount. This is probably due to the fact that it is more difficult for workers to avoid exposure to radiation in the field, where conditions are not the best and may change every day. In order to see the contribution that each radiography licensee made to the total collective dose, a summary of the information reported by each of these licensees in 1985 is presented in alphabetical order in Appendix A.

TABLE 3.4
ANNUAL EXPOSURE INFORMATION FOR INDUSTRIAL RADIOGRAPHERS

1983-1985

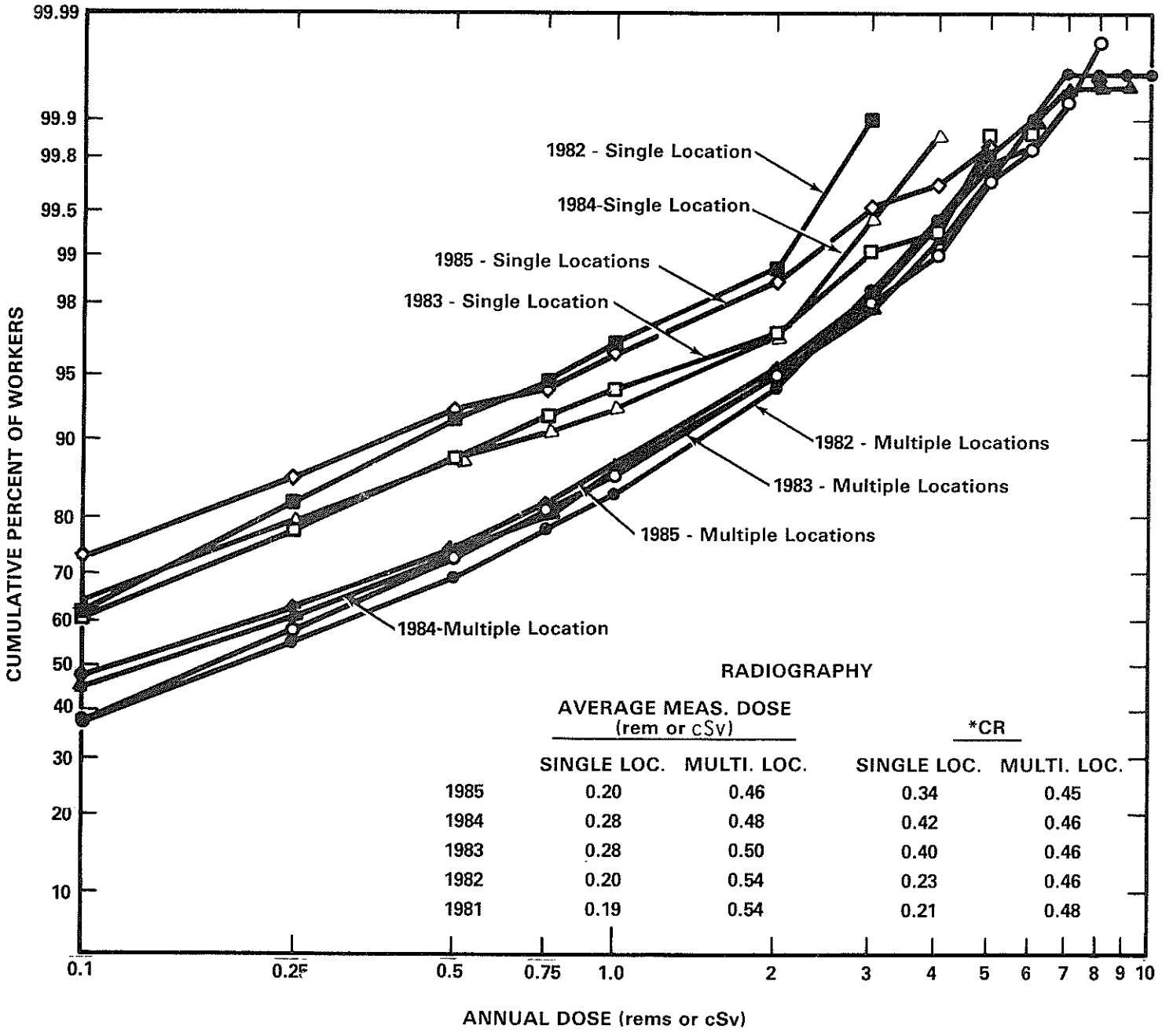
| Year | Type of License | Number of Licenses | Number of Monitored Individuals | Workers with Measurable Doses | Collective Dose (person-rems or person-cSv) | Average Measurable Dose (rems or cSv) |
|---|---|---|---|---|---|---|
| 1985 | Single location | 111 | 1,703 | 635 | 124 | 0.20 |
| | Multiple locations | 229 | 6,773 | 4,915 | 2,250 | 0.46 |
| | Total | 340 | 8,476 | 5,550 | 2,374 | 0.43 |
| 1984 | Single location | 129 | 1,778 | 701 | 196 | 0.28 |
| | Multiple locations | 232 | 6,680 | 4,745 | 2,294 | 0.48 |
| | Total | 361 | 8,458 | 5,446 | 2,490 | 0.46 |
| 1983 | Single location | 128 | 1,714 | 773 | 213 | 0.28 |
| | Multiple locations | 210 | 6,910 | 4,358 | 2,171 | 0.50 |
| | Total | 338 | 8,624 | 5,131 | 2,384 | 0.46 |

Since personnel monitoring data has frequently been found to have log-normal distributions [Ref. 11], trends in the data reported by radiography licensees may be observed from log probability plots* of data (see for example Fig. 3.1). There are a few characteristics of these distributions readers should keep in mind. First, each single plotted point represents the total cumulative percent of all workers with measurable doses up to the plotted value. All measurable average doses up to 0.1 rem are included in the value plotted at 0.1 rem, and the values shown on the "Annual Dose" axis are derived from the dose ranges specified in 10 CFR § 20.407(b). Second, because it is not possible to plot 100% on these figures, the data for the highest dose group must be inferred from the plotted data.

For example, if the last plotted point on a curve represented 90% at one rem, it must be inferred that the remaining 10% of workers fell in the range one to two rems (ie., none exceeded 2 rems) Figure 3.1 displays such plots of the doses incurred by workers monitored by the two types of radiography licensees for each of the years 1982 through 1985. The plots of the dose distributions of workers at single-location radiography facilities, where the workers receive doses that are lower than those usually received by

* If the data have a log-normal distribution, the data points will form a straight line when plotted on log probability paper on which cumulative probabilities are laid off on the vertical axis at distances proportional to the corresponding number of standard deviations above or below the median and the dose is plotted on the horizontal axis with a logarithmic scale.

Figure 3.1
ANNUAL DOSE DISTRIBUTION OF WORKERS
AT INDUSTRIAL RADIOGRAPHY FACILITIES
1982 - 1985




RADIOGRAPHY

| | AVERAGE MEAS. DOSE (rem or cSv) | | *CR | |
|---|---|---|---|---|
| | SINGLE LOC. | MULTI. LOC. | SINGLE LOC. | MULTI. LOC. |
| 1985 | 0.20 | 0.46 | 0.34 | 0.45 |
| 1984 | 0.28 | 0.48 | 0.42 | 0.46 |
| 1983 | 0.28 | 0.50 | 0.40 | 0.46 |
| 1982 | 0.20 | 0.54 | 0.23 | 0.46 |
| 1981 | 0.19 | 0.54 | 0.21 | 0.48 |

*CR is the ratio of the annual collective dose delivered at individual doses exceeding 1.5 rems to the total annual collective dose.

Note: Each point on the curves represents the cumulative percentage of workers with measurable doses who received doses less than the indicated annual dose.

workers at multiple-location facilities, form fairly straight lines and usually lie above those of the multiple-location facilities.

Another feature of these types of graphs is that several comparisons of various dose distributions can be quickly made. For example, one can easily see in Figure 3.1 that in 1985, about 87% of the workers monitored by firms licensed for radiography at multiple locations received doses that were less than one rem (cSv), while some 96% of the workers monitored at single location radiography facilities received such doses. Also, the relative positions and curvature of the graphs are indicative of certain characteristics of the dose distributions. This is demonstrated by the positions of the 1982 and 1985 plots of the dose distribution of workers at single-location facilities above that of the other plots indicate smaller values of the average doses and CR (as shown in the chart at the bottom of the graph). This is due to the fact that there was a smaller proportion of workers with doses that exceeded three rems (cSv) in 1982 and 1985 as compared to 1983 and 1984. The plots of the multiple-location licensees appear to be inching upwards, and one finds that the average doses and values of CR exhibit a decreasing trend, overall.

The tendency of the plots to curve upward for doses greater than one rem (cSv) is typical of distributions having several workers with doses in the higher dose ranges [Refs. 10, 11], and indicates that the entire distribution is not a log-normal one. Another theoretical analysis of occupational dose distributions [Ref. 12] has found that these data may be fitted by a hybrid log-normal distribution. At low doses, this distribution is log-normal, but at higher doses, where radiation control programs very closely monitor each worker's total dose so that the frequency of doses approaching the dose limits is reduced, the distribution is normal.

### 3.3.2 Manufacturer and Distributor Licenses, Broad and Other

Manufacturer and distributor 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 persons specifically licensed by the NRC or an Agreement State. Broad licenses are issued to larger organizations who may use many different radionuclides in many different ways and who have a comprehensive radiation protection program. The Other licenses are usually issued to smaller firms requiring a more restrictive license. Some 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. Other 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. However, only those NRC licensees (about 35) that possess or use at any one time specified quantities of the nuclides listed in paragraph 20.408(a)(6) are required to submit annual (10 CFR § 20.407) and termination (10 CFR § 20.408) reports.

Table 3.5 presents the annual data that were reported by the two types of licensees for 1985 and the previous two years. The total number of workers receiving measurable doses as reported by these types of licensees increased by about 14% to 2,250 workers in 1985. The collective dose also increased by about the same percentage so that the average dose remained about 0.34 rem (cSv). Looking at the information shown separately for the Broad and Other licensees, one can see that the values of all of the parameters remain higher for the Broad licensees, probably because this type of license allows the possession of larger quantities of radioactive materials than do the Other licenses. However, when attempting to examine trends in the data presented for this category of licensees, one should note that the types and quantities of radionuclides may fluctuate from year to year, and even during the year, so that some licensees may report dose data one year and not the next and may be included as a Broad licensee one year and an Other licensee at other times. Since the number of reporting licensees is quite small, these fluctuations may have a significant impact on the values of the parameters.

In order to see the contribution that each of these licensees made toward the total values of the number of persons monitored, number of workers, and collective dose, Appendix A lists the values of these parameters for each licensee in alphabetical order by licensee name for 1985.

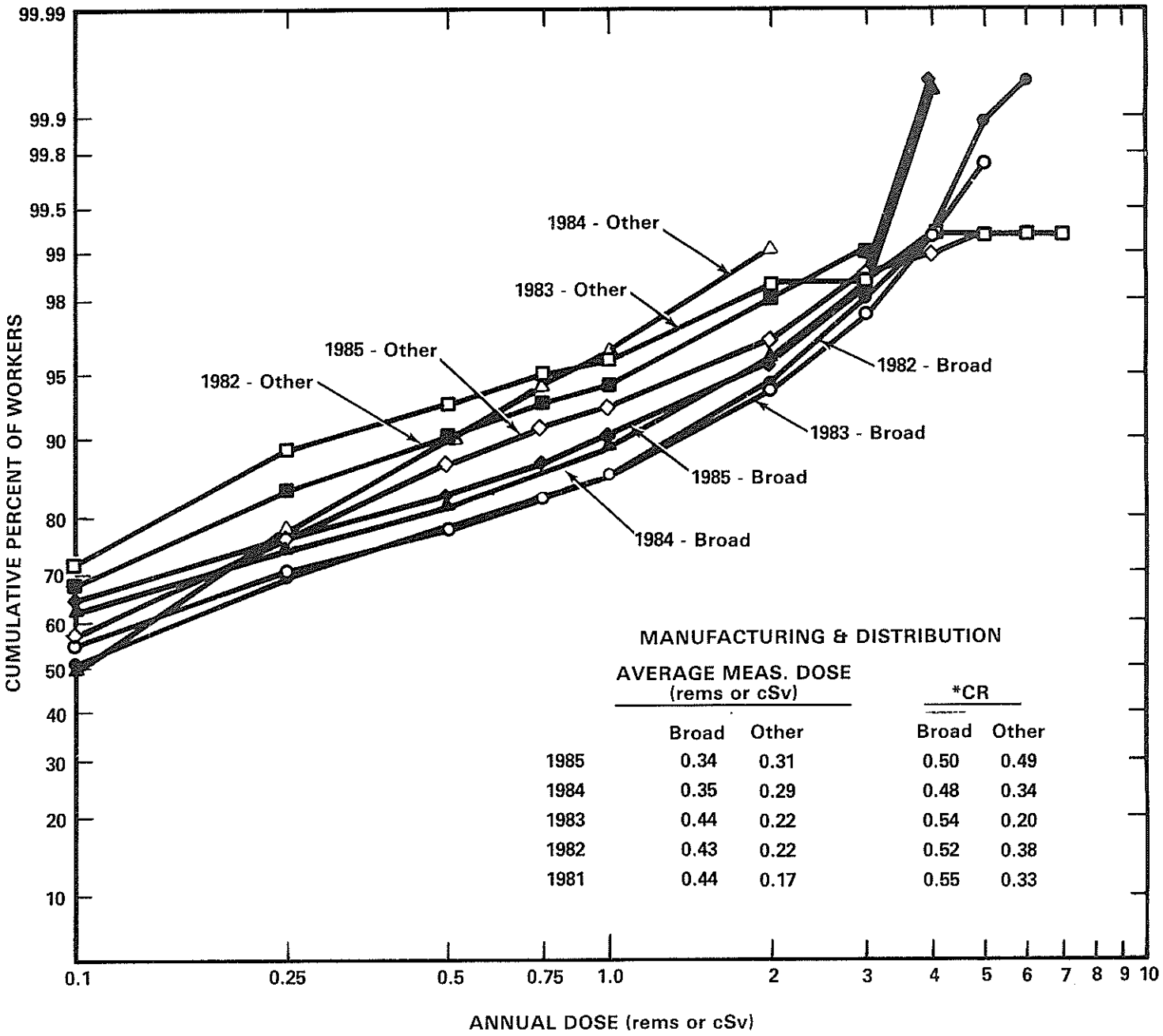
Figure 3.2 displays log probability plots of the doses incurred by workers under the two types of manufacturing and distribution licenses for the years 1982 through 1985. The position of the curves plotted for the Other licenses above those plotted for the Broad licenses indicates that a larger portion of the workers reported by the Other licensees have lower doses than those reported by the Broad licensees. For example, the graphs show that about 90% of workers monitored by the broad licensees received doses that were less than one rem (cSv), while about 93% of the workers monitored by the Other licensees received such doses in 1985.

### 3.3.3 Low-Level Waste Disposal Licenses

These 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 dipose of them in a properly prepared burial ground. The licensees in this category are located in and licensed by Agreement States that have primary regulatory authority over its activity. However, they also have an NRC license that covers certain special nuclear material they might receive. The annual dose reports submitted by these licensees include all doses received during the year regardless of whether they were due to NRC or Agreement State licensed material.

The requirement for this category of NRC licensee to file annual reports became effective in January 1983. Two licensees in this category submitted annual reports in 1984 and 1985, while in 1982 and 1983 there was only one licensee in this category. Table 3.1 summarizes the data reported for 1982 through 1985. In 1985, the total number of monitored individuals increased by about 34% to 1,240 individuals. However, the number of workers receiving measurable doses decreased somewhat so that although the collective dose, 70

Figure 3.2
ANNUAL DOSE DISTRIBUTION OF WORKERS
AT MANUFACTURING & DISTRIBUTION FACILITIES
1982 - 1985




MANUFACTURING & DISTRIBUTION

| | AVERAGE MEAS. DOSE (rems or cSv) | | *CR | |
|---|---|---|---|---|
| | Broad | Other | Broad | Other |
| 1985 | 0.34 | 0.31 | 0.50 | 0.49 |
| 1984 | 0.35 | 0.29 | 0.48 | 0.34 |
| 1983 | 0.44 | 0.22 | 0.54 | 0.20 |
| 1982 | 0.43 | 0.22 | 0.52 | 0.38 |
| 1981 | 0.44 | 0.17 | 0.55 | 0.33 |

*CR is the ratio of the annual collective dose delivered at individual doses exceeding 1.5 rems to the total annual collective dose.

Note: Each point on the curves represents the cumulative percentage of workers with measurable doses who received doses less than the indicated annual dose.

TABLE 3.5
ANNUAL EXPOSURE INFORMATION FOR MANUFACTURERS AND DISTRIBUTORS

1983-1985

| Year | Type of License | Number of Licenses | Number of Monitored Individuals | Workers with Measurable Doses | Collective Dose (person-rems or person-cSv) | Average Measurable Dose (rems or cSv) |
|---|---|---|---|---|---|---|
| 1985 | M & D-Broad | 12 | 3,460 | 1,967 | 668 | 0.34 |
| | M & D-Other | 21 | 498 | 283 | 87 | 0.31 |
| | Total | 33 | 3,958 | 2,250 | 755 | 0.34 |
| 1984 | M & D-Broad | 13 | 4,625 | 1,716 | 594 | 0.35 |
| | M & D-Other* | 27 | 451 | 261 | 77 | 0.29 |
| | Total* | 40 | 5,076 | 1,977 | 671 | 0.34 |
| 1983 | M & D-Broad | 16 | 4,332 | 1,744 | 767 | 0.44 |
| | M & D-Other | 17 | 719 | 259 | 57 | 0.22 |
| | Total | 33 | 5,051 | 2,003 | 824 | 0.41 |

* The figures for 1984 were corrected to include data for two licensees that had been erroneously excluded from this category.

person-rems (person-cSv), remained about the same as that found for the previous two years, the average measurable dose rose slightly to 0.28 rem (cSv).

Figure 3.3 displays log probability plots of the doses incurred by workers at the low-level waste disposal facilities from 1982 through 1985. One can quickly see that the distributions are quite similar, with all of the doses being two rems (cSv) or less, and 96% of the doses being less than one rem (cSv) each year. However, the position of the plot for 1985 below that of the others is indicative of the increases in the average dose and CR. Appendix A summarizes the exposure information reported by these two licensees in 1985.

### 3.3.4 Independent Spent Fuel Storage Installation Licenses

These 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 independent spent fuel storage installation (ISFSI). Here, the spent fuel, which has undergone at least one 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. Presently, there is only one license for a facility that is not located at a nuclear power plant. Two other licenses have been issued to nuclear power utilities and any doses due to the storage of spent fuel are included in the annual dose report submitted for the utilities' nuclear power plants.

Table 3.1 summarizes the data submitted for 1982 through 1985 by the only ISFSI that is separate from a nuclear power plant. Only about 35 individuals have been monitored at the facility each year. However, in 1984 the collective dose increased to a value of 13 person-rems (person-cSv), and in 1985 the collective dose increased to 34 person-rems (person-cSv). The number of workers receiving measurable doses, however, remained at 32 so that the average dose increased to 1.06 rems (cSv) in 1985. These increases were primarily due to significant increase in the amount of incoming spent fuel. Also, the licensee reports the doses of only those workers required to be monitored for exposure to radiation instead of the doses of all individuals for whom monitoring was provided. This results in the calculation of a higher average dose.

Figure 3.3 displays log probability plots of the doses incurred by workers at the ISFSI for the years 1982 through 1985. The plots are quite similar for 1982 and 1983 when all doses were less than 0.75 rem so the value of CR was zero each year. The position of the plot of the 1985 data considerably below that of the previous years indicates more doses in the higher ranges and is reflected in the higher value (0.51) of CR. However, the figure shows that all doses remained less than 3 rems (cSv).

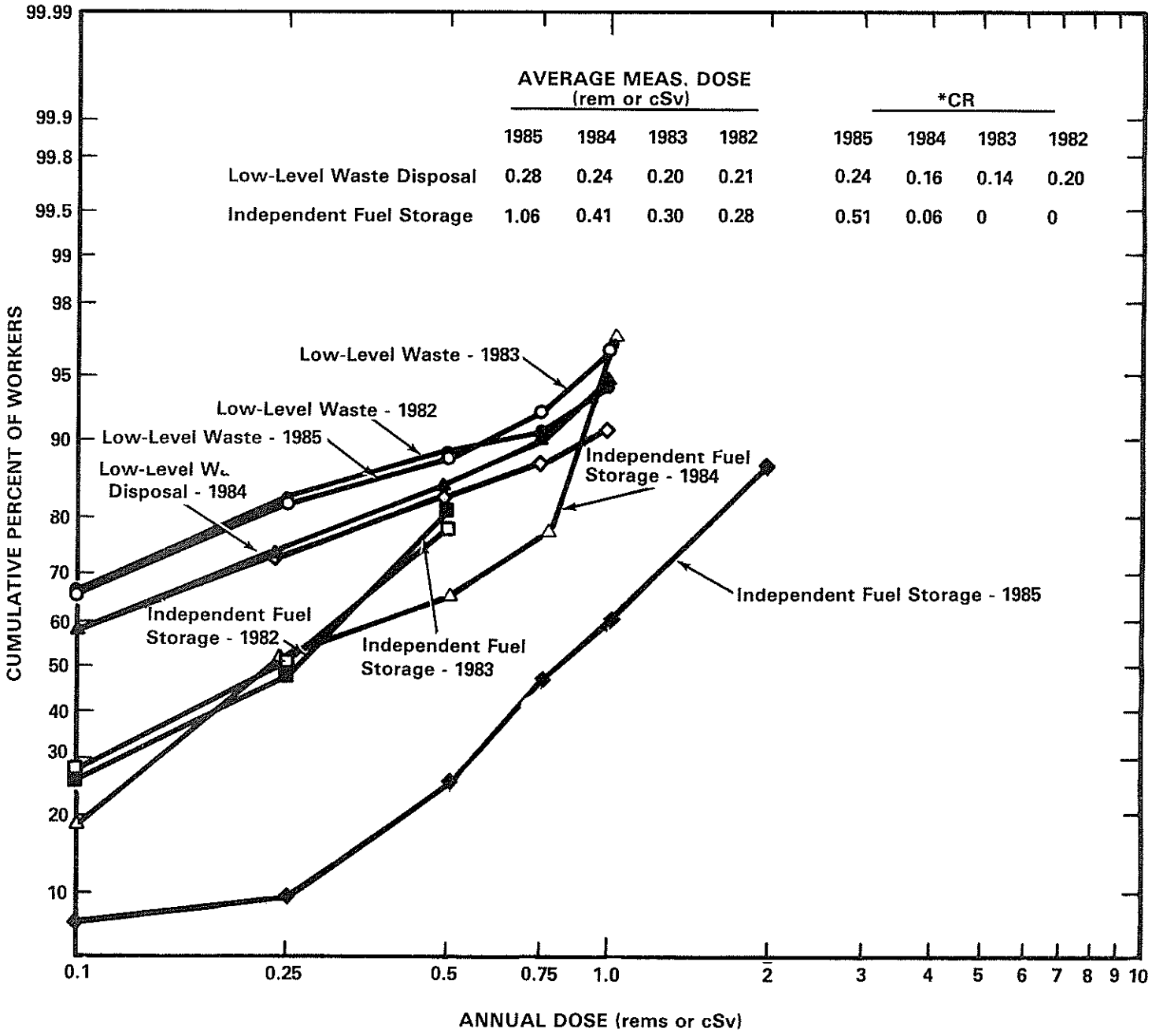
### 3.3.5 Fuel Fabrication and Reprocessing Licenses

The fuel fabrication licenses are issued to allow the processing and fabrication of reactor fuels. In most uranium facilities where light water reactor fuels are processed, uranium hexafluoride enriched in the isotope U-235 is converted to solid uranium dioxide pellets and inserted into zirconium alloy tubes. The tubes are fabricated into fuel assemblies which are shipped to nuclear power plants. Some facilities also perform chemical operations to recover the uranium from scrap and other off-specification materials. On a much smaller scale, fuel assemblies containing plutonium oxide pellets can be similarly fabricated and used in reactors for experimental purposes. However, there are no NRC licensees engaged in this activity at this time.

The number of facilities licensed by the NRC to fabricate fuel, especially plutonium fuel, has been decreasing for the last several years (Table 3.1). Therefore, a number of licensees ceased fuel fabrication and began decommissioning activities so that the information that was provided for these years is shown as "Decommissioning" in Table 3.6.

Table 3.6 shows that in 1985 the number of licensees involved in fuel fabrication and decommissioning activities continued to decline, as did the collective dose. One of the licensees (SNM-0021, see Appendix A) that was included with the uranium fuel fabricators in previous years had fuel fabrication activities dropped from their license in 1984. Therefore, in 1985, this licensee's data are shown in the "Decommissioning" category. However, most of the dose incurred by workers monitored by this licensee

Figure 3.3
ANNUAL DOSE DISTRIBUTION OF WORKERS AT LOW-LEVEL WASTE DISPOSAL FACILITIES AND AT AN INDEPENDENT SPENT FUEL STORAGE FACILITY
1982 - 1985




*CR is the ratio of the annual collective dose delivered at individual doses exceeding 1.5 rems to the total annual collective dose.

Note: Each point on the curves represents the cumulative percentage of workers with measurable doses who received doses less than the indicated annual dose.

TABLE 3.6
ANNUAL EXPOSURE INFORMATION FOR FUEL FABRICATORS

1983-1985

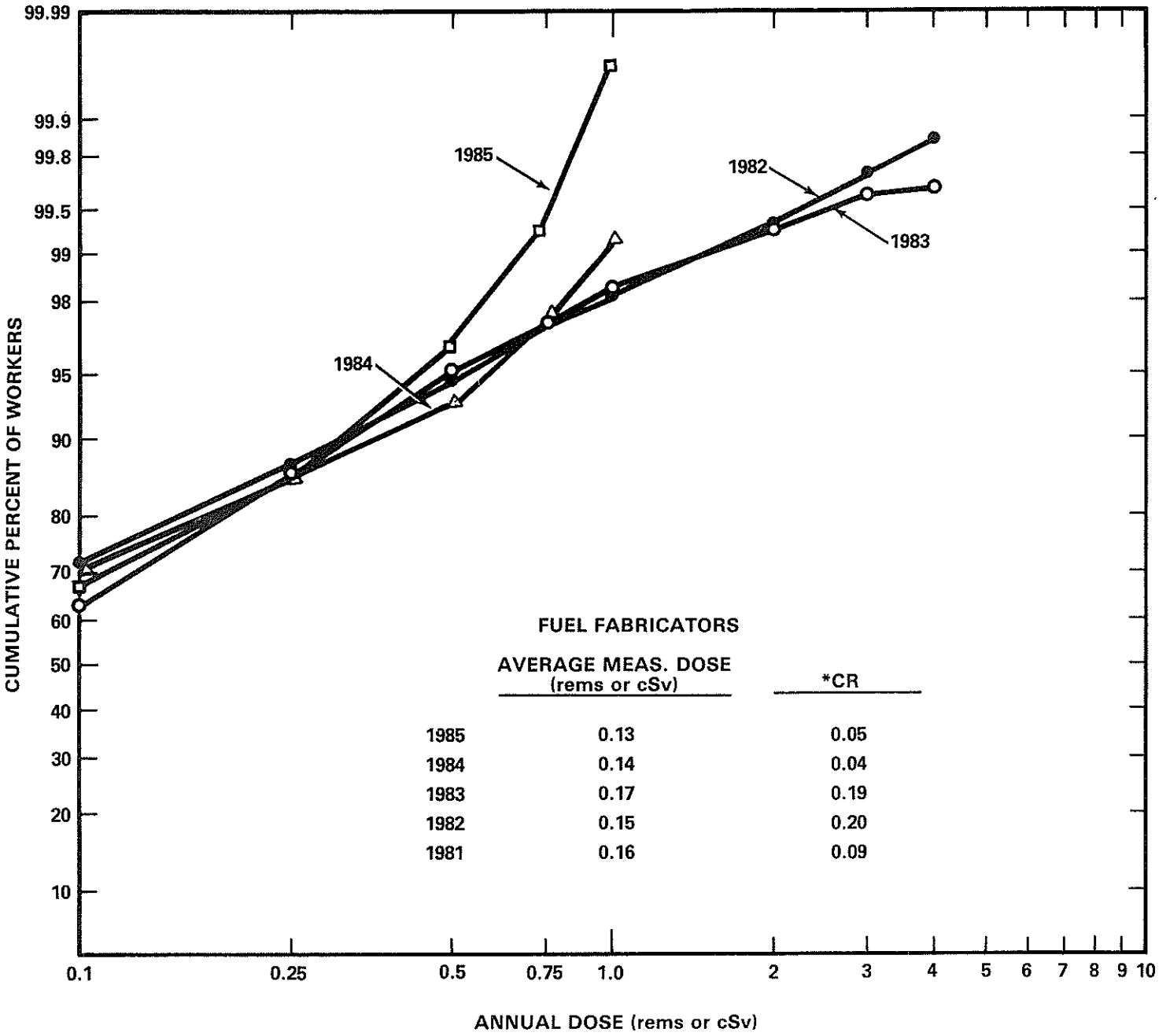
| Year | Type of License | Number of Licenses | Number of Monitored Individuals | Workers with Measurable Doses | Collective Dose (person-rems or person-cSv) | Average Measurable Dose (rems or cSv) |
|---|---|---|---|---|---|---|
| 1985 | Uranium Fuel Fab | 9 | 6,920 | 4,244 | 519 | 0.12 |
| | Pu Decommissioning | 2 | 1,067 | 457 | 98 | 0.21 |
| | Total | 11 | 7,987 | 4,701 | 617 | 0.13 |
| 1984 | Uranium Fuel Fab | 11 | 9,379 | 5,947 | 815 | 0.14 |
| | Pu Decommissioning | 3 | 109 | 25 | 3 | 0.12 |
| | Total | 14 | 9,488 | 5,772 | 818 | 0.14 |
| 1983 | Uranium Fuel Fab | 11 | 8,440 | 4,746 | 748 | 0.16 |
| | Pu Decommissioning | 4 | 583 | 267 | 87 | 0.33 |
| | Total | 15 | 9,023 | 5,013 | 835 | 0.17 |

continues to be due to hot cell operations involving the examination of post-irradiated fuel. As annual exposure reports are not required to be submitted for this type of licensed activity , information for this licensee will not be included in this report. Also, for similar reasons, those licensees that were included in the "Decommissioning" category in previous years are no longer required to file annual reports, and they are no longer included in this document. Appendix A lists alphabetically each of the eleven licensees reporting in 1985, with the number of persons monitored, the number of workers receiving measurable doses, and the collective dose for each licensee.

Figure 3.4 consists of the log-normal plots of the dose distributions of workers at fuel fabrication facilities for the years 1982 through 1985. The plots for 1982 and 1983 are quite similar, with all doses being less than five rems (cSv) and about 99% of the doses being less than two rems (cSv) each year. The average dose and the value of CR were therefore about the same for each year. However, in 1984 and 1985, there were so few doses greater than two rems (cSv) that the value of CR fell to 0.04 and 0.05, respectively.

Fuel reprocessing licenses are issued to allow the separation of usable uranium and plutonium from spent nuclear fuel. There was only one commercial facility that was ever licensed to reprocess fuel, and it has been shut down since 1972. However, the licensee did some decontamination work and stored radioactive waste at the facility for several years, and the annual report that was submitted each year was usually grouped with those of

Figure 3.4
ANNUAL DOSE DISTRIBUTION OF WORKERS
AT FUEL FABRICATORS AND PROCESSORS
1982 - 1985




FUEL FABRICATORS

| | AVERAGE MEAS. DOSE (rems or cSv) | *CR |
|---|---|---|
| 1985 | 0.13 | 0.05 |
| 1984 | 0.14 | 0.04 |
| 1983 | 0.17 | 0.19 |
| 1982 | 0.15 | 0.20 |
| 1981 | 0.16 | 0.09 |

*CR is the ratio of the annual collective dose delivered at individual doses exceeding 1.5 rems to the total annual collective dose.

Note: Each point on the curves represents the cumulative percentage of workers with measurable doses who received doses less than the indicated annual dose.

the fuel fabricators. In February 1982, the Department of Energy assumed possession and control of the reprocessing facility to conduct waste solidification activities necessary for final decommissioning. During this period, the NRC license will, in effect, be suspended, and no reports will be filed with the NRC.

### 3.3.6 Light Water-Cooled Power Reactor (LWR) Licenses

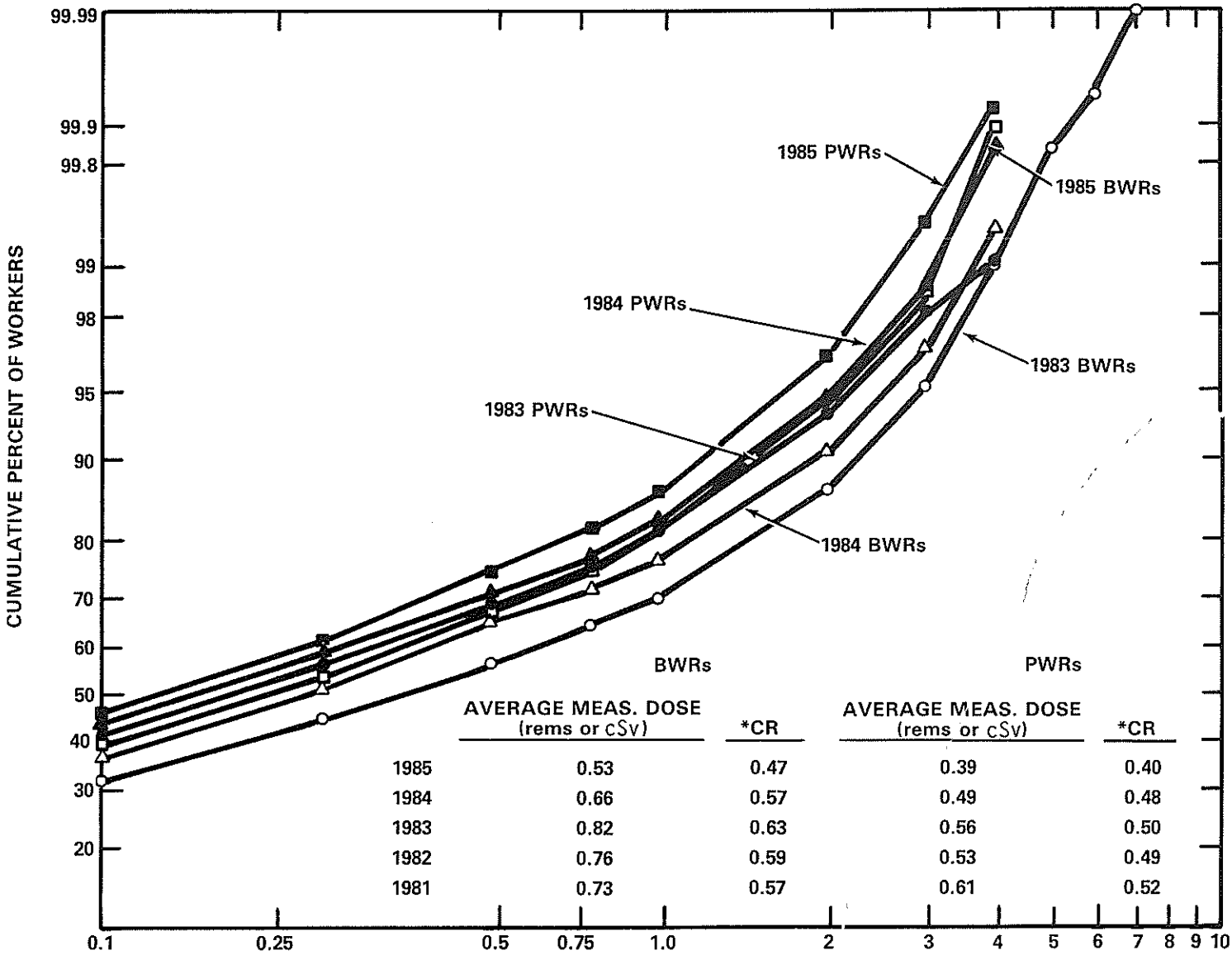
These licenses are issued to utilities to allow them to use special nuclear material in a reactor to produce heat generate electricity to be sold to consumers. There are two major types of commercial LWRs in the United States -pressurized water reactors (PWRs) and boiling water reactors (BWRs) - each of which uses water as the primary coolant.

As shown in Table 3.1, annual reports were received from nuclear power facilities for 93 licensed, LWRs where 191,132 individuals were monitored for exposure to radiation in 1985. Of this number, 97,978 workers received a measurable dose and incurred a collective dose of 43,624 person-rems (person-cSv). This is a significant decrease (21%) in the collective dose from that reported for the previous two years. However, the number of workers has continued to increase somewhat. This has resulted in the average measurable dose continuing to decrease to an all-time low of 0.44 rem (cSv) in 1985. The dose distribution of workers monitored at each plant site is presented in alphabetical order by site name in Appendix B.

Figure 3.5 presents the log-normal plot of the distribution of the whole body doses received by radiation workers at nuclear power facilities in 1983, 1984, and 1985. The position of the plots of the 1985 data above the others indicates a smaller portion of doses were distributed in the higher ranges. For example, in 1984 about 78% of the workers receiving measurable doses at BWRs received doses that were less than one rem (cSv), but in 1985 about 82% of such workers at BWRs received doses of less than one rem (cSv). The plots for the PWRs showed a similar shift. However, the position of the BWR plots below those of the PWRs each year indicates that higher average doses were received at BWRs. Also, departures from a straight line for doses that exceed one rem are again seen, and, according to the hybrid log-normal method [Ref. 12] of analyzing these dose distributions, the sharpness of the departure indicates that a strong feedback mechanism operates when workers begin to incur larger doses and may reflect efforts to keep doses as low as reasonably achievable [Ref. 13].

Listed at the bottom of the figure are the values of the average measurable dose and of CR for the last five years. These show that both parameters continue to be larger at BWRs, but that there were significant decreases in the values of both in 1985. The portion of the collective dose due to doses greater than 1.5 rems (cSv) fell to 40% at PWRs and 47% at BWRs (less than 50% for the first time), and the average doses fell to 0.39 rem (cSv) and 0.53 rem (cSv) at PWRs and BWRs, respectively. More detailed presentations and analyses of the annual exposure information reported by nuclear power facilities can be found in Section 4.

Figure 3.5
ANNUAL DOSE DISTRIBUTION OF WORKERS AT
LIGHT WATER REACTOR FACILITIES
1983 - 1985




| | BWRs | | PWRs | |
|---|---|---|---|---|
| | AVERAGE MEAS. DOSE (rems or cSv) | *CR | AVERAGE MEAS. DOSE (rems or cSv) | *CR |
| 1985 | 0.53 | 0.47 | 0.39 | 0.40 |
| 1984 | 0.66 | 0.57 | 0.49 | 0.48 |
| 1983 | 0.82 | 0.63 | 0.56 | 0.50 |
| 1982 | 0.76 | 0.59 | 0.53 | 0.49 |
| 1981 | 0.73 | 0.57 | 0.61 | 0.52 |

*CR is the ratio of the annual collective dose delivered at individual doses exceeding 1.5 rems to the total annual collective dose.

Note: Each point on the curves represents the cumulative percentage of workers with measurable doses who received doses less than the indicated annual dose.

### 3.3.7 High-Temperature Gas-Cooled Power Reactor (HTGR) Licenses

A license to operate a power reactor is issued to utilities to allow them to use special nuclear material in a reactor to produce heat to generate electricity to be sold to consumers. In this type of a reactor, a gas, usually helium, is used as the primary coolant. Fort St. Vrain near Greeley, Colorado, is the only such reactor in operation in the U.S. As shown in Table 3.7, annual whole body doses incurred by workers at the plant have been minimal. No one exceeded an annual dose of 0.25 rem (cSv) until 1985 when the highest annual dose was between 1 and 2 rems (cSv). Also, in 1985 the average dose per worker increased to 0.08 rem (cSv). The reactor has not operated near full power for significant periods of time since July, 1984, with most of the collective dose in 1985 resulting from maintenance activities. These activities resulted in the largest annual and average collective doses in the history of the plant, though these figures still remain much smaller than for PWRs and BWRs.

TABLE 3.7
ANNUAL EXPOSURE INFORMATION FOR FORT ST. VRAIN

1974-1985

| Year | No. of Individuals with Annual Doses in Ranges (rems or cSv) | | | | Total No. of Individuals Monitored | Annual Collective Dose (person-rems or person-cSv) | Gross Electricity Generated (MW-yr) | Average Measurable Dose per Worker (rem or cSv) |
|---|---|---|---|---|---|---|---|---|
| | No Meas'ble Dose | Meas'ble Dose <0.10 | 0.10-0.25 | 0.25-2.00 | | | | |
| 1974 | 1,597 | 63 | 1 | 0 | 1,661 | 3.3 | 0.0 | 0.05 |
| 1975 | 1,263 | 0 | 0 | 0 | 1,263 | 0.0 | 0.0 | 0.00 |
| 1976 | 1,362 | 25 | 0 | 0 | 1,387 | 1.3 | 2.8 | 0.05 |
| 1977 | 946 | 55 | 1 | 0 | 1,002 | 2.9 | 29.8 | 0.05 |
| 1978 | 896 | 34 | 0 | 0 | 930 | 1.7 | 75.7 | 0.05 |
| 1979 | 1,149 | 120 | 2 | 0 | 1,271 | 6.4 | 28.6 | 0.05 |
| 1980 | 902 | 57 | 1 | 0 | 960 | 3.0 | 83.2 | 0.05 |
| 1981 | 1,096 | 31 | 0 | 0 | 1,127 | 1.0 | 93.6 | 0.03 |
| 1982 | 978 | 22 | 0 | 0 | 1,000 | 0.4 | 72.6 | 0.02 |
| 1983 | 965 | 48 | 0 | 0 | 1,013 | 1.0 | 94.4 | 0.02 |
| 1984 | 1,616 | 62 | 8 | 0 | 1,686 | 3.0 | 10.9 | 0.04 |
| 1985 | 1,929 | 370 | 40 | 33 | 2,372 | 35.0 | 3.8 | 0.08 |

# 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 chapter, some of the tables and appendices that summarize exposure data also show the type, capacity, and age of the reactor; the amount of electricity generated; the type of workers being exposed; and the sort of tasks being performed. Exposure data is then presented as a function of these data.

## 4.2 Definitions 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 one full year as of December 31 of each of the indicated years. This is the number of reactors on which the average number of workers and average collective dose per reactor is based. Excluded are those reactors that may have been in commercial operation for only a few months during the first year and reactors that have been defueled and declared that they will not be commercially operated again. This 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 found in Reference 14.

### 4.2.2. Electric Energy Generated

The electric energy generated in gross megawatt-years (MW-yr) each year by each facility is shown in Appendix C. This number was obtained by dividing the gross 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 gross megawatt-years of generated electricity that are presented in Tables 4.1, 4.2, and 4.3 are the sums of that produced by the number of reactors included in each year. These sums are divided by the number of those reactors included in each year to yield the average amount of electric energy generated (MW-yr) per reactor, which is also shown in Tables 4.1, 4.2, and 4.3. The number of gross megawatt-hours of electricity produced each year was also found in Reference 14.

### 4.2.3 Collective Dose per Megawatt-Year

The number of megawatt-years of electricity generated was used in determining the ratio of the average value of the annual collective dose to the number of megawatt-years of electricity generated. The ratio was calculated by dividing the total collective dose by the total gross megawatt-years generated and is a figure that is a measure of the dose incurred by workers at power plants in relation to the gross electric energy produced. This ratio was also calculated for each reactor site and is presented in Tables 4.1, 4.2, and 4.3 and Appendix C.

TABLE 4.1

SUMMARY OF ANNUAL INFORMATION REPORTED BY COMMERCIAL BOILING WATER REACTORS†

1973-1985

| Year | Number of Reactors Included | Annual Collective Doses (person-rems or person-cSv) | No. of Workers With Measurable Doses | Gross Electricity Generated (MW-yr) | Average Dose Per Worker (rems or cSv) | Average Collective Dose Per Reactor (person-rems or person-cSv) | Average No. Personnel With Measurable Doses Per Reactor | Average Collective Dose per MW-yr | Average Electricity Generated Per Reactor (MW-yr) | Average Rated Capacity Net (MWe) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1973 | 12 | 4,564 | 5,340 | 3,394 | 0.85 | 380 | 445 | 1.3 | 283 | 459 |
| 1974 | 14 | 7,095 | 8,769 | 4,059 | 0.81 | 507 | 626 | 1.7 | 290 | 513 |
| 1975 | 18 | 12,611 | 14,607 | 5,786 | 0.86 | 701 | 812 | 2.2 | 321 | 611 |
| 1976 | 23 | 12,626 | 17,859 | 8,586 | 0.71 | 549 | 776 | 1.5 | 373 | 647 |
| 1977 | 23 | 19,042 | 21,388 | 9,098 | 0.89 | 828 | 930 | 2.1 | 396 | 645 |
| 1978 | 25 | 15,096 | 20,278 | 11,774 | 0.74 | 604 | 811 | 1.3 | 471 | 668 |
| 1979 | 25 | 18,322 | 25,245 | 11,671 | 0.73 | 733 | 1,010 | 1.6 | 467 | 669 |
| 1980 | 26 | 29,530 | 34,094 | 10,868 | 0.87 | 1,136 | 1,311 | 2.7 | 418 | 664 |
| 1981 | 26 | 25,471 | 34,832 | 10,899 | 0.73 | 980 | 1,340 | 2.3 | 419 | 674 |
| 1982 | 26 | 24,437 | 32,235 | 10,665 | 0.76 | 940 | 1,240 | 2.3 | 410 | 674 |
| 1983 | 26 | 27,455 | 33,473 | 9,730 | 0.82 | 1,056 | 1,287 | 2.8 | 374 | 675 |
| 1984 | 27* | 27,074 | 41,105 | 9,963 | 0.66 | 1,003 | 1,522 | 2.7 | 369 | 722 |
| 1985 | 28** | 20,572 | 38,237 | 11,461 | 0.54 | 735 | 1,366 | 1.8 | 409 | 766 |

† Includes only those reactors that had been in commercial operation for at lease one full year as of December 31 of each of the indicated years, and all figures are uncorrected for multiple reporting of transient individuals.

*In 1984 it was decided that Humboldt Bay, a plant that has been shut down since 7/76, would not be put in commercial operation again, and it is no longer included in this count of reactors.

**In 1985 it was decided that Dresden 1, a plant that has been shut down since 10/78, would not be put in commercial operation again, and it is not included in this count of reactors.

TABLE 4.2

SUMMARY OF ANNUAL INFORMATION REPORTED BY COMMERCIAL PRESSURIZED WATER REACTORS †

1973-1985

| Year | Number of Reactors Included | Annual Collective Doses (person-rems or person-cSv) | No. of Workers With Measurable Doses | Gross Electricity Generated (MW-yr) | Average Dose Per Worker (rems or cSv) | Average Collective Dose Per Reactor (person-rems or person-cSv) | Average No. Personnel With Measurable Doses Per Reactor | Average Collective Doses per MW-yr | Average Electricity Generated Per Reactor (MW-yr) | Average Rated Capacity Net (MWe) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1973 | 12 | 9,399 | 9,440 | 3,770 | 1.00 | 783 | 787 | 2.5 | 314 | 533 |
| 1974 | 20 | 6,627 | 9,697 | 6,824 | 0.68 | 331 | 485 | 1.0 | 341 | 619 |
| 1975 | 26 | 8,268 | 10,884 | 11,983 | 0.76 | 318 | 419 | 0.7 | 461 | 643 |
| 1976 | 30 | 13,807 | 17,588 | 13,325 | 0.79 | 460 | 586 | 1.0 | 444 | 675 |
| 1977 | 34 | 13,469 | 20,878 | 17,346 | 0.65 | 396 | 614 | 0.8 | 510 | 699 |
| 1978 | 39 | 16,713 | 25,720 | 19,840 | 0.65 | 429 | 659 | 0.8 | 509 | 723 |
| 1979 | 42 | 21,659 | 38,877 | 18,249 | 0.56 | 516 | 924 | 1.2 | 434 | 729 |
| 1980 | 42 | 24,266 | 46,237 | 18,287 | 0.52 | 578 | 1,101 | 1.3 | 435 | 721 |
| 1981 | 44 | 28,671 | 47,351 | 20,552 | 0.61 | 652 | 1,076 | 1.4 | 467 | 745 |
| 1982 | 48 | 27,753 | 52,147 | 22,141 | 0.53 | 578 | 1,086 | 1.3 | 461 | 773 |
| 1983 | 49 | 29,016 | 52,173 | 23,196 | 0.56 | 592 | 1,065 | 1.3 | 473 | 778 |
| 1984 | 51 | 28,140 | 56,987 | 26,478 | 0.49 | 552 | 1,117 | 1.1 | 519 | 805 |
| 1985 | 54* | 22,470 | 54,634 | 30,140 | 0.41 | 416 | 1,012 | 0.7 | 558 | 826 |

† 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, and all figures are uncorrected for multiple reporting of transient individuals.

*In 1984 it was decided that Indian Point 1, a plant that has been shut down since 10/78, would not be put in commercial operation, and it is no longer included in this count of reactors.

TABLE 4.3

SUMMARY OF ANNUAL INFORMATION REPORTED BY COMMERCIAL LIGHT WATER COOLED REACTORS†

1973-1985

| Year | Number of Reactors Included | Annual Collective Doses (person-rems or person-cSv) | No. of Workers With Measurable Doses | Gross Electricity Generated (MW-yr) | Average Dose Per Worker (rems or cSv) | Average Collective Dose Per Reactor (person-rems or person-cSv) | Average No. Personnel With Measurable Doses Per Reactor | Average Collective Dose per MW-yr | Average Electricity Generated Per Reactor (MW-yr) | Average Rated Capacity Net (MWe) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1973 | 24 | 13,963 | 14,780 | 7,164 | 0.94 | 582 | 616 | 1.9 | 299 | 496 |
| 1974 | 34 | 13,722 | 18,466 | 10,883 | 0.74 | 404 | 543 | 1.3 | 320 | 575 |
| 1975 | 44 | 20,879 | 25,489 | 17,769 | 0.82 | 475 | 579 | 1.2 | 404 | 630 |
| 1976 | 53 | 26,433 | 35,447 | 21,911 | 0.75 | 499 | 669 | 1.2 | 413 | 663 |
| 1977 | 57 | 32,511 | 42,266 | 26,444 | 0.77 | 570 | 742 | 1.2 | 462 | 677 |
| 1978 | 64 | 31,809 | 45,998 | 31,614 | 0.69 | 497 | 719 | 1.0 | 494 | 702 |
| 1979 | 67 | 39,981 | 64,122 | 29,920 | 0.62 | 597 | 956 | 1.3 | 447 | 705 |
| 1980 | 68 | 53,796 | 80,331 | 29,155 | 0.67 | 791 | 1,181 | 1.8 | 429 | 699 |
| 1981 | 70 | 54,142 | 82,183 | 31,451 | 0.66 | 773 | 1,174 | 1.7 | 449 | 719 |
| 1982 | 74 | 52,190 | 84,382 | 32,795 | 0.62 | 705 | 1,139 | 1.6 | 443 | 738 |
| 1983 | 75 | 56,471 | 85,646 | 32,926 | 0.66 | 753 | 1,142 | 1.7 | 439 | 742 |
| 1984 | 78* | 55,214 | 98,092 | 36,441 | 0.56 | 708 | 1,258 | 1.5 | 467 | 776 |
| 1985 | 82** | 43,042 | 92,871 | 41,601 | 0.46 | 525 | 1,132 | 1.0 | 507 | 806 |

† 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, and all figures are uncorrected for multiple reporting of transient individuals.

*In 1984 it was decided that Humboldt Bay and Indian Point 1 would not be put in commercial operation again, and they are no longer included in this count of reactors.

**In 1985 it was decided that Dresden 1, a plant that has been shut down since 10/78, would not be put in commercial operation again, and it is not included in this count of reactors.

### 4.2.4 Average Rated Capacity

Average rated capacity, shown in Tables 4.1, 4.2, and 4.3 was found by dividing the sum of the net maximum dependable capacities (net MWe) of the reactors by the number of reactors included each year. The net maximum dependable capacity is defined to be 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 Reference 14, and it is shown for each site in Appendix C.

## 4.3 Annual Whole Body Dose Distributions

Table 4.4 summarizes the distribution of the annual whole body doses received by workers at all commercial LWRs during each of the years 1973 through 1985. This distribution is the sum of the annual dose distributions reported by each licensed LWR each year. As previously mentioned, the distribution reported by each LWR site for 1985 is shown in Appendix B. The table shows that the number of monitored individuals continues to increase somewhat while the collective dose, after leveling off for a couple of years, declined sharply in 1985. The values of CR show that the fraction of the collective dose due to individual doses greater than 1.5 rems (cSv), also decreased significantly, falling to a value (0.44) less than 0.50 for the first time. However, the distribution shown in Table 4.4 for 1985 has not been corrected for the number of individuals that may have been reported by more than one site (see Section 5) and the corrected value of CR would probably be slightly higher. Appendix D provides uncorrected dose distributions for BWRs and PWRs separately for 1985.

## 4.4. Average Annual Whole Body 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 1982. At that time, the average collective dose per reactor appeared to begin leveling off or decreasing slightly, as did the number of workers. However, in 1985, the collective dose decreased sharply at both types of facilities so that the average measurable doses fell to 0.54 rem (cSv) and 0.41 rem (cSv) at BWRs and PWRs, respectively.

Figures 4.2 and 4.3 are plots of much of the information that is given in Tables 4.1, 4.2, and 4.3. The values of all of the parameters plotted, except for the electricity generated, decreased significantly from last year's values. These figures and the fluctuations in the parameters for the years following the accident at the Three Mile Island plant in 1979, may reflect some of the impact that this incident had on the nuclear power industry. The recent reversal in dose trends may be attributable to several factors. Utilities have completed most of the tasks initiated as a result of the lessons learned from the Three Mile Island accident and they are increasing efforts to avoid and reduce exposure. The importance of exposure control and the concept of keeping exposures as low as reasonably achievable is continually being stressed, and programs to collect and share information

TABLE 4.4

SUMMARY DISTRIBUTION OF ANNUAL WHOLE BODY DOSES AT COMMERCIAL LIGHT WATER REACTORS*

1973 - 1985

| Year | Number of Individuals with Whole Body Doses in the Ranges (rems or cSv) | | | | | | | | | | | | | | | | | Total Number Monitored | Number with Measurable Exposure | **Collective Dose (person-rems or cSv) | CR*** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No Meas'ble Exposure | Meas'ble <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 | 6.0-7.0 | 7.0-8.0 | 8.0-9.0 | 9.0-10.0 | 10.0-12.0 | >12.0 | | | | |
| 1973 | 19,043 | 5,494 | 1,698 | 1,214 | 740 | 652 | 2,468 | 1,584 | 422 | 251 | 125 | 71 | 38 | 16 | 7 | | | 33,823 | 14,780 | 13,963 | 0.72 |
| 1974 | 20,472 | 6,735 | 2,887 | 2,056 | 1,182 | 906 | 2,503 | 1,378 | 471 | 226 | 86 | 30 | 6 | | | | | 38,938 | 18,466 | 13,722 | 0.63 |
| 1975 | 18,854 | 8,841 | 3,674 | 2,750 | 1,685 | 1,339 | 3,948 | 1,872 | 691 | 423 | 169 | 60 | 24 | 12 | 0 | 1 | | 44,343 | 25,489 | 20,879 | 0.65 |
| 1976 | 25,704 | 12,821 | 5,130 | 4,135 | 2,520 | 2,030 | 4,880 | 2,354 | 789 | 487 | 188 | 70 | 26 | 11 | 5 | 1 | | 61,151 | 35,447 | 26,433 | 0.62 |
| 1977 | 23,502 | 12,395 | 6,030 | 4,518 | 2,890 | 2,220 | 5,649 | 2,856 | 1,288 | 661 | 186 | 89 | 47 | 23 | 6 | | | 62,360 | 38,858 | 32,511 | 0.64 |
| 1978 | 28,372 | 15,101 | 6,342 | 4,998 | 3,088 | 2,247 | 5,995 | 3,034 | 1,197 | 514 | 109 | 37 | 9 | 0 | 1 | 0 | 2 | 71,046 | 42,674 | 31,804 | 0.61 |
| 1979 | 39,434 | 22,711 | 9,020 | 7,400 | 4,755 | 3,206 | 7,536 | 3,403 | 1,404 | 545 | 117 | 42 | 17 | 3 | 0 | 1 | | 99,594 | 60,160 | 39,981 | 0.57 |
| 1980 | 44,703 | 26,903 | 10,676 | 8,904 | 5,570 | 4,134 | 10,671 | 4,607 | 1,816 | 831 | 235 | 119 | 29 | 7 | 1 | | | 119,206 | 74,503 | 53,796 | 0.59 |
| 1981 | 39,245 | 26,836 | 11,226 | 9,330 | 6,042 | 4,497 | 11,170 | 4,811 | 1,999 | 585 | 122 | 96 | 11 | 3 | 1 | 0 | 1 | 115,975 | 76,730 | 54,142 | 0.58 |
| 1982 | 41,713 | 29,226 | 11,713 | 9,903 | 6,229 | 4,420 | 10,220 | 4,716 | 2,066 | 596 | 97 | 31 | 5 | 0 | 1 | 1 | | 120,937 | 79,224 | 52,190 | 0.57 |
| 1983 | 48,545 | 29,774 | 11,413 | 9,522 | 5,998 | 4,366 | 11,553 | 5,390 | 2,276 | 716 | 121 | 38 | 8 | 2 | | | | 129,722 | 81,177 | 57,212 | 0.60 |
| 1984 | 55,606 | 37,723 | 13,936 | 10,734 | 6,689 | 5,061 | 12,026 | 5,364 | 2,153 | 485 | 52 | 19 | | | | | | 149,848 | 94,252 | 57,487 | 0.55 |
| 1985 | 64,470 | 39,991 | 14,115 | 11,978 | 7,214 | 4,897 | 10,557 | 3,317 | 716 | 84 | | | | | | | | 157,339 | 92,869 | 43,042 | 0.44 |

*Summary of reports submitted in accordance with 10 CFR 20.407 by plants that had been in commercial operation for at least one full year as of December 31 of each of the indicated years. Figures shown for the years 1977-1984 have been adjusted for the muliple reporting of transient individuals (see Section 5).

**Not all plants' collective dose and no values of CR were reported by the utilities; they were calculated by the NRC staff using methods described in this document.

***CR is the ratio of annual collective dose delivered at individual doses exceeding 1.5 rems (cSv) to the total annual collective dose.

Figure 4.1

## AVERAGE COLLECTIVE DOSE AND NUMBER OF WORKERS PER REACTOR 1973 - 1985

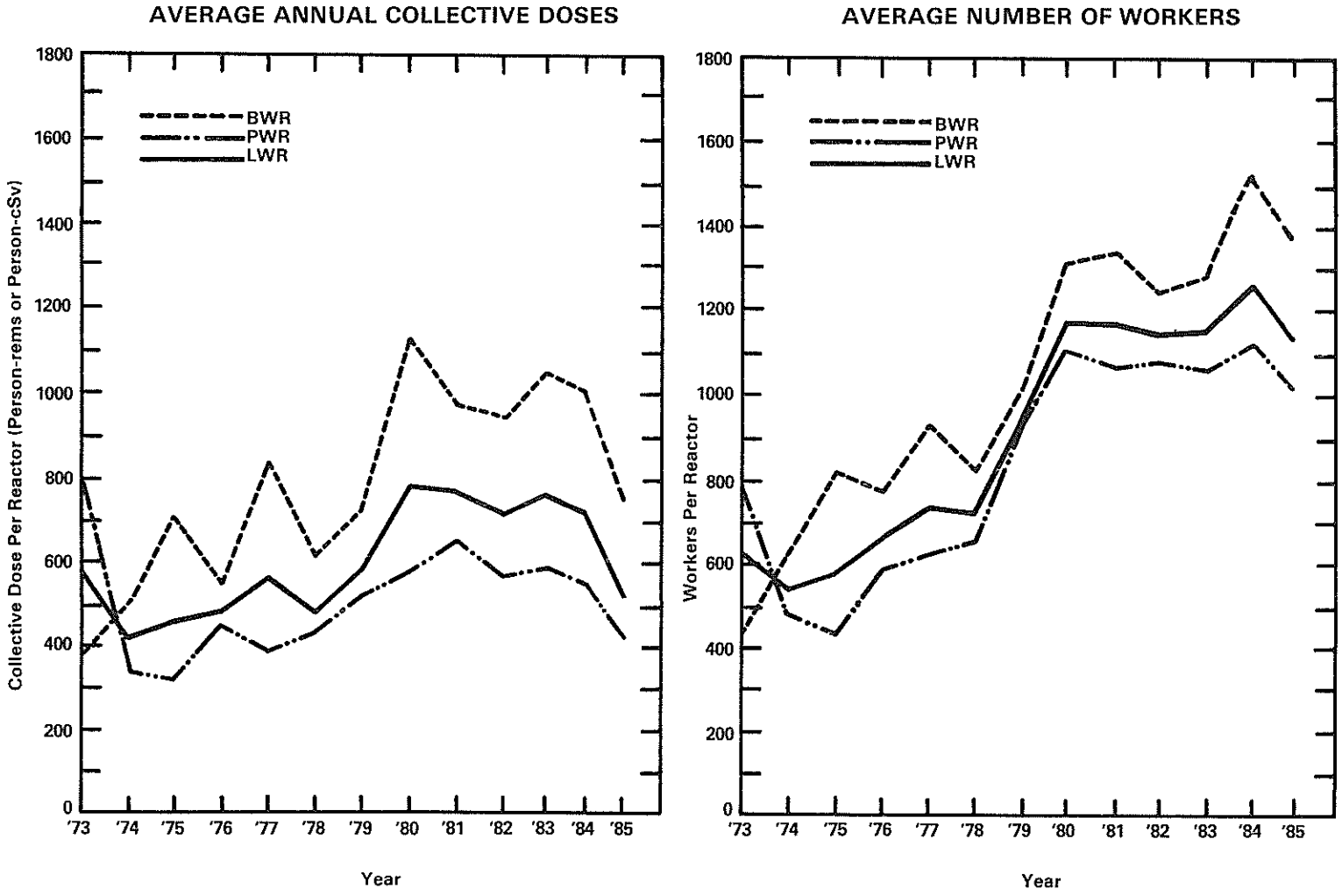


Figure 4.2
**ANNUAL VALUES AT BWRs AND PWRs**
**1973 - 1985**

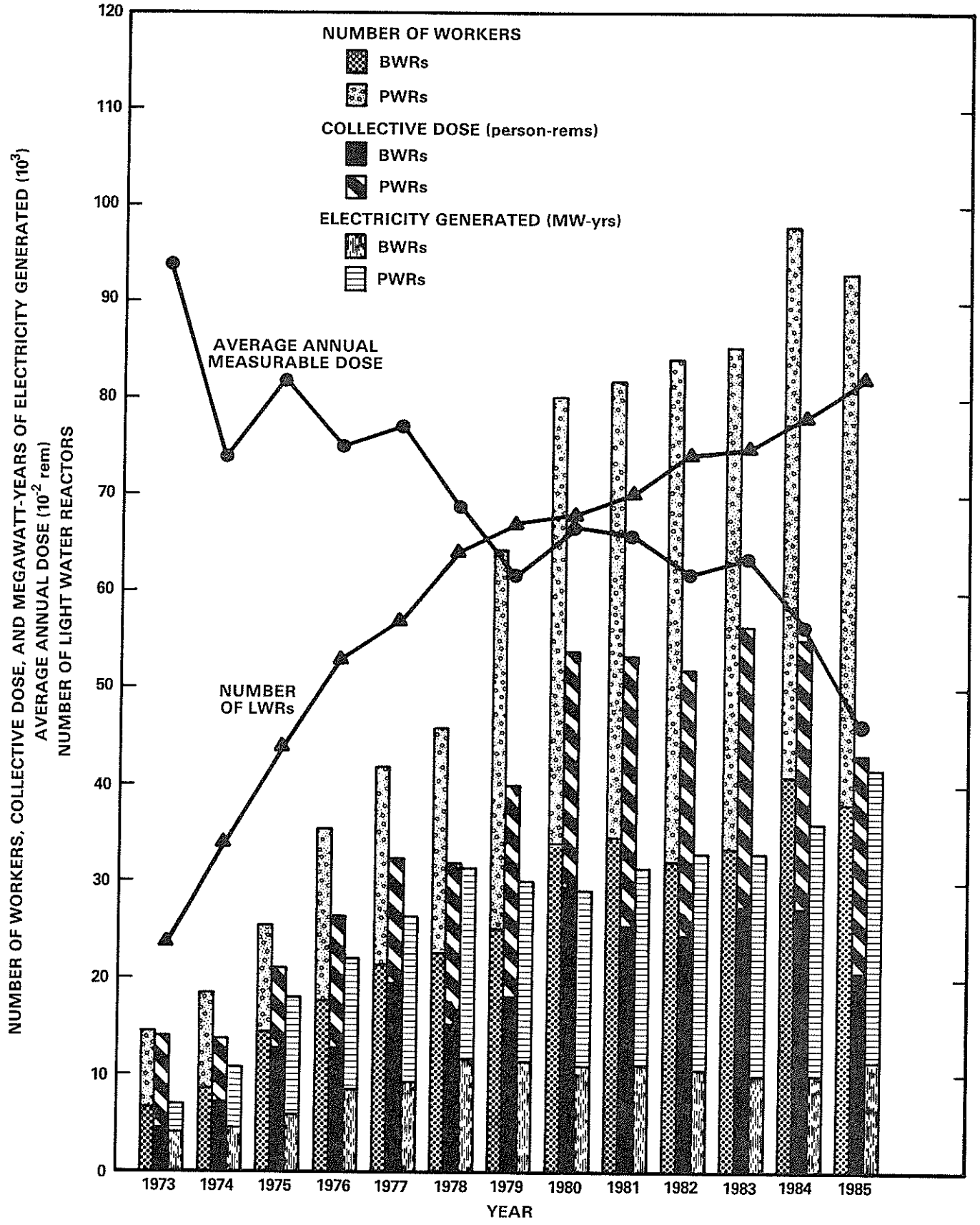


Figure 4.3

## AVERAGE ANNUAL VALUES AT LWRs
## 1973 - 1985

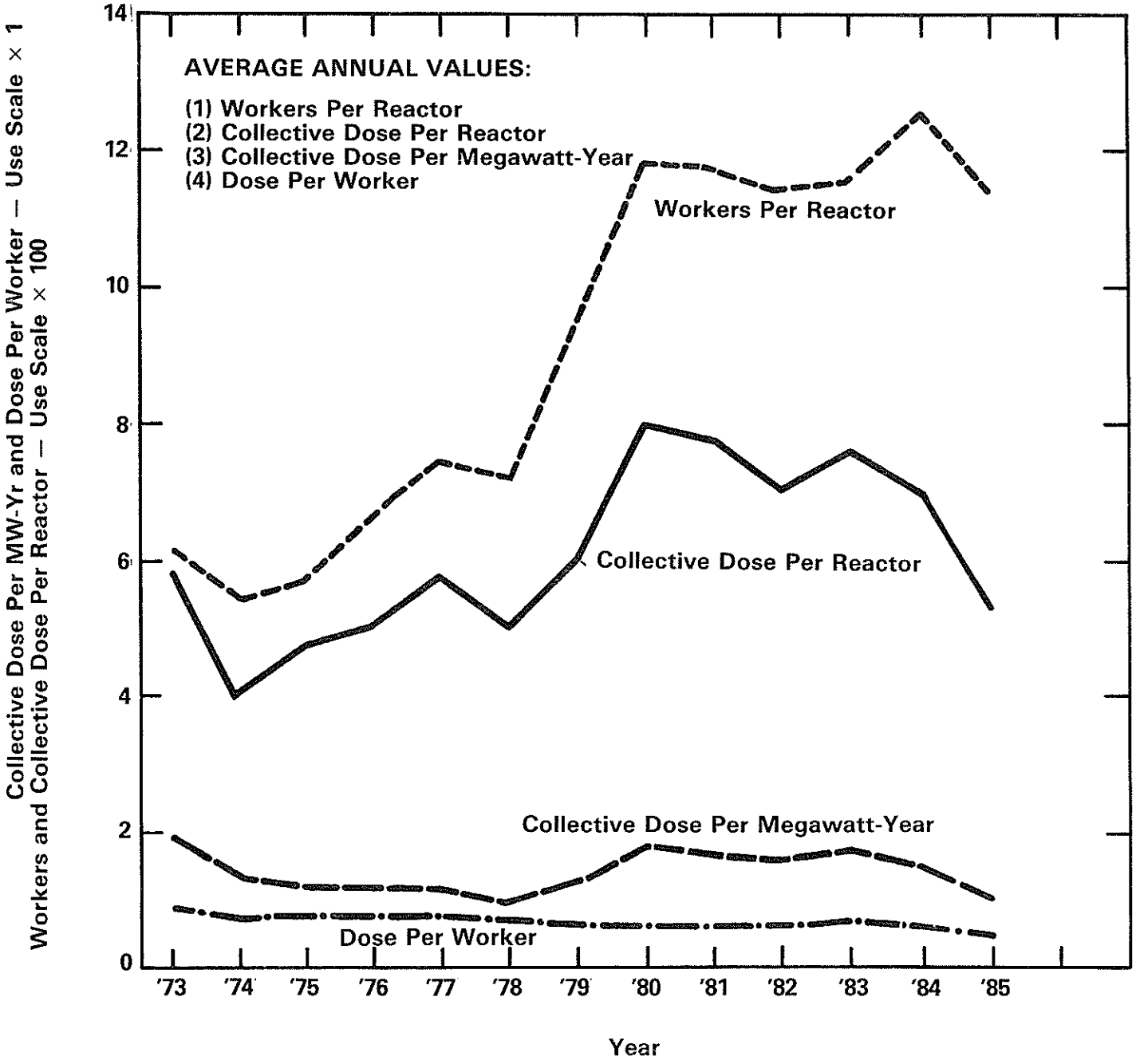
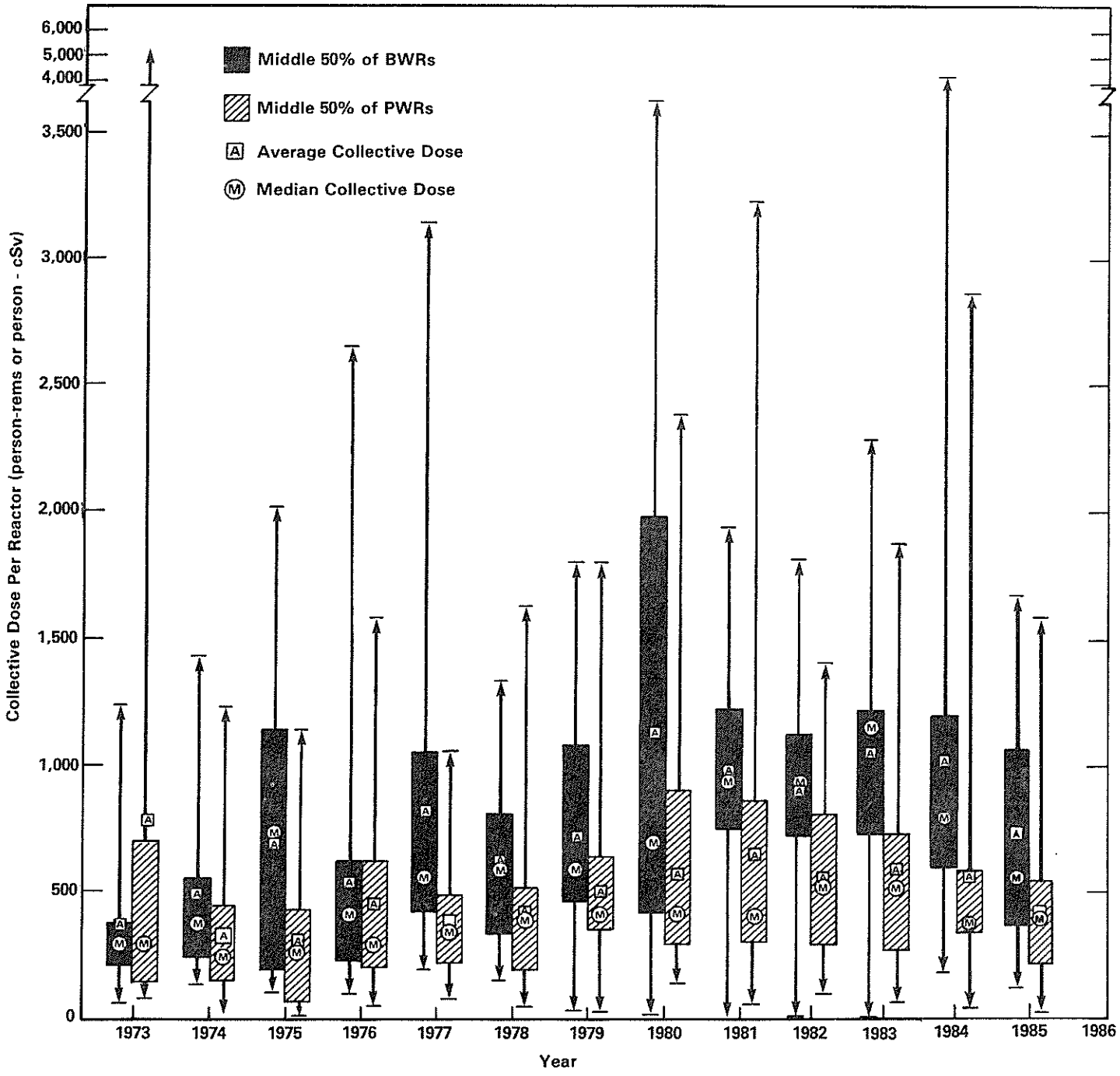


Figure 4.4

**AVERAGE, MEDIAN AND EXTREME VALUES OF THE COLLECTIVE DOSE PER REACTOR 1973 - 1985**



relative to tasks, techniques, and exposures have been established.

To further assist in the identification of any trends that might exist, Figure 4.4 displays the average and median* values of the collective dose per reactor for BWRs and for PWRs for the years 1973 through 1985. 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 twenty-fifth through the seventy-fifth percentiles. Since the median values usually are not as greatly affected by the extreme values of the collective doses, they do not normally fluctuate as much from year to year as do the average values. The median collective dose for PWRs continues to range between 400 and 500 person-rems (person-cSv). At BWRs the median fluctuates more from year to year, but in 1985 the median decreased to 550 person-rems (person-cSv), which is closer to that found for PWRs (400 person-rems (person-cSv)). Figure 4.4 also shows that in 1985 fifty percent of the PWRs reported collective doses between 220 and 540 person-rems (person-cSv) while fifty percent of the BWRs reported collective doses between 375 and 1,070 person-rems (person-cSv). 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).

## 4.5 Plant Rankings by Collective Dose per Reactor

The number of reactors from which data have been collected is still rather small, and the information reported by a few reactors where unusual conditions or problems may have occurred could have a large impact on some of the statistics presented in this report. In an effort to identify those plants, Tables 4.5 and 4.6 list the BWRs and PWRs in ascending order of person-rems (person-cSv) per reactor for each of the five years from 1981 through 1985. Two other parameters, dose per worker and collective dose per megawatt-year, are also given for each plant and could have been used in ranking the plants as well. Also shown is a parameter "CR" which is defined to be the ratio of the annual collective dose delivered at individual doses exceeding 1.5 rems (cSv) to the total annual collective dose. In 1985 the value of CR continued to decline for most plants so that about 80% (up from about 65% in 1984) of the U.S. LWRs fell within the range 0.05 to 0.50 which is recommended by the UNSCEAR [Ref. 10]. Most of the reactors having values of CR greater than 0.50 were BWRs, the highest value being 0.68.

Table 4.7 lists the plants that had been in commercial operation for at least five years as of December 31, 1985, and shows the values of several parameters for each of the sites. It also gives a number of averages for the two types of reactors. Based on the 123 reactor-years of operation accumulated by the BWRs listed, the average annual collective dose per reactor was found to be 996 person-rems (person-cSv), the average measurable dose was 0.72 rem (cSv), and the average collective dose per megawatt-year was 2.5.

* The value at which 50% of the reactors reported greater collective doses and the other 50% reported smaller collective doses.

TABLE 4.5

BOILING WATER REACTORS LISTED IN ASCENDING ORDER OF COLLECTIVE DOSE PER REACTOR

1981 - 1985

1981

| Site Name | *Coll. Dose per Site | Dose per Worker (rems or cSv) | Coll. Dose per MW-Yr | **CR |
|---|---|---|---|---|
| Humboldt Bay | 9 | 0.12 | - | 0.00 |
| La Crosse | 123 | 0.66 | 4.2 | 0.68 |
| Big Rock Point | 160 | 0.33 | 2.8 | 0.47 |
| Cooper Station | 579 | 0.62 | 1.3 | 0.45 |
| Hatch 1, 2 | 1,337 | 0.46 | 1.5 | 0.35 |
| Vermont Yankee | 731 | 0.58 | 1.7 | 0.45 |
| Duane Arnold | 790 | 0.61 | 2.8 | 0.50 |
| Browns Ferry 1, 2, 3 | 2,380 | 0.70 | 1.1 | 0.49 |
| Oyster Creek | 917 | 0.54 | 2.9 | 0.40 |
| Dresden 1, 2, 3 | 2,820 | 1.16 | 2.7 | 0.76 |
| Monticello | 1,004 | 0.69 | 2.6 | 0.52 |
| Peach Bottom 2, 3 | 2,506 | 0.88 | 2.2 | 0.56 |
| Brunswick 1, 2 | 2,638 | 0.68 | 2.9 | 0.66 |
| Fitzpatrick | 1,425 | 0.57 | 2.5 | 0.44 |
| Millstone 1 | 1,496 | 0.60 | 4.9 | 0.44 |
| Quad Cities 1, 2 | 3,146 | 1.40 | 2.7 | 0.81 |
| Nine Mile Point | 1,592 | 0.78 | 4.1 | 0.59 |
| Pilgrim | 1,836 | 0.66 | 4.5 | 0.44 |

1982

| Site Name | *Coll. Dose per Site | Dose per Worker (rems or cSv) | Coll. Dose per MW-Yr | **CR |
|---|---|---|---|---|
| Humboldt Bay | 19 | 0.27 | - | 0.08 |
| La Crosse | 205 | 1.39 | 11.9 | 0.81 |
| Vermont Yankee | 205 | 0.43 | 0.4 | 0.24 |
| Duane Arnold | 227 | 0.44 | 0.8 | 0.48 |
| Big Rock Point | 328 | 0.63 | 7.5 | 0.58 |
| Cooper Station | 542 | 0.73 | 0.9 | 0.52 |
| Hatch 1, 2 | 1,460 | 0.43 | 1.9 | 0.33 |
| Browns Ferry 1, 2, 3 | 2,220 | 0.68 | 1.1 | 0.51 |
| Oyster Creek | 865 | 0.68 | 3.6 | 0.51 |
| Millstone Point 1 | 929 | 0.68 | 1.9 | 0.48 |
| Dresden 1, 2, 3 | 2,923 | 1.14 | 2.7 | 0.73 |
| Peach Bottom 2, 3 | 1,977 | 0.72 | 1.2 | 0.48 |
| Monticello | 993 | 0.76 | 3.4 | 0.57 |
| Fitzpatrick | 1,190 | 0.51 | 2.0 | 0.37 |
| Nine Mile Point | 1,264 | 0.93 | 9.5 | 0.66 |
| Pilgrim | 1,539 | 0.54 | 3.9 | 0.42 |
| Quad Cities 1, 2 | 3,757 | 1.62 | 3.7 | 0.79 |
| Brunswick 1, 2 | 3,792 | 0.76 | 6.5 | 0.70 |

1983

| Site Name | *Coll. Dose per Site | Dose per Worker (rems or cSv) | Coll. Dose per MW-Yr | **CR |
|---|---|---|---|---|
| Humboldt Bay | 17 | 0.20 | - | 0.09 |
| Monticello | 121 | 0.29 | 0.2 | 0.16 |
| Millstone Point 1 | 244 | 0.79 | 0.4 | 0.66 |
| Big Rock Point | 263 | 0.53 | 6.2 | 0.46 |
| La Crosse | 313 | 1.96 | 12.6 | 0.90 |
| Hatch 1, 2 | 1,299 | 0.38 | 1.4 | 0.29 |
| Nine Mile Point | 860 | 0.61 | 2.6 | 0.45 |
| Fitzpatrick | 1,090 | 0.64 | 2.0 | 0.58 |
| Browns Ferry 1, 2, 3 | 3,363 | 1.02 | 2.0 | 0.68 |
| Duane Arnold | 1,135 | 0.77 | 4.0 | 0.53 |
| Pilgrim | 1,162 | 0.50 | 2.1 | 0.47 |
| Dresden 1, 2, 3 | 3,582 | 1.26 | 3.9 | 0.75 |
| Quad Cities 1, 2 | 2,491 | 1.38 | 2.3 | 0.77 |
| Cooper Station | 1,293 | 0.93 | 3.3 | 0.68 |
| Peach Bottom 2, 3 | 2,963 | 0.95 | 3.6 | 0.67 |
| Vermont Yankee | 1,527 | 1.16 | 4.4 | 0.61 |
| Brunswick 1, 2 | 3,475 | 0.62 | 5.5 | 0.63 |
| Oyster Creek | 2,257 | 0.98 | 80.9 | 0.63 |

1984

| Site Name | *Coll. Dose per Site | Dose per Worker (rems or cSv) | Coll. Dose per MW-Yr | **CR |
|---|---|---|---|---|
| Big Rock Point | 155 | 0.52 | 3.1 | 0.52 |
| La Salle 1, 2 | 252 | 0.20 | 0.4 | 0.07 |
| Duane Arnold | 189 | 0.31 | 0.6 | 0.19 |
| La Crosse | 252 | 0.87 | 6.5 | 0.87 |
| Susquehanna 1 | 308 | 0.11 | 0.4 | 0.02 |
| Dresden 1, 2, 3 | 1,774 | 0.78 | 2.2 | 0.54 |
| Vermont Yankee | 603 | 0.63 | 1.5 | 0.39 |
| Browns Ferry 1, 2, 3 | 1,940 | 0.66 | 1.4 | 0.51 |
| Quad Cities 1, 2 | 1,579 | 0.94 | 1.6 | 0.63 |
| Cooper Station | 799 | 0.50 | 1.9 | 0.53 |
| Millstone Point 1 | 836 | 0.42 | 1.6 | 0.31 |
| Nine Mile Point | 890 | 0.58 | 2.1 | 0.50 |
| Fitzpatrick | 971 | 0.60 | 1.7 | 0.57 |
| Hatch 1,2 | 2,218 | 0.54 | 3.4 | 0.44 |
| Peach Bottom 2,3 | 2,450 | 0.74 | 2.1 | 0.57 |
| Brunswick 1,2 | 3,260 | 0.66 | 4.3 | 0.62 |
| Oyster Creek | 2,054 | 0.87 | 55.4 | 0.60 |
| Monticello | 2,462 | 1.32 | 73.1 | 0.79 |
| Pilgrim | 4,082 | 0.90 | - | 0.65 |

1985

| Site Name | *Coll. Dose per Site | Dose per Worker (rems or cSv) | Coll. Dose per MW-Yr | **CR |
|---|---|---|---|---|
| WNP 2 | 119 | 0.16 | 0.2 | 0.11 |
| La Crosse | 173 | 0.46 | 4.4 | 0.68 |
| Nine Mile Point 1 | 265 | 0.26 | 0.5 | 0.25 |
| Big Rock Point 1 | 291 | 0.67 | 6.6 | 0.61 |
| Monticello | 327 | 0.56 | 0.6 | 0.42 |
| La Salle 1, 2 | 685 | 0.42 | 0.7 | 0.35 |
| Browns Ferry 1, 2, 3 | 1,159 | 0.42 | 3.1 | 0.30 |
| Hatch 1, 2 | 818 | 0.29 | 0.7 | 0.19 |
| Quad Cities 1, 2 | 990 | 0.84 | 0.8 | 0.58 |
| Millstone Point 1 | 608 | 0.83 | 1.1 | 0.60 |
| Oyster Creek 1 | 748 | 0.32 | 1.7 | 0.33 |
| Dresden 2,3 | 1,685 | 0.60 | 1.9 | 0.39 |
| Pilgrim 1 | 893 | 0.40 | 1.5 | 0.39 |
| Fitzpatrick | 1,051 | 0.57 | 2.1 | 0.53 |
| Vermont Yankee | 1,051 | 0.76 | 2.9 | 0.42 |
| Susquehanna 1 | 1,106 | 0.30 | 1.8 | 0.20 |
| Duane Arnold | 1,112 | 0.79 | 4.7 | 0.30 |
| Cooper Station | 1,333 | 0.67 | 10.5 | 0.59 |
| Brunswick 1,2 | 2,804 | 0.69 | 3.4 | 0.65 |
| Peach Bottom 2,3 | 3,354 | 0.80 | 4.9 | 0.59 |

*For sites with more than one operating reactor, the collective dose per reactor is obtained by dividing the collective dose for the site by the number of reactors.

**CR is the ratio of the annual collective dose delivered at individual doses exceeding 1.5 rems (cSv) to the total collective dose.

TABLE 4.6

PRESSURIZED WATER REACTORS LISTED IN ASCENDING ORDER OF COLLECTIVE DOSE PER REACTOR

1981 - 1985

1981

| Site Name | *Coll. Dose per Site | Dose per Worker (rems or cSv) | Coll. Dose per MW-Yr | **CR |
|---|---|---|---|---|
| Davis Besse | 58 | 0.10 | 0.1 | 0.04 |
| Kawaunee | 141 | 0.37 | 0.3 | 0.18 |
| Prarie Island 1, 2 | 329 | 0.39 | 0.4 | 0.30 |
| Three Mile Island 1, 2 | 376 | 0.18 | - | 0.06 |
| Beaver Valley | 229 | 0.19 | 0.4 | 0.10 |
| Salem 1 | 254 | 0.15 | 0.3 | 0.09 |
| Point Beach 1, 2 | 596 | 0.77 | 0.8 | 0.46 |
| Yankee Rowe | 302 | 0.59 | 2.8 | 0.43 |
| Calvert Cliffs 1, 2 | 607 | 0.39 | 0.4 | 0.19 |
| Cook 1, 2 | 655 | 0.49 | 0.4 | 0.29 |
| North Anna 1, 2 | 680 | 0.28 | 0.5 | 0.37 |
| Indian Point 3 | 364 | 0.54 | 1.0 | 0.65 |
| Rancho Seco | 402 | 0.52 | 1.3 | 0.28 |
| Oconee 1, 2, 3 | 1,211 | 0.50 | 0.7 | 0.45 |
| Crystal River 3 | 408 | 0.36 | 0.8 | 0.23 |
| Maine Yankee | 424 | 0.49 | 0.7 | 0.29 |
| Fort Calhoun | 458 | 0.56 | 1.8 | 0.50 |
| Farley | 511 | 0.38 | 1.6 | 0.28 |
| Millstone Point 2 | 531 | 0.60 | 0.7 | 0.44 |
| Arkansas 1, 2 | 1,102 | 0.50 | 1.0 | 0.39 |
| Trojan | 609 | 0.46 | 0.8 | 0.33 |
| Ginna | 655 | 0.71 | 1.6 | 0.45 |
| Robinson 2 | 733 | 0.50 | 1.7 | 0.51 |
| Zion 1, 2 | 1,720 | 0.98 | 1.3 | 0.69 |
| Palisades | 902 | 0.42 | 2.2 | 0.41 |
| St. Lucie | 929 | 0.63 | 1.6 | 0.43 |
| Haddam Neck | 1,036 | 0.67 | 2.1 | 0.52 |
| Turkey Point 3, 4 | 2,251 | 0.77 | 3.4 | 0.51 |
| Indian Point 1, 2 | 2,731 | 1.05 | 7.4 | 0.65 |
| Surry 1, 2 | 4,244 | 1.13 | 4.7 | 0.77 |
| San Onofre | 3,223 | 1.11 | 33.6 | 0.72 |

1982

| Site Name | *Coll. Dose per Site | Dose per Worker (rems or cSv) | Coll. Dose per MW-Yr | **CR |
|---|---|---|---|---|
| Kewaunee | 101 | 0.29 | 0.2 | 0.11 |
| Prairie Island 1, 2 | 229 | 0.36 | 0.2 | 0.16 |
| Haddam Neck | 126 | 0.23 | 0.2 | 0.27 |
| Davis Besse | 164 | 0.12 | 0.4 | 0.06 |
| McGuire | 169 | 0.11 | 0.3 | 0.03 |
| Crystal River | 177 | 0.23 | 0.3 | 0.13 |
| Fort Calhoun | 217 | 0.36 | 0.5 | 0.42 |
| Farley 1, 2 | 484 | 0.33 | 0.4 | 0.18 |
| St. Lucie | 272 | 0.26 | 0.3 | 0.18 |
| Point Beach 1, 2 | 609 | 0.79 | 0.8 | 0.50 |
| Palisades | 330 | 0.21 | 0.8 | 0.20 |
| Rancho Seco | 337 | 0.44 | 0.8 | 0.36 |
| Cook 1, 2 | 699 | 0.46 | 0.5 | 0.27 |
| Arkansas 1, 2 | 803 | 0.50 | 0.9 | 0.40 |
| Trojan | 419 | 0.42 | 0.7 | 0.35 |
| Yankee Rowe | 474 | 0.58 | 4.4 | 0.54 |
| Three Mile Island 1,2 | 1,004 | 0.47 | - | 0.44 |
| Calvert Cliffs 1, 2 | 1,057 | 0.59 | 0.8 | 0.40 |
| Sequoyah | 570 | 0.29 | 1.0 | 0.18 |
| Oconee 1, 2, 3 | 1,792 | 0.73 | 1.4 | 0.58 |
| Beaver Valley | 599 | 0.34 | 1.8 | 0.26 |
| Salem 1, 2 | 1,203 | 0.37 | 0.8 | 0.29 |
| Maine Yankee | 619 | 0.48 | 1.1 | 0.32 |
| Surry 1, 2 | 1,490 | 0.79 | 1.1 | 0.73 |
| Indian Point 1, 2 | 1,635 | 0.76 | 3.1 | 0.52 |
| San Onofre | 832 | 0.27 | 13.5 | 0.35 |
| North Anna 1, 2 | 1,915 | 0.67 | 2.5 | 0.67 |
| Zion 1, 2 | 2,103 | 1.34 | 1.8 | 0.76 |
| Turkey Point 3, 4 | 2,119 | 0.72 | 2.3 | 0.48 |
| Ginna | 1,140 | 1.02 | 3.9 | 0.65 |
| Indian Point 3 | 1,226 | 0.83 | 7.1 | 0.52 |
| Millstone Point 2 | 1,413 | 0.68 | 2.4 | 0.48 |
| Robinson 2 | 1,426 | 0.71 | 5.1 | 0.65 |

1983

| Site Name | *Coll. Dose per Site | Dose per Worker (rems or cSv) | Coll. Dose per MW-Yr | **CR |
|---|---|---|---|---|
| Yankee Rowe | 68 | 0.17 | 0.4 | 0.20 |
| Davis Besse | 80 | 0.11 | 0.1 | 0.04 |
| Prairie Island 1, 2 | 233 | 0.36 | 0.3 | 0.24 |
| San Onofre 1 | 155 | 0.09 | - | 0.13 |
| Maine Yankee | 164 | 0.28 | 0.2 | 0.14 |
| Kewaunee | 165 | 0.37 | 0.4 | 0.24 |
| Indian Point 1, 2 | 486 | 0.46 | 0.7 | 0.46 |
| Sesquoyah 1, 2 | 491 | 0.28 | 0.3 | 0.14 |
| Salem 1, 2 | 581 | 0.24 | 0.8 | 0.16 |
| Trojan | 307 | 0.32 | 0.6 | 0.25 |
| Cook 1, 2 | 658 | 0.46 | 0.5 | 0.33 |
| North Anna 1, 2 | 665 | 0.30 | 0.5 | 0.38 |
| Calvert Cliffs 1, 2 | 668 | 0.35 | 0.5 | 0.32 |
| Oconee 1, 2, 3 | 1,207 | 0.63 | 0.6 | 0.46 |
| Fort Calhoun | 433 | 0.50 | 1.3 | 0.39 |
| Farley 1, 2 | 1,021 | 0.53 | 0.8 | 0.41 |
| McGuire 1 | 521 | 0.30 | 0.9 | 0.32 |
| Crystal River | 552 | 0.32 | 1.2 | 0.18 |
| Three Mile Island 1, 2 | 1,159 | 0.73 | - | 0.57 |
| Indian Point 3 | 607 | 0.65 | 77.8 | 0.46 |
| Zion 1, 2 | 1,311 | 1.02 | 1.1 | 0.62 |
| Arkansas 1, 2 | 1,397 | 0.66 | 1.5 | 0.65 |
| Point Beach 1, 2 | 1,403 | 0.82 | 2.2 | 0.53 |
| Beaver Valley | 772 | 0.52 | 1.4 | 0.42 |
| Rancho Seco | 787 | 0.59 | 2.3 | 0.39 |
| Ginna | 855 | 0.88 | 2.3 | 0.55 |
| Robinson | 923 | 0.41 | 2.3 | 0.44 |
| Palisades | 977 | 0.45 | 2.2 | 0.54 |
| St. Lucie | 1,204 | 0.54 | 4.2 | 0.47 |
| Turkey Point 1, 2 | 2,681 | 0.92 | 3.1 | 0.60 |
| Haddam Neck | 1,384 | 0.84 | 3.1 | 0.57 |
| Surry 1, 2 | 3,220 | 1.17 | 3.5 | 0.78 |
| Millstone Point 2 | 1,881 | 0.79 | 6.4 | 0.67 |

1984

| Site Name | *Coll. Dose per Site | Dose per Worker (rems or cSv) | Coll. Dose per MW-Yr | **CR |
|---|---|---|---|---|
| Crystal River | 49 | 0.09 | 0.1 | 0.00 |
| Prairie Island 1, 2 | 147 | 0.27 | 0.2 | 0.16 |
| Millstone Point 2 | 120 | 0.42 | 0.2 | 0.33 |
| Kewaunee | 139 | 0.29 | 0.3 | 0.15 |
| Davis Besse | 177 | 0.16 | 0.3 | 0.07 |
| Rancho Seco | 222 | 0.28 | 0.5 | 0.22 |
| Indian Point 3 | 230 | 0.35 | 0.3 | 0.61 |
| Calvert Cliffs 1, 2 | 479 | 0.35 | 0.3 | 0.33 |
| Summer | 295 | 0.26 | 0.6 | 0.11 |
| Salem 1, 2 | 681 | 0.49 | 1.0 | 0.39 |
| Three Mile Island 1, 2 | 688 | 0.64 | - | 0.45 |
| Yankee Rowe | 348 | 0.53 | 2.8 | 0.44 |
| Oconee 1, 2, 3 | 1,105 | 0.53 | 0.5 | 0.39 |
| Cook 1, 2 | 762 | 0.49 | 0.5 | 0.32 |
| Zion 1, 2 | 786 | 0.71 | 0.6 | 0.47 |
| Ginna | 394 | 0.55 | 1.0 | 0.39 |
| Point Beach 1, 2 | 789 | 0.58 | 1.0 | 0.50 |
| Arkansas 1, 2 | 806 | 0.46 | 0.6 | 0.37 |
| Trojan | 433 | 0.42 | 0.8 | 0.34 |
| Farley 1, 2 | 902 | 0.44 | 0.6 | 0.41 |
| San Onofre 1, 2 | 946 | 0.15 | 0.7 | 0.14 |
| Beaver Valley | 504 | 0.36 | 0.9 | 0.32 |
| McGuire 1 | 507 | 0.30 | 0.7 | 0.26 |
| Sequoyah 1, 2 | 1,117 | 0.47 | 0.8 | 0.36 |
| Fort Calhoun | 563 | 0.62 | 2.0 | 0.47 |
| Palisades | 573 | 0.43 | 5.8 | 0.41 |
| Turkey Point 3, 4 | 1,255 | 0.62 | 1.3 | 0.53 |
| St. Lucie 1, 2 | 1,263 | 0.60 | 1.1 | 0.49 |
| Maine Yankee | 884 | 0.70 | 1.5 | 0.47 |
| North Anna 1, 2 | 1,945 | 0.64 | 1.9 | 0.59 |
| Surry 1, 2 | 2,247 | 0.70 | 2.2 | 0.61 |
| Haddam Neck | 1,216 | 0.85 | 3.0 | 0.66 |
| Indian Point 2 | 2,644 | 0.91 | 6.3 | 0.61 |
| Robinson 2 | 2,880 | 0.70 | - | 0.69 |

1985

| Site Name | *Coll. Dose per Site | Dose per Worker (rems or cSv) | Coll. Dose per MW-Yr | **CR |
|---|---|---|---|---|
| Callaway 1 | 36 | 0.04 | 0.0 | 0.00 |
| Beaver Valley | 60 | 0.10 | 0.1 | 0.00 |
| Davis-Besse | 71 | 0.10 | 0.3 | 0.04 |
| Haddam Neck | 101 | 0.26 | 0.2 | 0.28 |
| Salem 1, 2 | 204 | 0.18 | 0.1 | 0.15 |
| Arkansas 1, 2 | 286 | 0.23 | 0.2 | 0.10 |
| Kewaunee | 176 | 0.34 | 0.4 | 0.15 |
| San Onofre 1 | 189 | 0.07 | 0.6 | 0.06 |
| Indian Point 2 | 192 | 0.27 | 0.2 | 0.20 |
| Prarie Island 1, 2 | 416 | 0.38 | 0.5 | 0.31 |
| Yankee-Rowe | 211 | 0.32 | 1.5 | 0.24 |
| Point Beach 1, 2 | 482 | 0.72 | 0.6 | 0.43 |
| San Onofre 2, 3 | 533 | 0.17 | 0.5 | 0.18 |
| Robinson 2 | 311 | 0.23 | 0.5 | 0.28 |
| Calvert Cliffs 1, 2 | 694 | 0.43 | 0.6 | 0.37 |
| Trojan | 363 | 0.43 | 0.4 | 0.26 |
| Fort Calhoun 1 | 373 | 0.38 | 1.0 | 0.37 |
| Summer 1 | 379 | 0.32 | 0.6 | 0.34 |
| McGuire 1, 2 | 771 | 0.35 | 0.5 | 0.29 |
| Farley 1, 2 | 799 | 0.31 | 0.6 | 0.30 |
| North Anna 1, 2 | 839 | 0.34 | 0.6 | 0.31 |
| Ginna | 426 | 0.50 | 1.0 | 0.37 |
| Three Mile Island 1, 2 | 857 | 0.45 | 8.3 | 0.50 |
| Oconee 1, 2, 3 | 1,304 | 0.48 | 0.6 | 0.42 |
| Cook 1, 2 | 945 | 0.48 | 1.0 | 0.31 |
| Palisades | 507 | 0.37 | 0.8 | 0.27 |
| Sequoyah 1, 2 | 1,071 | 0.58 | 0.9 | 0.47 |
| Indian Point 3 | 570 | 0.52 | 1.0 | 0.20 |
| Zion 1, 2 | 1,166 | 0.78 | 1.0 | 0.55 |
| Turkey Point 3, 4 | 1,253 | 0.66 | 1.2 | 0.48 |
| St. Lucie 1, 2 | 1,344 | 0.68 | 0.9 | 0.50 |
| Crystal River 3 | 689 | 0.35 | 2.0 | 0.20 |
| Maine Yankee | 700 | 0.69 | 1.1 | 0.49 |
| Rancho Seco | 756 | 0.43 | 3.2 | 0.27 |
| Surry 1, 2 | 1,815 | 0.57 | 1.6 | 0.58 |
| Millstone 2 | 1,581 | 0.83 | 3.8 | 0.64 |

*For sites with more than one operating reactor, the collective dose per reactor is obtained by dividing the collective dose for the site by the number of reactors.

**CR is the ratio of the annual collective dose delivered at individual doses exceeding 1.5 rems (cSv) to the total collective dose.

TABLE 4.7a

FIVE-YEAR TOTALS AND AVERAGES LISTED IN ASCENDING ORDER OF COLLECTIVE DOSE PER BWR

1981-1985

| BWRs<br>**Site name | *Total Collective Dose per Site | Workers with Measurable Doses | Average Dose per Worker (rem or cSv) | Total Mega-watt-years | Average Collective Dose per MW-yr |
|---|---|---|---|---|---|
| La Crosse | 1,066 | 1,156 | 0.92 | 149.3 | 7.1 |
| Big Rock Point | 1,197 | 2,225 | 0.54 | 236.9 | 5.1 |
| Duane Arnold | 3,455 | 5,303 | 0.65 | 1,404.8 | 2.5 |
| Hatch 1, 2 | 7,132 | 16,696 | 0.43 | 4,443.2 | 1.6 |
| Browns Ferry 1, 2, 3 | 11,062 | 15,675 | 0.71 | 7,599.4 | 1.5 |
| Millstone 1 | 4,113 | 6,909 | 0.60 | 2,499.2 | 1.6 |
| Vermont Yankee | 4,117 | 5,407 | 0.76 | 2,035.7 | 2.0 |
| Cooper Station | 4,546 | 6,639 | 0.68 | 2,015.2 | 2.3 |
| Nine Mile Point | 4,871 | 7,323 | 0.67 | 1,856.2 | 2.6 |
| Monticello | 4,907 | 5,627 | 0.87 | 1,718.5 | 2.9 |
| Dresden 1,2, 3 | 12,766 | 12,915 | 0.99 | 4,727.4 | 2.7 |
| Fitzpatrick | 5,727 | 9,982 | 0.57 | 2,761.2 | 2.1 |
| Quad Cities 1, 2 | 11,963 | 9,224 | 1.30 | 5,526.7 | 2.2 |
| Peach Bottom 2, 3 | 13,250 | 16,220 | 0.82 | 5,418.3 | 2.4 |
| Oyster Creek | 6,841 | 9,973 | 0.69 | 1,068.6 | 6.4 |
| Brunswick 1, 2 | 15,969 | 23,516 | 0.68 | 3,685.7 | 4.3 |
| Pilgrim | 9,512 | 14,734 | 0.65 | 1,947.0 | 4.9 |
| (123 reactor-years) | | | | | |
| Grand Totals and Averages | 122,494 | 169,521 | 0.72 | 49,093.1 | 2.5 |
| Averages per Reactor-year | 996 | 1,378 | | 399 | |

*For sites with more than one operating reactor, the collective dose per reactor is obtained by dividing the collective dose for the site by the number of reactors.

**Sites where not all reactors had completed five full years of commercial operation as of 12/31/85 are not included.

TABLE 4.7b

FIVE-YEAR TOTALS AND AVERAGES LISTED IN ASCENDING ORDER OF COLLECTIVE DOSE PER PWR

1981-1985

| PWRs<br>**Site name | *Total Collective Dose per Site | Workers with Measurable Doses | Average Dose per Worker (rem or cSv) | Total Mega-watt-years | Average Collective Dose per MW-yr |
|---|---|---|---|---|---|
| Davis Besse | 550 | 4,452 | 0.12 | 2,271.1 | 0.2 |
| Prairie Island 1, 2 | 1,354 | 3,756 | 0.36 | 4,565.9 | 0.3 |
| Kewaunee | 722 | 2,182 | 0.33 | 2,252.7 | 0.3 |
| Yankee Rowe | 1,403 | 3,036 | 0.46 | 650.2 | 2.2 |
| Calvert Cliffs 1, 2 | 3,505 | 8,242 | 0.43 | 6,594.4 | 0.5 |
| Cook 1, 2 | 3,719 | 7,829 | 0.48 | 6,926.9 | 0.5 |
| Crystal River 3 | 1,875 | 6,145 | 0.31 | 2,650.7 | 0.7 |
| Point Beach 1, 2 | 3,879 | 5,285 | 0.73 | 3,786.0 | 1.0 |
| Three Mile Island 1, 2 | 4,084 | 8,787 | 0.46 | 103.6 | 39.4*** |
| Fort Calhoun | 2,044 | 4,181 | 0.40 | 1,655.5 | 1.2 |
| Trojan | 2,131 | 5,151 | 0.41 | 3,245.4 | 0.7 |
| Beaver Valley | 2,164 | 6,489 | 0.33 | 2,755.7 | 0.8 |
| Arkansas 1, 2 | 4,394 | 8,946 | 0.49 | 5,406.5 | 0.8 |
| Oconee 1, 2, 3 | 6,620 | 11,606 | 0.57 | 9,375.3 | 0.7 |
| Rancho Seco | 2,504 | 5,442 | 0.46 | 1,777.3 | 1.4 |
| Main Yankee | 2,791 | 5,026 | 0.56 | 3,084.9 | 0.9 |
| Indian Point 3 | 2,997 | 4,846 | 0.62 | 1,827.7 | 1.6 |
| North Anna 1, 2 | 6,044 | 13,014 | 0.46 | 5,896.2 | 1.0 |
| Palisades | 3,289 | 8,571 | 0.38 | 2,014.8 | 1.6 |
| Ginna | 3,470 | 4,569 | 0.76 | 1,867.8 | 1.9 |
| Zion 1, 2 | 7,086 | 7,222 | 0.98 | 6,353.4 | 1.1 |
| Haddam Neck | 3,863 | 5,572 | 0.69 | 2,445.2 | 1.6 |
| Turkey Point 3, 4 | 9,559 | 12,733 | 0.75 | 4,429.7 | 2.2 |
| San Onofre 1 | 4,912 | 14,725 | 0.33 | 491.2 | 10.0 |
| Millstone 2 | 5,526 | 7,546 | 0.73 | 2,812.8 | 2.0 |
| Robinson 2 | 6,273 | 11,222 | 0.56 | 1,771.4 | 3.5 |
| Surry 1, 2 | 13,016 | 14,789 | 0.88 | 5,340.2 | 2.4 |
| Indian Point 2 | 7,688 | 9,423 | 0.82 | 2,810.6 | 2.7 |
| (200 reactor-years) | | | | | |
| Grand Totals and Averages | 117,462 | 210,784 | 0.53 | 95,163.3 | 1.2 |
| Averages per Reactor-year | 587 | 1054 | | 475.8 | |

*For sites with more than one operating reactor, the collective dose per reactor is obtained by dividing the collective dose for the site by the number of reactors.

**Sites where not all reactors had completed five full years of commercial operation as of 12/31/85 are not included.

***These two units were shut down after the 1979 accident at unit 2. Unit 1 was unable to begin normal power generation during this period. Most of the collective dose during 1981-1985 was the result of recovery effort at unit 2 and steam generator repairs at unit 1.

Based on the 200 reactor-years of operation at the PWRs listed, these averages were found to be 587 person-rems (person-cSv), 0.53 rem and 1.2, respectively. All of these values, at both types of facilities, are lower than those found for the previous five years.

In 1985, there were five BWR units where collective doses exceeded 1,300 person-rems (person-cSv) per reactor. Although these five units represented only 18% of the 28 BWRs, they contributed nearly 37% of the total collective dose incurred at BWRs in 1985. Most of the collective dose accumulated at the BWR site with the highest collective dose (3,354 person-rems (person-cSv)) was attributed to routine maintenance activities, such as snubber and control rod drive repair, standing fire watches, and pipe safe-end replacement (weld overlays).

At PWRs, there were three units where the collective dose exceeded 900 person-rems (person-cSv) per reactor. Although representing less than 6% of the 54 PWRs operating in 1985, they contributed over 15% of the total collective dose at PWRs in 1985. The plant with the highest collective dose (1,581 person-rems (person-cSv)) in 1985 accumulated most of the dose during cleaning, decontamination, plugging and sleeving of steam generators.

In general, particularly for BWRs, the plants having the lower values of most of the parameters shown are usually the newer plants. Some of the older, smaller plants also appear near the top of the listings since they report small collective doses; however, the ratio of their collective dose to the number of megawatt-years of electricity generated will be higher because of their limited power generation capacity. In the case of PWRs, this generalization does not always apply. For example, Prairie Island 1 and 2 and Kewaunee, three reactors that have been operating for 11 or 12 years, have experienced lower collective doses than many new reactors for years.

Usually, the combination of a large annual collective dose and a large collective dose to megawatt-year ratio for a plant indicates that extensive maintenance or modifications were undertaken during the year. For example, maintenance jobs that were large contributors to BWR doses in 1985 included replacement of recirculation system piping, inspection for intergranular stress corrosion cracking (IGSCC), IGSCC repair, induction heating stress improvement (IHSI) of welds, reactor vessel component inservice inspection, and plant decontamination activities. At PWR facilities, the major contributors to the collective dose have been extensive tube inspection, sleeving, and plugging related to the repair of steam generators. Even with the use of better techniques and robots, these tasks continue to be a major source of exposure. It should be noted that the differences in nuclear plant designs and the ages of the plants [Ref. 15], even between plants of a given type, affect the nature of these parameters. Therefore care should be exercised when attempting to draw conclusions from these data.

## 4.6 Collective Dose by Work Function and Employee Type

A second type of annual statistical report that is required by each plant's technical specifications provides the collective dose of workers monitored at each plant site by employee type (plant, utility, or contractor) and by work and job functions. A copy of the report submitted for each reactor

site, is provided in Appendix D. Table 4.8 and Figure 4.5 are presented to summarize the 1985 data. The collective doses obtained from these reports are not used in any other tables in this document for the following reasons: the technical specifications of each plant requires only 80% of the plant's collective dose be accounted for, and some utilities do not use the official dosimeter results in compiling the data. Also, when examining the number of personnel shown on these reports, it should be kept in mind that individuals who perform tasks in more than one category may be counted more than once.

Table 4.9 shows that workers performing special maintenance usually incurred the largest portion (35%-45%) of the collective dose and that workers performing routine maintenance activities usually incurred between 30% and 35%. The figures have been fairly stable over the years with these two categories always accounting for the majority of the collective dose. Figure 4.5 graphically shows the trends in the collective dose by work function and type of personnel for the years 1979 through 1985 for BWRs and PWRs separately. Contractor personnel incur most of the collective dose during special maintenance while it is nearly equally divided between contractor and plant and utility personnel during routine maintenance and waste processing.

Table 4.10 presents the distribution of the collective dose for 1985 at all LWRs among five occupations. As expected, maintenance personnel incurred the majority (67%) of the collective dose with contractor maintenance personnel receiving about twice as much as the station and utility maintenance employees combined. This is about the same as that reported for 1984. Supervisory personnel received 3.1% of the dose, compared to 4.1% in 1984, while workers in the remaining three occupations--operations, health physics, and engineering--received 9.3%, 13%, and 8.3% respectively, of the collective dose. None of these values changed very much from those found for 1983 and 1984. The collective doses shown in Tables 4.8 and 4.10 do not equal those shown in other tables in the report because they are the sum of the doses taken from the type of annual reports shown in Appendix D rather than the collective dose that was obtained or calculated from the § 20.407 annual reports.

Another use made of the reports given in Appendix D is in proportioning the collective dose obtained from the § 20.407 annual reports into the work functions and personnel types shown in Appendix C. This was done in the following way:

(1) The collective dose incurred by workers in the work function "Reactor Operations and Surveillance" on each plant's annual report submitted pursuant to their technical specifications (the first number in the last column in Appendix D) was determined.

(2) The ratio of this dose to the total collective dose (the last number in the last column in Appendix D) was calculated and multiplied by the total collective dose that had been estimated or obtained from the § 20.407 annual report. This product is the collective dose shown in the column headed "Operations" in Appendix C.

(3) The collective dose shown in the column headed "Maintenance and Others" in Appendix C was determined by first summing the collective doses

TABLE 4.8

ANNUAL COLLECTIVE DOSE
BY WORK FUNCTION AND PERSONNEL TYPE
1985

| WORK FUNCTION | STATION EMPLOYEES PERSON-REM | % OF TOTAL | UTILITY EMPLOYEES PERSON-REM | % OF TOTAL | CONTRACT WORKERS PERSON-REM | % OF TOTAL | TOTAL PER FUNCTION PERSON-REM | % OF TOTAL |
|---|---|---|---|---|---|---|---|---|
| *BOILING WATER REACTORS | | | | | | | | |
| REACTOR OPS & SURV | 1,399.699 | 7.02% | 354.807 | 1.78% | 735.848 | 3.69% | 2,490.354 | 12.49% |
| ROUTINE MAINTENANCE | 2,137.180 | 10.72% | 962.727 | 4.83% | 4,221.369 | 21.17% | 7,321.276 | 36.71% |
| IN-SERVICE INSPECTION | 134.393 | 0.67% | 267.932 | 1.34% | 1,316.130 | 6.60% | 1,718.455 | 8.62% |
| SPECIAL MAINTENANCE | 869.333 | 4.36% | 456.970 | 2.29% | 5,919.359 | 29.68% | 7,245.662 | 36.33% |
| WASTE PROCESSING | 347.800 | 1.74% | 17.666 | 0.09% | 375.753 | 1.88% | 741.219 | 3.72% |
| REFUELING | 180.344 | 0.90% | 35.145 | 0.18% | 212.257 | 1.06% | 427.746 | 2.14% |
| TOTALS | 5,068.749 | 25.41% | 2,095.247 | 10.51% | 12,780.716 | 64.08% | 19,944.712 | 100.00% |
| *PRESSURIZED WATER REACTORS | | | | | | | | |
| REACTOR OPS & SURV | 1,815.508 | 7.55% | 161.315 | 0.67% | 1,177.418 | 4.89% | 3,154.241 | 13.11% |
| ROUTINE MAINTENANCE | 2,618.156 | 10.88% | 678.291 | 2.82% | 4,587.473 | 19.07% | 7,883.920 | 32.77% |
| IN-SERVICE INSPECTION | 341.003 | 1.42% | 370.901 | 1.54% | 1,332.540 | 5.54% | 2,044.444 | 8.50% |
| SPECIAL MAINTENANCE | 1,775.804 | 7.38% | 841.856 | 3.50% | 4,441.228 | 18.46% | 7,058.888 | 29.34% |
| WASTE PROCESSING | 642.477 | 2.67% | 60.398 | 0.25% | 780.442 | 3.24% | 1,483.317 | 6.17% |
| REFUELING | 781.935 | 3.25% | 359.409 | 1.49% | 1,290.225 | 5.36% | 2,431.569 | 10.11% |
| TOTALS | 7,974.883 | 33.15% | 2,472.170 | 10.28% | 13,609.326 | 56.57% | 24,056.379 | 100.00% |
| *ALL LIGHT WATER REACTORS | | | | | | | | |
| REACTOR OPS & SURV | 3,215.207 | 7.31% | 516.122 | 1.17% | 1,913.266 | 4.35% | 5,644.595 | 12.83% |
| ROUTINE MAINTENANCE | 4,755.336 | 10.81% | 1,641.018 | 3.73% | 8,808.842 | 20.02% | 15,205.196 | 34.56% |
| IN-SERVICE INSPECTION | 475.396 | 1.08% | 638.833 | 1.45% | 2,648.670 | 6.02% | 3,762.899 | 8.55% |
| SPECIAL MAINTENANCE | 2,645.137 | 6.01% | 1,298.826 | 2.95% | 10,360.587 | 23.55% | 14,304.550 | 32.51% |
| WASTE PROCESSING | 990.277 | 2.25% | 78.064 | 0.18% | 1,156.195 | 2.63% | 2,224.536 | 5.06% |
| REFUELING | 962.279 | 2.19% | 394.554 | 0.90% | 1,502.482 | 3.41% | 2,859.315 | 6.50% |
| TOTALS | 13,043.632 | 29.64% | 4,567.417 | 10.38% | 26,390.042 | 59.98% | 44,001.091 | 100.00% |

*Table does not inlcude results from the PWRs at Point Beach 1, 2 (444 person-rems) and the BWR at Shoreham (19.21 person-rems), because the data for these plants were not submitted in the suggested format.

TABLE 4.9

PERCENTAGES OF ANNUAL COLLECTIVE
DOSE AT LWR'S BY WORK FUNCTION

| WORK FUNCTION | PERCENTAGE OF COLLECTIVE DOSE EACH YEAR | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
| REACTOR OPERATIONS AND SURVEILLANCE | 10.8% | 10.2% | 10.5% | 13.3% | 12.2% | 9.5% | 8.9% | 9.4% | 10.1% | 11.4% | 12.8% |
| ROUTINE MAINTENANCE | 52.6% | 31.0% | 28.1% | 31.5% | 29.2% | 35.5% | 36.1% | 27.9% | 29.7% | 26.9% | 34.6% |
| INSERVICE INSPECTION | 3.0% | 6.0% | 6.4% | 7.7% | 9.0% | 5.5% | 5.3% | 6.5% | 7.6% | 6.3% | 8.6% |
| SPECIAL MAINTENANCE | 19.0% | 40.0% | 42.5% | 35.9% | 39.4% | 40.6% | 40.5% | 46.8% | 43.9% | 45.4% | 32.5% |
| WASTE PROCESSING | 6.9% | 5.0% | 5.8% | 5.0% | 3.6% | 3.0% | 4.2% | 5.0% | 4.6% | 3.6% | 5.1% |
| REFUELING | 7.7% | 7.9% | 6.7% | 6.6% | 6.6% | 6.1% | 5.0% | 4.4% | 4.1% | 6.4% | 6.5% |

TABLE 4.10

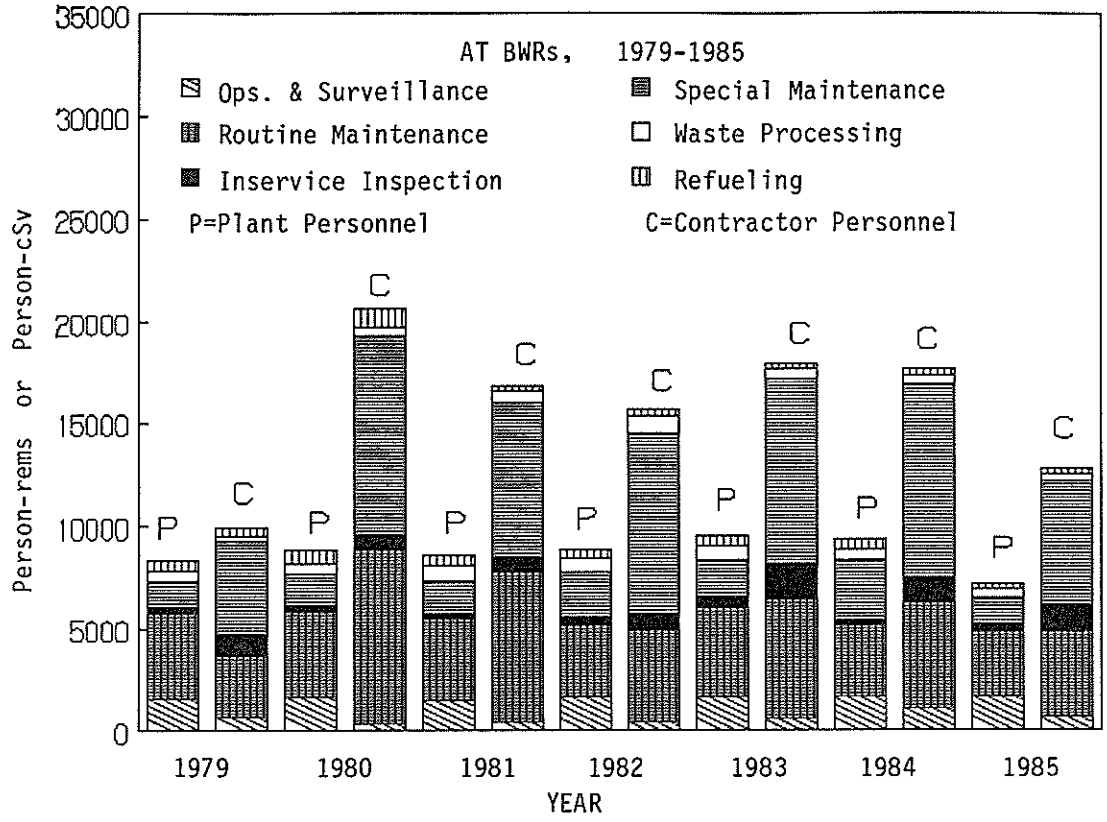
ANNUAL COLLECTIVE DOSE
BY OCCUPATION AND PERSONNEL TYPE
1985

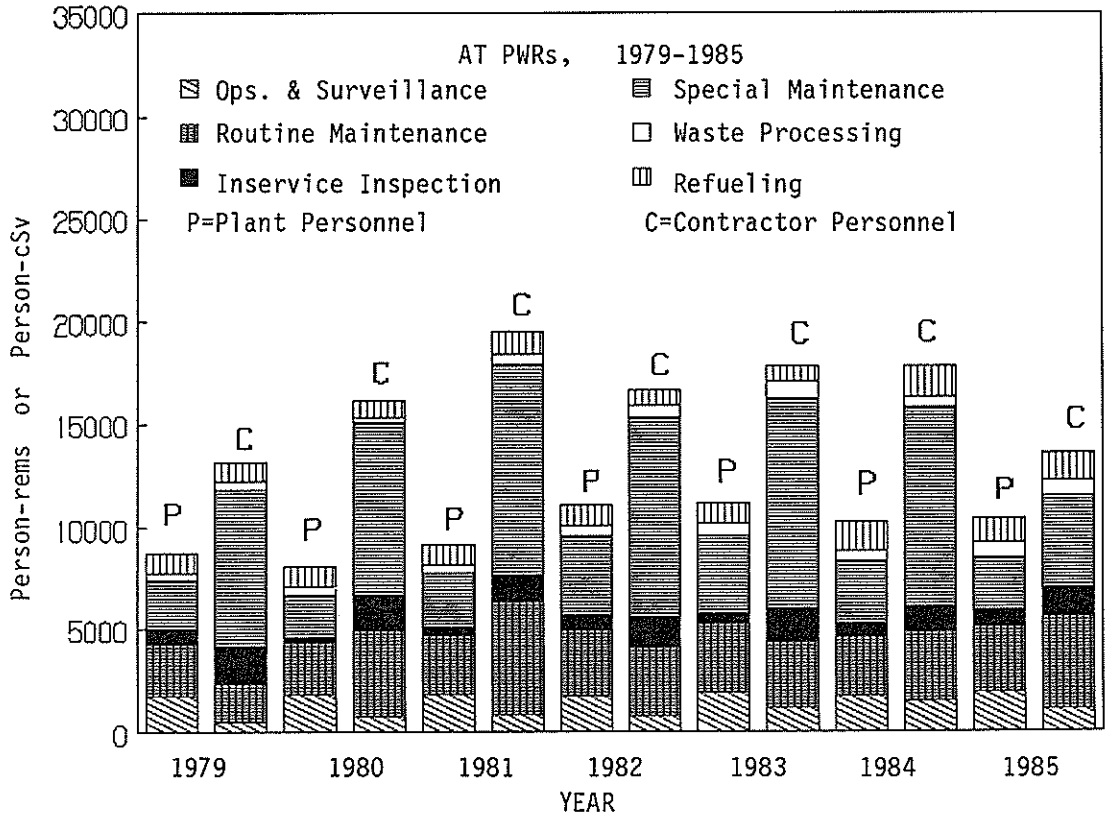
| OCCUPATION | STATION EMPLOYEES PERSON-REM | % OF TOTAL | UTILITY EMPLOYEES PERSON-REM | % OF TOTAL | CONTRACT WORKERS PERSON-REM | % OF TOTAL | TOTAL PER FUNCTION PERSON-REM | % OF TOTAL |
|---|---|---|---|---|---|---|---|---|
| *BOILING WATER REACTORS | | | | | | | | |
| MAINTENANCE | 2,605.499 | 13.06% | 1,603.877 | 8.04% | 10,094.016 | 50.61% | 14,303.392 | 71.72% |
| OPERATIONS | 1,163.361 | 5.83% | 206.333 | 1.03% | 384.173 | 1.93% | 1,753.867 | 8.79% |
| HEALTH PHYSICS | 700.327 | 3.51% | 90.095 | 0.45% | 1,045.809 | 5.24% | 1,836.231 | 9.21% |
| SUPERVISORY | 280.383 | 1.41% | 34.962 | 0.18% | 394.704 | 1.98% | 710.049 | 3.56% |
| ENGINEERING | 319.179 | 1.60% | 159.980 | 0.80% | 862.014 | 4.32% | 1,341.173 | 6.72% |
| TOTALS | 5,068.749 | 25.41% | 2,095.247 | 10.51% | 12,780.716 | 64.08% | 19,944.712 | 100.00% |
| *PRESSURIZED WATER REACTORS | | | | | | | | |
| MAINTENANCE | 4,439.867 | 18.46% | 1,907.124 | 7.93% | 8,768.051 | 36.45% | 15,115.042 | 62.83% |
| OPERATIONS | 1,410.701 | 5.86% | 229.810 | 0.96% | 680.201 | 2.83% | 2,320.712 | 9.65% |
| HEALTH PHYSICS | 1,276.539 | 5.31% | 73.333 | 0.30% | 2,348.569 | 9.76% | 3,698.441 | 15.37% |
| SUPERVISORY | 367.705 | 1.53% | 46.088 | 0.19% | 217.021 | 0.90% | 630.814 | 2.62% |
| ENGINEERING | 480.071 | 2.00% | 215.815 | 0.90% | 1,595.484 | 6.63% | 2,291.370 | 9.52% |
| TOTALS | 7,974.883 | 33.15% | 2,472.170 | 10.28% | 13,609.326 | 56.57% | 24,056.379 | 100.00% |
| *ALL LIGHT WATER REACTORS | | | | | | | | |
| MAINTENANCE | 7,045.366 | 16.01% | 3,511.001 | 7.98% | 18,862.067 | 42.87% | 29,418.434 | 66.86% |
| OPERATIONS | 2,574.062 | 5.85% | 436.143 | 0.99% | 1,064.374 | 2.42% | 4,074.579 | 9.26% |
| HEALTH PHYSICS | 1,976.866 | 4.49% | 163.428 | 0.37% | 3,394.378 | 7.71% | 5,534.672 | 12.58% |
| SUPERVISORY | 648.088 | 1.47% | 81.050 | 0.18% | 611.725 | 1.39% | 1,340.863 | 3.05% |
| ENGINEERING | 799.250 | 1.82% | 375.795 | 0.85% | 2,457.498 | 5.59% | 3,632.543 | 8.26% |
| TOTALS | 13,043.632 | 29.64% | 4,567.417 | 10.38% | 26,390.042 | 59.98% | 44,001.091 | 100.00% |

*Table does not include results from the PWRs at Point Beach 1, 2 (444 person-rems) and the BWR at Shoreham (19.21 person-rems), because the data for these plants were not submitted in the suggested format.

Figure 4.5

COLLECTIVE DOSE BY WORK FUNCTION and PERSONNEL TYPE



incurred by workers in the five remaining functions given in Appendix D and then calculating the fraction that this dose is of the total collective dose. This fraction was multiplied by the total collective dose estimated from the § 20.407 annual reports to yield the collective dose shown in this column of Appendix C.

(4) A similar procedure was followed in determining the collective dose for the columns headed "Contractor" and "Station & Utility" in Appendix C.

## 4.7 Health Implications of Average Annual Doses

Of interest to individuals exposed to radiation in the workplace, are the potential health risks associated with occupational exposure. If any damage to health is caused by exposure to radiation in the workplace, it would likely manifest itself as certain types of cancer in the exposed worker or, less likely, as inherited genetic damage in the first few generations of the workers' offspring. However, the likelihood of cancer or genetic damage occurring as a result of radiation exposure experienced by workers in the nuclear industry is small. A vast amount of scientific information is available from which estimates of these risks can be made. Much of this information, however, has been obtained from epidemiologic studies of human populations at levels of exposure considerably higher than those normally experienced in the workplace. Complementary to this, information obtained from many animal and cell biology studies have greatly enhanced our knowledge and understanding of the biological effects of ionizing radiation. Although using this information to estimate risks in the workplace introduces uncertainties, these uncertainties can be dealt with in such a manner that the risk is not likely to be underestimated. Thus, the discussion below is likely to overstate the health implications rather than understate them.

Cancer induction as a result of radiation exposure has been examined by many organizations having scientific and medical expertise in the subject. One of these, the National Academy of Sciences (NAS), published a comprehensive review of the biological effects of ionizing radiation in 1980 [Ref. 16]. Based on this report, a large working population receiving one million person-rems (person-cSv) might suffer an estimated 100 to 200 additional cancer deaths over the remaining years of their lives. This risk estimate can be applied to the 47,474 person-rems (person-cSv) (Table 3.1) and the 110,763 workers who received measurable exposures in 1985. The result is that for these workers the expected number of additional cancer deaths that might result from radiation dose received that year would be about ten. These deaths would occur many years following the exposure and would be in addition to the approximately 20,000 cancer deaths that occur normally in a population of 110,763 workers without exposure to this amount of radiation. Perhaps more meaningful to the individual workers are the health implications to the workers receiving the average dose of 0.43 rem (cSv) or the maximum dose of 27 rems (cSv) during 1985. The estimated increased cancer death risk is about one chance in 10,000 for the average dose and about three chances in 1000 for the maximum dose. Should a worker receive 0.43 rem (cSv) per year continuously during his entire working career (working from age 20 until age 65) his risk of dying from cancer could increase by less than 2% over the normal risk of dying of cancer. These risks can be compared to the American Cancer Society's estimates of one

chance in four of developing cancer and one chance in five of dying of cancer.

The potential genetic effects from a worker population receiving about 47,474 person-rems (person-cSv) is very small compared to genetic damages that normally occur spontaneously in a population of this size. Approximately 100,000 serious genetic defects occur normally in one million live births, i.e., an average of about one serious defect in every ten live births. Theoretically, the total genetic damage in the first generation children of the 110,763 exposed* workers would, according to the 1980 NAS report, be an increase of three or less cases (less than 0.05%) compared to the expected 10,000 cases that occur normally. No significant increase in the number of genetic defects has been observed in the children of individuals exposed to much higher levels of ionizing radiation at Hiroshima and Nagasaki, Japan.

* Assuming that, on the average, each exposed person will have one live born child in the future, i.e., 110,763 children born to this worker population.

# 5 TERMINATION DATA SUBMITTED PURSUANT TO 10 CFR § 20.408

## 5.1 Termination Reports, 1969-1984*

In 1969, the Atomic Energy Commission (predecessor of the NRC) began requiring certain categories of licensees** to submit personal identification and exposure information upon the termination of each monitored person's employment or work assignment at their facility. The appropriate information on each report has been manually coded and entered into the Commission's computerized Radiation Exposure Information Reporting System (REIRS) for permanent retention. The data are retrievable by several criteria - social security number, name, facility, etc. - which allows statistical analysis of the data as well as the tracing of individual dose histories. During the years that this information has been collected, some 1,600,000 termination records have been received for approximately 390,000 individuals who have been reported as having terminated their employment at facilities in one or more of the categories of covered licensees. The figures given for the number of reports and the number of individuals are different because numerous individuals have been terminated more than once over the years and because some individuals may have had external doses reported for more than one part of the body, as well as estimates of internal depositions of radioactive material, each of which is counted as one record. Due to the large number of records, it takes a considerable amount of time to process these records so that the termination data for 1985 are not yet available. It should be noted that the data presented in this section are revised from last year's report as all the termination data for 1983 and 1984 have now been entered into REIRS. Table 5.1 provides a breakdown of this information for individuals terminating during each of these 16 years and, since the majority of termination reports are now submitted by nuclear power facilities, the number of records and individuals that they reported are displayed separately. As shown, the number of records continues to increase each year, primarily because of the growing need for workers at power reactors.

## 5.2 Limitations of Termination Data

When examining or using the statistics that are based on the termination data, one should keep in mind that these data have various limitations: (1) some licensees submit a termination report for each monitoring period rather than waiting until the individual actually completes his work assignment at the facility, (2) the period(s) of exposure that are reported for terminating individuals may indicate the monitoring period during which he may have been exposed to radiation rather than the actual dates of exposure,

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* Updated for 1983 and 1984 data which have now been entered into REIRS.

** Commercial nuclear power reactors; industrial radiographers; fuel processors, fabricators, and reprocessors; and manufacturers and distributors of specified quantities of byproduct material. Three other types of NRC licensees are now required to submit reports pursuant to 10 CFR § 20.407 and § 20.408: geologic repositories for high-level radioactive waste; receivers of radioactive waste from other persons for land disposal; and independent installations for the storage of spent fuel.

(3) some licensees report cumulative periods of exposure and doses rather than the actual periods and dose incurred during each period, and (4) licensees having more than one licensed facility sometimes include in the termination report submitted when the individual leaves the second facility the dose that he incurred at the first facility, which may already have been reported. Although attempts have been made to correct for some of these problems, they are still a small additional source of error in any statistics developed from the termination data.

TABLE 5.1

TERMINATION REPORTS SUBMITTED TO THE NRC

1969 - 1984**

| YEAR | All Covered Categories* | | Power Reactor Licensees | |
|---|---|---|---|---|
| | Number of Termination Records | Number of Terminating Individuals | Number of Termination Records | Number of Terminating Individuals |
| 1969 | 5,009 | 3,992 | 790 | 727 |
| 1970 | 8,606 | 6,069 | 2,126 | 1,908 |
| 1971 | 12,955 | 8,874 | 2,246 | 2,197 |
| 1972 | 15,685 | 10,353 | 4,997 | 3,888 |
| 1973 | 19,985 | 15,588 | 11,525 | 9,071 |
| 1974 | 30,389 | 21,499 | 16,946 | 11,603 |
| 1975 | 44,676 | 27,415 | 38,376 | 22,627 |
| 1976 | 70,230 | 40,079 | 63,593 | 35,294 |
| 1977 | 88,295 | 42,183 | 81,074 | 36,864 |
| 1978 | 96,010 | 44,541 | 85,308 | 37,359 |
| 1979 | 133,470 | 58,913 | 118,218 | 48,305 |
| 1980 | 175,408 | 73,662 | 162,515 | 65,092 |
| 1981** | 205,103 | 73,004 | 196,104 | 67,908 |
| 1982** | 200,191 | 67,589 | 192,314 | 63,848 |
| 1983** | 243,229 | 76,202 | 234,803 | 72,869 |
| 1984** | 294,556 | 77,251 | 284,144 | 74,182 |

*Commercial nuclear power reactors; industrial radiographers; fuel processors, fabricators, and reprocessors; manufacturers and distributors of specified quantities of byproduct materials; low-level waste disposal facilities; and independent spent fuel storage installations.

**Additional termination data for these years have now been entered into the REIR System and the corresponding figures have been updated.

## 5.3 Transient Workers per Calendar Quarter

One use of the information contained in the termination reports is the examination of the doses being received by short-term workers. Since nearly half of the termination reports indicated periods of exposure that were less than 90 days, it is possible that several thousand individuals could have been employed by two or more licensees during the same calendar quarter. Thus, in this report, a "quarterly transient" worker is defined to be an individual who began and terminated employment at two or more different licensed facilities within one calendar quarter. This allows one to examine the doses of those workers most likely to approach the quarterly limits without their employer's knowledge since they move so rapidly among facilities.

Table 5.2 displays some of the information gathered from these termination reports that were submitted by all covered licensees and by licensed nuclear power facilities, separately. One can quickly see that the vast majority of these individuals are monitored by nuclear power facilities. The number of these individuals increased about tenfold during the past ten years from 332 in 1974 to 3,284 in 1984, and yet the average individual dose (which is close to being a quarterly dose for these workers) has steadily decreased over these years to a value of .34 rem (cSv) for 1984. As previously noted, there are no data yet available for 1985.

The bottom half of the table separates the information shown for power reactor licensees into that for reactor workers employed by two, three, and four or more different reactor licensees. The table shows that most of these transients were reported by two different licensees during a quarter. The smaller number of workers terminated by three licensees received the same or higher average doses than those terminated by two employers every year until 1983. In 1983, for the first time workers terminating from three nuclear power licensees received a lesser average dose than those workers terminated by two such licensees, and in 1984 the average dose is about the same for these workers. This is believed to be a reflection of the industry's efforts to reduce the exposure of all individuals working at their facilities.

Examination of these records also revealed that some individuals have worked for as many as six different NRC licensees during one calendar quarter. However, on the average, less than two instances per year have been found in which a worker exceeded his quarterly limit of three rems (cSv) as a result of his working at two or more different licensed facilities within one calendar quarter. In a few of these instances, the doses that the workers had received while employed by the first utility were revised upward later in the year. The underestimates resulted in quarterly doses that slightly exceeded three rems (cSv). A very few quarterly exposures exceeding three rems (cSv) may have gone undetected because a worker's dose was received over a period spanning a calendar quarter and was reported for the entire period. When this happens, it is not possible to determine the portion of the dose received during each quarter.

## 5.4 Transient Workers per Calendar Year at Nuclear Power Facilities

Since the number of transient workers per calendar quarter comprise only a

TABLE 5.2

TRANSIENT WORKERS PER CALENDAR QUARTER

1973 - 1984

| All Covered Licensees | | | | Power Reactor Facilities | | | |
|---|---|---|---|---|---|---|---|
| Year | No. of Persons Terminated by Two or more Licensees Within One Quarter | Collective Dose (person-rems person-cSv) | Average Individual Dose (rem or cSv) | Year | No. of Persons Terminated by Two or more Licensees Within One Quarter | Collective Dose (person-rems person-cSv) | Average Individual Dose (rem or cSv) |
| 1973 | 157 | 138 | 0.88 | 1973 | 146 | 123 | 0.84 |
| 1974 | 332 | 170 | 0.51 | 1974 | 285 | 158 | 0.55 |
| 1975 | 709 | 508 | 0.72 | 1975 | 684 | 493 | 0.72 |
| 1976 | 1,299 | 904 | 0.70 | 1976 | 1,257 | 889 | 0.71 |
| 1977 | 1,481 | 870 | 0.59 | 1977 | 1,437 | 851 | 0.59 |
| 1978 | 1,570 | 720 | 0.46 | 1978 | 1,500 | 680 | 0.45 |
| 1979 | 1,809 | 836 | 0.46 | 1979 | 1,754 | 802 | 0.46 |
| 1980 | 2,355 | 1,063 | 0.45 | 1980 | 2,218 | 1,033 | 0.47 |
| 1981 | 2,344 | 955 | 0.41 | 1981 | 2,335 | 952 | 0.41 |
| 1982* | 2,428 | 935 | 0.39 | 1982* | 2,396 | 914 | 0.38 |
| 1983* | 2,774 | 913 | 0.33 | 1983* | 2,728 | 886 | 0.32 |
| 1984* | 3,284 | 1,122 | 0.34 | 1984* | 3,223 | 1,090 | 0.34 |

Power Reactor Facilities

| Year | No. of Workers Terminated by Two Licensees | Collective Dose | Average Dose | No. of Workers Terminated by Three Licensees | Collective Dose | Average Dose | No. of Workers Terminated by >Three Licensees | Collective Dose | Average Dose |
|---|---|---|---|---|---|---|---|---|---|
| 1973 | 133 | 108 | 0.81 | 11 | 13 | 1.18 | 2 | 2 | 1.00 |
| 1974 | 255 | 132 | 0.52 | 28 | 24 | 0.86 | 2 | 1 | 0.50 |
| 1975 | 609 | 427 | 0.70 | 70 | 62 | 0.89 | 5 | 4 | 0.80 |
| 1976 | 1,095 | 720 | 0.66 | 145 | 146 | 1.01 | 17 | 23 | 1.35 |
| 1977 | 1,271 | 718 | 0.56 | 147 | 115 | 0.78 | 17 | 18 | 1.06 |
| 1978 | 1,303 | 590 | 0.45 | 165 | 75 | 0.45 | 32 | 15 | 0.47 |
| 1979 | 1,527 | 647 | 0.43 | 178 | 130 | 0.73 | 49 | 25 | 0.51 |
| 1980 | 1,896 | 856 | 0.45 | 259 | 140 | 0.54 | 63 | 36 | 0.57 |
| 1981 | 1,967 | 780 | 0.40 | 308 | 145 | 0.47 | 60 | 27 | 0.45 |
| 1982* | 2,047 | 789 | 0.39 | 288 | 113 | 0.39 | 61 | 12 | 0.20 |
| 1983* | 2,276 | 767 | 0.34 | 362 | 101 | 0.28 | 90 | 18 | 0.20 |
| 1984* | 2,677 | 907 | 0.34 | 414 | 146 | 0.35 | 132 | 37 | 0.28 |

*Figures for these years have been updated because additional termination data have now been entered into the REIR System.

TABLE 5.3

TRANSIENT WORKERS PER CALENDAR YEAR AT NUCLEAR POWER FACILITIES

1977 - 1984

| Year | No. of Commercial Reactors | No. of Workers Terminated by Two or More Licensees | Collective Dose (person-rems person cSv) | Average Dose (rems or cSv) |
|---|---|---|---|---|
| 1977 | 57 | 3,161 | 3,776 | 1.19 |
| 1978 | 64 | 3,202 | 3,231 | 1.01 |
| 1979 | 68 | 3,938 | 3,891 | 0.99 |
| 1980 | 69 | 5,463 | 6,028 | 1.10 |
| 1981 | 71 | 5,425 | 5,381 | 0.99 |
| 1982 | 75 | 5,303 | 5,610 | 1.06 |
| 1983* | 76 | 6,340 | 6,675 | 1.05 |
| 1984* | 79 | 7,403 | 7,763 | 1.05 |

| Year | No. of Workers Terminated by Two Licensees | Collective Dose | Average Dose | No. of Workers Terminated by Three Licensees | Collective Dose | Average Dose | No. of Workers Terminated by >Three Licensees | Collective Dose | Average Dose |
|---|---|---|---|---|---|---|---|---|---|
| 1977 | 2,166 | 1,987 | 0.92 | 572 | 842 | 1.47 | 423 | 947 | 2.24 |
| 1978 | 2,119 | 1,490 | 0.70 | 621 | 792 | 1.28 | 462 | 949 | 2.05 |
| 1979 | 2,761 | 2,097 | 0.76 | 688 | 805 | 1.17 | 489 | 989 | 2.02 |
| 1980 | 3,772 | 3,444 | 0.91 | 959 | 1,245 | 1.30 | 732 | 1,339 | 1.83 |
| 1981 | 3,745 | 3,033 | 0.81 | 924 | 1,172 | 1.27 | 756 | 1,176 | 1.56 |
| 1982 | 3,645 | 3,349 | 0.92 | 913 | 1,131 | 1.24 | 745 | 1,130 | 1.52 |
| 1983* | 4,203 | 3,624 | 0.86 | 1,256 | 1,694 | 1.39 | 881 | 1,357 | 1.53 |
| 1984* | 4,868 | 4,034 | 0.83 | 1,420 | 1,924 | 1.35 | 1,115 | 1,805 | 1.62 |

*Figures for these years have been updated because additional termination data have now been entered into the REIR System.

small percentage of the total number of individuals terminating each year, it was decided to change the criteria so that the records of more workers would be examined. This was done by selecting the records of all individuals who began and terminated two or more periods of employment with at least two different reactor facilities within one calendar year and summing each worker's whole body doses. An examination of these data would allow one to determine the number and average dose for these "annual transients." Since more than 95% of these transients are reported by nuclear power facilities, only the termination records of these individuals were examined in detail. Table 5.3 summarizes the number and doses of the transients found among the individuals terminating during the eight years from 1977 through 1984. The number of these workers increased from about 3,200 workers in 1977 to about 7,400 in 1984. After a sharp peak of about 6,000 person-rems (person-cSv) in 1980, the collective dose incurred by these workers decreased to about 5,400 person-rems (person-cSv) in 1981 and then began increasing again to a value of 7,763 person-rems (person-cSv) in 1984. The average dose, however, has remained constant at about 1.05 rem (cSv) during this period. The lower portion of Table 5.3 shows the number and doses of workers who were terminated by two, three, and four or more different licensees during each calendar year.

Another way in which the distribution of the doses received by transient workers can be useful is in the determination of the impact that the inclusion of these individuals in each of two or more licensee's annual reports had on the annual summary (Table 4.4) for all nuclear power facilities (one of the problems mentioned in Section 2). Table 5.4a shows the corrected distribution of transient worker doses as determined from the above-mentioned termination reports and compares it with the distribution of the doses of these workers as they would have appeared in a summation of the annual statistical reports submitted by each of the nuclear power facilities. During each of the years shown, each of the transient workers was counted an average of 2.6 times. This was not surprising because some individuals were reported by as many as nine different facilities.

Table 5.4b illustrates the impact that the multiple reporting of these transient workers had on the staff's summation of the annual statistical reports for the years 1978 through 1984. Since each nuclear power facility reports the distribution of the doses received by workers while monitored by the particular facility during the year, one would expect 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 dose (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 distribution, and average dose 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 1983 the summation of annual reports indicated that 85,839 workers received a measurable dose, 85 of whom received doses greater than five rems (cSv). After accounting for those individuals that were reported more than once, the corrected distribution indicated that there were only 81,177 workers that received a measurable dose and that 169 of them received doses greater than five rems (cSv). This resulted in an average measurable dose of 0.76 rem (cSv) rather than the 0.65 rem (cSv) obtained from a summation of the reports.

# TABLE 5.4a

## REPORTED AND CORRECTED DOSE DISTRIBUTIONS OF TRANSIENT WORKERS PER CALENDAR YEAR AT POWER REACTORS

| Type of Distribution and Year | Number of Individuals with Whole Body Doses in the Ranges (rems or cSv) | | | | | | | | | | | | | | | | [b]Collective Dose (Person-rem or -cSv) | Avg. Dose (rem or cSv) | Avg. Measurable Dose (rem or cSv) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Less than Measurable | Meas'ble <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 | 5.0-6.0 | 6.0-7.0 | 7.0-8.0 | 8.0-9.0 | 9.0-10.0 | >10 | Total Individuals | | | |
| Corrected Distribution of Transients - 1978 | 308 | 885 | 317 | 282 | 177 | 131 | 463 | 307 | 168 | 107 | 42 | 13 | 1 | 0 | 1 | | 3,202 | 3,231 | 1.01 | 1.12 |
| Reported Distribution of Transients - 1978 | 2,079 | 2,423 | 918 | 788 | 488 | 382 | 873 | 262 | 51 | 11 | 0 | 2 | | | | | 8,277 | 3,231 | 0.39 | 0.52 |
| Corrected Distribution of Transients - 1979 | 373 | 883 | 398 | 358 | 281 | 240 | 678 | 410 | 195 | 71 | 32 | 14 | 4 | 1 | | | 3,938 | 3,888 | 0.99 | 1.09 |
| Reported Distribution of Transients - 1979 | 2,130 | 2,676 | 1,259 | 1,048 | 673 | 460 | 1,040 | 313 | 46 | 13 | 1 | | | | | | 9,649 | 3,888 | 0.40 | 0.52 |
| Corrected Distribution of Transients - 1980 | 533 | 1,175 | 565 | 482 | 388 | 277 | 829 | 595 | 353 | 174 | 47 | 25 | 15 | 4 | 1 | | 5,463 | 6,028 | 1.10 | 1.22 |
| Reported Distribution of Transients - 1980 | 3,207 | 3,910 | 1,639 | 1,398 | 900 | 661 | 1,632 | 503 | 74 | 29 | 4 | 4 | 4 | | | | 13,955 | 6,028 | 0.43 | 0.56 |
| Corrected Distribution of Transients - 1981 | 562 | 1,271 | 482 | 422 | 380 | 310 | 954 | 614 | 275 | 107 | 30 | 17 | 0 | 1 | | | 5,425 | 5,381 | 0.99 | 1.08 |
| Reported Distribution of Transients - 1981 | 3,640 | 3,767 | 1,473 | 1,418 | 963 | 716 | 1,550 | 349 | 69 | 8 | 1 | 1 | | | | | 13,955 | 5,381 | 0.39 | 0.52 |
| Corrected Distribution of Transients - 1982 | 623 | 1,226 | 452 | 397 | 332 | 286 | 867 | 536 | 339 | 184 | 42 | 18 | 1 | 0 | 0 | 1 | 5,303 | 5,610 | 1.06 | 1.20 |
| Reported Distribution of Transients - 1982 | 3,803 | 3,480 | 1,432 | 1,308 | 842 | 661 | 1,502 | 506 | 87 | 20 | 1 | | | | | | 13,642 | 5,610 | 0.41 | 0.57 |
| Corrected Distribution of Transients - 1983 | 881 | 1,480 | 513 | 445 | 367 | 320 | 975 | 663 | 420 | 185 | 61 | 24 | 4 | 2 | | | 6,340 | 6,675 | 1.05 | 1.22 |
| Reported Distribution of Transients - 1983 | 4,904 | 4,273 | 1,529 | 1,397 | 986 | 752 | 1,801 | 642 | 101 | 13 | 5 | 2 | | | | | 16,405 | 6,675 | 0.41 | 0.58 |
| Corrected Distribution of Transients - 1984 | 1,043 | 1,748 | 539 | 510 | 406 | 361 | 1,148 | 844 | 536 | 197 | 52 | 19 | | | | | 7,403 | 7,762 | 1.05 | 1.22 |
| Reported Distribution of Transients - 1984 | 5,757 | 5,120 | 1,826 | 1,692 | 1,184 | 930 | 2,335 | 611 | 93 | 7 | 0 | | | | | | 19,555 | 7,762 | 0.40 | 0.56 |

[a]Includes data from Fort St. Vrain.
[b]Collective dose found by summing the actual doses reported for those workers on their termination reports.
[c]Distribution found by subtracting the corrected from the reported distribution shown in Table 5.4a and then subtracting this difference from the reported statistical distribution shown in Table 5.4b.

TABLE 5.4b
EFFECTS OF TRANSIENT WORKERS ON ANNUAL STATISTICAL COMPILATIONS

| Type of Distribution and Year | Number of Individuals with Whole Body Doses in the Ranges (rems or cSv) | | | | | | | | | | | | | | | | Total Individuals | [b]Collective Dose (Person-rem or -cSv) | Avg. Dose (rem or cSv) | Avg. Measurable Dose (rem or cSv) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Less than Measurable | Meas'ble <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 | 5.0-6.0 | 6.0-7.0 | 7.0-8.0 | 8.0-9.0 | 9.0-10.0 | >10 | | | | |
| [a]Reported Statistical Distribution - 1978 | 31,039 | 16,673 | 6,943 | 5,504 | 3,399 | 2,498 | 6,405 | 2,989 | 1,080 | 418 | 67 | 26 | 8 | 0 | 0 | 2 | 77,051 | 31,806 | 0.41 | 0.69 |
| [c]Corrected Statistical Distribution - 1978 | 29,268 | 15,135 | 6,342 | 4,998 | 3,088 | 2,247 | 5,995 | 3,034 | 1,197 | 514 | 109 | 37 | 9 | 0 | 1 | 2 | 71,976 | 31,668 | 0.45 | 0.74 |
| [a]Reported Statistical Distribution - 1979 | 42,340 | 24,632 | 9,883 | 8,090 | 5,147 | 3,426 | 7,898 | 3,306 | 1,255 | 477 | 86 | 28 | 13 | 2 | 0 | 1 | 106,584 | 39,987 | 0.38 | 0.62 |
| [c]Corrected Statistical Distribution - 1979 | 40,583 | 22,831 | 9,022 | 7,400 | 4,755 | 3,206 | 7,536 | 3,403 | 1,404 | 545 | 117 | 42 | 17 | 3 | 0 | 1 | 100,865 | 39,525 | 0.39 | 0.66 |
| [a]Reported Statistical Distribution - 1980 | 47,377 | 29,695 | 11,751 | 9,820 | 6,082 | 4,518 | 11,474 | 4,515 | 1,537 | 686 | 192 | 98 | 18 | 3 | | | 128,668 | 53,799 | 0.42 | 0.67 |
| [c]Corrected Statistical Distribution - 1980 | 44,703 | 26,960 | 10,677 | 8,904 | 5,570 | 4,134 | 10,671 | 4,607 | 1,816 | 831 | 235 | 119 | 29 | 7 | 1 | | 120,166 | 53,626 | 0.45 | 0.72 |
| [a]Reported Statistical Distribution - 1981 | 42,323 | 29,332 | 12,217 | 10,326 | 6,625 | 4,903 | 11,766 | 4,546 | 1,763 | 486 | 93 | 81 | 11 | 2 | 1 | 1 | 124,506 | 54,152 | 0.43 | 0.66 |
| [c]Corrected Statistical Distribution - 1981 | 39,245 | 25,836 | 11,226 | 9,330 | 6,042 | 4,497 | 11,170 | 4,811 | 1,969 | 585 | 122 | 91 | 11 | 3 | 1 | 1 | 115,946 | 54,142 | 0.47 | 0.71 |
| [a]Reported Statistical Distribution - 1982 | 45,871 | 31,502 | 12,693 | 10,814 | 6,739 | 4,795 | 10,855 | 4,686 | 1,814 | 432 | 56 | 13 | 4 | 0 | 1 | | 130,275 | 52,191 | 0.40 | 0.62 |
| [c]Corrected Statistical Distribution - 1982 | 42,691 | 29,248 | 11,713 | 9,903 | 6,229 | 4,420 | 10,220 | 4,716 | 2,066 | 596 | 97 | 31 | 5 | 0 | 1 | 1 | 121,937 | 52,191 | 0.43 | 0.66 |
| [a]Reported Statistical Distribution - 1983 | 52,568 | 32,567 | 12,429 | 10,474 | 6,617 | 4,798 | 12,379 | 5,369 | 1,957 | 544 | 65 | 16 | 4 | | | | 139,787 | 57,212 | 0.41 | 0.65 |
| [c]Corrected Statistical Distribution - 1983 | 48,545 | 29,774 | 11,413 | 9,522 | 5,998 | 4,366 | 11,553 | 5,390 | 2,276 | 716 | 121 | 38 | 8 | 2 | | | 129,722 | 57,212 | 0.44 | 0.76 |
| [a]Reported Statistical Distribution - 1984 | 60,330 | 41,095 | 15,223 | 11,916 | 7,467 | 5,630 | 13,213 | 5,140 | 1,710 | 295 | | | | | | | 162,019 | 57,487 | 0.39 | 0.58 |
| [c]Corrected Statistical Distribution - 1984 | 55,606 | 37,723 | 13,936 | 10,734 | 6,689 | 5,061 | 12,026 | 5,364 | 2,153 | 485 | 52 | 19 | | | | | 149,848 | 57,487 | 0.51 | 0.72 |

[a]Includes data from Fort St. Vrain.
[b]Collective dose found by summing the actual doses reported for those workers on their termination reports.
[c]Distribution found by subtracting the corrected from the reported distribution shown in Table 5.4a and then subtracting this difference from the reported statistical distributi shown in Table 5.4b.

Since the number of transient workers receiving measurable doses is only about 5% of the total number of workers receiving measurable doses during the year, their impact on most of the statistics derived from compilations of the annual summary reports is not very great. However, when examining the number of annual doses exceeding five rems, one finds that the corrected statistical distribution (Table 5.4a) indicates that the number of workers who received doses greater than five rems (cSv) was between 50 and 70 more than the number found in the reported statistical distribution for each year. This is more clearly shown in Table 5.5, where it can be seen that in 1984 the corrected number of transient workers receiving doses greater than five rems (cSv) was 71, as opposed to zero reported doses in excess of five rems. This corrected number of workers (71) represents a significant decrease from previous years and reflects the industry's concerted efforts to keep annual doses of all workers under five rems.

TABLE 5.5

ANNUAL WHOLE BODY DOSES EXCEEDING FIVE REMS (cSv)
AT NUCLEAR POWER FACILITIES

| Year | Reported Number >5 Rems (cSv) | Corrected Number >5 Rems (cSv) | Percent of Workers |
|---|---|---|---|
| 1977 | 270 | 351 | 0.9 |
| 1978 | 103 | 158 | 0.4 |
| 1979 | 130 | 180 | 0.3 |
| 1980 | 311 | 391 | 0.5 |
| 1981 | 189 | 235 | 0.3 |
| 1982 | 74 | 135 | 0.2 |
| 1983* | 85 | 168 | 0.2 |
| 1984* | 0 | 71 | <0.1 |

*Figures for these years have been updated because additional termination data have now been entered into the REIR System.

## 5.5 Temporary Workers per Calendar Year at Nuclear Power Facilities

To complete the examination of the doses received by the short-term workers employed at nuclear power facilities, Table 5.6 summarizes the data compiled on "temporary workers." For purposes of this report, temporary workers were defined to be those individuals who began and ended their employment at only one nuclear power facility during the calendar year. Table 5.6 shows that the number of these temporary individuals has increased by 77% between 1977 and 1984 while the number of reactors has increased by about 40% during this time. The number of temporary workers receiving a measurable dose, however, has increased by only 51%. The average dose per monitored individual remains at about 0.30 rem (cSv) and, since about half of them received less than measurable doses, the average measurable dose for 1984 is 0.54 rem (cSv). Comparison of these figures with those in Table 5.4b reveals that

these workers comprised 31% of the total number of workers receiving a measurable dose in 1984 (94,242), while their collective dose was only 27% of the total collective dose. Their average measurable dose of 0.54 rem (cSv) was also considerably less than the overall average of 0.72 rem (cSv).

TABLE 5.6

TEMPORARY WORKERS PER CALENDAR YEAR
AT NUCLEAR POWER FACILITIES
(Individuals Terminated by Only One Employer)

| Year | No. of Reactors | Number of Temps. Monitored | Number with Measurable Doses | Collective Dose (person-rems person-cSv) | Average Dose (rem or cSv) | Average Measurable Dose (rem or cSv) |
|---|---|---|---|---|---|---|
| 1977 | 57 | 29,090 | 19,094 | 11,373 | 0.39 | 0.60 |
| 1978 | 64 | 28,864 | 17,110 | 9,821 | 0.34 | 0.57 |
| 1979 | 68 | 38,347 | 21,491 | 9,488 | 0.25 | 0.44 |
| 1980 | 69 | 48,383 | 28,305 | 16,168 | 0.33 | 0.57 |
| 1981 | 71 | 48,265 | 28,675 | 16,755 | 0.35 | 0.58 |
| 1982 | 75 | 44,503 | 25,646 | 14,266 | 0.32 | 0.56 |
| 1983* | 76 | 50,903 | 26,682 | 16,007 | 0.31 | 0.60 |
| 1984* | 79 | 51,502 | 28,820 | 15,549 | 0.30 | 0.54 |

*Figures for these years have been updated because additional termination data have now been entered into the REIR System.

# 6 PERSONNEL OVEREXPOSURES - 10 CFR § 20.403 and 10 CFR § 20.405

## 6.1 Control Levels

One requirement of the above-referenced sections of Part 20, Title 10, Chapter I, Code of Federal Regulations, is that all persons licensed by the NRC must submit reports of all occurrences involving personnel radiation exposures that exceed certain control levels, thus providing for investigations and corrective actions as necessary. The term "overexposure" is not necessarily intended to indicate that a worker has been subjected to an unacceptable biological risk. Based on the magnitude of the exposure, the occurrence may be placed into one of three categories:

(1) Category A

10 CFR § 20.403(a)(1) - Exposure of the whole body of any individual to 25 rems (cSv) or more; exposure to the skin of the whole body of any individual to 150 rems (cSv) or more; or exposure of the extremities (feet, ankles, hands or forearms) of any individual to 375 rems (cSv) or more. The Commission must be notified immediately of these events.

(2) Category B

10 CFR § 20.403(b)(1) - Exposure of the whole body of any individual to 5 rems (cSv) or more; exposure of the skin of the whole body of any individual to 30 rems (cSv) or more; or exposure of the extremities to 75 rems (cSv) or more. The Commission must be notified within 24 hours of these events.

(3) Category C

10 CFR § 20.405 - Exposure of any individual to radiation or concentrations of radioactive material that exceeds any applicable quarterly limit in Part 20 [§ 20.101 or § 20.104(b)] or in the licensee's license but is less than the values given above. This includes reports of whole body exposures that exceed 1.25 rems (cSv), or that exceed 3 rems (cSv), as discussed in Section 3.2. Reports of skin exposures that exceed 7.5 rems (cSv) and extremity exposures that exceed 18.75 rems (cSv) are included, and reports of exposures of individuals to concentrations in excess of the levels given in 10 CFR § 20.103 and Appendix B usually fall into this category as well. These reports must be submitted to the Commission within 30 days of the occurrence.

## 6.2 Summary of Overexposures

Table 6.1 summarizes all the occupational overexposures to external sources of radiation as reported by Commission licensees pursuant to § 20.403 and § 20.405 during the years 1978 through 1985. For 1983, 1984, and 1985, it shows the number of individuals that exceeded various limits while employed by one of several types of licensees. For the years 1978 through 1982, only the overexposures reported by licensed industrial radiography firms are shown separately. Most of the occurrences included in the "Others" category

# TABLE 6.1
# PERSONNEL OVEREXPOSURES TO EXTERNAL RADIATION
# 1978-1985

| YEAR | LICENSE CATEGORY | PERSONS AND DOSES (REM) | TYPES OF OVEREXPOSURES AND DOSES | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | WHOLE BODY (REMS) | | | SKIN (REMS) | | | EXTREMITY (REMS) | | |
| | | | (<5) | (>5<25) | (>25) | (>7.5<30) | (>30<150) | (>150) | (>18.75<75) | (>75<375) | (>375) |
| 1985 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | 5 | 3 | 1 | | | | | 1 | |
| | | SUM OF DOSES | 13.3 | 32.6 | 27.0 | | | | | 288 | |
| | POWER REACTORS | NO. OF PERSONS | 3 | | | 1 | | | | | |
| | | SUM OF DOSES | 3.3 | | | 10.8 | | | | | |
| | MEDICAL FACILITIES | NO. OF PERSONS | 3 | | | | | | | | |
| | | SUM OF DOSES | 6.7 | | | | | | | | |
| | MARKETING & MANUFACT. | NO. OF PERSONS | | | | | | | 2 | 1 | |
| | | SUM OF DOSES | | | | | | | 38.7 | 93 | |
| | OTHERS | NO. OF PERSONS | 1 | | | | 1 | | 1 | | |
| | | SUM OF DOSES | 1.8 | | | | 38.0 | | 21.5 | | |
| 1984 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | 3 | 1 | | | | | 3 | | |
| | | SUM OF DOSES | 12.5 | 8.2 | | | | | 127.9 | | |
| | POWER REACTORS | NO. OF PERSONS | 3 | | | | | | | | |
| | | SUM OF DOSES | 7.6 | | | | | | | | |
| | MEDICAL FACILITIES | NO. OF PERSONS | 2 | 1 | | | | | 1 | | |
| | | SUM OF DOSES | 5.7 | 5.2 | | | | | 18.8 | | |
| | MARKETING & MANUFACT. | NO. OF PERSONS | | | | | | | 1 | | |
| | | SUM OF DOSES | | | | | | | 21.8 | | |
| | OTHERS | NO. OF PERSONS | 1 | | | | | | 3 | | |
| | | SUM OF DOSES | 1.7 | | | | | | 70.1 | | |
| 1983 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | 1 | | | | | | | | 1 |
| | | SUM OF DOSES | 4.7 | | | | | | | | 650 |
| | POWER REACTORS | NO. OF PERSONS | 8 | | | | | | | | |
| | | SUM OF DOSES | 14.9 | | | | | | | | |
| | MEDICAL FACILITIES | NO. OF PERSONS | 3 | | | | | | | | |
| | | SUM OF DOSES | 5.2 | | | | | | | | |
| | MARKETING & MANUFACT. | NO. OF PERSONS | | 1[a] | | | | | 2 | | |
| | | SUM OF DOSES | | 25 | | | | | 49.5 | | |
| | OTHERS | NO. OF PERSONS | | | | | | | 25 | 2 | |
| | | SUM OF DOSES | | | | | | | 837 | 228 | |
| 1982 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | 6 | 3 | | | | | | | |
| | | SUM OF DOSES | 16.1 | 20.7 | | | | | | | |
| | ALL OTHERS | NO. OF PERSONS | 5[b] | 1 | | | | | 15 | 2 | |
| | | SUM OF DOSES | 12.5 | 9.4 | | | | | 569 | 206 | |
| 1981 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | 7 | 1 | | | | | | | |
| | | SUM OF DOSES | 12.2 | 7.1 | | | | | | | |
| | ALL OTHERS | NO. OF PERSONS | 10 | 2[c] | | 1 | | | 4 | | |
| | | SUM OF DOSES | 24.1 | 30.9 | | 8.1 | | | 102.9 | | |
| 1980 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | 4 | 1 | | | | | 1 | | |
| | | SUM OF DOSES | 23.6 | 7.7 | | | | | 56 | | |
| | ALL OTHERS | NO. OF PERSONS | 84 | | | | | | 3 | | 3 |
| | | SUM OF DOSES | 285.4[d] | | | | | | 73.5 | | 33,000 |
| 1979 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | 8[d] | 3 | | | | | | | |
| | | SUM OF DOSES | 25.9 | 34.6 | | | | | | | |
| | ALL OTHERS | NO. OF PERSONS | 30 | 3[e] | | 7 | 1 | 2[f] | 15 | 1[g] | |
| | | SUM OF DOSES | 65.0 | 39.0 | | 125.7 | 40.0 | 327 | 468.1 | 147 | |
| 1978 | INDUSTRIAL RADIOGRAPHY | NO. OF PERSONS | 4 | 1 | | | | | | 1 | |
| | | SUM OF DOSES | 15.3 | 21.6 | | | | | | 150 | |
| | ALL OTHERS | NO. OF PERSONS | 12 | 4 | 1 | 2 | | | 2 | | |
| | | SUM OF DOSES | 36.0 | 51.9 | 27.3 | 18.2 | | | 49.2 | | |

[a] This person simultaneously received an extremity overexposure of 61 rems (cSv) that is not shown.
[b] One of these persons simultaneously received a skin overexposure of 15.2 rems (cSv) that is not shown.
[c] One of these persons simultaneously received an extremity overexposure of 21 rems (cSv) that is not shown.
[d] One of these persons simultaneously received an extremity overexposure of 46 rems (cSv) that is not shown.
[e] One of these persons simultaneously received an extremity overexposure of 45 rems (cSv) that is not shown.
[f] These two persons simultaneously received extremity overexposures of 82 and 38 rems (cSv) that are not shown.
[g] This person simultaneously received a skin overexposure of 13 rems (cSv) that is not shown.

come from research facilities, universities and measuring and well-logging activities. In 1980 the total number of individuals reported as being overexposed was 96, a considerable increase over the numbers reported for other years. This increase was due to the overexposure of some 67 individuals at one nuclear power facility during steam generator repair work. They received doses between three and five rems. In 1984, the total number of overexposed individuals was 19, which was the lowest number reported during the years shown. In 1985, the number of individuals increased somewhat to 23, and the highest whole body dose was 27 rem (cSv).In each of the years from 1978 through 1984, the highest whole body doses were 27.3, 17.0, 7.7, 21, 9.4, 25, and 8.2 rems (cSv), respectively.

In 1985, there were six incidents in which external exposures of the magnitude described in Category A or B were received by seven individuals. A summary of these incidents is provided below. The first four incidents occurred during industrial radiography operations, and the remaining two incidents occurred at a chemistry laboratory and a university.

On February 7, 1985, two radiographers were conducting radiography of reheat tubes located inside the reheat boiler of a fossil fuel power generating station. One radiographer received a whole body dose of 7.96 rems when he failed to completely retract the 93-curie iridium-192 source to its shielded position, and he entered the radiation area without surveying the exposure device. The second radiographer surveyed the device, alerted the first radiographer to leave the area and properly retracted the source.

On June 14, 1985, two unsupervised radiographer's assistants were performing radiographic exposures of furnace boiler tubes using a 61-curie iridium-192 source. One radiographer's assistant received an extremity dose between 96 and 288 rems to the left hand when he failed to properly perform a survey of the exposure device and as a result, his hand was in close proximity to the unshielded source when he disconnected the guide tube.

During August 1 and August 2, 1985, two radiographers were conducting radiography on a pipeline near Table Rock, Wyoming. They received whole body doses of 27 rems and 9 rems when a 28-curie iridium-192 source failed to retract and remained in the unshielded tube. They failed to conduct proper surveys of their equipment, and the source remained undetected at the end of the source tube for two days.

The fourth radiography overexposure occurred on October 8, 1985, when two radiographers were conducting radiography on small diameter piping at an industrial facility in Olean, New York. When the radiographer noticed that the number on the film being used was incorrect, he started to retract the 100-curie iridium-192 source so that he could change the film number. However, after a conversation with the assistant radiographer about the problem, he neglected to retract the source, failed to survey the exposure device, entered the radiation area and received a whole body dose of 15.59 rems.

On November 18, 1985, a chem-technologist received an extremity dose of 93 rems averaged over a one square centimeter area on the thumb of the left hand. The chem-technologist was manipulating 200 mCi of carbon-14 (acetic anhydride) when she experienced difficulty in removing the syringe from the

rubber septum and attempted to grasp the needle with her PVC gloved hand. Contamination from the syringe and septum passed through the gloves to her hand during the attempt.

On the morning of May 7, 1985, a researcher at a university opened a vial containing 1.8 millicuries of a phosphorus-32 labeled compound. The researcher, who was not working behind a shield nor wearing a lab coat, was sprayed with the material when he opened it. It is believed that the vial somehow became pressurized either in the preparation for shipment or during shipment. The researcher did not survey himself or his lab after opening the vial, and the incident was not discovered until late in the day when another researcher was surveying nearby areas. Calculations determined that the researcher received a dose of approximately 38 rems to the skin of the whole body.

There were no instances in 1985 in which the intake of radioactive material exceeded the quarterly intake limit, nor were there any reports of personnel exposure to airborne concentrations of radioactive material in excess of applicable limits.

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# APPENDIX A

## Alphabetical Listing of Annual Exposure Data Compiled for Certain NRC Licensees

## 1985

# APPENDIX A

## INDUSTRIAL RADIOGRAPHERS Single Location - 1985

| Licensee Name | License Number | Total Individuals Monitored | Workers with Measurable Dose | Collective Dose (person-rems) | Average Meas'ble Dose (rems or cSv) |
|---|---|---|---|---|---|
| ABEX CORP | 48-13776-01 | 9 | 3 | 0 | 0.05 |
| ABEX CORP. | 34-24346-01 | 11 | 11 | 1 | 0.07 |
| ABEX CORPORATION | 29-01208-02 | 5 | 0 | 0 | 0.00 |
| AIR PRODUCTS AND CHEMICALS, IN | 37-05105-05 | 17 | 4 | 0 | 0.05 |
| ALLOY CRAFTS COMPANY | 13-17511-01 | 5 | 4 | 0 | 0.08 |
| ALONSO & CARUS IRON WORKS | 52-21350-01 | 7 | 3 | 0 | 0.13 |
| ANCHOR/DARLING VALVE COMPANY | 37-15476-01 | 6 | 4 | 0 | 0.05 |
| ARMY, DEPARTMENT OF THE | 13-18235-01 | 159 | 22 | 1 | 0.05 |
| ARMY, DEPARTMENT OF THE | 29-00047-06 | 166 | 39 | 2 | 0.05 |
| ARROW TANK & ENGINEERING COMPA | 22-13253-01 | 4 | 4 | 0 | 0.05 |
| ATLANTIC RESEARCH CORPORATION | 45-02808-04 | 16 | 16 | 5 | 0.34 |
| BABCOCK & WILCOX COMPANY | 34-02160-03 | 37 | 37 | 2 | 0.05 |
| BELOIT CORPORATION | 48-02412-02 | 2 | 0 | 0 | 0 00 |
| BORG-WARNER CORPORATION | 37-16828-01 | 11 | 2 | 0 | 0.05 |
| BRAND EXAMINATION SERVICES | 06-17156-01 | 20 | 15 | 16 | 1.04 |
| BRIGHTON CORP. | 34-21480-01 | 3 | 3 | 3 | 0.83 |
| BUCKEYE INTERNATIONAL | 34-06627-01 | 3 | 2 | 0 | 0.05 |
| CALUMET TESTING SERVICES INC. | 13-16347-01 | 38 | 25 | 21 | 0 82 |
| CATERPILLAR TRACTOR COMPANY | 12-18023-01 | 6 | 0 | 0 | 0 00 |
| CHICAGO BRIDGE AND IRON COMPAN | 12-05639-01 | 7 | 6 | 0 | 0.05 |
| COLT INDUSTRIES OPERATING CORP | 48-02387-03 | 5 | 0 | 0 | 0.00 |
| COLT INDUSTRIES OPERATING CORP | 48-02387-03 | 5 | 0 | 0 | 0.00 |
| CONNECTICUT, STATE OF | 06-06472-03 | 36 | 2 | 0 | 0.05 |
| CONSOLIDATED FOUNDRIES & MFG. | 34-04657-02 | 0 | 0 | 0 | 0.00 |
| CONSTRUCTION ENGINEERING CONSU | 37-18456-01 | 22 | 8 | 1 | 0.08 |
| COPES-VULCAN | 37-19530-01 | 1 | 1 | 0 | 0.38 |
| CRANE COMPANY - INDIAN ORCHARD | 20-00518-02 | 2 | 0 | 0 | 0.00 |
| DAY AND ZIMMERMANN INC. | 42-15051-02 | 3 | 3 | 0 | 0.05 |
| DELTAK CORP. | 22-21447-01 | 0 | 0 | 0 | 0.00 |
| DEPT. OF ARMY, MCALESTER ARMY | 35-19189-02 | 29 | 1 | 0 | 0.05 |
| DEPT. OF THE NAVY, NONDESTRUCT | 04-06145-03 | 11 | 0 | 0 | 0.00 |
| DODGE FOUNDRY AND MACHINE COMP | 37-15324-01 | 5 | 3 | 0 | 0.05 |
| DRAVO CORPORATION | 34-00850-02 | 10 | 2 | 0 | 0.05 |
| DUNCAN FOYNDRY & MACHINE WORKS | 12-09687-01 | 0 | 0 | 0 | 0.00 |
| DURALOY COMPANY (THE) | 37-02279-02 | 6 | 5 | 1 | 0.24 |
| DURIRON COMPANY INCORPORATED | 34-06398-01 | 5 | 5 | 1 | 0.27 |
| EMPIRE STEEL CASTINGS, INC. | 37-02448-01 | 3 | 1 | 0 | 0.38 |
| EXXON COMPANY U. S. A. | 25-03375-02 | 7 | 0 | 0 | 0.00 |

## INDUSTRIAL RADIOGRAPHERS Single Location - 1985

| Licensee Name | License Number | Total Individuals Monitored | Workers with Measurable Dose | Collective Dose (person-rems) | Average Meas'ble Dose (rems or cSv) |
|---|---|---|---|---|---|
| GENERAL ELECTRIC COMPANY | 20-00815-05 | 12 | 1 | 0 | 0.05 |
| GENERAL ELECTRIC COMPANY | 34-00499-10 | 3 | 1 | 0 | 0 05 |
| GENERAL MOTORS CORP. | 21-08678-04 | 4 | 0 | 0 | 0.00 |
| GENERAL MOTORS CORPORATION | 12-02251-01 | 4 | 0 | 0 | 0.00 |
| GENERAL MOTORS CORPORATION | 21-02392-01 | 3 | 0 | 0 | 0.00 |
| GENERAL MOTORS CORPORATION | 34-15315-02 | 8 | 0 | 0 | 0.00 |
| GLOBE X-RAY SERVICES INC | 35-15194-01 | 22 | 22 | 25 | 1.14 |
| GREDE FOUNDRIES INCORPORATED | 48-02844-01 | 3 | 1 | 0 | 0.05 |
| HARRISON STEEL CASTINGS COMPAN | 13-02141-01 | 6 | 4 | 1 | 0.31 |
| HESS OIL VIRGIN ISLAND CORPORA | 55-15533-02 | 11 | 4 | 0 | 0.08 |
| HIGH STEEL STRUCTURES INC. | 37-17534-01 | 9 | 5 | 0 | 0.05 |
| INDUSTRIAL RADIOGRAPHIC SERVIC | 55-16734-01 | 0 | 0 | 0 | 0.00 |
| INGERSOLL-RAND COMPANY | 29-02015-02 | 2 | 2 | 1 | 0.40 |
| INTERIOR, DEPARTMENT OF THE | 24-02619-02 | 6 | 3 | 0 | 0.05 |
| INTERIOR, DEPARTMENT OF THE | 36-01142-03 | 6 | 3 | 0 | 0.05 |
| JOHN DEERE FOUNDRY | 12-09111-01 | 3 | 3 | 0 | 0.05 |
| KELSEY-HAYES COMPANY INCORPORA | 12-02360-02 | 4 | 0 | 0 | 0.00 |
| LABARGE INC. | 35-15514-01 | 4 | 4 | 1 | 0.19 |
| LUKENS STEEL COMPANY | 37-02827-01 | 9 | 0 | 0 | 0.00 |
| LYNCHBURG FOUNDRY COMPANY | 45-17464-01 | 9 | 2 | 0 | 0.05 |
| MASON & HANGER-SILAS MASON COM | 16-17692-01 | 106 | 11 | 1 | 0.05 |
| MAYNARD ELECTRIC STEEL CASTING | 48-07080-01 | 4 | 4 | 2 | 0.46 |
| MINNEAPOLIS ELECTRIC STEEL CAS | 22-05572-02 | 2 | 2 | 0 | 0.05 |
| MINNESOTA VALLEY ENGINEERING | 22-24393-01 | 6 | 4 | 1 | 0.28 |
| MISSOURI STEEL CASTINGS COMPAN | 24-15152-01 | 5 | 0 | 0 | 0.00 |
| NATIONAL AERONAUTICS AND SPACE | 34-00507-04 | 34 | 15 | 1 | 0.06 |
| NATIONAL AERONAUTICS AND SPACE | 45-08886-02 | 4 | 0 | 0 | 0.00 |
| NAVY, DEPARTMENT OF THE | 04-06145-01 | 37 | 7 | 1 | 0.07 |
| NAVY, DEPARTMENT OF THE | 04-09369-01 | 99 | 1 | 0 | 0.05 |
| NAVY, DEPARTMENT OF THE | 28-01012-02 | 53 | 49 | 5 | 0.10 |
| NAVY, DEPARTMENT OF THE | 37-00314-06 | 44 | 11 | 1 | 0.07 |
| NAVY, DEPARTMENT OF THE | 39-06126-01 | 57 | 50 | 5 | 0.10 |
| NAVY, DEPARTMENT OF THE | 39-19047-01 | 10 | 0 | 0 | 0.00 |
| NAVY, DEPARTMENT OF THE | 39-19047-01 | 10 | 0 | 0 | 0.00 |
| NAVY, DEPARTMENT OF THE | 45-02757-01 | 26 | 2 | 0 | 0.05 |
| NAVY, DEPARTMENT OF THE | 45-17845-01 | 7 | 1 | 0 | 0.05 |
| NAVY, DEPARTMENT OF THE | 46-09611-01 | 3 | 0 | 0 | 0.00 |
| NAVY, DEPARTMENT OF THE | 46-19259-01 | 26 | 25 | 1 | 0 05 |

## APPENDIX A (cont.)

## INDUSTRIAL RADIOGRAPHERS Single Location - 1985

| Licensee Name | License Number | Total Individuals Monitored | Workers with Measurable Dose | Collective Dose (person-rems) | Average Meas'ble Dose (rems or cSv) |
|---|---|---|---|---|---|
| NAVY, DEPARTMENT OF THE | 53-06007-01 | 32 | 28 | 1 | 0.05 |
| NAVY, DEPT OF THE NAVAL AIR | 29-14031-02 | 4 | 0 | 0 | 0 00 |
| NAVY, DEPT. OF, USS FRANK CABL | 31-19283-01 | 14 | 13 | 3 | 0.25 |
| NILES STEEL TANK COMPANY | 21-04741-01 | 4 | 1 | 0 | 0.05 |
| NORTHWEST AIRLINES INC. | 22-12080-01 | 30 | 8 | 0 | 0.05 |
| OKLAHOMA STEEL CASTINGS CO. | 35-21159-01 | 7 | 2 | 0 | 0.05 |
| OZARK AIR LINES, INC. | 24-13591-01 | 24 | 2 | 0 | 0.11 |
| P. X. ENGINEERING COMPANY INC. | 20-15102-01 | 2 | 1 | 0 | 0.05 |
| PELTON CASTEEL INC | 48-02669-02 | 3 | 3 | 0 | 0.05 |
| PENNSYLVANIA SHIPBUILDING CO. | 37-21067-01 | 7 | 6 | 0 | 0.05 |
| PROFESSIONAL SERVICES INDUSTRI | 12-21501-01 | 15 | 15 | 1 | 0.05 |
| PROFESSIONAL SERVICES INDUSTRI | 24-20039-01 | 11 | 1 | 0 | 0.05 |
| PROGRESSIVE FABRICATORS | 24-21200-01 | 0 | 0 | 0 | 0.00 |
| QUAKER ALLOY CASTING COMPANY | 37-03671-01 | 19 | 16 | 4 | 0.24 |
| REFINERY PRODUCTS CORPORATION | 48-03665-02 | 3 | 3 | 1 | 0.33 |
| RICHMOND ENGINEERING COMPANY I | 45-02884-01 | 15 | 1 | 2 | 1.50 |
| SAWYER RESEARCH PRODUCT INC | 34-02044-01 | 6 | 3 | 0 | 0.09 |
| SHAFER VALVE CO. | 34-21198-01 | ′5 | 1 | 0 | 0.05 |
| SOUTHWESTERN ENGINEERING CO. | 24-19500-01 | 4 | 2 | 0 | 0.11 |
| ST. LOUIS STEEL CASTING, INC. | 24-01587-01 | 3 | 3 | 0 | 0.05 |
| STRUTHERS WELLS CORPORATION | 37-11152-01 | 15 | 8 | 0 | 0.05 |
| TAYLOR AND FENN COMPANY | 06-02024-01 | 2 | 0 | 0 | 0.00 |
| THIOKOL CHEMICAL CORPORATION | 01-00856-02 | 16 | 0 | 0 | 0.00 |
| THIOKOL CORPORATION | 17-16380-01 | 58 | 32 | 2 | 0.05 |
| TRANS WORLD AIRLINES INC | 24-05151-05 | 28 | 7 | 0 | 0.05 |
| U.S.A. WORTHINGTON PUMP CORPOR | 29-02210-02 | 4 | 0 | 0 | 0.00 |
| UNITED STATES PIPE AND FOUNDRY | 29-07262-01 | 3 | 0 | 0 | 0.00 |
| VOLLRATH COMPANY (THE) | 48-05395-01 | 6 | 0 | 0 | 0.00 |
| WEATHERLY FOUNDRY AND MANUFACT | 37-09859-01 | 2 | 0 | 0 | 0.00 |
| WEHR STEEL COMPANY | 48-02005-02 | 4 | 3 | 1 | 0.24 |
| WESTINGHOUSE ELECTRIC CORPORAT | 37-05809-02 | 5 | 1 | 0 | 0.05 |
| WHITING CORPORATION | 12-04921-01 | 4 | 0 | 0 | 0.00 |
| WILLIAM POWELL COMPANY (THE) | 34-02963-01 | 6 | 1 | 0 | 0.05 |
| WISCONSIN CENTRIFUGAL INCORPOR | 48-11641-01 | 4 | 4 | 3 | 0.70 |
| YUBA HEAT TRANSFER CORPORATION | 35-13735-01 | 3 | 3 | 2 | 0.60 |

## INDUSTRIAL RADIOGRAPHERS Multiple Location - 1985

| Licensee Name | License Number | Total Individuals Monitored | Workers with Measurable Dose | Collective Dose (person-rems) | Average Meas'ble Dose (rems or cSv) |
|---|---|---|---|---|---|
| A-1 INSPECTION, INC. | 49-21496-01 | 3 | 2 | 2 | 1.06 |
| ABC TESTING | 20-19778-01 | 18 | 10 | 2 | 0.20 |
| ADVANCED RADIATION SERVICE INC | 29-14171-01 | 8 | 3 | 2 | 0.71 |
| ADVEX CORPORATION | 45-16452-01 | 15 | 10 | 9 | 0.94 |
| AIR FORCE, DEPARTMENT OF THE | 09-15149-01 | 7 | 7 | 1 | 0.07 |
| ALASKA INDUSTRIAL X-RAY | 50-16084-01 | 7 | 6 | 1 | 0.23 |
| ALASKA WELDING CENTER | 50-19202-01 | 65 | 58 | 54 | 0.94 |
| ALLEGHENY LABS. | 37-20734-01 | 2 | 2 | 3 | 1.44 |
| ALLIED INSPECTION SERVICES INC | 21-18428-01 | 9 | 6 | 6 | 0.93 |
| ALLIS-CHALMERS HYDRO | 37-16280-03 | 14 | 5 | 0 | 0.05 |
| AMERICAN AIRLINES INC | 35-13964-01 | 92 | 32 | 2 | 0.08 |
| AMERICAN OIL COMPANY (THE) | 13-00155-10 | 21 | 17 | 1 | 0.07 |
| AMOCO OIL COMPANY | 45-01378-02 | 14 | 4 | 1 | 0.14 |
| ANP PIPELINE CO, LABORATORY SE | 21-24502-01 | 6 | 3 | 0 | 0.09 |
| ARMY, DEPARTMENT OF THE | 30-02405-05 | 4 | 4 | 1 | 0.11 |
| ARNOLD GREENE TESTING LABORATO | 20-01074-02 | 42 | 29 | 7 | 0.24 |
| ASTROTECH INC | 37-09928-01 | 13 | 12 | 4 | 0.35 |
| BABCOCK & WILCOX CO. (THE) | 34-02160-04 | 101 | 38 | 6 | 0.16 |
| BAKER TESTING SERVICES INC. | 20-19067-01 | 4 | 3 | 0 | 0.09 |
| BASIN INDUSTRIAL X-RAY, INC. | 42-19906-01 | 0 | 0 | 0 | 0.00 |
| BATH IRON WORKS CORPORATION | 18-00828-04 | 15 | 3 | 0 | 0.05 |
| BENJAMIN F. SHAW COMPANY | 39-13318-01 | 1 | 1 | 0 | 0.38 |
| BILL MILLER INC. | 35-19048-01 | 31 | 27 | 22 | 0.82 |
| BRANCH RADIOGRAPHIC LABORATORI | 29-03405-02 | 66 | 66 | 8 | 0.12 |
| BRAUN ENGINEERING TESTING, INC | 22-16537-02 | 0 | 0 | 0 | 0.00 |
| BRIGGS ENGINEERING & TESTING C | 20-16401-01 | 8 | 8 | 1 | 0.15 |
| BRISTOL STEEL AND IRON WORKS I | 45-16947-01 | 8 | 6 | 2 | 0.37 |
| BOOTHE-TWINING,INC | 04-19522-01 | 68 | 59 | 58 | 0.98 |
| C & R LABORATORIES | 53-19179-01 | 4 | 4 | 0 | 0.05 |
| CAPITAL X-RAY SERVICE | 35-11114-01 | 25 | 25 | 59 | 2.35 |
| CARIBE SHELL & TUBE, INC. | 52-19438-01 | 5 | 5 | 3 | 0.58 |
| CATERPILLAR TRACTOR COMPANY | 12-00013-02 | 3 | 0 | 0 | 0.00 |
| CERTIFIED TESTING LABORATORIES | 29-14150-01 | 47 | 47 | 9 | 0.20 |
| CHERNE CONTRACTING CORPORATION | 22-18342-01 | 6 | 4 | 1 | 0.23 |
| CHICAGO BRIDGE AND IRON COMPAN | 42-13553-02 | 97 | 83 | 82 | 0.99 |
| CLEVELAND X-RAY INSPECTION INC | 35-15205-01 | 45 | 44 | 44 | 1.01 |
| COLBY AND THIELMEIER TESTING C | 24-13737-01 | 4 | 4 | 4 | 0.95 |
| COLONIAL GAS CO | 20-15003-01 | 5 | 0 | 0 | 0.00 |

## INDUSTRIAL RADIOGRAPHERS Multiple Location - 1985

| Licensee Name | License Number | Total Individuals Monitored | Workers with Measurable Dose | Collective Dose (person-rems) | Average Meas'ble Dose (rems or cSv) |
|---|---|---|---|---|---|
| COLUMBIA GAS TRANSMISSION CORP | 47-16060-01 | 7 | 4 | 1 | 0.24 |
| COMBUSTION ENGINEERING INC | 06-04154-01 | 24 | 22 | 4 | 0.18 |
| CONSOLIDATED X-RAY SERVICE | 29-21452-01 | 108 | 98 | 49 | 0.50 |
| CONSOLIDATED X-RAY SERVICE COR | 42-08456-02 | 113 | 113 | 122 | 1.08 |
| CONSUMERS POWER COMPANY | 21-08606-03 | 20 | 12 | 2 | 0.17 |
| CORPORACION GEOTEC | 52-21486-01 | 3 | 3 | 0 | 0.05 |
| CRAMER & LINDELL ENGINEERS | 06-20794-01 | 4 | 2 | 0 | 0.05 |
| CRANE COMPANY | 24-00563-02 | 9 | 9 | 3 | 0.32 |
| CTL ENGINEERING INC. | 34-08331-01 | 2 | 2 | 2 | 1.06 |
| CYCLOPS TESTING LABS. | 07-23400-01 | 0 | 0 | 0 | 0.00 |
| D & S TESTING, INC. | 34-21458-01 | 11 | 11 | 13 | 1.15 |
| DANIEL INTERNATIONAL CORPORATI | 39-01261-02 | 0 | 0 | 0 | 0.00 |
| DAYTON X-RAY COMPANY | 34-06943-01 | 20 | 20 | 9 | 0.47 |
| DEPT. OF NAVY, USS AJAX (AR-6) | 04-17872-01 | 17 | 2 | 0 | 0.05 |
| DEPT. OF NAVY, USS DIXON (AS-3 | 04-17976-01 | 13 | 13 | 1 | 0.05 |
| DEPT. OF NAVY, USS HECTOR (AR- | 04-18130-01 | 32 | 2 | 0 | 0.11 |
| DEPT. OF NAVY, USS JASON (AR-8 | 04-17765-01 | 34 | 0 | 0 | 0.00 |
| DEPT. OF NAVY, USS PRAIRIE (AD | 04-18013-01 | 12 | 0 | 0 | 0.00 |
| DEPT. OF NAVY, USS PROTEUS (AS | 04-18041-01 | 19 | 19 | 1 | 0.05 |
| DEPT. OF NAVY, USS SAMUEL GOMP | 04-18082-01 | 18 | 3 | 0 | 0.05 |
| DEPT. OF THE NAVY | 09-21465-01 | 13 | 10 | 1 | 0.11 |
| DEPT. OF THE NAVY | 31-17825-02 | 71 | 60 | 4 | 0.06 |
| DEPT. OF THE NAVY, COMMANDING | 38-05314-05 | 8 | 0 | 0 | 0.00 |
| DEPT. OF THE NAVY, USS SIERRA | 09-19770-01 | 15 | 1 | 0 | 0.05 |
| DUQUESNE LIGHT COMPANY | 37-17507-01 | 14 | 10 | 3 | 0.25 |
| E. L. CONWELL & COMPANY | 37-17637-01 | 0 | 0 | 0 | 0.00 |
| EASTERN TESTING AND INSPECTION | 29-09814-01 | 32 | 32 | 15 | 0.46 |
| EBASCO SERVICES INC. | 29-07056-03 | 63 | 42 | 10 | 0.24 |
| EG & G FLORIDA, INC. | 09-21233-01 | 52 | 13 | 2 | 0.15 |
| ELPASO NATURAL GAS COMPANY | 42-03201-02 | 5 | 5 | 2 | 0.31 |
| EQUITABLE GAS COMPANY | 37-17491-01 | 7 | 1 | 0 | 0.18 |
| EXAM COMPANY | 35-16191-01 | 474 | 474 | 81 | 0.17 |
| FACTORY MUTUAL RESEARCH CORPOR | 20-04007-02 | 7 | 5 | 0 | 0.05 |
| FINLAY TESTING LABORATORIES | 53-17854-01 | 7 | 7 | 8 | 1.17 |
| FOSTER WHEELER ENERGY CORP. | 31-01776-05 | 28 | 16 | 6 | 0.40 |
| FRANKLIN RESEARCH CENTER | 37-00637-11 | 17 | 0 | 0 | 0.00 |
| FROEHLING & ROBERTSON INC. | 45-08890-01 | 11 | 8 | 4 | 0.45 |
| GAMMA FIELD RADIOGRAPHIC FACIL | 12-13858-01 | 28 | 18 | 8 | 0.42 |

## INDUSTRIAL RADIOGRAPHERS Multiple Location - 1985

| Licensee Name | License Number | Total Individuals Monitored | Workers with Measurable Dose | Collective Dose (person-rems) | Average Meas'ble Dose (rems or cSv) |
|---|---|---|---|---|---|
| GENERAL DYNAMICS CORPORATION | 06-01781-08 | 92 | 91 | 18 | 0.20 |
| GENERAL DYNAMICS CORPORATION | 20-11915-01 | 12 | 6 | 0 | 0.07 |
| GEO CONSTRUCTION TESTING | 04-00616-04 | 175 | 118 | 42 | 0.36 |
| GLITCH FIELD SERVICE | 34-14071-01 | 41 | 37 | 20 | 0.54 |
| GREAT LAKES TESTING CORP. | 13-21306-01 | 0 | 0 | 0 | 0.00 |
| GRINNELL COMPANY, INC. | 38-02839-01 | 50 | 29 | 2 | 0.07 |
| H. C. NUTTING CO. | 34-14924-01 | 4 | 4 | 0 | 0.08 |
| H. R. INSPECTION SERVICE INC. | 15-06209-01 | 8 | 6 | 5 | 0.83 |
| H&H X-RAY SERVICES INC. | 17-19236-01 | 0 | 0 | 0 | 0.00 |
| H&H X-RAY SERVICES INC. | 17-19236-01 | 9 | 8 | 10 | 1.21 |
| HERRON TESTING LABORATORY INC. | 34-00681-03 | 9 | 9 | 1 | 0.14 |
| HOUSTON INSPECTION SERVICE, IN | 42-23150-01 | 5 | 5 | 11 | 2.15 |
| HUNTINGTON TESTING LAB | 47-23076-01 | 17 | 16 | 8 | 0.50 |
| HUTCHINSON AREA VO-TECH INSTIT | 22-15554-01 | 219 | 45 | 3 | 0.08 |
| INDEPENDENT INSPECTION, C/O P | 42-19441-01 | 3 | 2 | 2 | 0.88 |
| INDEPENDENT TESTING LABORATORI | 03-15981-02 | 46 | 46 | 17 | 0.36 |
| INDUSTRIAL GAMMA INSPECTION | 24-19850-01 | 1 | 1 | 0 | 0.18 |
| INDUSTRIAL LABORATORIES INC | 41-04226-02 | 5 | 5 | 8 | 1.64 |
| INDUSTRIAL NDT COMPANY | 45-19494-01 | 16 | 15 | 6 | 0.43 |
| INDUSTRIAL NDT SERVICES DIVISI | 13-06147-04 | 12 | 11 | 2 | 0.17 |
| INDUSTRIAL TESTING LABORATORY | 37-16406-01 | 14 | 3 | 1 | 0.20 |
| INSPECTION SERVICE CORP OF PEN | 37-11636-01 | 4 | 3 | 5 | 1.54 |
| INSPECTION SERVICE, INC. | 41-21154-01 | 34 | 16 | 15 | 0.93 |
| INTERMOUNTAIN TESTING COMPANY | 05-07872-01 | 22 | 22 | 20 | 0.89 |
| INTERNATIONAL TESTING LABS. IN | 29-14027-01 | 8 | 2 | 0 | 0.05 |
| J.T. CULLEN COMPANY INC. | 12-15025-01 | 8 | 5 | 8 | 1.50 |
| JACKSONVILLE SHIPYARDS INC. | 09-15611-01 | 10 | 5 | 1 | 0.12 |
| JAN X-RAY SERVICES INC. | 21-16560-01 | 20 | 19 | 15 | 0.78 |
| KELLOG RUST CONSTRUCTORS | 42-16573-01 | 0 | 0 | 0 | 0.00 |
| LAKEHEAD TESTING LABORATORY IN | 22-14897-01 | 8 | 2 | 0 | 0.11 |
| LATY INSPECTION SERVICE | 37-21473-01 | 0 | 0 | 0 | 0.00 |
| LAW ENGINEERING TESTING COMPAN | 10-00346-03 | 289 | 135 | 18 | 0.13 |
| LEHIGH TESTING LABORATORIES IN | 07-01173-03 | 14 | 11 | 5 | 0.41 |
| LOCKHEED SHIPBUILDING & CONSTR | 46-06926-02 | 8 | 3 | 0 | 0.13 |
| MAGNA CHEK, INC. | 21-19111-02 | 9 | 8 | 1 | 0.15 |
| MASSACHUSETTS MATERIALS RESEAR | 20-19130-01 | 5 | 3 | 0 | 0.05 |
| MATERIALS TESTING LABORATORY O | 45-17151-01 | 21 | 19 | 9 | 0.49 |
| MATTINGLY & 01REILLY SERVICE | 25-21479-01 | 5 | 4 | 3 | 0 67 |

## INDUSTRIAL RADIOGRAPHERS Multiple Location - 1985

| Licensee Name | License Number | Total Individuals Monitored | Workers with Measurable Dose | Collective Dose (person-rems) | Average Meas'ble Dose (rems or cSv) |
|---|---|---|---|---|---|
| MET LAB INC | 45-09963-01 | 7 | 5 | 4 | 0.70 |
| MET-CHEM ENGINEERING LAB | 43-19662-01 | 43 | 40 | 35 | 0.88 |
| MET-CHEM ENGINEERING LAB | 43-19662-01 | 42 | 39 | 32 | 0.83 |
| MET-CHEM ENGINEERING LAB | 43-19662-01 | 43 | 40 | 33 | 0.83 |
| METALOGIC, INC. | 02-19728-01 | 63 | 58 | 12 | 0.20 |
| METILS INC. | 42-16534-01 | 0 | 0 | 0 | 0.00 |
| MID-CON INSPECTION | 49-16670-01 | 102 | 102 | 29 | 0.28 |
| MIDWEST INSPECTION SERVICE LTD | 48-16296-01 | 14 | 10 | 4 | 0.37 |
| MINNOTTE MANUFACTURING CORPORA | 37-11460-01 | 1 | 0 | 0 | 0.00 |
| MONROE X-RAY CO. | 17-12201-02 | 0 | 0 | 0 | 0.00 |
| MONTANA X-RAY INC. | 25-21134-01 | 1 | 1 | 2 | 1.50 |
| MORRISON-KNUDSEN COMPANY INC | 11-15946-01 | 12 | 11 | 9 | 0.78 |
| MQS INSPECTION | 12-00622-07 | 537 | 408 | 236 | 0.58 |
| NATIONAL INSPECTION & CONSUL | 09-21289-01 | 0 | 0 | 0 | 0.00 |
| NAVY DEPT, NAVAL SUB BASE, DEP | 53-10226-01 | 25 | 4 | 0 | 0.05 |
| NAVY DEPT, USS ACADIA (AD-42) | 04-19846-01 | 10 | 10 | 1 | 0.05 |
| NAVY, DEPARTMENT OF USS FULT | 31-18014-01 | 12 | 12 | 1 | 0.05 |
| NAVY, DEPARTMENT OF USS L. Y | 31-17970-01 | 13 | 13 | 1 | 0.06 |
| NAVY, DEPARTMENT OF USS ORIO | 31-18096-01 | 11 | 11 | 1 | 0.05 |
| NAVY, DEPARTMENT OF USS PUGE | 31-17928-01 | 23 | 7 | 0 | 0.05 |
| NAVY, DEPARTMENT OF THE | 04-03141-01 | 25 | 1 | 0 | 0.05 |
| NAVY, DEPARTMENT OF THE | 04-13252-01 | 18 | 0 | 0 | 0.00 |
| NAVY, DEPARTMENT OF THE | 06-07150-01 | 20 | 19 | 2 | 0.10 |
| NAVY, DEPARTMENT OF THE | 45-04052-03 | 66 | 59 | 7 | 0.11 |
| NAVY, DEPARTMENT OF THE | 45-15650-02 | 15 | 0 | 0 | 0.00 |
| NAVY, DEPARTMENT OF THE | 46-03078-01 | 86 | 85 | 12 | 0.15 |
| NAVY, DEPT. OF THE, (USS CANO | 09-19932-01 | 14 | 13 | 1 | 0.05 |
| NAVY, DEPT. OF THE, USS MCKEE | 04-19966-01 | 16 | 15 | 1 | 0.05 |
| NAVY, DEPT. OF THE, USS CAPE C | 04-21246-01 | 14 | 1 | 0 | 0.05 |
| NAVY, DEPT. OF THE, USS EMORY | 31-19040-01 | 12 | 12 | 1 | 0.05 |
| NAVY, DEPT. OF THE, USS HOLLAN | 31-18061-01 | 13 | 13 | 2 | 0.16 |
| NDE SERVICES, INC. | 05-19821-01 | 48 | 44 | 52 | 1.18 |
| NEW YORK TESTING LABORATORIES | 31-02933-01 | 4 | 2 | 0 | 0.21 |
| NEWPORT NEWS INDUSTRIAL CORP. | 34-16805-01 | 0 | 0 | 0 | 0.00 |
| NEWPORT NEWS SHIPBUILDING AND | 45-09428-02 | 87 | 86 | 26 | 0.30 |
| NIC TESTING SERVICE | 37-18348-02 | 19 | 10 | 3 | 0.29 |
| NONDESTRUCTIVE INSPECTION SERV | 47-11883-01 | 10 | 10 | 4 | 0.41 |
| NONDESTRUCTIVE TESTING CORP | 29-19742-01 | 23 | 16 | 5 | 0.28 |
| NOOTER CORPORATION | 24-03783-01 | 21 | 14 | 1 | 0.07 |

## INDUSTRIAL RADIOGRAPHERS Multiple Location - 1985

| Licensee Name | License Number | Total Individuals Monitored | Workers with Measurable Dose | Collective Dose (person-rems) | Average Meas'ble Dose (rems or cSv) |
|---|---|---|---|---|---|
| NORFOLK SHIPBUILDING AND DRYDO | 45-12042-01 | 14 | 11 | 1 | 0.08 |
| NORTH AMERICAN INSPECTION, INC | 37-23370-01 | 26 | 23 | 9 | 0.39 |
| NORTHEASTERN RESEARCH & TESTIN | 29-18006-01 | 0 | 0 | 0 | 0.00 |
| NUCLEAR ENERGY SERVICE INC | 42-16559-01 | 78 | 56 | 19 | 0.34 |
| NUCLEAR INSTALLATION SERV. CO. | 09-23042-01 | 8 | 4 | 0 | 0.08 |
| OKLAHOMA TRSTING LABORATORIES | 35-10577-01 | 15 | 5 | 1 | 0.14 |
| OLD DOMINION IRON & STEEL CORP | 45-15581-01 | 5 | 4 | 1 | 0.11 |
| PANHANDLE EASTERN PIPE LINE CO | 15-17729-01 | 9 | 7 | 1 | 0.20 |
| PARKER INDUSTRIAL X-RAY LABORA | 06-01337-03 | 18 | 13 | 3 | 0.21 |
| PATZIG TESTING LABS INC | 14-18897-02 | 15 | 9 | 1 | 0.11 |
| PDM LATIN AMERICA, LTD. | 10-19980-01 | 0 | 0 | 0 | 0.00 |
| PENN INSPECTION CO. | 35-21144-01 | 18 | 18 | 7 | 0.38 |
| PERINI CORP. | 20-21490-01 | 0 | 0 | 0 | 0.00 |
| PHOTON FIELD INSPECTION, INC. | 21-21010-01 | 4 | 2 | 0 | 0.05 |
| PITTSBURGH DES MOINES STEEL CO | 14-01837-04 | 12 | 8 | 2 | 0.19 |
| PITTSBURGH DES MOINES STEEL CO | 37-02607-02 | 21 | 14 | 4 | 0.26 |
| PITTSBURGH TESTING LABORATORY | 37-00276-25 | 312 | 232 | 172 | 0.74 |
| PLANT INSPECTION CO | 04-21032-01 | 0 | 0 | 0 | 0.00 |
| POGUE INDUSTRIES | 24-24541-01 | 9 | 8 | 2 | 0.20 |
| PORTABLE ATOMIC X-RAY COMPANY | 35-07488-03 | 2 | 1 | 0 | 0.38 |
| POWER INSPECTION, INC. | 37-21428-01 | 0 | 0 | 0 | 0.00 |
| POWER PIPING COMPANY | 37-09945-01 | 9 | 7 | 2 | 0.27 |
| PRECISION COMPONENTS | 37-16280-01 | 72 | 53 | 4 | 0.08 |
| PROGRESS SERVICES,INC. | 34-19592-01 | 15 | 12 | 3 | 0.23 |
| PULLMAN POWER PRODUCTS, DIV. O | 37-08042-01 | 77 | 41 | 10 | 0.23 |
| Q.C. LABORATORIES INC. | 09-11579-03 | 27 | 25 | 9 | 0.34 |
| QUAD CITY TESTING LABORATORY, | 14-17989-01 | 9 | 8 | 5 | 0.64 |
| QUALITY ASSURANCE INDUSTRIES | 48-14158-01 | 0 | 0 | 0 | 0.00 |
| QUALITY ASSURANCE LABORATORIES | 18-19078-01 | 7 | 5 | 1 | 0.26 |
| QUALITY SYSTEMS OF ALASKA, INC | 50-23426-01 | 0 | 0 | 0 | 0.00 |
| QUALITY TESTING INC. | 34-17799-01 | 2 | 2 | 0 | 0.11 |
| RADIOGRAPHY INSPECTION | 35-26812-01 | 16 | 16 | 7 | 0.42 |
| RADIOGRAPHY INSPECTION, INC. | 15-21451-01 | 16 | 16 | 7 | 0.42 |
| REACTOR CONTROLS INC. | 04-15365-01 | 10 | 7 | 1 | 0.10 |
| RELIANCE TESTING LABORATORIES | 19-17176-01 | 21 | 16 | 5 | 0.31 |
| RICHARD KRUEGEL, DBA GENERAL T | 34-09037-01 | 0 | 0 | 0 | 0.00 |
| ROCKWELL INTERNATIONAL, SPACE | 04-17624-03 | 0 | 0 | 0 | 0.00 |
| S & S INSPECTION COMPANY | 12-19780-01 | 20 | 17 | 6 | 0.38 |

## APPENDIX A (cont.)

## INDUSTRIAL RADIOGRAPHERS Multiple Location - 1985

| Licensee Name | License Number | Total Individuals Monitored | Workers with Measurable Dose | Collective Dose (person-rems) | Average Meas'ble Dose (rems or cSv) |
|---|---|---|---|---|---|
| SMITH-EMERY COMPANY | 04-19467-01 | 12 | 3 | 0 | 0.05 |
| SOUTHWEST X-RAY CORP. | 03-21354-01 | 25 | 25 | 37 | 1.46 |
| SPACE SCIENCE SERVICES INC | 09-07550-01 | 36 | 31 | 30 | 0.95 |
| SPECTRUM LABORATORIES INC. | 29-07266-01 | 7 | 3 | 0 | 0.05 |
| SSW INSPECTION SERVICES | 14-19899-01 | 0 | 0 | 0 | 0.00 |
| ST. LOUIS TESTING LABORATORIES | 24-00188-02 | 14 | 12 | 17 | 1.38 |
| STONE & WEBSTER ENGINEERING CO | 20-05600-02 | 84 | 23 | 1 | 0.05 |
| SUN RAY TESTING INTERNATIONAL | 04-19810-01 | 0 | 0 | 0 | 0.00 |
| SUPERIOR INDUSTRIAL X-RAY COMP | 12-02370-01 | 11 | 2 | 0 | 0 05 |
| TENNECO INC | 42-09073-02 | 22 | 22 | 5 | 0.21 |
| TENNESSEE VALLEY AUTHORITY, D | 41-06832-06 | 44 | 25 | 3 | 0.12 |
| TEREX CORPORATION | 34-19607-01 | 4 | 0 | 0 | 0.00 |
| TESTING INSTITUTE OF ALASKA | 50-17446-01 | 7 | 6 | 3 | 0.51 |
| TOWNSEND AND BOTTUM INC. | 21-17095-01 | 0 | 0 | 0 | 0.00 |
| TRANS-EASTERN INSPECTION SERVI | 37-14855-01 | 107 | 91 | 16 | 0.17 |
| TRANS-WORLD TESTING LABS., INC | 04-23360-01 | 13 | 13 | 2 | 0.16 |
| TRI-STATE INSPECTION & CONSULT | 37-19640-01 | 3 | 3 | 1 | 0.24 |
| TRUTOM LTD. | 06-20755-01 | 21 | 16 | 6 | 0.37 |
| TULSA GAMMA RAY INC. | 35-17178-01 | 26 | 25 | 24 | 0.97 |
| TULSA INSPECTION SERVICE, INC. | 35-23362-01 | 40 | 40 | 22 | 0.54 |
| TUMBLEWEED X-RAY | 03-23185-01 | 54 | 54 | 43 | 0.79 |
| TWIN PORTS TESTING, INC. | 48-23476-01 | 19 | 15 | 11 | 0.70 |
| TWIN PORTS TESTING, INC. | 48-23476-01 | 0 | 0 | 0 | 0.00 |
| U.S. TESTING CO., INC. | 29-02477-09 | 176 | 80 | 9 | 0.11 |
| ULRA TECHNOLOGY, INC. | 50-23363-01 | 15 | 11 | 6 | 0.50 |
| UNITED INSPECTION, INC. | 35-23436-01 | 18 | 18 | 25 | 1.39 |
| UNIVERSAL TECHNICAL TESTING LA | 37-00453-03 | 27 | 18 | 16 | 0.87 |
| UNIVERSAL TESTING | 43-11213-02 | 20 | 17 | 18 | 1.08 |
| UNIVERSAL TESTING LABORATORIES | 29-16397-01 | 6 | 3 | 0 | 0.05 |
| VECTOR CORP. | 37-20827-01 | 5 | 3 | 1 | 0.28 |
| VENEGAS INDUSTRIAL TESTING LAB | 28-14847-02 | 5 | 3 | 1 | 0.18 |
| WALASHEK ENTERPRISES | 53-23225-01 | 4 | 4 | 0 | 0.05 |
| WESTERN STRESS, INC. | 49-23490-01 | 30 | 26 | 29 | 1.10 |
| WESTERN X-RAY COMPANY | 35-19993-01 | 13 | 13 | 9 | 0.69 |
| WISCONSIN INDUSTRIAL TESTING I | 48-17480-01 | 73 | 68 | 46 | 0.68 |
| X-R-I TESTING OF MICHIGAN | 21-05472-01 | 60 | 28 | 5 | 0.19 |
| X-RAY, INC. | 46-03414-03 | 38 | 36 | 33 | 0.91 |
| X-SCAN INSPECTION COMPANY | 35-19507-01 | 11 | 8 | 16 | 2.01 |

## APPENDIX A (cont.)

## MANUFACTURERS AND DISTRIBUTORS - 1985

| Licensee Name | License Number | Program Type | Total Individuals Monitored | Workers with Measurable Dose | Collective Dose (person-rems) | Average Meas'ble Dose (rems or cSv) |
|---|---|---|---|---|---|---|
| ACCURAY CORPORATION | 34-00255-03 | BROAD | 401 | 184 | 17 | 0.09 |
| AMERSHAM CORPORATION | 12-12836-01 | BROAD | 206 | 52 | 20 | 0.39 |
| E. I. DUPONT (NEN) | 20-00320-21 | BROAD | 873 | 657 | 302 | 0.46 |
| E. R. SQUIBB AND SONS INC. | 29-00139-02 | BROAD | 364 | 241 | 48 | 0.20 |
| HALLIBURTON COMPANY | 35-00502-03 | BROAD | 406 | 350 | 42 | 0.12 |
| MALLINCKRODT/NUCLEAR | 24-04206-01 | BROAD | 352 | 320 | 204 | 0.64 |
| NEW ENGLAND NUCLEAR CORPORATIO | 20-00320-19 | BROAD | 4 | 4 | 1 | 0.11 |
| NUCLEAR RESEARCH CORPORATION | 29-04236-01 | BROAD | 46 | 11 | 1 | 0.07 |
| PITTWAY CORPORATION | 12-15023-01 | BROAD | 101 | 7 | 0 | 0.05 |
| RAMSEY ENGINEERING CO., TEXAS | 42-01485-04 | BROAD | 91 | 82 | 22 | 0.26 |
| TECHNICAL OPERATIONS INC. | 20-00277-03 | BROAD | 68 | 43 | 11 | 0.25 |
| UPJOHN COMPANY | 21-00182-03 | BROAD | 548 | 16 | 1 | 0.06 |
| ADVANCED MEDICAL SYSTEMS INC. | 34-19089-01 | OTHER | 34 | 20 | 35 | 1.74 |
| AIRCO INCORPORATED | 29-02085-01 | OTHER | 18 | 3 | 0 | 0.05 |
| ATOMIC ENERGY OF CANADA LIMITE | 54-00300-09 | OTHER | 69 | 40 | 6 | 0.14 |
| CAMBRIDGE NUCLEAR CORPORATION- | 20-06799-02 | OTHER | 24 | 17 | 3 | 0.19 |
| GAMMA DIAGNOSTIC LABORATORIES | 20-15215-02 | OTHER | 18 | 18 | 12 | 0.65 |
| KAY-RAY INCORPORATED | 12-11184-01 | OTHER | 43 | 26 | 3 | 0.11 |
| NUCLEAR RESEARCH CORPORATION | 37-02401-01 | OTHER | 43 | 9 | 1 | 0.05 |
| SEAMAN NUCLEAR CORPORATION | 48-12016-01 | OTHER | 16 | 16 | 11 | 0.69 |
| ELFRETH ALLEY APOTHECARY | 37-18461-01 | *OTHER | 21 | 10 | 3 | 0.31 |
| NUCLEAR PHARMACY, INC. | 20-21227-01 | *OTHER | 29 | 12 | 1 | 0.10 |
| PHARMACO NUCLEAR INC. | 37-18467-01 | *OTHER | 14 | 4 | 1 | 0.11 |
| PHARMATOPES INC. | 21-19219-01 | *OTHER | 17 | 3 | 0 | 0.05 |
| PHARMATOPES INC. | 34-16654-01 | *OTHER | 20 | 20 | 8 | 0.38 |
| PHARMATOPES INC. | 34-19007-01 | *OTHER | 12 | 9 | 1 | 0.05 |
| PHARMATOPES INC. | 34-19008-01 | *OTHER | 7 | 1 | 0 | 0.05 |
| PHARNATOPES & COMPANY | 13-19451-01 | *OTHER | 0 | 0 | 0 | 0.00 |
| SYNCOR CORP. | 12-19333-01 | *OTHER | 59 | 38 | 3 | 0.08 |
| SYNCOR CORP. | 24-19360-01 | *OTHER | 17 | 15 | 2 | 0.16 |
| SYNCOR CORP. | 34-18484-01 | *OTHER | 14 | 14 | 3 | 0.18 |
| SYNCOR CORP. | 35-19583-01 | *OTHER | 9 | 2 | 0 | 0.11 |
| SYNCOR CORP. | 37-21092-01 | *OTHER | 14 | 6 | 1 | 0.11 |

*Activity includes distribution of radiopharmaceuticals.

## APPENDIX A (cont.)

## FUEL FABRICATORS AND PROCESSORS - 1985

| Licensee Name | License Number | Total Individuals Monitored | Workers with Measurable Dose | Collective Dose (person-rems) | Average Meas'ble Dose (rems or cSv) |
|---|---|---|---|---|---|
| BABCOCK AND WILCOX | SNM-1168 | 160 | 160 | 43 | 0.27 |
| BABCOCK AND WILCOX INC NAVAL N | SNM-0042 | 2579 | 1663 | 142 | 0.09 |
| COMBUSTION ENGINEERING INC. | SNM-1067 | 264 | 106 | 24 | 0.23 |
| COMBUSTION ENGINEERING, INC. C | SNM-0033 | 70 | 46 | 5 | 0.10 |
| EXXON NUCLEAR COMPANY INC | SNM-1227 | 857 | 488 | 57 | 0.12 |
| GENERAL ATOMIC COMPANY | SNM-0696 | 825 | 224 | 32 | 0.14 |
| GENERAL ELECTRIC CO. | SNM-1097 | 1151 | 617 | 75 | 0.12 |
| NUCLEAR FUEL SERVICES INC, | SNM-0124 | 871 | 562 | 28 | 0.05 |
| UNITED NUCLEAR CORPORATION NAV | SNM-0368 | 134 | 71 | 4 | 0.05 |
| WESTINGHOUSE ELECTRIC CORP | SNM-1107 | 866 | 795 | 219 | 0.28 |
| ATOMICS INTERNATIONAL DIVISION* | SNM-0021 | 819 | 300 | 68 | 0.23 |

## LOW LEVEL WASTE DISPOSAL FACILITIES

| | | | | | |
|---|---|---|---|---|---|
| CHEM-NUCLEAR SYSTEMS | 12-13536-01 | 636 | 183 | 32 | 0.17 |
| U. S. ECOLOGY | 16-19204-01 | 604 | 69 | 38 | 0.55 |

## INDEPENDENT SPENT FUEL STORAGE INSTALLATION

| | | | | | |
|---|---|---|---|---|---|
| GENERAL ELECTRIC COMPANY | SNM-2500 | 32 | 32 | 34 | 1.05 |

*No longer engaged in fuel fabrication.

# APPENDIX B

## Annual Whole Body Doses at Licensed Nuclear Power Facilities

## 1985

# APPENDIX B
# ANNUAL WHOLE BODY DOSES AT LICENSED NUCLEAR POWER FACILITIES
# CY 1985

| PLANT NAME | TYPE | Number of Individuals with Whole Body Doses in the Ranges (rems or cSv) | | | | | | | | | | | | | TOTAL NUMBER MONI-TORED | NUMBER WITH MEAS. EXPOSURE | COLLEC-TIVE DOSE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Meas-urable | 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 | 1,341 | 600 | 273 | 219 | 93 | 40 | 37 | | | | | | | | 2,603 | 1,262 | 286** |
| BEAVER VALLEY | PWR | 1,157 | 448 | 114 | 36 | 18 | 3 | | | | | | | | | 1,776 | 619 | 60** |
| BIG ROCK | BWR | 143 | 165 | 73 | 53 | 26 | 20 | 50 | 28 | 19 | 1 | | | | | 578 | 435 | 291 |
| BROWNS FERRY 1,2,3 | BWR | 4,158 | 903 | 558 | 515 | 288 | 156 | 281 | 53 | 1 | | | | | | 6,913 | 2,755 | 1,159** |
| BRUNSWICK 1,2 | BWR | 1,707 | 1,682 | 429 | 340 | 260 | 220 | 630 | 395 | 101 | | | | | | 5,764 | 4,057 | 2,804** |
| CALLAWAY | PWR | 886 | 861 | 71 | 23 | 8 | 1 | | | | | | | | | 1,850 | 964 | 36** |
| CALVERT CLIFFS 1,2 | PWR | 489 | 710 | 239 | 209 | 141 | 80 | 167 | 52 | | | | | | | 2,087 | 1,598 | 694 |
| COOK 1,2 | PWR | 776 | 637 | 377 | 328 | 254 | 100 | 245 | 40 | 3 | | | | | | 2,760 | 1,984 | 945 |
| COOPER STATION | BWR | 1,503 | 816 | 210 | 198 | 151 | 99 | 302 | 151 | 50 | 3 | | | | | 3,483 | 1,980 | 1,333** |
| CRYSTAL RIVER 3 | PWR | 1,048 | 796 | 411 | 330 | 164 | 119 | 143 | 13 | | | | | | | 3,024 | 1,976 | 689 |
| DAVIS BESSE | PWR | 1,748 | 497 | 154 | 51 | 10 | 2 | 4 | | | | | | | | 2,466 | 718 | 71** |
| DRESDEN 2,3 | BWR | 1,059 | 945 | 388 | 357 | 233 | 229 | 578 | 81 | 6 | | | | | | 3,876 | 2,817 | 1,685 |
| DUANE ARNOLD | BWR | 1,029 | 342 | 203 | 207 | 149 | 124 | 217 | 148 | 23 | 1 | | | | | 2,443 | 1,414 | 1,112 |
| FARLEY 1,2 | PWR | 246 | 1,276 | 393 | 320 | 218 | 129 | 170 | 43 | 2 | | | | | | 2,797 | 2,551 | 799** |
| FITZPATRICK | BWR | 825 | 758 | 247 | 205 | 139 | 99 | 272 | 89 | 29 | 7 | | | | | 2,670 | 1,845 | 1,051** |
| FORT CALHOUN | PWR | 195 | 419 | 84 | 112 | 93 | 70 | 122 | 48 | 21 | 13 | | | | | 1,177 | 982 | 373** |
| GINNA | PWR | 436 | 322 | 114 | 130 | 80 | 66 | 102 | 29 | 1 | 1 | | | | | 1,281 | 845 | 426 |
| HADDAM NECK | PWR | 804 | 224 | 59 | 37 | 24 | 9 | 28 | 3 | | | | | | | 1,188 | 384 | 101** |
| HATCH 1,2 | BWR | 1,500 | 1,275 | 558 | 434 | 246 | 150 | 167 | 9 | 2 | | | | | | 4,341 | 2,841 | 818** |
| INDIAN POINT 2 | PWR | 1,456 | 407 | 98 | 89 | 39 | 30 | 42 | 3 | | | | | | | 2,164 | 708 | 192 |
| INDIAN POINT 3 | PWR | 694 | 338 | 204 | 170 | 101 | 91 | 164 | 23 | 2 | | | | | | 1,787 | 1,093 | 570 |
| KEWAUNEE | PWR | 331 | 162 | 113 | 99 | 75 | 39 | 30 | 0 | 1 | | | | | | 850 | 519 | 176** |
| LACROSSE | BWR | 291 | 267 | 13 | 6 | 13 | 10 | 27 | 32 | 5 | | | | | | 664 | 373 | 173 |
| LASALLE 1,2 | BWR | 723 | 717 | 247 | 243 | 140 | 112 | 115 | 57 | 4 | | | | | | 2,358 | 1,635 | 685 |
| MAINE YANKEE | PWR | 240 | 375 | 86 | 99 | 84 | 72 | 224 | 64 | 5 | | | | | | 1,249 | 1,009 | 700 |
| MCGUIRE 1 | PWR | 1,197 | 932 | 389 | 395 | 158 | 112 | 203 | 28 | | | | | | | 3,414 | 2,217 | 771** |
| MILLSTONE 1 | BWR | 485 | 196 | 96 | 91 | 70 | 46 | 130 | 76 | 22 | 5 | | | | | 1,217 | 732 | 608** |
| MILLSTONE 2 | PWR | 1,259 | 510 | 250 | 235 | 182 | 119 | 339 | 198 | 57 | 15 | | | | | 3,164 | 1,905 | 1,581** |
| MONTICELLO | BWR | 1,004 | 190 | 87 | 103 | 67 | 44 | 63 | 24 | 7 | 1 | | | | | 1,590 | 586 | 327 |
| NINE MILE POINT 1 | BWR | 788 | 624 | 119 | 108 | 59 | 36 | 51 | 8 | 1 | 1 | | | | | 1,795 | 1,007 | 265 |
| NORTH ANNA 1,2 | PWR | 1,069 | 1,423 | 246 | 202 | 186 | 128 | 209 | 41 | 1 | | | | | | 3,505 | 2,436 | 839 |

** Indicates actual collective dose reported by facility, otherwise calculated by staff.

# APPENDIX B(cont.)
# ANNUAL WHOLE BODY DOSES AT LICENSED NUCLEAR POWER FACILITIES
# CY 1985

| PLANT NAME | TYPE | Number of Individuals with Whole Body Doses in the Ranges (rems or cSv) | | | | | | | | | | | | | TOTAL NUMBER MONI-TORED | NUMBER WITH MEAS. EXPOSURE | COLLEC-TIVE DOSE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Meas-urable | 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 | 863 | 991 | 465 | 404 | 248 | 175 | 327 | 113 | 6 | | | | | | 3,592 | 2,729 | 1,304** |
| OYSTER CREEK | BWR | 439 | 1,361 | 285 | 252 | 153 | 93 | 147 | 40 | 11 | | | | | | 2,781 | 2,342 | 748 |
| PALISADES | PWR | 470 | 678 | 178 | 157 | 107 | 75 | 150 | 9 | 1 | | | | | | 1,825 | 1,355 | 507 |
| PEACH BOTTOM 2,3 | BWR | 2,080 | 1,004 | 607 | 621 | 384 | 329 | 794 | 295 | 156 | 19 | | | | | 6,289 | 4,209 | 3,354** |
| PILGRIM 1 | BWR | 0 | 702 | 551 | 483 | 124 | 79 | 199 | 54 | 14 | 3 | | | | | 2,209 | 2,209 | 893** |
| POINT BEACH 1,2 | PWR | 851 | 165 | 89 | 96 | 67 | 61 | 157 | 35 | 1 | | | | | | 1,522 | 671 | 482 |
| PRAIRIE ISLAND 1,2 | PWR | 511 | 399 | 280 | 161 | 86 | 45 | 87 | 21 | 3 | | | | | | 1,593 | 1,082 | 416 |
| QUAD CITIES 1,2 | BWR | 1,167 | 286 | 136 | 141 | 97 | 75 | 322 | 109 | 17 | 1 | | | | | 2,351 | 1,184 | 990** |
| RANCHO SECO | PWR | 793 | 642 | 335 | 275 | 180 | 116 | 192 | 24 | | | | | | | 2,557 | 1,764 | 756 |
| ROBINSON 2 | PWR | 1,679 | 818 | 205 | 187 | 64 | 30 | 59 | 10 | 5 | | | | | | 3,057 | 1,378 | 311** |
| SALEM 1,2 | PWR | 1,214 | 752 | 162 | 96 | 44 | 24 | 31 | 3 | | | | | | | 2,326 | 1,112 | 204 |
| SAN ONOFRE 1 | PWR | 8,188 | 2,264 | 233 | 120 | 44 | 17 | 15 | | | | | | | | 10,881 | 2,693 | 189** |
| SAN ONOFRE 2,3 | PWR | 2,858 | 1,872 | 588 | 302 | 121 | 56 | 103 | 7 | | | | | | | 5,907 | 3,049 | 533** |
| SEQUOYAH 1,2 | PWR | 1,804 | 581 | 280 | 284 | 193 | 134 | 264 | 111 | 7 | | | | | | 3,658 | 1,854 | 1,071** |
| ST. LUCIE 1,2 | PWR | 1,265 | 611 | 288 | 261 | 166 | 87 | 419 | 131 | 7 | 1 | | | | | 3,236 | 1,971 | 1,344 |
| SUMMER 1 | PWR | 597 | 558 | 194 | 143 | 91 | 52 | 160 | 3 | | | | | | | 1,798 | 1,201 | 379** |
| SURRY 1,2 | PWR | 365 | 1,670 | 288 | 267 | 181 | 109 | 421 | 211 | 52 | 7 | | | | | 3,571 | 3,206 | 1,815 |
| SUSQUEHANNA 1,2 | BWR | 920 | 1,501 | 846 | 551 | 299 | 191 | 272 | 9 | | | | | | | 4,589 | 3,669 | 1,106** |
| THREE MILE ISLAND 1,2 | PWR | 1,005 | 1,068 | 176 | 157 | 109 | 90 | 188 | 72 | 30 | | | | | | 2,895 | 1,890 | 857 |
| TROJAN | PWR | 592 | 264 | 159 | 155 | 100 | 68 | 98 | 8 | | | | | | | 1,444 | 852 | 363** |
| TURKEY POINT 3,4 | PWR | 1,505 | 535 | 299 | 312 | 185 | 116 | 324 | 115 | 19 | | | | | | 3,410 | 1,905 | 1,253 |
| VERMONT YANKEE 1 | BWR | 930 | 223 | 189 | 223 | 176 | 169 | 339 | 73 | | | | | | | 2,322 | 1,392 | 1,051** |
| WPPS-2 | BWR | 1,310 | 489 | 115 | 87 | 33 | 14 | 17 | | | | | | | | 2,065 | 755 | 119** |
| YANKEE-ROWE 1 | PWR | 1,402 | 309 | 78 | 101 | 65 | 35 | 64 | 1 | | | | | | | 2,055 | 653 | 211** |
| ZION 1,2 | PWR | 1,075 | 431 | 186 | 199 | 128 | 102 | 296 | 127 | 24 | 5 | | | | | 2,573 | 1,498 | 1,166 |
| TOTALS - BWR's | | 22,061 | 14,446 | 5,957 | 5,218 | 3,107 | 2,295 | 4,973 | 1,731 | 468 | 42 | | | | | 60,298 | 38,237 | 20,572 |
| TOTALS - PWR's | | 42,409 | 25,545 | 8,158 | 6,761 | 4,107 | 2,602 | 5,584 | 1,586 | 248 | 42 | | | | | 97,042 | 54,633 | 22,470 |
| TOTALS - LWR's | | 64,470 | 39,991 | 14,115 | 11,979 | 7,214 | 4,897 | 10,557 | 3,317 | 716 | 84 | | | | | 157,340 | 92,870 | 43,042 |
| FT. ST. VRAIN | HTGR | 1,929 | 370 | 40 | 15 | 7 | 4 | 7 | | | | | | | | 2,372 | 443 | 35** |

** Indicates actual collective dose reported by facility, otherwise calculated by staff.

APPENDIX B(cont.)
ANNUAL WHOLE BODY DOSES AT LICENSED NUCLEAR POWER FACILITIES
PLANTS NOT IN COMMERCIAL OPERATION OR IN OPERATION LESS THAN ONE YEAR
CY 1985

| PLANT NAME | TYPE | Number of Individuals with Whole Body Doses in the Ranges (rems or cSv) | | | | | | | | | | | | | TOTAL NUMBER MONITORED | NUMBER WITH MEAS. EXPOSURE | COLLECTIVE DOSE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Measurable | 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 | | | |
| BYRON 1,2 | PWR | 4,061 | 1,233 | 213 | 76 | 5 | 2 | 2 | | | | | | | | 5,592 | 1,531 | 135 |
| CATAWBA | PWR | 2,601 | 947 | 130 | 36 | 12 | 2 | 1 | | | | | | | | 3,729 | 1,128 | 63** |
| DIABLO CANYON 1,2 | PWR | 2,709 | 964 | 80 | 17 | 1 | | | | | | | | | | 3,771 | 1,062 | 68 |
| FERMI-2 | BWR | 3,245 | 323 | 2 | 1 | | | | | | | | | | | 3,571 | 326 | 17 |
| GRAND GULF | BWR | 1,933 | 510 | 165 | 95 | 40 | 10 | 9 | | | | | | | | 2,762 | 829 | 137 |
| HUMBOLDT BAY | BWR | 233 | 94 | 27 | 26 | 15 | 4 | 11 | 1 | | | | | | | 411 | 178 | 51 |
| LIMERICK 1 | BWR | 5,109 | 491 | 30 | 3 | | | | | | | | | | | 5,633 | 524 | 31 |
| PALO VERDE 1,2 | PWR | 2,534 | 292 | 23 | 4 | | | | | | | | | | | 2,853 | 319 | 20 |
| RIVER BEND 1 | BWR | 1,518 | 142 | 15 | 1 | | | | | | | | | | | 1,676 | 158 | 10 |
| SHOREHAM | BWR | 1,606 | 577 | 31 | 4 | 3 | 1 | | | | | | | | | 2,222 | 616 | 38 |
| WOLFCREEK 1 | PWR | 1,404 | 155 | 11 | 4 | | | | | | | | | | | 1,574 | 170 | 13 |
| TOTALS | | 26,953 | 5,728 | 727 | 267 | 76 | 19 | 23 | 1 | | | | | | | 33,794 | 6,841 | 583 |

# APPENDIX C*

## Personnel, Dose and Power Generation Summary

## 1969-1985

* A discussion of the methods used to collect and calculate the information contained in this appendix is given in Section 2.1.

Appendix C
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| ARKANSAS 1, 2 | 1975 | 588.0 | 76.5 | 147 | 21 | | | | | 0.14 | 0.0 |
| Docket 50-313; DPR-51, NPF-6 | 1976 | 464.6 | 56.6 | 476 | 289 | 27 | 262 | 100 | 189 | 0.61 | 0.6 |
| 1st commercial operation 12/74,- | 1977 | 610.3 | 76.8 | 601 | 256 | 28 | 228 | 111 | 145 | 0.43 | 0.4 |
| Type - PWRs 3/80 | 1978 | 627.2 | 77.5 | 722 | 189 | 32 | 157 | 109 | 80 | 0.26 | 0.3 |
| Capacity - 836, 858 MWe | 1979 | 397.0 | 55.3 | 1321 | 369 | 54 | 315 | 252 | 117 | 0.28 | 0.9 |
| | 1980 | 452.8 | 63.7 | 1233 | 342 | 81 | 261 | 213 | 129 | 0.28 | 0.8 |
| | 1981 | 1104.7 | 68.3 | 2225 | 1102 | 130 | 972 | 843 | 259 | 0.50 | 1.0 |
| | 1982 | 905.4 | 58.6 | 1608 | 803 | 97 | 706 | 505 | 298 | 0.50 | 0.9 |
| | 1983 | 915.0 | 54.6 | 2109 | 1397 | 97 | 1300 | 1145 | 252 | 0.66 | 1.5 |
| | 1984 | 1289.1 | 77.4 | 1742 | 806 | 89 | 717 | 533 | 273 | 0.46 | 0.6 |
| | 1985 | 1192.3 | 73.6 | 1262 | 286 | 61 | 225 | 148 | 138 | 0.23 | 0.2 |
| BEAVER VALLEY 1 | 1977 | 355.6 | 57.0 | 331 | 87 | 8 | 79 | 58 | 29 | 0.26 | 0.2 |
| Docket 50-334; DPR-66 | 1978 | 304.2 | 40.8 | 646 | 190 | 11 | 179 | 152 | 38 | 0.29 | 0.6 |
| 1st commercial operation 10/76 | 1979 | 221.0 | 40.0 | 704 | 132 | 22 | 110 | 67 | 65 | 0.19 | 0.6 |
| Type - PWR | 1980 | 39.8 | 6.8 | 1817 | 553 | 76 | 477 | 477 | 76 | 0.30 | 13.9 |
| Capacity - 810 MWe | 1981 | 573.4 | 73.6 | 1237 | 229 | 38 | 191 | 142 | 87 | 0.19 | .4 |
| | 1982 | 326.7 | 41.6 | 1755 | 599 | 126 | 473 | 481 | 118 | 0.34 | 1.8 |
| | 1983 | 561.2 | 68.2 | 1485 | 772 | 158 | 614 | 615 | 157 | 0.52 | 1.4 |
| | 1984 | 576.7 | 71.8 | 1393 | 504 | 125 | 379 | 302 | 202 | 0.36 | 0.9 |
| | 1985 | 717.7 | 91.9 | 619 | 60 | 17 | 43 | 12 | 48 | 0.10 | 0.1 |
| BIG ROCK POINT | 1969 | 48.1 | | 165 | 136 | | | | | 0.82 | 2.8 |
| Docket 50-155, DPR-6 | 1970 | 43.5 | | 290 | 194 | | | | | 0.67 | 4.5 |
| 1st commercial operation 3/63 | 1971 | 44.4 | | 260 | 184 | | | | | 0.71 | 4.1 |
| Type - BWR | 1972 | 43.5 | | 195 | 181 | | | | | 0.93 | 4.2 |
| Capacity 69 MWe | 1973 | 50.9 | | 241 | 285 | | | 119 | 166 | 1.18 | 5.6 |
| | 1974 | 40.7 | 70.3 | 281 | 276 | 54 | 222 | 42 | 234 | 0.98 | 6.8 |
| | 1975 | 35.1 | 59.8 | 300 | 180 | 58 | 122 | 20 | 160 | 0.60 | 5.1 |
| | 1976 | 29.5 | 50.1 | 488 | 289 | 82 | 207 | 105 | 184 | 0.59 | 9.8 |
| | 1977 | 43.6 | 73.4 | 465 | 334 | 94 | 240 | 60 | 274 | 0.72 | 7.7 |
| | 1978 | 48.5 | 77.9 | 285 | 175 | 93 | 82 | 9 | 166 | 0.61 | 3.6 |
| | 1979 | 13.0 | 23.5 | 623 | 455 | 89 | 366 | 102 | 353 | 0.73 | 35.0 |
| | 1980 | 48.9 | 79.0 | 599 | 354 | 16 | 338 | 91 | 263 | 0.59 | 7.2 |
| | 1981 | 56.9 | 90.6 | 479 | 160 | 58 | 102 | 38 | 122 | 0.33 | 2.8 |
| | 1982 | 43.6 | 70.8 | 521 | 328 | 129 | 199 | 68 | 260 | 0.63 | 7.5 |

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| BIG ROCK POINT (Continued) | 1983 | 42.3 | 71.0 | 493 | 263 | 32 | 231 | 55 | 208 | 0.53 | 6.9 |
| | 1984 | 50.3 | 78.6 | 297 | 155 | 37 | 118 | 20 | 135 | 0.52 | 3.1 |
| | 1985 | 43.8 | 73.5 | 435 | 291 | 54 | 237 | 60 | 231 | 0.67 | 6.6 |
| BROWNS FERRY 1, 2, 3 | 1975 | 161.7 | 17.8 | 2380 | 325 | | | | | 0.14 | 2.0 |
| Docket 50-259, 50-260, 50-296; | 1976 | 337.6 | 26.9 | 2207 | 234 | | | | | 0.11 | 0.7 |
| DPR-33, -52, -68 | 1977 | 1327.5 | 73.0 | 1858 | 863 | 60 | 803 | 249 | 614 | 0.46 | 0.6 |
| 1st commercial operation 8/74, | 1978 | 1992.1 | 73.5 | 2376 | 1792 | 4 | 1788 | 259 | 1533 | 0.75 | 0.9 |
| 3/75, 3/77 | 1979 | 2393.0 | 79.1 | 2689 | 1667 | 0 | 1667 | 289 | 1378 | 0.62 | 0.7 |
| Type - BWRs | 1980 | 2182.1 | 73.6 | 2712 | 1825 | 4 | 1821 | 49 | 1776 | 0.67 | 0.8 |
| Capacity - 1065, 1065, 1065 MWe | 1981 | 2132.9 | 69.5 | 3379 | 2380 | 100 | 2280 | 404 | 1976 | 0.70 | 1.1 |
| | 1982 | 2025.4 | 67.6 | 3277 | 2220 | 181 | 2039 | 317 | 1903 | 0.68 | 1.1 |
| | 1983 | 1641.0 | 54.3 | 3302 | 3363 | 276 | 3087 | 908 | 2454 | 1.02 | 2.0 |
| | 1984 | 1431.9 | 54.2 | 2962 | 1940 | 229 | 1711 | 541 | 1399 | 0.66 | 1.4 |
| | 1985 | 368.2 | 11.9 | 2755 | 1159 | 201 | 958 | 306 | 853 | 0.42 | 3.1 |
| BRUNSWICK 2, 1 | 1976 | 297.2 | 56.0 | 1265 | 326 | 15 | 311 | 222 | 104 | 0.26 | 1.1 |
| Docket 50-324, 50-325; DPR-62, -71 | 1977 | 291.1 | 55.7 | 1512 | 1119 | 48 | 1071 | 782 | 337 | 0.74 | 3.8 |
| 1st commercial operation 11/75, | 1978 | 1173.1 | 83.7 | 1458 | 1004 | 99 | 905 | 695 | 309 | 0.69 | 0.8 |
| 3/77 | 1979 | 810.0 | 60.1 | 2891 | 2602 | 97 | 2505 | 2074 | 528 | 0.90 | 3.2 |
| Type - BWR | 1980 | 687.2 | 52.2 | 3788 | 3870 | 111 | 3759 | 3098 | 772 | 1.02 | 5.6 |
| Capacity - 790, 790 MWe | 1981 | 925.2 | 56.9 | 3854 | 2638 | 159 | 2479 | 1890 | 748 | 0.68 | 2.9 |
| | 1982 | 540.3 | 50.3 | 4957 | 3792 | 162 | 3630 | 2841 | 951 | 0.76 | 6.5 |
| | 1983 | 636.7 | 40.6 | 5602 | 3475 | 152 | 3323 | 2428 | 1047 | 0.62 | 5.5 |
| | 1984 | 761.3 | 51.5 | 5046 | 3260 | 143 | 3117 | 2363 | 897 | 0.66 | 4.3 |
| | 1985 | 822.2 | 58.4 | 4057 | 2804 | 121 | 2683 | 2078 | 726 | 0.69 | 3.4 |
| CALLAWAY | 1985 | 967.4 | 90.0 | 964 | 36 | 16 | 20 | 7 | 29 | 0.04 | 0.0 |
| Docket 50-483, NPF-30 | | | | | | | | | | | |
| 1st commercial operation 12/84 | | | | | | | | | | | |
| Type - PWR | | | | | | | | | | | |
| Capacity - 1120 MWe | | | | | | | | | | | |

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| CALVERT CLIFFS 1, 2 | 1976 | 753.4 | 95.2 | 507 | 74 | 28 | 46 | 8 | 66 | 0.15 | 0.1 |
| Docket 50-317, 50-318; DPR-53, -69 | 1977 | 583.0 | 72.1 | 2265 | 547 | 36 | 511 | 224 | 323 | 0.24 | 0.9 |
| | 1978 | 1188.5 | 75.8 | 1391 | 500 | 13 | 487 | 143 | 357 | 0.36 | 0.4 |
| 1st commercial operation 5/75, 4/77 | 1979 | 1161.0 | 74.0 | 1428 | 805 | 33 | 772 | 423 | 382 | 0.56 | 0.7 |
| | 1980 | 1309.9 | 84.1 | 1496 | 677 | 15 | 662 | 402 | 275 | 0.45 | 0.5 |
| Type - PWRs | 1981 | 1379.7 | 83.1 | 1555 | 607 | 29 | 578 | 378 | 229 | 0.39 | 0.4 |
| Capacity 825, 825 MWe | 1982 | 1238.3 | 73.7 | 1805 | 1057 | 84 | 973 | 402 | 655 | 0.59 | 0.8 |
| | 1983 | 1397.2 | 81.6 | 1915 | 668 | 5 | 663 | 143 | 525 | 0.35 | 0.5 |
| | 1984 | 1389.4 | 79.2 | 1369 | 479 | 61 | 418 | 78 | 401 | 0.35 | 0.3 |
| | 1985 | 1189.8 | 68.4 | 1598 | 694 | 69 | 625 | 144 | 550 | 0.43 | 0.6 |
| COOK 1, 2 | 1976 | 807.4 | 83.1 | 395 | 116 | 13 | 103 | 71 | 45 | 0.29 | 0.1 |
| Docket 50-315; DPR-58, -74 | 1977 | 573.0 | 76.1 | 802 | 299 | 21 | 278 | 138 | 161 | 0.37 | 0.5 |
| 1st commercial operation 8/75, 7/78 | 1978 | 744.8 | 73.6 | 778 | 336 | 49 | 287 | 139 | 197 | 0.43 | 0.4 |
| | 1979 | 1373.0 | 65.3 | 1445 | 718 | 45 | 673 | 454 | 264 | 0.50 | 0.5 |
| Type - PWRs | 1980 | 1552.4 | 74.1 | 1345 | 493 | 46 | 447 | 323 | 170 | 0.37 | 0.3 |
| Capacity - 1020 MWe, 1060 MWe | 1981 | 1557.3 | 73.4 | 1341 | 655 | 48 | 607 | 442 | 213 | 0.49 | 0.4 |
| | 1982 | 1461.6 | 69.8 | 1527 | 699 | 67 | 632 | 472 | 227 | 0.46 | 0.5 |
| | 1983 | 1456.5 | 71.2 | 1418 | 658 | 50 | 608 | 467 | 191 | 0.46 | 0.5 |
| | 1984 | 1526.0 | 75.3 | 1559 | 762 | 42 | 720 | 597 | 165 | 0.49 | 0.5 |
| | 1985 | 925.4 | 47.6 | 1984 | 945 | 93 | 852 | 758 | 187 | 0.48 | 1.0 |
| COOPER STATION | 1975 | 456.4 | 83.6 | 579 | 117 | 30 | 87 | 19 | 98 | 0.20 | 0.2 |
| Docket 50-298; DPR-46 | 1976 | 433.3 | 75.5 | 763 | 350 | 39 | 311 | 210 | 140 | 0.46 | 0.8 |
| 1st commercial operation 7/74 | 1977 | 538.2 | 86.2 | 315 | 197 | 50 | 147 | 66 | 131 | 0.63 | 0.4 |
| Type - BWR | 1978 | 576.0 | 91.0 | 297 | 158 | 40 | 118 | 58 | 100 | 0.53 | 0.3 |
| Capacity - 764 MWe | 1979 | 591.0 | 87.6 | 426 | 221 | 50 | 171 | 89 | 132 | 0.52 | 0.4 |
| | 1980 | 448.3 | 71.2 | 785 | 859 | 70 | 789 | 644 | 215 | 1.09 | 1.9 |
| | 1981 | 457.1 | 71.2 | 935 | 579 | 63 | 516 | 382 | 197 | 0.62 | 1.3 |
| | 1982 | 622.3 | 84.6 | 743 | 542 | 66 | 476 | 361 | 181 | 0.73 | 0.9 |
| | 1983 | 396.6 | 63.3 | 1383 | 1293 | 57 | 1236 | 1081 | 212 | 0.93 | 3.3 |
| | 1984 | 411.9 | 67.2 | 1598 | 799 | 46 | 753 | 635 | 164 | 0.50 | 1.9 |
| | 1985 | 127.3 | 21.5 | 1980 | 1333 | 49 | 1284 | 1104 | 229 | 0.67 | 10.5 |

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| CRYSTAL RIVER 3 | 1978 | 311.5 | 41.4 | 643 | 321 | 8 | 313 | 244 | 77 | 0.50 | 1.0 |
| Docket 50-302; DPR-72 | 1979 | 453.0 | 58.9 | 1150 | 495 | 29 | 466 | 346 | 149 | 0.43 | 1.1 |
| 1st commercial operation 3/77 | 1980 | 402.1 | 53.2 | 1053 | 625 | 24 | 601 | 382 | 243 | 0.59 | 1.6 |
| Type - PWR | 1981 | 490.4 | 62.2 | 1120 | 408 | 18 | 340 | 236 | 172 | 0.36 | 0.8 |
| Capacity - 821 MWe | 1982 | 589.8 | 76.0 | 780 | 177 | 9 | 168 | 116 | 61 | 0.23 | 0.3 |
| | 1983 | 452.1 | 58.8 | 1720 | 552 | 71 | 481 | 353 | 199 | 0.32 | 1.2 |
| | 1984 | 774.2 | 94.5 | 549 | 49 | 10 | 39 | 22 | 27 | 0.09 | 0.1 |
| | 1985 | 344.2 | 47.6 | 1976 | 689 | 43 | 646 | 424 | 265 | 0.35 | 2.0 |
| DAVIS-BESSE 1 | 1978 | 326.4 | 48.7 | 421 | 48 | 13 | 35 | 14 | 34 | 0.11 | 0.1 |
| Docket 50-346; NPF-3 | 1979 | 381.0 | 67.0 | 304 | 30 | 8 | 22 | 5 | 25 | 0.10 | 0.1 |
| 1st commercial operation 11/77 | 1980 | 256.4 | 36.2 | 1283 | 154 | 4 | 150 | 121 | 33 | 0.12 | 0.6 |
| Type - PWR | 1981 | 531.4 | 67.4 | 578 | 58 | 1 | 57 | 32 | 26 | 0.10 | 0.1 |
| Capacity - 860 MWe | 1982 | 390.8 | 51.5 | 1350 | 164 | 12 | 152 | 139 | 25 | 0.12 | 0.4 |
| | 1983 | 592.1 | 73.0 | 718 | 80 | 6 | 74 | 46 | 34 | 0.11 | 0.1 |
| | 1984 | 518.5 | 62.5 | 1088 | 177 | 10 | 167 | 122 | 55 | 0.16 | 0.3 |
| | 1985 | 238.3 | 31.2 | 718 | 71 | 3 | 68 | 46 | 25 | 0.10 | 0.3 |
| DRESDEN 1,* 2, 3 | 1969 | 99.7 | | | 286 | | | | | | 2.9 |
| Docket 50-010, 50-237, 50-249; | 1970 | 163.1 | | | 143 | | | | | | 0.9 |
| DPR-2, -19, -25 | 1971 | 394.5 | | | 715 | | | | | | 1.8 |
| 1st commercial operation 7/60, | 1972 | 1243.7 | | | 728 | | | | | | 0.6 |
| 7/70, 11/71 | 1973 | 1112.2 | | 1341 | 939 | 143 | 796 | 344 | 595 | 0.70 | 0.8 |
| Type - BWRs | 1974 | 842.5 | 54.9 | 1594 | 1662 | | | 57 | 1605 | 1.04 | 2.0 |
| Capacity - 0, 772, 773 MWe | 1975 | 708.1 | 54.6 | 2310 | 3423 | 271 | 3152 | 2252 | 1171 | 1.48 | 4.8 |
| | 1976 | 1127.2 | 80.8 | 1746 | 1680 | 228 | 1452 | 749 | 931 | 0.96 | 1.5 |
| | 1977 | 1132.9 | 77.0 | 1862 | 1693 | 316 | 1377 | 693 | 1000 | 0.91 | 1.5 |
| | 1978 | 1242.2 | 79.5 | 1946 | 1529 | 204 | 1325 | 619 | 910 | 0.79 | 1.2 |
| | 1979 | 1013.0 | 74.7 | 2407 | 1800 | 191 | 1609 | 641 | 1159 | 0.75 | 1.8 |
| | 1980 | 1074.4 | 55.0 | 2717 | 2105 | 236 | 1869 | 1093 | 1012 | 0.77 | 2.0 |
| | 1981 | 1035.7 | 51.5 | 2408 | 2802 | 120 | 2682 | 1850 | 952 | 1.16 | 2.7 |
| | 1982 | 1085.3 | 77.9 | 2572 | 2923 | 136 | 2787 | 1731 | 1192 | 1.14 | 2.7 |
| | 1983 | 913.6 | 65.6 | 2854 | 3582 | 176 | 3406 | 2127 | 1455 | 1.26 | 3.9 |
| | 1984 | 789.8 | 55.3 | 2261 | 1774 | 153 | 1621 | 814 | 960 | 0.78 | 2.2 |
| | 1985 | 903.0 | 64.5 | 2817 | 1685 | 473 | 1212 | 878 | 807 | 0.60 | 1.9 |

*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 commercial reactors.

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| DUANE ARNOLD | 1976 | 305.2 | 78.0 | 350 | 105 | 14 | 91 | 62 | 43 | 0.30 | 0.3 |
| Docket 50-331; DPR-49 | 1977 | 353.6 | 78.9 | 538 | 299 | 36 | 263 | 220 | 79 | 0.56 | 0.8 |
| 1st commercial operation 2/75 | 1978 | 149.2 | 33.2 | 1112 | 974 | 59 | 915 | 932 | 42 | 0.88 | 6.5 |
| Type - BWR | 1979 | 352.0 | 78.0 | 757 | 275 | 35 | 240 | 219 | 56 | 0.36 | 0.8 |
| Capacity - 515 MWe | 1980 | 339.1 | 73.3 | 1108 | 671 | 32 | 639 | 570 | 101 | 0.61 | 2.0 |
| | 1981 | 277.7 | 69.8 | 1286 | 790 | 56 | 734 | 598 | 192 | 0.61 | 2.8 |
| | 1982 | 278.5 | 74.7 | 524 | 229 | 18 | 211 | 175 | 54 | 0.44 | 0.8 |
| | 1983 | 283.0 | 62.9 | 1468 | 1135 | 42 | 1093 | 1016 | 119 | 0.77 | 4.0 |
| | 1984 | 329.4 | 72.9 | 611 | 189 | 27 | 162 | 117 | 72 | 0.31 | 0.6 |
| | 1985 | 236.2 | 53.8 | 1414 | 1112 | 49 | 1063 | 954 | 158 | 0.79 | 4.7 |
| FARLEY 1, 2 | 1978 | 713.8 | 86.5 | 527 | 108 | 39 | 69 | 34 | 74 | 0.20 | 0.1 |
| Docket 50-348, 50-364; NPF-2, -8 | 1979 | 211.0 | 28.6 | 1227 | 643 | 108 | 535 | 460 | 183 | 0.52 | 3.0 |
| 1st commercial operation 12/77, 7/81 | 1980 | 557.3 | 69.3 | 1330 | 435 | 106 | 329 | 185 | 250 | 0.33 | 0.8 |
| | 1981 | 310.2 | 41.4 | 1331 | 511 | 96 | 415 | 270 | 241 | 0.38 | 1.6 |
| Type - PWR | 1982 | 1271.5 | 79.2 | 1453 | 484 | 155 | 329 | 196 | 288 | 0.33 | 0.4 |
| Capacity - 816, 807 MWe | 1983 | 1356.5 | 82.9 | 1938 | 1021 | 241 | 780 | 479 | 542 | 0.53 | 0.8 |
| | 1984 | 1447.0 | 86.6 | 2046 | 902 | 177 | 725 | 504 | 398 | 0.44 | 0.6 |
| | 1985 | 1368.2 | 81.1 | 2551 | 799 | 157 | 642 | 443 | 356 | 0.31 | 0.6 |
| FITZPATRICK | 1976 | 489.0 | 71.6 | 600 | 202 | | | | | 0.34 | 0.4 |
| Docket 50-333; DPR-59 | 1977 | 460.5 | 68.4 | 1380 | 1080 | 14 | 1066 | 937 | 143 | 0.78 | 2.3 |
| 1st commercial operation 7/75 | 1978 | 497.0 | 72.1 | 904 | 909 | 166 | 743 | 597 | 312 | 1.00 | 1.8 |
| Type - BWR | 1979 | 349.0 | 50.8 | 850 | 859 | 169 | 690 | 538 | 321 | 1.01 | 2.5 |
| Capacity - 810 MWe | 1980 | 509.5 | 70.3 | 2056 | 2040 | 118 | 1922 | 1808 | 232 | 0.99 | 4.0 |
| | 1981 | 562.9 | 74.7 | 2490 | 1425 | 187 | 1238 | 1072 | 353 | 0.57 | 2.5 |
| | 1982 | 583.6 | 75.0 | 2322 | 1190 | 136 | 1054 | 862 | 328 | 0.51 | 2.0 |
| | 1983 | 546.2 | 70.6 | 1715 | 1090 | 158 | 932 | 667 | 423 | 0.64 | 2.0 |
| | 1984 | 576.2 | 76.8 | 1610 | 971 | 82 | 889 | 467 | 504 | 0.60 | 1.7 |
| | 1985 | 492.3 | 63.7 | 1845 | 1051 | 110 | 941 | 718 | 333 | 0.57 | 2.1 |
| FORT CALHOUN | 1974 | 294.0 | 83.5 | 327 | 71 | | | 24 | 47 | 0.22 | 0.2 |
| Docket 50-285; DPR-40 | 1975 | 252.3 | 67.4 | 469 | 294 | | | 92 | 202 | 0.63 | 1.2 |
| 1st commercial operation 9/73 | 1976 | 265.9 | 69.5 | 516 | 313 | 28 | 285 | 38 | 275 | 0.61 | 1.2 |
| Type - PWR | 1977 | 351.8 | 79.4 | 535 | 297 | 33 | 264 | 72 | 225 | 0.56 | 0.8 |
| Capacity - 478 MWe | 1978 | 342.3 | 75.1 | 596 | 410 | 59 | 351 | 151 | 259 | 0.69 | 1.2 |

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| FORT CALHOUN (Continued) | 1979 | 440.0 | 95.7 | 451 | 126 | 19 | 107 | 47 | 79 | 0.28 | 0.3 |
| | 1980 | 242.3 | 60.4 | 891 | 668 | 38 | 630 | 426 | 242 | 0.75 | 2.8 |
| | 1981 | 260.9 | 72.3 | 822 | 458 | 61 | 397 | 254 | 204 | 0.56 | 1.8 |
| | 1982 | 418.0 | 89.7 | 604 | 217 | 44 | 173 | 99 | 118 | 0.36 | 0.5 |
| | 1983 | 330.4 | 73.1 | 860 | 433 | 66 | 367 | 205 | 228 | 0.50 | 1.3 |
| | 1984 | 279.2 | 59.9 | 913 | 563 | 91 | 472 | 313 | 250 | 0.62 | 2.0 |
| | 1985 | 367.0 | 73.7 | 982 | 373 | 54 | 319 | 231 | 142 | 0.38 | 1.0 |
| GINNA | 1971 | 327.8 | | 340 | 430 | 69 | 361 | 108 | 322 | 1.26 | 1.3 |
| Docket 50-244; DPR-18 | 1972 | 293.6 | | 677 | 1032 | 71 | 961 | 278 | 754 | 1.52 | 3.5 |
| 1st commercial operation 7/70 | 1973 | 409.5 | | 319 | 224 | 55 | 169 | 84 | 140 | 0.70 | 0.5 |
| Type - PWR | 1974 | 253.7 | 62.4 | 884 | 1225 | | | | | 1.39 | 4.8 |
| Capacity - 470 MWe | 1975 | 365.2 | 76.7 | 685 | 538 | | | | | 0.78 | 1.5 |
| | 1976 | 248.8 | 58.2 | 758 | 636 | 29 | 607 | 210 | 426 | 0.84 | 2.5 |
| | 1977 | 365.6 | 85.5 | 530 | 401 | 15 | 386 | 120 | 281 | 0.76 | 1.1 |
| | 1978 | 386.5 | 80.6 | 657 | 450 | 20 | 430 | 98 | 352 | 0.68 | 1.2 |
| | 1979 | 355.0 | 72.8 | 878 | 592 | 68 | 524 | 207 | 385 | 0.67 | 1.7 |
| | 1980 | 370.5 | 76.0 | 1073 | 708 | 64 | 644 | 302 | 406 | 0.66 | 1.9 |
| | 1981 | 399.0 | 82.1 | 925 | 655 | 49 | 606 | 251 | 404 | 0.71 | 1.6 |
| | 1982 | 289.0 | 58.8 | 1117 | 1140 | 80 | 1060 | 546 | 594 | 1.02 | 3.9 |
| | 1983 | 365.0 | 74.6 | 969 | 855 | 42 | 813 | 378 | 477 | 0.88 | 2.3 |
| | 1984 | 378.1 | 77.2 | 713 | 394 | 57 | 337 | 195 | 199 | 0.55 | 1.0 |
| | 1985 | 436.7 | 87.9 | 845 | 426 | 91 | 335 | 178 | 248 | 0.50 | 1.0 |
| HADDAM NECK (CONN. YANKEE) | 1969 | 438.5 | | 138 | 106 | | | 27 | 79 | 0.77 | 0.2 |
| Docket 50-213; DPR-61 | 1970 | 424.7 | | 734 | 689 | | | 463 | 226 | 0.94 | 1.6 |
| 1st commercial operation 1/68 | 1971 | 502.2 | | 289 | 342 | | | 166 | 176 | 1.18 | 0.7 |
| Type - PWR | 1972 | 515.6 | | 355 | 325 | | | 181 | 144 | 0.91 | 0.6 |
| Capacity - 569 MWe | 1973 | 293.1 | | 951 | 697 | | | 544 | 153 | 0.73 | 2.4 |
| | 1974 | 521.4 | 91.2 | 550 | 201 | | | | | 0.36 | 0.4 |
| | 1975 | 494.3 | 89.9 | 795 | 703 | 20 | 683 | | | 0.88 | 1.4 |
| | 1976 | 482.9 | 82.5 | 644 | 449 | 5 | 444 | 253 | 196 | 0.70 | 0.9 |
| | 1977 | 480.7 | 83.9 | 894 | 641 | 59 | 582 | 440 | 201 | 0.72 | 1.3 |
| | 1978 | 563.4 | 98.6 | 216 | 117 | 25 | 92 | 18 | 99 | 0.54 | 0.2 |
| | 1979 | 493.0 | 87.5 | 1226 | 1161 | 73 | 1088 | 783 | 378 | 0.95 | 2.4 |
| | 1980 | 426.8 | 75.0 | 1860 | 1353 | 175 | 1178 | 1076 | 277 | 0.73 | 3.2 |
| | 1981 | 487.5 | 84.3 | 1554 | 1036 | 174 | 862 | 809 | 227 | 0.67 | 2.1 |

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| HADDAM NECK (CONN. YANKEE) | 1982 | 543.9 | 93.4 | 559 | 126 | 46 | 80 | 22 | 104 | 0.23 | 0.2 |
| (Continued) | 1983 | 453.7 | 77.8 | 1645 | 1384 | 106 | 1278 | 1017 | 367 | 0.84 | 3.1 |
| | 1984 | 404.0 | 71.7 | 1430 | 1216 | 154 | 1062 | 803 | 413 | 0.85 | 3.0 |
| | 1985 | 556.1 | 98.4 | 384 | 101 | 21 | 80 | 22 | 79 | 0.26 | 0.2 |
| HATCH 1, 2 | 1976 | 496.3 | 83.8 | 630 | 134 | 79 | 55 | 4 | 130 | 0.21 | 0.3 |
| Docket 50-321, 50-366; DPR-57; | 1977 | 446.8 | 66.3 | 1303 | 465 | 96 | 369 | 220 | 245 | 0.36 | 1.0 |
| NPF-05 | 1978 | 513.0 | 72.8 | 1304 | 248 | 88 | 160 | 52 | 196 | 0.19 | 0.5 |
| 1st commercial operation 12/75, | 1979 | 401.0 | 54.6 | 2131 | 582 | 85 | 497 | 382 | 200 | 0.27 | 1.5 |
| 9/79 | 1980 | 1008.7 | 70.9 | 1930 | 449 | 143 | 306 | 163 | 286 | 0.23 | 0.4 |
| Type - BWR | 1981 | 870.9 | 64.3 | 2899 | 1337 | 200 | 1137 | 792 | 545 | 0.46 | 1.5 |
| Capacity - 752, 748 MWe | 1982 | 768.0 | 56.6 | 3418 | 1460 | 218 | 1242 | 1064 | 396 | 0.43 | 1.9 |
| | 1983 | 934.7 | 68.6 | 3428 | 1299 | 253 | 1046 | 851 | 448 | 0.38 | 1.4 |
| | 1984 | 658.6 | 117.3 | 4110 | 2218 | 311 | 1907 | 1861 | 357 | 0.54 | 3.4 |
| | 1985 | 124.0 | 79.1 | 2841 | 818 | 182 | 636 | 507 | 311 | 0.29 | 0.7 |
| HUMBOLDT BAY[a] | 1969 | 44.6 | | 125 | 164 | 69 | 95 | 12 | 152 | 1.31 | 3.7 |
| Docket 50-133; DPR-7 | 1970 | 49.3 | | 115 | 209 | 130 | 79 | 37 | 172 | 1.82 | 4.2 |
| 1st commercial operation 8/63 | 1971 | 39.6 | | 140 | 292 | 114 | 178 | 65 | 227 | 2.09 | 7.4 |
| Type - BWR | 1972 | 43.1 | | 127 | 253 | 81 | 172 | 57 | 196 | 1.99 | 5.9 |
| Capacity - 0 MWe | 1973 | 50.1 | | 210 | 266 | 60 | 206 | | | 1.27 | 5.3 |
| | 1974 | 43.4 | 83.8 | 296 | 318 | 103 | 215 | | | 1.07 | 7.3 |
| | 1975 | 45.3 | 83.9 | 265 | 339 | 131 | 208 | 112 | 227 | 1.28 | 7.5 |
| | 1976 | 23.5 | 46.4 | 523 | 683 | 37 | 646 | 50 | 633 | 1.31 | 29.1 |
| | 1977 | 0 | 0 | 1063 | 1904 | 24 | 1880 | 973 | 931 | 1.79 | - |
| | 1978 | 0 | 0 | 320 | 335 | 13 | 322 | 145 | 190 | 1.05 | - |
| | 1979 | 0 | 0 | 135 | 31 | 11 | 20 | 2 | 29 | 0.23 | - |
| | 1980 | 0 | 0 | 142 | 22 | 10 | 12 | 3 | 19 | 0.15 | - |
| | 1981 | 0 | 0 | 75 | 9 | | | | | 0.12 | - |
| | 1982 | 0 | 0 | 71 | 19 | 5 | 14 | 0 | 19 | 0.27 | - |
| | 1983 | 0 | 0 | 84 | 17 | 4 | 13 | 0 | 17 | 0.20 | - |

[a]Humboldt Bay has been shutdown 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 commercial reactors.

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| INDIAN POINT 1,* 2, 3** | 1969 | 206.2 | | | 298 | | | | | | 1.4 |
| Docket 50-3, 50-247, 50-286; | 1970 | 43.3 | | | 1639 | | | | | | 37.8 |
| DPR-5, -26, -64 | 1971 | 154.0 | | | 768 | | | | | | 5.0 |
| 1st commercial operation 10/62, | 1972 | 142.3 | | | 967 | | | | | | 6.8 |
| 8/73, 8/76 | 1973 | 0 | | 2998 | 5262 | 709 | 4553 | 2847 | 2415 | 1.75 | - |
| Type - PWR | 1974 | 556.1 | 59.4 | 1019 | 910 | | | | | 0.89 | 1.6 |
| | 1975 | 584.4 | 74.8 | 891 | 705 | 166 | 539 | 47 | 658 | 0.79 | 1.2 |
| | 1976 | 273.9 | 34.8 | 1590 | 1950 | 154 | 1796 | 172 | 1778 | 1.23 | 7.1 |
| | 1977 | 1278.3 | 75.3 | 1391 | 1070 | 189 | 881 | 383 | 687 | 0.77 | 0.8 |
| | 1978 | 1172.3 | 67.8 | 1909 | 2006 | 260 | 1746 | 759 | 1247 | 1.05 | 1.7 |
| INDIAN POINT 1,* 2 | 1979 | 574.0 | 71.4 | 1349 | 1279 | 209 | 1070 | 612 | 667 | 0.95 | 2.2 |
| Docket 50-3, 50-247, | 1980 | 510.8 | 64.8 | 1577 | 971 | 181 | 790 | 398 | 573 | 0.62 | 1.9 |
| DPR-5, -26 | 1981 | 367.5 | 46.0 | 2595 | 2731 | 237 | 2494 | 1595 | 1137 | 1.05 | 7.4 |
| 1st commercial operation 10/62, | 1982 | 532.4 | 65.4 | 2144 | 1635 | 343 | 1292 | 883 | 752 | 0.76 | 3.1 |
| 8/73 | 1983 | 702.6 | 84.0 | 1057 | 486 | 200 | 286 | 217 | 269 | 0.46 | 0.7 |
| Type - PWR | 1984 | 416.7 | 51.9 | 2919 | 2644 | 650 | 1994 | 1863 | 781 | 0.91 | 6.3 |
| Capacity, 0, 864 MWe | 1985 | 791.4 | 95.7 | 708 | 192 | 123 | 69 | 95 | 97 | 0.27 | 0.2 |
| INDIAN POINT 3** | 1979 | 568.0 | 66.5 | 808 | 636 | 63 | 573 | 482 | 154 | 0.79 | 1.1 |
| Docket 50-286; DPR-64 | 1980 | 367.3 | 53.2 | 977 | 308 | 47 | 261 | 210 | 98 | 0.32 | 0.8 |
| 1st commercial operation 8/76 | 1981 | 365.8 | 59.8 | 677 | 364 | 46 | 318 | 255 | 109 | 0.54 | 1.0 |
| Type - PWR | 1982 | 171.5 | 22.5 | 1477 | 1226 | 42 | 1184 | 1094 | 132 | 0.83 | 7.1 |
| Capacity - 965 MWe | 1983 | 7.8 | 2.6 | 941 | 607 | 38 | 569 | 494 | 113 | 0.65 | 77.8 |
| | 1984 | 714.4 | 76.3 | 658 | 230 | 48 | 182 | 127 | 103 | 0.35 | 0.3 |
| | 1985 | 566.5 | 66.0 | 1093 | 570 | 35 | 535 | 455 | 115 | 0.52 | 1.0 |
| KEWAUNEE | 1975 | 401.9 | 88.2 | 104 | 28 | 1 | 27 | 12 | 16 | 0.27 | 0.1 |
| Docket 50-305; DPR-43 | 1976 | 405.9 | 78.9 | 381 | 270 | 16 | 254 | 193 | 77 | 0.71 | 0.7 |
| 1st commercial operation 6/74 | 1977 | 425.0 | 79.9 | 312 | 139 | 8 | 131 | 76 | 63 | 0.44 | 0.3 |
| Type - PWR | 1978 | 466.6 | 89.5 | 335 | 154 | 11 | 143 | 89 | 65 | 0.46 | 0.3 |
| Capacity - 503 MWe | 1979 | 412.0 | 79.0 | 343 | 127 | 6 | 121 | 79 | 48 | 0.37 | 0.3 |
| | 1980 | 433.8 | 82.1 | 401 | 165 | 7 | 158 | 103 | 62 | 0.41 | 0.4 |
| | 1981 | 451.8 | 86.7 | 383 | 141 | 7 | 134 | 94 | 47 | 0.37 | 0.3 |

*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 commercial reactors.

**INDIAN POINT 3 was purchased by a different utility and now reports separately.

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| KEWAUNEE (Continued) | 1982 | 458.4 | 87.6 | 353 | 101 | 5 | 96 | 51 | 50 | 0.29 | 0.2 |
| | 1983 | 444.1 | 83.7 | 445 | 165 | 10 | 155 | 119 | 46 | 0.37 | 0.4 |
| | 1984 | 455.3 | 85.7 | 482 | 139 | 7 | 132 | 90 | 49 | 0.29 | 0.3 |
| | 1985 | 443.1 | 82.4 | 519 | 176 | 4 | 172 | 118 | 58 | 0.34 | 0.4 |
| LACROSSE | 1970 | 15.3 | | | 111 | | | 40 | 71 | | 7.2 |
| Docket 50-409; DPR-45 | 1971 | 33.1 | | 218 | 158 | | | | | 0.72 | 4.8 |
| 1st commercial operation 11/69 | 1972 | 29.2 | | 151 | 172 | | | | | 1.14 | 5.9 |
| Type - BWR | 1973 | 24.4 | | 157 | 221 | | | | | 1.41 | 9.1 |
| Capacity - 48 MWe | 1974 | 37.9 | 81.0 | 115 | 139 | 89 | 50 | 6 | 133 | 1.21 | 3.7 |
| | 1975 | 32.0 | 69.6 | 165 | 234 | | | | | 1.42 | 7.3 |
| | 1976 | 21.2 | 47.6 | 118 | 111 | 40 | 71 | 6 | 105 | 0.94 | 5.2 |
| | 1977 | 11.3 | 33.7 | 141 | 224 | 60 | 164 | 8 | 216 | 1.59 | 19.8 |
| | 1978 | 21.6 | 62.0 | 182 | 164 | 69 | 95 | 6 | 158 | 0.90 | 7.6 |
| | 1979 | 24.0 | 71.8 | 153 | 186 | 65 | 121 | 21 | 165 | 1.22 | 7.7 |
| | 1980 | 26.4 | 68.5 | 124 | 218 | 63 | 155 | 11 | 207 | 1.76 | 8.3 |
| | 1981 | 29.6 | 76.0 | 187 | 123 | 62 | 61 | 3 | 120 | 0.66 | 4.2 |
| | 1982 | 17.2 | 44.6 | 148 | 205 | 65 | 140 | 16 | 189 | 1.39 | 11.9 |
| | 1983 | 24.8 | 59.7 | 160 | 313 | 103 | 210 | 31 | 282 | 1.96 | 12.6 |
| | 1984 | 38.5 | 80.5 | 288 | 252 | 141 | 111 | 5 | 247 | 0.87 | 6.5 |
| | 1985 | 39.2 | 86.7 | 373 | 173 | 76 | 97 | 22 | 151 | 0.46 | 4.4 |
| LASALLE 1, 2* | 1984 | 677.8 | 68.9 | 1245 | 252 | 30 | 222 | 86 | 166 | 0.20 | 0.4 |
| Docket 50-373, -374; NPF-11, -18 | 1985 | 987.9 | 52.5 | 1635 | 685 | 88 | 597 | 420 | 265 | 0.42 | 0.7 |
| 1st commercial operation 1/84, 10/84 | | | | | | | | | | | |
| Type - BWR | | | | | | | | | | | |
| Capacity - 1036, 1036 MWe | | | | | | | | | | | |
| MAINE YANKEE | 1973 | 408.7 | | 782 | 117 | | | 59 | 58 | 0.15 | 0.3 |
| Docket 50-309; DPR-36 | 1974 | 432.6 | 68.7 | 619 | 420 | 64 | 356 | 188 | 232 | 0.68 | 1.0 |
| 1st commercial operation 12/72 | 1975 | 542.9 | 79.9 | 440 | 319 | 15 | 304 | 181 | 138 | 0.72 | 0.6 |
| Type - PWR | 1976 | 712.2 | 95.0 | 244 | 85 | 27 | 58 | 26 | 59 | 0.35 | 0.1 |
| Capacity - 810 MWe | 1977 | 617.6 | 82.2 | 508 | 245 | 46 | 199 | 112 | 133 | 0.48 | 0.4 |
| | 1978 | 642.7 | 84.1 | 638 | 420 | 54 | 366 | 262 | 158 | 0.66 | 0.6 |
| | 1979 | 537.0 | 68.4 | 393 | 154 | 70 | 84 | 26 | 128 | 0.39 | 0.3 |

*LaSalle 2 was counted for the first time in 1985.

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| MAINE YANKEE (Continued) | 1980 | 527.0 | 72.2 | 735 | 462 | 117 | 345 | 277 | 185 | 0.63 | 0.9 |
| | 1981 | 624.2 | 78.2 | 868 | 424 | 11 | 413 | 308 | 116 | 0.49 | 0.7 |
| | 1982 | 542.5 | 69.1 | 1295 | 619 | 33 | 586 | 462 | 157 | 0.48 | 1.1 |
| | 1983 | 677.1 | 83.6 | 592 | 164 | 40 | 124 | 72 | 92 | 0.28 | 0.2 |
| | 1984 | 605.7 | 74.4 | 1262 | 884 | 9 | 875 | 702 | 182 | 0.70 | 1.5 |
| | 1985 | 635.4 | 79.2 | 1009 | 700 | 54 | 646 | 529 | 171 | 0.69 | 1.1 |
| MCGUIRE 1, 2* | 1982 | 524.9 | 80.4 | 1560 | 169 | 26 | 143 | 29 | 140 | 0.11 | 0.3 |
| Docket 50-369, -370; NPF-9, -17 | 1983 | 558.3 | 55.4 | 1751 | 521 | 35 | 486 | 123 | 398 | 0.30 | 0.9 |
| 1st commercial operation 12/81 | 1984 | 764.1 | 68.5 | 1663 | 507 | 40 | 467 | 110 | 397 | 0.30 | 0.7 |
| Type - PWR | 1985 | 1477.6 | 68.1 | 2217 | 771 | 92 | 679 | 277 | 494 | 0.35 | 0.5 |
| Capacity - 1180, 1180 MWe | | | | | | | | | | | |
| MILLSTONE POINT 1 | 1972 | 377.6 | | 612 | 596 | 50 | 546 | 340 | 256 | 0.97 | 1.6 |
| Docket 50-245; DPR-21 | 1973 | 225.1 | | 1184 | 663 | 125 | 538 | 422 | 241 | 0.56 | 2.9 |
| 1st commercial operation 3/71 | 1974 | 430.3 | 79.1 | 2477 | 1430 | | | | | 0.58 | 3.3 |
| Type - BWR | 1975 | 465.4 | 75.6 | 2587 | 2022 | | | | | 0.78 | 4.3 |
| Capacity - 654 MWe | 1976 | 449.8 | 76.1 | 1377 | 1194 | 54 | 1140 | 955 | 239 | 0.87 | 2.6 |
| | 1977 | 575.7 | 89.6 | 1075 | 392 | 118 | 274 | 159 | 233 | 0.36 | 0.7 |
| | 1978 | 556.6 | 87.6 | 1391 | 1239 | 140 | 1099 | 907 | 332 | 0.89 | 2.2 |
| | 1979 | 505.0 | 77.3 | 1769 | 1793 | 198 | 1595 | 1326 | 467 | 1.01 | 3.6 |
| | 1980 | 405.8 | 69.0 | 3024 | 2158 | 100 | 2058 | 1864 | 294 | 0.71 | 5.3 |
| | 1981 | 304.3 | 51.6 | 2506 | 1496 | 96 | 1400 | 1201 | 295 | 0.60 | 4.9 |
| | 1982 | 490.2 | 79.9 | 1370 | 929 | 78 | 851 | 587 | 342 | 0.68 | 1.9 |
| | 1983 | 640.1 | 95.6 | 309 | 244 | 63 | 181 | 74 | 170 | 0.79 | 0.4 |
| | 1984 | 516.1 | 78.8 | 1992 | 836 | 80 | 756 | 532 | 304 | 0.42 | 1.6 |
| | 1985 | 548.5 | 83.6 | 732 | 608 | 65 | 543 | 369 | 239 | 0.83 | 1.1 |
| MILLSTONE POINT 2 | 1976 | 545.7 | 78.7 | 620 | 168 | 26 | 142 | 73 | 95 | 0.27 | 0.3 |
| Docket 50-336; DPR-65 | 1977 | 518.7 | 65.7 | 667 | 242 | 38 | 204 | 153 | 89 | 0.36 | 0.5 |
| 1st commercial operation 12/75 | 1978 | 536.6 | 67.3 | 1420 | 1621 | 72 | 1549 | 1534 | 87 | 1.14 | 3.0 |
| Type-PWR | 1979 | 520.0 | 62.8 | 757 | 472 | 81 | 391 | 305 | 167 | 0.62 | 0.9 |
| Capacity - 857 MWe | 1980 | 579.3 | 69.2 | 892 | 636 | 76 | 560 | 514 | 122 | 0.71 | 1.1 |
| | 1981 | 722.4 | 82.6 | 890 | 531 | 44 | 487 | 393 | 138 | 0.60 | 0.7 |
| | 1982 | 595.9 | 70.6 | 2083 | 1413 | 27 | 1386 | 1219 | 194 | 0.68 | 2.4 |
| | 1983 | 294.0 | 34.2 | 2383 | 1881 | 170 | 1711 | 1548 | 333 | 0.79 | 6.4 |

*McGuire 2 was counted for the first time in 1985.

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| MILLSTONE POINT 2 (Continued) | 1984 | 782.7 | 93.5 | 285 | 120 | 11 | 109 | 63 | 57 | 0.42 | 0.2 |
| | 1985 | 417.8 | 49.4 | 1905 | 1581 | 60 | 1521 | 1255 | 326 | 0.83 | 3.8 |
| MONTICELLO | 1972 | 424.4 | | 99 | 61 | 40 | 21 | 1 | 60 | 0.62 | 0.1 |
| Docket 50-263; DPR-22 | 1973 | 389.5 | | 401 | 176 | 48 | 128 | 67 | 109 | 0.44 | 0.4 |
| 1st commercial operation 6/71 | 1974 | 349.3 | 74.9 | 842 | 349 | | | 91 | 258 | 0.41 | 1.0 |
| Type - BWR | 1975 | 344.8 | 72.2 | 1353 | 1353 | | | | | 1.00 | 3.9 |
| Capacity - 536 MWe | 1976 | 476.4 | 91.5 | 325 | 263 | 59 | 204 | 51 | 212 | 0.81 | 0.5 |
| | 1977 | 425.6 | 79.9 | 860 | 1000 | 135 | 865 | 661 | 339 | 1.16 | 2.3 |
| | 1978 | 459.4 | 87.2 | 679 | 375 | 62 | 313 | 165 | 210 | 0.55 | 0.8 |
| | 1979 | 522.0 | 97.6 | 372 | 157 | 62 | 95 | 51 | 106 | 0.42 | 0.3 |
| | 1980 | 411.8 | 78.2 | 1114 | 531 | 82 | 449 | 248 | 283 | 0.48 | 1.3 |
| | 1981 | 389.3 | 72.6 | 1446 | 1004 | 101 | 903 | 756 | 248 | 0.69 | 2.6 |
| | 1982 | 291.1 | 63.3 | 1307 | 993 | 130 | 863 | 760 | 233 | 0.76 | 3.4 |
| | 1983 | 494.6 | 96.3 | 416 | 121 | 57 | 64 | 23 | 98 | 0.29 | 0.2 |
| | 1984 | 33.7 | 9.2 | 1872 | 2462 | 208 | 2254 | 927 | 1535 | 1.32 | 73.1 |
| | 1985 | 509.8 | 91.7 | 586 | 327 | 87 | 240 | 47 | 280 | 0.56 | 0.6 |
| NINE MILE POINT 1 | 1970 | 227.0 | | 821 | 44 | 12 | 32 | 17 | 27 | 0.05 | 0.2 |
| Docket 50-220; DPR-63 | 1971 | 346.5 | | 1006 | 195 | 43 | 152 | 63 | 132 | 0.19 | 0.6 |
| 1st commercial operation 12/69 | 1972 | 381.8 | | 735 | 285 | 59 | 226 | 28 | 257 | 0.39 | 0.7 |
| Type - BWR | 1973 | 411.0 | | 550 | 567 | 139 | 428 | 118 | 449 | 1.03 | 1.4 |
| Capacity - 610 MWe | 1974 | 385.9 | 70.5 | 740 | 824 | 42 | 782 | 279 | 545 | 1.11 | 2.1 |
| | 1975 | 359.0 | 72.1 | 649 | 681 | 68 | 613 | 203 | 478 | 1.05 | 1.9 |
| | 1976 | 484.6 | 88.2 | 392 | 428 | 52 | 376 | 229 | 199 | 1.09 | 0.9 |
| | 1977 | 347.4 | 59.2 | 1093 | 1383 | 41 | 1342 | 883 | 500 | 1.26 | 4.0 |
| | 1978 | 527.7 | 95.1 | 561 | 314 | 59 | 255 | 26 | 288 | 0.56 | 0.6 |
| | 1979 | 354.0 | 66.1 | 1326 | 1497 | 106 | 1391 | 940 | 557 | 1.13 | 4.2 |
| | 1980 | 533.9 | 92.3 | 1174 | 591 | 75 | 516 | 251 | 340 | 0.50 | 1.1 |
| | 1981 | 385.2 | 66.0 | 2029 | 1592 | 144 | 1448 | 1064 | 528 | 0.78 | 4.1 |
| | 1982 | 133.5 | 21.4 | 1352 | 1264 | 63 | 1201 | 944 | 320 | 0.93 | 9.5 |
| | 1983 | 329.8 | 56.2 | 1405 | 860 | 50 | 810 | 576 | 284 | 0.61 | 2.6 |
| | 1984 | 426.8 | 71.9 | 1530 | 890 | 163 | 727 | 372 | 518 | 0.58 | 2.1 |
| | 1985 | 580.9 | 96.4 | 1007 | 265 | 60 | 205 | 43 | 222 | 0.26 | 0.5 |

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| NORTH ANNA 1, 2 | 1979 | 507.0 | 61.7 | 2025 | 449 | 78 | 371 | 190 | 259 | 0.22 | 0.9 |
| Docket 50-338; NPF-04, - 09 | 1980 | 681.8 | 86.5 | 2086 | 218 | 128 | 90 | 85 | 133 | 0.10 | 0.3 |
| 1st commercial operation 6/78, | 1981 | 1241.9 | 71.5 | 2416 | 680 | 188 | 492 | 343 | 337 | 0.28 | 0.5 |
| 12/80 | 1982 | 777.7 | 45.8 | 2872 | 1915 | 78 | 1837 | 1207 | 708 | 0.67 | 2.5 |
| Type - PWRs | 1983 | 1338.4 | 76.1 | 2228 | 665 | 129 | 536 | 296 | 369 | 0.30 | 0.5 |
| Capacity - 893, 893 MWe | 1984 | 1021.3 | 58.8 | 3062 | 1945 | 154 | 1791 | 1416 | 529 | 0.54 | 1.9 |
| | 1985 | 1516.9 | 86.1 | 2436 | 839 | 141 | 698 | 502 | 337 | 0.34 | 0.6 |
| OCONEE 1, 2, 3 | 1974 | 650.6 | 60.1 | 844 | 517 | 18 | 499 | 144 | 373 | 0.61 | 0.8 |
| Docket 50-269, 50-270, 50-287; | 1975 | 1838.3 | 75.5 | 829 | 497 | 72 | 425 | 90 | 407 | 0.60 | 0.3 |
| DPR-38, -47, -55 | 1976 | 1561.4 | 63.0 | 1215 | 1026 | 65 | 961 | 219 | 807 | 0.84 | 0.6 |
| 1st commercial operation 7/73 | 1977 | 1566.4 | 65.9 | 1595 | 1328 | 244 | 1084 | 294 | 1034 | 0.83 | 0.8 |
| 9/74, 12/74 | 1978 | 1909.0 | 75.8 | 1636 | 1393 | 179 | 1214 | 340 | 1053 | 0.85 | 0.7 |
| Type - PWRs | 1979 | 1708.0 | 67.7 | 2100 | 1001 | 123 | 878 | 181 | 820 | 0.48 | 0.6 |
| Capacity - 860, 860, 860 MWe | 1980 | 1703.7 | 70.1 | 2124 | 1055 | 117 | 938 | 162 | 893 | 0.50 | 0.6 |
| | 1981 | 1661.5 | 66.8 | 2445 | 1211 | 113 | 1098 | 275 | 936 | 0.50 | 0.7 |
| | 1982 | 1293.1 | 52.5 | 2445 | 1792 | 97 | 1695 | 364 | 1428 | 0.73 | 1.4 |
| | 1983 | 2141.5 | 82.2 | 1902 | 1207 | 88 | 1119 | 316 | 891 | 0.63 | 0.6 |
| | 1984 | 2242.9 | 85.7 | 2085 | 1106 | 63 | 1043 | 260 | 846 | 0.53 | 0.5 |
| | 1985 | 2036.3 | 80.5 | 2729 | 1304 | 143 | 1161 | 378 | 926 | 0.48 | 0.6 |
| OYSTER CREEK | 1970 | 413.6 | | 95 | 63 | 21 | 42 | 11 | 52 | 0.66 | 0.1 |
| Docket 50-219; DPR-16 | 1971 | 448.9 | | 249 | 240 | 50 | 190 | 92 | 148 | 0.96 | 0.5 |
| 1st commercial operation 12/69 | 1972 | 515.0 | | 339 | 582 | 150 | 432 | 167 | 415 | 1.72 | 1.1 |
| Type - BWR | 1973 | 424.6 | | 782 | 1236 | 195 | 1041 | 683 | 553 | 1.58 | 2.9 |
| Capacity - 620 MWe | 1974 | 434.5 | 70.4 | 935 | 984 | 166 | 818 | 162 | 822 | 1.05 | 2.3 |
| | 1975 | 373.6 | 73.3 | 1210 | 1140 | 169 | 971 | 271 | 869 | 0.94 | 3.0 |
| | 1976 | 456.5 | 79.3 | 1582 | 1078 | 70 | 1008 | 587 | 491 | 0.68 | 2.4 |
| | 1977 | 385.7 | 70.1 | 1673 | 1614 | 76 | 1538 | 1048 | 566 | 0.96 | 4.2 |
| | 1978 | 431.8 | 74.3 | 1411 | 1279 | 134 | 1145 | 696 | 583 | 0.91 | 3.0 |
| | 1979 | 541.0 | 85.9 | 842 | 467 | 95 | 372 | 135 | 332 | 0.55 | 0.9 |
| | 1980 | 232.9 | 41.4 | 1966 | 1733 | 97 | 1636 | 1182 | 551 | 0.88 | 7.4 |
| | 1981 | 314.8 | 59.8 | 1689 | 917 | 48 | 869 | 479 | 438 | 0.54 | 2.9 |
| | 1982 | 242.7 | 62.5 | 1270 | 865 | 33 | 832 | 491 | 374 | 0.68 | 3.6 |
| | 1983 | 27.9 | 11.5 | 2303 | 2257 | 65 | 2192 | 1863 | 394 | 0.98 | 80.9 |
| | 1984 | 37.1 | 9.6 | 2369 | 2054 | 134 | 1920 | 1538 | 516 | 0.87 | 55.4 |
| | 1985 | 446.1 | 89.4 | 2342 | 748 | 116 | 632 | 318 | 430 | 0.32 | 1.7 |

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| PALISADES | 1972 | 216.8 | | | 78 | | | | | | 0.4 |
| Docket 50-255; DPR-20 | 1973 | 286.8 | | 975 | 1133 | 16 | 1117 | 661 | 472 | 1.16 | 3.9 |
| 1st commercial operation 12/71 | 1974 | 10.7 | 5.5 | 774 | 627 | | | | | 0.81 | 58.6 |
| Type - PWR | 1975 | 302.0 | 64.5 | 495 | 306 | | | | | 0.62 | 1.0 |
| Capacity - 730 MWe | 1976 | 346.9 | 55.2 | 742 | 696 | 23 | 673 | 109 | 587 | 0.94 | 2.0 |
| | 1977 | 616.6 | 91.4 | 332 | 100 | 13 | 87 | 23 | 77 | 0.30 | 0.2 |
| | 1978 | 320.2 | 49.7 | 849 | 764 | 52 | 712 | 173 | 591 | 0.90 | 2.4 |
| | 1979 | 415.0 | 59.9 | 1599 | 854 | 99 | 755 | 360 | 494 | 0.53 | 2.1 |
| | 1980 | 288.3 | 42.9 | 1307 | 424 | 191 | 233 | 312 | 112 | 0.32 | 1.5 |
| | 1981 | 418.2 | 57.2 | 2151 | 902 | 167 | 735 | 737 | 165 | 0.42 | 2.2 |
| | 1982 | 404.3 | 54.7 | 1554 | 330 | 73 | 257 | 203 | 127 | 0.21 | 0.8 |
| | 1983 | 454.4 | 60.3 | 2167 | 977 | 145 | 832 | 494 | 483 | 0.45 | 2.2 |
| | 1984 | 98.7 | 15.2 | 1344 | 573 | 79 | 494 | 339 | 334 | 0.43 | 5.8 |
| | 1985 | 639.2 | 83.8 | 1355 | 507 | 105 | 402 | 239 | 268 | 0.37 | 0.8 |
| PEACH BOTTOM 2, 3 | 1975 | 1234.3 | 80.9 | 971 | 228 | | | | | 0.23 | 0.2 |
| Docket 50-277, 50-278; DPR-44, -56 | 1976 | 1379.2 | 73.0 | 2136 | 840 | 180 | 660 | 434 | 406 | 0.39 | 0.6 |
| 1st commercial operation 7/74, 12/74 | 1977 | 1052.4 | 58.7 | 2827 | 2036 | 223 | 1813 | 1374 | 662 | 0.72 | 1.9 |
| Type - BWR | 1978 | 1636.3 | 84.0 | 2244 | 1317 | 162 | 1155 | 709 | 608 | 0.59 | 0.8 |
| Capacity - 1051, 1035 MWe | 1979 | 1740.0 | 84.5 | 2276 | 1388 | 245 | 1143 | 717 | 671 | 0.61 | 0.8 |
| | 1980 | 1374.2 | 66.3 | 2774 | 2302 | 311 | 1991 | 1596 | 706 | 0.83 | 1.7 |
| | 1981 | 1161.8 | 58.0 | 2857 | 2506 | 273 | 2233 | 1880 | 626 | 0.88 | 2.2 |
| | 1982 | 1583.3 | 76.9 | 2734 | 1977 | 313 | 1664 | 1347 | 630 | 0.72 | 1.2 |
| | 1983 | 824.7 | 40.5 | 3107 | 2963 | 331 | 2632 | 2422 | 541 | 0.95 | 3.6 |
| | 1984 | 1165.8 | 57.4 | 3313 | 2450 | 225 | 2225 | 2045 | 405 | 0.74 | 2.1 |
| | 1985 | 682.7 | 42.5 | 4209 | 3354 | 396 | 2958 | 2727 | 627 | 0.80 | 4.9 |
| PILGRIM 1 | 1973 | 484.0 | | 230 | 126 | 49 | 77 | | | 0.55 | 0.3 |
| Docket 50-293; DPR-35 | 1974 | 234.1 | 39.2 | 454 | 415 | | | | | 0.91 | 1.8 |
| 1st commercial operation 12/72 | 1975 | 308.1 | 71.3 | 473 | 798 | 142 | 656 | 412 | 386 | 1.69 | 2.6 |
| Type - BWR | 1976 | 287.8 | 60.7 | 1317 | 2648 | 66 | 2582 | 2270 | 378 | 2.01 | 9.2 |
| Capacity - 670 MWe | 1977 | 316.6 | 61.4 | 1875 | 3142 | 146 | 2996 | 2176 | 966 | 1.68 | 9.9 |
| | 1978 | 519.5 | 83.1 | 1667 | 1327 | 157 | 1170 | 895 | 432 | 0.80 | 2.5 |
| | 1979 | 574.0 | 89.4 | 2458 | 1015 | 131 | 884 | 516 | 499 | 0.41 | 1.8 |
| | 1980 | 360.3 | 56.2 | 3549 | 3626 | 207 | 3419 | 3076 | 550 | 1.02 | 10.1 |
| | 1981 | 408.9 | 65.9 | 2803 | 1836 | 70 | 1766 | 1418 | 418 | 0.66 | 4.5 |
| | 1982 | 389.9 | 63.9 | 2854 | 1539 | 314 | 1225 | 1094 | 445 | 0.54 | 3.9 |

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| PILGRIM 1 (Continued) | 1983 | 559.5 | 87.2 | 2326 | 1162 | 296 | 886 | 776 | 386 | 0.50 | 2.1 |
| | 1984 | 1.4 | 0.4 | 4542 | 4082 | 647 | 3435 | 3767 | 315 | 0.90 | - |
| | 1985 | 587.3 | 91.5 | 2209 | 893 | 13 | 880 | 718 | 175 | 0.40 | 1.5 |
| POINT BEACH 1, 2 | 1971 | 393.4 | | | 164 | | | | | | 0.4 |
| Docket 50-266, 50-301; DPR-24, -27 | 1972 | 378.3 | | | 580 | | | | | | 1.5 |
| 1st commercial operation 12/70, 10/72 | 1973 | 693.7 | | 501 | 588 | 72 | 516 | | | 1.17 | 0.8 |
| Type - PWRs | 1974 | 760.2 | 81.3 | 400 | 295 | 70 | 225 | 81 | 214 | 0.74 | 0.4 |
| Capacity - 485, 485 MWe | 1975 | 801.2 | 82.9 | 339 | 459 | | | | | 1.35 | 0.6 |
| | 1976 | 857.3 | 86.7 | 313 | 370 | 58 | 312 | 107 | 263 | 1.18 | 0.4 |
| | 1977 | 873.9 | 87.3 | 417 | 429 | 63 | 366 | 212 | 217 | 1.03 | 0.5 |
| | 1978 | 914.4 | 90.9 | 336 | 320 | 71 | 249 | 111 | 209 | 0.95 | 0.3 |
| | 1979 | 808.0 | 80.8 | 610 | 644 | 65 | 579 | 449 | 195 | 1.06 | 0.8 |
| | 1980 | 727.2 | 82.5 | 561 | 598 | 60 | 538 | 420 | 178 | 1.07 | 0.8 |
| | 1981 | 760.4 | 83.6 | 773 | 596 | 83 | 513 | 364 | 232 | 0.77 | 0.8 |
| | 1982 | 757.2 | 84.3 | 767 | 609 | 72 | 537 | 375 | 234 | 0.79 | 0.8 |
| | 1983 | 648.2 | 72.7 | 1702 | 1403 | 81 | 1322 | 1179 | 224 | 0.82 | 2.2 |
| | 1984 | 788.9 | 78.6 | 1372 | 789 | 121 | 668 | 457 | 332 | 0.56 | 1.0 |
| | 1985 | 831.3 | 82.5 | 671 | 482 | 71 | 411 | 242 | 240 | 0.72 | 0.6 |
| PRAIRIE ISLAND 1, 2 | 1974 | 181.9 | 43.9 | 150 | 18 | | | 5 | 13 | 0.12 | 0.1 |
| Docket 50-282, 50-306; DPR-42, -60 | 1975 | 836.0 | 83.3 | 477 | 123 | | | | | 0.26 | 0.1 |
| 1st commercial operation 12/73, 12/74 | 1976 | 725.2 | 76.6 | 818 | 447 | 68 | 379 | 235 | 212 | 0.55 | 0.6 |
| Type - PWRs | 1977 | 922.9 | 87.2 | 718 | 300 | 73 | 227 | 60 | 240 | 0.42 | 0.3 |
| Capacity - 503, 500 MWe | 1978 | 941.1 | 92.2 | 546 | 221 | 43 | 178 | 48 | 173 | 0.40 | 0.2 |
| | 1979 | 865.0 | 86.0 | 594 | 180 | 29 | 151 | 49 | 131 | 0.30 | 0.2 |
| | 1980 | 800.7 | 79.9 | 983 | 353 | 40 | 313 | 141 | 212 | 0.36 | 0.4 |
| | 1981 | 844.9 | 80.5 | 836 | 329 | 153 | 176 | 128 | 201 | 0.39 | 0.4 |
| | 1982 | 944.9 | 90.4 | 645 | 229 | 30 | 199 | 68 | 161 | 0.36 | 0.2 |
| | 1983 | 921.1 | 86.8 | 654 | 233 | 14 | 219 | 73 | 160 | 0.36 | 0.3 |
| | 1984 | 972.4 | 91.7 | 539 | 147 | 18 | 129 | 52 | 95 | 0.27 | 0.2 |
| | 1985 | 882.6 | 84.0 | 1082 | 416 | 31 | 385 | 136 | 280 | 0.38 | 0.5 |

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| QUAD CITIES 1, 2 | 1974 | 958.1 | 72.3 | 678 | 482 | | | 36 | 446 | 0.71 | 0.5 |
| Docket 50-254, 50-265; DPR-29, -30 | 1975 | 833.6 | 68.4 | 1083 | 1618 | 114 | 1504 | 692 | 926 | 1.49 | 1.9 |
| 1st commercial operation 2/73, 3/73 | 1976 | 951.2 | 73.1 | 1225 | 1651 | 269 | 1382 | 648 | 1003 | 1.35 | 1.7 |
| Type - BWRs | 1977 | 970.1 | 84.0 | 907 | 1031 | 108 | 923 | 373 | 658 | 1.14 | 1.1 |
| Capacity - 769, 769 MWe | 1978 | 1124.5 | 88.6 | 1207 | 1618 | 156 | 1462 | 722 | 896 | 1.34 | 1.4 |
| | 1979 | 1075.0 | 84.6 | 1688 | 2158 | 215 | 1943 | 1250 | 908 | 1.28 | 2.0 |
| | 1980 | 866.9 | 64.4 | 3089 | 4838 | 291 | 4547 | 3657 | 1181 | 1.57 | 5.6 |
| | 1981 | 1156.9 | 81.1 | 2246 | 3146 | 100 | 3046 | 2623 | 523 | 1.40 | 2.7 |
| | 1982 | 1018.7 | 76.0 | 2314 | 3757 | 177 | 3580 | 2653 | 1104 | 1.62 | 3.7 |
| | 1983 | 1088.5 | 79.2 | 1802 | 2491 | 166 | 2325 | 1937 | 554 | 1.38 | 2.3 |
| | 1984 | 994.6 | 65.7 | 1678 | 1579 | 122 | 1457 | 1078 | 501 | 0.94 | 1.6 |
| | 1985 | 1268.0 | 82.7 | 1184 | 990 | 172 | 818 | 27 | 963 | 0.84 | 0.8 |
| RANCHO SECO | 1976 | 268.1 | 30.4 | 297 | 58 | 6 | 52 | 17 | 41 | 0.19 | 0.2 |
| Docket 50-312; DPR-54 | 1977 | 706.4 | 77.1 | 515 | 390 | 61 | 329 | 248 | 142 | 0.76 | 0.5 |
| 1st commercial operation 4/75 | 1978 | 607.7 | 80.5 | 508 | 323 | 76 | 247 | 176 | 147 | 0.64 | 0.5 |
| Type - PWR | 1979 | 687.0 | 91.1 | 287 | 126 | 27 | 99 | 64 | 62 | 0.44 | 0.2 |
| Capacity - 873 MWe | 1980 | 530.9 | 60.4 | 890 | 412 | 110 | 302 | 281 | 131 | 0.46 | 0.8 |
| | 1981 | 321.2 | 40.2 | 772 | 402 | 83 | 319 | 266 | 137 | 0.52 | 1.3 |
| | 1982 | 409.5 | 53.3 | 766 | 337 | 49 | 288 | 217 | 120 | 0.44 | 0.8 |
| | 1983 | 347.9 | 46.8 | 1338 | 787 | 158 | 629 | 604 | 183 | 0.59 | 2.3 |
| | 1984 | 460.0 | 58.3 | 802 | 222 | 73 | 149 | 115 | 107 | 0.28 | 0.5 |
| | 1985 | 238.7 | 30.8 | 1764 | 756 | 183 | 573 | 583 | 173 | 0.43 | 3.2 |
| ROBINSON 2 | 1972 | 580.0 | | 245 | 215 | 42 | 173 | 137 | 78 | 0.88 | 0.4 |
| Docket 50-261; DPR-23 | 1973 | 455.1 | | 831 | 695 | | | | | 0.84 | 1.5 |
| 1st commercial operation 3/71 | 1974 | 578.1 | 83.3 | 853 | 672 | 185 | 487 | | | 0.79 | 1.2 |
| Type - PWR | 1975 | 501.8 | 72.7 | 849 | 1142 | | | | | 1.34 | 2.3 |
| Capacity - 665 MWe | 1976 | 585.5 | 84.7 | 597 | 715 | 30 | 685 | 457 | 758 | 1.20 | 1.2 |
| | 1977 | 511.5 | 85.2 | 634 | 455 | 52 | 403 | 223 | 232 | 0.72 | 0.9 |
| | 1978 | 480.5 | 72.0 | 943 | 963 | 63 | 900 | 529 | 434 | 1.02 | 2.0 |
| | 1979 | 482.0 | 70.8 | 1454 | 1188 | 60 | 1128 | 794 | 394 | 0.82 | 2.5 |
| | 1980 | 387.3 | 62.2 | 2009 | 1852 | 79 | 1773 | 1379 | 473 | 0.92 | 4.8 |
| | 1981 | 426.6 | 73.0 | 1462 | 733 | 45 | 688 | 513 | 220 | 0.50 | 1.7 |
| | 1982 | 277.5 | 48.9 | 2011 | 1426 | 128 | 1298 | 945 | 481 | 0.71 | 5.1 |
| | 1983 | 409.8 | 75.5 | 2244 | 923 | 96 | 827 | 628 | 295 | 0.41 | 2.3 |

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| ROBINSON 2 (Continued) | 1984 | 28.0 | 7.0 | 4127 | 2880 | 196 | 2684 | 2549 | 331 | 0.70 | - |
| | 1985 | 629.5 | 87.9 | 1378 | 311 | 52 | 259 | 165 | 146 | 0.23 | 0.5 |
| SALEM 1, 2 | 1978 | 546.4 | 55.6 | 574 | 122 | 28 | 94 | 32 | 90 | 0.21 | 0.2 |
| Docket 50-272,-311; DPR-70,-75 | 1979 | 250.0 | 25.5 | 1488 | 584 | 100 | 484 | 359 | 225 | 0.39 | 2.3 |
| 1st commercial operation 6/77, 10/81 | 1980 | 680.6 | 69.2 | 1704 | 449 | 55 | 394 | 281 | 168 | 0.26 | 0.7 |
| | 1981 | 743.0 | 78.1 | 1652 | 254 | 4 | 250 | 152 | 102 | 0.15 | 0.3 |
| Type - PWRs | 1982 | 1440.4 | 72.6 | 3228 | 1203 | 66 | 1137 | 846 | 357 | 0.37 | 0.8 |
| Capacity - 1079, 1106 MWe | 1983 | 742.0 | 35.4 | 2383 | 581 | 10 | 571 | 463 | 118 | 0.24 | 0.8 |
| | 1984 | 650.1 | 31.8 | 1395 | 681 | 10 | 671 | 469 | 212 | 0.70 | 1.0 |
| | 1985 | 1657.7 | 75.8 | 1112 | 204 | 26 | 178 | 91 | 113 | 0.18 | 0.1 |
| SAN ONOFRE 1 | 1969 | 314.1 | | 123 | 42 | 10 | 32 | 5 | 37 | 0.34 | 0.1 |
| Docket 50-206; DPR-13 | 1970 | 365.9 | | 251 | 155 | 13 | 142 | 59 | 96 | 0.62 | 0.4 |
| 1st commercial operation 1/68 | 1971 | 362.1 | | 121 | 50 | 12 | 38 | 3 | 47 | 0.41 | 0.1 |
| Type - PWR | 1972 | 338.5 | | 326 | 256 | 29 | 227 | 117 | 139 | 0.78 | 0.8 |
| Capacity - 436 MWe | 1973 | 273.7 | | 570 | 353 | 40 | 313 | 168 | 185 | 0.62 | 1.3 |
| | 1974 | 377.8 | 86.1 | 219 | 71 | | | | | 0.32 | 0.2 |
| | 1975 | 389.0 | 87.4 | 424 | 292 | | | | | 0.69 | 0.7 |
| | 1976 | 297.9 | 70.2 | 1330 | 880 | 147 | 733 | 629 | 251 | 0.66 | 2.9 |
| | 1977 | 281.2 | 63.7 | 985 | 847 | 77 | 770 | 451 | 396 | 0.86 | 3.0 |
| | 1978 | 323.2 | 80.2 | 764 | 401 | 25 | 376 | 234 | 167 | 0.52 | 1.2 |
| | 1979 | 401.0 | 90.2 | 521 | 139 | 23 | 116 | 65 | 74 | 0.27 | 0.3 |
| | 1980 | 97.3 | 22.3 | 3063 | 2387 | 219 | 2168 | 2018 | 369 | 0.78 | 24.5 |
| | 1981 | 95.9 | 26.7 | 2902 | 3223 | 100 | 3123 | 3104 | 119 | 1.11 | 33.6 |
| | 1982 | 61.6 | 15.7 | 3055 | 832 | 81 | 751 | 729 | 102 | 0.27 | 13.5 |
| | 1983 | 0.0 | 0.0 | 1701 | 155 | 31 | 124 | 113 | 42 | 0.09 | - |
| | 1984 | 34.7 | 9.4 | 4374 | 513 | 67 | 444 | 432 | 79 | 0.12 | 14.7 |
| | 1985 | 299.0 | 76.8 | 2693 | 189 | 46 | 143 | 126 | 63 | 0.07 | 0.6 |
| SAN ONOFRE 2, 3* | 1984 | 635.7 | 58.9 | 3140 | 473 | 38 | 435 | 398 | 75 | 0.15 | 0.7 |
| Docket 50-361, -362; NPF-10, -15 | 1985 | 1082.8 | 56.1 | 3049 | 533 | 12 | 521 | 455 | 78 | 0.17 | 0.5 |
| 1st commercial operation 3/83 | | | | | | | | | | | |
| Type - PWR | | | | | | | | | | | |
| Capacity - 1070, 1080 MWe | | | | | | | | | | | |

*San Onofre 3 was counted for the first time in 1985.

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| SEQUOYAH 1, 2 | 1982 | 583.5 | 52.8 | 1965 | 570 | 67 | 503 | 57 | 513 | 0.29 | 1.0 |
| Docket 50-327, -328; DPR-77, -79 | 1983 | 1663.7 | 75.0 | 1772 | 491 | 74 | 417 | 46 | 445 | 0.28 | 0.3 |
| 1st commercial operation 7/81, 6/82 | 1984 | 1481.9 | 69.0 | 2373 | 1117 | 153 | 964 | 111 | 1006 | 0.47 | 0.8 |
| Type - PWR | 1985 | 1151.3 | 51.3 | 1854 | 1071 | 118 | 953 | 243 | 828 | 0.58 | 0.9 |
| Capacity - 1148, 1148 MWe | | | | | | | | | | | |
| ST. LUCIE 1, 2 | 1977 | 649.1 | 84.7 | 445 | 152 | 26 | 126 | 92 | 60 | 0.34 | 0.2 |
| Docket 50-335,-387;DPR-67;NPF-16 | 1978 | 606.4 | 76.5 | 797 | 337 | 15 | 322 | 140 | 197 | 0.42 | 0.6 |
| 1st commercial oper. 12/76, 3/83 | 1979 | 592.0 | 74.0 | 907 | 438 | 25 | 413 | 209 | 229 | 0.48 | 0.7 |
| Type - PWRs | 1980 | 627.9 | 77.5 | 1074 | 532 | 82 | 450 | 195 | 337 | 0.50 | 0.8 |
| Capacity - 827, 837 MWe | 1981 | 599.1 | 72.7 | 1473 | 929 | 20 | 909 | 556 | 373 | 0.63 | 1.6 |
| | 1982 | 816.8 | 94.0 | 1045 | 272 | 17 | 255 | 105 | 167 | 0.26 | 0.3 |
| | 1983 | 290.3 | 15.4 | 2211 | 1204 | 5 | 1199 | 924 | 280 | 0.54 | 4.2 |
| | 1984 | 1183.0 | 69.6 | 2090 | 1263 | 41 | 1222 | 808 | 455 | 0.60 | 1.1 |
| | 1985 | 1445.8 | 82.5 | 1971 | 1344 | 293 | 1046 | 809 | 535 | 0.68 | 0.9 |
| SUMMER 1 | 1984 | 504.6 | 61.1 | 1120 | 295 | 29 | 266 | 202 | 93 | 0.26 | 0.6 |
| Docket 50-395; NPF-12 | 1985 | 627.7 | 71.6 | 1201 | 379 | 74 | 305 | 241 | 138 | 0.32 | 0.6 |
| 1st commercial operation 1/84 | | | | | | | | | | | |
| Type - PWR | | | | | | | | | | | |
| Capacity - 885 MWe | | | | | | | | | | | |
| SURRY 1, 2 | 1973 | 420.6 | | 936 | 152 | | | | | 0.16 | 0.4 |
| Docket 50-280, 50-281; DPR-32, -37 | 1974 | 717.4 | 49.8 | 1715 | 884 | 72 | 812 | | | 0.51 | 1.2 |
| 1st commercial operation 12/72, 5/73 | 1975 | 1079.0 | 70.8 | 1948 | 1649 | 27 | 1622 | 1065 | 584 | 0.85 | 1.5 |
| | 1976 | 930.7 | 60.4 | 2753 | 3165 | 444 | 2721 | 1873 | 1292 | 1.15 | 3.4 |
| Type - PWRs | 1977 | 1139.0 | 72.2 | 1860 | 2307 | 348 | 1959 | 1380 | 927 | 1.24 | 2.0 |
| Capacity - 781, 775 MWe | 1978 | 1210.6 | 77.2 | 2203 | 1837 | 726 | 1111 | 1029 | 808 | 0.83 | 1.5 |
| | 1979 | 343.0 | 42.3 | 5065 | 3584 | 173 | 3411 | 2975 | 609 | 0.71 | 10.4 |
| | 1980 | 568.2 | 40.3 | 5317 | 3836 | 353 | 3483 | 3117 | 719 | 0.72 | 6.6 |
| | 1981 | 907.6 | 59.3 | 3753 | 4244 | 428 | 3816 | 3040 | 1204 | 1.13 | 4.7 |
| | 1982 | 1323.3 | 88.5 | 1878 | 1490 | 399 | 1091 | 506 | 984 | 0.79 | 1.1 |
| | 1983 | 916.2 | 61.3 | 2754 | 3220 | 571 | 2649 | 1786 | 1434 | 1.17 | 3.5 |
| | 1984 | 1026.7 | 71.0 | 3198 | 2247 | 536 | 1711 | 1575 | 672 | 0.70 | 2.2 |
| | 1985 | 1166.4 | 78.2 | 3206 | 1815 | 508 | 1307 | 1232 | 583 | 0.57 | 1.6 |

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| SUSQUEHANNA 1 | 1984 | 719.9 | 72.6 | 2827 | 308 | 71 | 237 | 128 | 180 | 0.11 | 0.4 |
| Docket 50-387; NPF-14 | 1985 | 628.3 | 62.5 | 3669 | 1106 | 77 | 1029 | 790 | 316 | 0.30 | 1.8 |
| 1st commercial operation 6/83 | | | | | | | | | | | |
| Type - BWR | | | | | | | | | | | |
| Capacity - 1032 MWe | | | | | | | | | | | |
| THREE MILE ISLAND 1, 2* | 1975 | 675.9 | 82.2 | 131 | 73 | | | 18 | 55 | 0.56 | 0.1 |
| Docket 50-289; DPR-50, -73 | 1976 | 530.0 | 65.4 | 819 | 286 | 23 | 263 | 69 | 217 | 0.35 | 0.5 |
| 1st commercial operation-9/74, | 1977 | 664.5 | 80.9 | 1122 | 359 | 15 | 344 | 128 | 231 | 0.32 | 0.5 |
| Type - PWRs 12/78 | 1978 | 690.0 | 85.1 | 1929 | 504 | 23 | 481 | 235 | 269 | 0.26 | 0.7 |
| Capacity - 776, 880 MWe | 1979 | 266.0 | 21.9 | 4024 | 1392 | 197 | 1195 | 907 | 485 | 0.35 | 5.2 |
| | 1980 | 0.0 | 0.0 | 2328 | 394 | 29 | 365 | 234 | 160 | 0.17 | - |
| | 1981 | 0.0 | 0.0 | 2103 | 376 | 50 | 326 | 190 | 186 | 0.18 | - |
| | 1982 | 0.0 | 0.0 | 2123 | 1004 | 62 | 942 | 433 | 571 | 0.47 | - |
| | 1983 | 0.0 | 0.0 | 1592 | 1159 | 79 | 1080 | 637 | 522 | 0.73 | - |
| | 1984 | 0.0 | 0.0 | 1079 | 688 | 49 | 639 | 330 | 358 | 0.64 | - |
| | 1985 | 103.6 | 10.1 | 1890 | 857 | 85 | 772 | 591 | 266 | 0.45 | 8.3 |
| TROJAN | 1977 | 792.0 | 92.6 | 591 | 174 | 30 | 144 | 105 | 69 | 0.29 | 0.2 |
| Docket 50-344; NPF-1 | 1978 | 205.5 | 20.6 | 711 | 319 | 81 | 238 | 124 | 195 | 0.45 | 1.5 |
| 1st commercial operation 5/76 | 1979 | 631.0 | 58.1 | 736 | 257 | 74 | 183 | 113 | 144 | 0.35 | 0.4 |
| Type - PWR | 1980 | 727.5 | 72.5 | 1159 | 421 | 77 | 344 | 305 | 116 | 0.36 | 0.6 |
| Capacity - 1080 MWe | 1981 | 775.6 | 74.1 | 1311 | 609 | 113 | 496 | 363 | 246 | 0.46 | 0.8 |
| | 1982 | 579.5 | 60.8 | 977 | 419 | 76 | 343 | 168 | 251 | 0.42 | 0.7 |
| | 1983 | 494.2 | 62.4 | 969 | 307 | 35 | 272 | 129 | 178 | 0.32 | 0.6 |
| | 1984 | 567.0 | 54.4 | 1042 | 433 | 40 | 393 | 230 | 203 | 0.42 | 0.8 |
| | 1985 | 829.1 | 76.7 | 852 | 363 | 31 | 332 | 210 | 153 | 0.43 | 0.4 |
| TURKEY POINT 3, 4 | 1973 | 401.9 | | 444 | 78 | | | | | 0.18 | 0.2 |
| Docket 50-250, 50-251; DPR-31, -41 | 1974 | 953.6 | | 794 | 454 | 88 | 366 | 202 | 252 | 0.57 | 0.5 |
| 1st commercial operation 12/72, | 1975 | 1003.7 | 74.9 | 1176 | 876 | 270 | 606 | 559 | 317 | 0.74 | 0.9 |
| 9/73 | 1976 | 974.2 | 71.2 | 1647 | 1184 | 89 | 1095 | 868 | 316 | 0.72 | 1.2 |
| Type - PWRs | 1977 | 979.5 | 72.1 | 1319 | 1036 | 94 | 942 | 522 | 514 | 0.78 | 1.1 |
| Capacity - 666, 666 MWe | 1978 | 1000.2 | 78.8 | 1336 | 1032 | 90 | 942 | 546 | 486 | 0.77 | 1.0 |
| | 1979 | 811.0 | 62.4 | 2002 | 1680 | 299 | 1381 | 997 | 683 | 0.84 | 2.1 |

*Three Mile Island 2 is shut down, but it is still included in the count of commercial reactors.

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| TURKEY POINT 3, 4 (Continued) | 1980 | 990.6 | 73.6 | 1803 | 1651 | 232 | 1419 | 1218 | 433 | 0.92 | 1.7 |
| | 1981 | 654.0 | 46.8 | 2932 | 2251 | 274 | 1977 | 1854 | 397 | 0.77 | 3.4 |
| | 1982 | 915.7 | 65.2 | 2956 | 2119 | 197 | 1922 | 1656 | 463 | 0.72 | 2.3 |
| | 1983 | 878.4 | 62.8 | 2930 | 2681 | 272 | 2409 | 2119 | 562 | 0.92 | 3.1 |
| | 1984 | 946.7 | 68.5 | 2010 | 1255 | 217 | 1038 | 876 | 379 | 0.62 | 1.3 |
| | 1985 | 1034.9 | 74.7 | 1905 | 1253 | 91 | 1162 | 817 | 436 | 0.66 | 1.2 |
| VERMONT YANKEE | 1973 | 222.1 | | 244 | 85 | | | | | 0.35 | 0.4 |
| Docket 50-271; DPR-28 | 1974 | 303.5 | | 357 | 216 | 24 | 192 | 103 | 113 | 0.60 | 0.7 |
| 1st commercial operation 11/72 | 1975 | 429.0 | 87.8 | 282 | 153 | 70 | 83 | 63 | 90 | 0.54 | 0.4 |
| Type - BWR | 1976 | 389.6 | 77.1 | 815 | 411 | 36 | 375 | 246 | 165 | 0.50 | 1.0 |
| Capacity - 504 MWe | 1977 | 423.5 | 85.1 | 641 | 258 | 83 | 175 | 90 | 168 | 0.40 | 0.6 |
| | 1978 | 387.5 | 75.9 | 934 | 339 | 78 | 261 | 158 | 181 | 0.36 | 0.9 |
| | 1979 | 414.0 | 82.1 | 1220 | 1170 | 546 | 624 | 642 | 528 | 0.96 | 2.8 |
| | 1980 | 357.8 | 71.5 | 1443 | 1338 | 141 | 1197 | 926 | 412 | 0.93 | 3.7 |
| | 1981 | 429.1 | 84.6 | 1264 | 731 | 121 | 610 | 408 | 323 | 0.58 | 1.7 |
| | 1982 | 501.0 | 96.0 | 481 | 205 | 60 | 145 | 80 | 125 | 0.43 | 0.4 |
| | 1983 | 346.1 | 69.3 | 1316 | 1527 | 215 | 1312 | 787 | 740 | 1.16 | 4.4 |
| | 1984 | 398.1 | 79.0 | 954 | 603 | 80 | 523 | 307 | 296 | 0.63 | 1.5 |
| | 1985 | 361.4 | 71.8 | 1392 | 1051 | 164 | 887 | 898 | 153 | 0.76 | 2.9 |
| YANKEE ROWE | 1969 | 138.3 | | 193 | 215 | 83 | 132 | 78 | 133 | 1.11 | 1.5 |
| Docket 50-29; DPR-3 | 1970 | 146.1 | | 355 | 255 | 90 | 165 | 158 | 97 | 0.72 | 1.7 |
| 1st commercial operation 7/61 | 1971 | 173.5 | | 155 | 90 | 46 | 44 | 19 | 71 | 0.58 | 0.5 |
| Type - PWR | 1972 | 78.7 | | 282 | 255 | 63 | 192 | 146 | 109 | 0.90 | 3.2 |
| Capacity - 167 MWe | 1973 | 127.1 | | 133 | 99 | | | 47 | 52 | 0.74 | 0.8 |
| | 1974 | 111.3 | | 243 | 205 | | | 99 | 106 | 0.84 | 1.8 |
| | 1975 | 145.1 | 82.4 | 249 | 116 | 52 | 64 | 66 | 50 | 0.47 | 0.8 |
| | 1976 | 152.2 | 89.8 | 152 | 59 | 17 | 42 | 4 | 55 | 0.39 | 0.4 |
| | 1977 | 124.6 | 73.9 | 725 | 356 | 28 | 328 | 174 | 182 | 0.49 | 2.9 |
| | 1978 | 145.0 | 81.0 | 565 | 282 | 26 | 256 | 95 | 187 | 0.50 | 1.9 |
| | 1979 | 149.0 | 81.6 | 441 | 127 | 16 | 111 | 52 | 75 | 0.29 | 0.9 |
| | 1980 | 35.6 | 22.0 | 502 | 213 | 6 | 207 | 90 | 123 | 0.42 | 6.0 |
| | 1981 | 109.0 | 74.4 | 515 | 302 | 8 | 294 | 136 | 166 | 0.59 | 2.8 |
| | 1982 | 108.6 | 73.4 | 814 | 474 | 6 | 468 | 215 | 259 | 0.54 | 4.4 |
| | 1983 | 163.5 | 91.4 | 395 | 68 | 19 | 49 | 4 | 64 | 0.17 | 0.4 |

Appendix C (Continued)
Personnel, Dose and Power Generation Summary

| Reporting Organization | Year | Mega-watt-Years (MW-Yr) | Unit Availa-bility Factor | Total Personnel With Measur-able Doses | Collective Dose (person-rems or cSv) | Person-rems (-cSv) per Work Function | | Person-rems (-cSv) per Personnel Type | | Average Meas'ble Dose (rems or cSv) | Person-rems (-cSv)/ MW-Yr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Opera-tions | Maint. & Others | Contrac-tor | Station & Utility | | |
| YANKEE ROWE (Continued) | 1984 | 124.8 | 71.4 | 654 | 348 | 15 | 333 | 141 | 207 | 0.53 | 2.8 |
| | 1985 | 144.3 | 85.3 | 653 | 211 | 17 | 194 | 81 | 130 | 0.32 | 1.5 |
| WASHINGTON NUCLEAR 2* | 1985 | 616.0 | 87.6 | 755 | 119 | 42 | 77 | 42 | 77 | 0.16 | 0.2 |
| Docket 50-397; NPF-21 | | | | | | | | | | | |
| 1st commercial operation 12/84 | | | | | | | | | | | |
| Type - BWR | | | | | | | | | | | |
| Capacity - 1095 MWe | | | | | | | | | | | |
| ZION 1, 2 | 1974 | 425.3 | 71.1 | 306 | 56 | | | 13 | 43 | 0.18 | 0.1 |
| Docket 50-295, 50-304; DPR-39, -48 | 1975 | 1181.5 | 74.9 | 436 | 127 | 17 | 110 | 49 | 78 | 0.29 | 0.1 |
| 1st commercial operation 12/73, 9/74 | 1976 | 1134.9 | 61.9 | 774 | 571 | 64 | 507 | 257 | 314 | 0.74 | 0.5 |
| | 1977 | 1358.6 | 75.0 | 784 | 1003 | 43 | 960 | 561 | 442 | 1.28 | 0.7 |
| Type - PWRs | 1978 | 1613.5 | 80.2 | 1104 | 1017 | 150 | 867 | 418 | 599 | 0.92 | 0.6 |
| Capacity - 1040, 1040 MWe | 1979 | 1238.0 | 67.6 | 1472 | 1274 | 168 | 1106 | 747 | 527 | 0.87 | 1.0 |
| | 1980 | 1411.2 | 74.1 | 1363 | 920 | 97 | 823 | 560 | 360 | 0.67 | 0.7 |
| | 1981 | 1366.9 | 72.3 | 1754 | 1720 | 50 | 1670 | 1155 | 564 | 0.98 | 1.3 |
| | 1982 | 1186.4 | 64.3 | 1575 | 2103 | 42 | 2061 | 1688 | 415 | 1.34 | 1.8 |
| | 1983 | 1222.3 | 66.8 | 1285 | 1311 | 118 | 1193 | 905 | 406 | 1.02 | 1.1 |
| | 1984 | 1389.9 | 69.5 | 1110 | 786 | 23 | 763 | 556 | 230 | 0.71 | 0.6 |
| | 1985 | 1187.9 | 62.9 | 1498 | 1166 | 41 | 1125 | 784 | 382 | 0.78 | 1.0 |

*Washington Nuclear 2 was counted for the first time in 1985.

# APPENDIX D

## Number of Personnel and Collective Dose by Work and Job Function

## 1985

# APPENDIX D

## NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *ARKANSAS 1,2 TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 22 | 0 | 41 | | 3.944 | 0 | 6.939 | |
| OPERATING PERSONNEL | 50 | 0 | 0 | | 15.557 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 37 | 0 | 50 | | 11.065 | 0 | 11.109 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.124 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 1 | 5 | | 0 | 0.119 | 0.938 | |
| TOTAL | 110 | 1 | 96 | 207 | 30.69 | 0.119 | 18.986 | 49.795 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 50 | 1 | 4 | | 10.539 | 0.147 | 0.538 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 9 | 0 | 0 | | 1.554 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 59 | 1 | 4 | 64 | 12.093 | 0.147 | 0.538 | 12.778 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 31 | | 0 | 0 | 11.207 | |
| OPERATING PERSONNEL | 2 | 0 | 0 | | 0.697 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 4 | 0 | 4 | | 0.802 | 0 | 0.853 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 3 | | 0 | 0 | 0.96 | |
| TOTAL | 6 | 0 | 38 | 44 | 1.499 | 0 | 13.02 | 14.519 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 99 | 5 | 213 | | 42.552 | 0.784 | 54.265 | |
| OPERATING PERSONNEL | 2 | 0 | 0 | | 0.597 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 31 | 0 | 44 | | 7.409 | 0 | 13.443 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.15 | 0 | 0 | |
| ENGINEERING PERSONNEL | 3 | 3 | 19 | | 0.356 | 0.591 | 9.305 | |
| TOTAL | 136 | 8 | 276 | 420 | 51.064 | 1.375 | 77.013 | 129.452 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 7 | 0 | 11 | | 2.215 | 0 | 3.412 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 21 | 0 | 0 | | 6.462 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 28 | 0 | 11 | 39 | 8.677 | 0 | 3.412 | 12.089 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 24 | 2 | 20 | | 5.371 | 0.655 | 6.152 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 3 | | 0 | 0 | 0.412 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 24 | 2 | 23 | 49 | 5.371 | 0.655 | 6.564 | 12.59 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 202 | 8 | 320 | 530 | 64.621 | 1.586 | 82.513 | 148.72 |
| OPERATING PERSONNEL | 54 | 0 | 0 | 54 | 16.851 | 0 | 0 | 16.851 |
| HEALTH PHYSICS PERSONNEL | 102 | 0 | 101 | 203 | 27.292 | 0 | 25.817 | 53.109 |
| SUPERVISORY PERSONNEL | 2 | 0 | 0 | 2 | 0.274 | 0 | 0 | 0.274 |
| ENGINEERING PERSONNEL | 3 | 4 | 27 | 34 | 0.356 | 0.71 | 11.203 | 12.269 |
| GRAND TOTALS | 363 | 12 | 448 | 823 | 109.394 | 2.296 | 119.533 | 231.223 |

*Workers may be counted in more than one category.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: BEAVER VALLEY TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 4.63 | 0 | 4.61 | | 1.179 | 0 | 0.758 | |
| OPERATING PERSONNEL | 5.1 | 0 | 0 | | 0.85 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 15.9 | 0 | 0 | | 4.912 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 3.79 | 0 | 0 | | 1.154 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0.28 | | 0 | 0 | 0.03 | |
| TOTAL | 29.42 | 0 | 4.89 | 34.31 | 8.095 | 0 | 0.788 | 8.883 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 40.48 | 0 | 4.86 | | 9.149 | 0 | 1.405 | |
| OPERATING PERSONNEL | 0.37 | 0 | 0 | | 0.095 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 9.85 | 0 | 0 | | 3.232 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 1.08 | 0 | 0 | | 0.362 | 0 | 0 | |
| ENGINEERING PERSONNEL | 3 | 0 | 0.8 | | 0.042 | 0 | 0.08 | |
| TOTAL | 54.78 | 0 | 5.66 | 60.44 | 12.88 | 0 | 1.485 | 14.365 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 1.02 | 0 | 0 | | 0.241 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 1.53 | 0 | 0 | | 0.532 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0.86 | 0 | 0 | | 0.265 | 0 | 0 | |
| TOTAL | 3.41 | 0 | 0 | 3.41 | 1.038 | 0 | 0 | 1.038 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 3.12 | 0 | 14.53 | | 0.66 | 0 | 3.516 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.272 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0.63 | 0 | 0 | | 0.05 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0.18 | 0 | 0 | | 0.015 | 0 | 0.095 | |
| ENGINEERING PERSONNEL | 0.14 | 0 | 0.92 | | 0.99 | 0 | 0.29 | |
| TOTAL | 4.07 | 0 | 15.45 | 19.52 | 1.987 | 0 | 3.901 | 5.888 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 6.75 | 0 | 2 | | 1.395 | 0 | 0 | |
| OPERATING PERSONNEL | 2.53 | 0 | 0 | | 0.05 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0.09 | 0 | 0 | | 0.425 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0.95 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 10.32 | 0 | 2 | 12.32 | 1.87 | 0 | 0 | 1.87 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 56 | 0 | 26 | 82 | 12.624 | 0 | 5.679 | 18.303 |
| OPERATING PERSONNEL | 8 | 0 | 0 | 8 | 1.267 | 0 | 0 | 1.267 |
| HEALTH PHYSICS PERSONNEL | 28 | 0 | 0 | 28 | 9.151 | 0 | 0 | 9.151 |
| SUPERVISORY PERSONNEL | 6 | 0 | 0 | 6 | 1.531 | 0 | 0.095 | 1.626 |
| ENGINEERING PERSONNEL | 4 | 0 | 2 | 6 | 1.297 | 0 | 0.4 | 1.697 |
| GRAND TOTALS | 102 | 0 | 28 | 130 | 25.87 | 0 | 6.174 | 32.044 |

# APPENDIX D (cont)

## NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *BIG ROCK TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **REACTOR OPS & SURV** | | | | | | | | |
| MAINTENANCE PERSONNEL | 4 | 1 | 0 | | 1.097 | 0.187 | 0.013 | |
| OPERATING PERSONNEL | 34 | 0 | 0 | | 35.758 | 0.1 | 0.019 | |
| HEALTH PHYSICS PERSONNEL | 12 | 0 | 0 | | 8.88 | 0.005 | 0.107 | |
| SUPERVISORY PERSONNEL | 10 | 0 | 0 | | 2.937 | 0.04 | 0.057 | |
| ENGINEERING PERSONNEL | 1 | 1 | 0 | | 0.438 | 0.129 | 0.002 | |
| TOTAL | 61 | 2 | 0 | 63 | 49.11 | 0.461 | 0.198 | 49.769 |
| **ROUTINE MAINTENANCE** | | | | | | | | |
| MAINTENANCE PERSONNEL | 24 | 42 | 8 | | 12.938 | 17.16 | 1.85 | |
| OPERATING PERSONNEL | 6 | 0 | 0 | | 4.828 | 0.01 | 0 | |
| HEALTH PHYSICS PERSONNEL | 10 | 0 | 7 | | 3.387 | 0.259 | 3.356 | |
| SUPERVISORY PERSONNEL | 3 | 3 | 0 | | 0.535 | 1.463 | 0.021 | |
| ENGINEERING PERSONNEL | 1 | 0 | 0 | | 0.474 | 0.062 | 0.044 | |
| TOTAL | 44 | 45 | 15 | 104 | 22.162 | 18.954 | 5.271 | 46.387 |
| **IN-SERVICE INSPECTION** | | | | | | | | |
| MAINTENANCE PERSONNEL | 1 | 32 | 22 | | 0.793 | 28.654 | 16.379 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.094 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 6 | 1 | 8 | | 1.341 | 0.257 | 5.634 | |
| SUPERVISORY PERSONNEL | 0 | 1 | 0 | | 0.083 | 0.772 | 0 | |
| ENGINEERING PERSONNEL | 1 | 4 | 5 | | 0.393 | 0.987 | 3.76 | |
| TOTAL | 8 | 38 | 35 | 81 | 2.704 | 30.67 | 25.773 | 59.147 |
| **SPECIAL MAINTENANCE** | | | | | | | | |
| MAINTENANCE PERSONNEL | 25 | 58 | 30 | | 24.45 | 25.299 | 7.985 | |
| OPERATING PERSONNEL | 10 | 0 | 1 | | 2.252 | 0.019 | 0.112 | |
| HEALTH PHYSICS PERSONNEL | 13 | 0 | 8 | | 9.103 | 0.145 | 3.405 | |
| SUPERVISORY PERSONNEL | 6 | 8 | 0 | | 1.875 | 1.716 | 0.091 | |
| ENGINEERING PERSONNEL | 4 | 0 | 3 | | 1.016 | 0.147 | 0.392 | |
| TOTAL | 58 | 66 | 42 | 166 | 38.696 | 27.326 | 11.985 | 78.007 |
| **WASTE PROCESSING** | | | | | | | | |
| MAINTENANCE PERSONNEL | 14 | 1 | 13 | | 4.017 | 0.515 | 4.501 | |
| OPERATING PERSONNEL | 3 | 0 | 0 | | 0.785 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 6 | 0 | 6 | | 2.48 | 0.019 | 1.756 | |
| SUPERVISORY PERSONNEL | 2 | 0 | 0 | | 0.36 | 0.009 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.117 | 0 | 0 | |
| TOTAL | 25 | 1 | 19 | 45 | 7.759 | 0.543 | 6.257 | 14.559 |
| **REFUELING** | | | | | | | | |
| MAINTENANCE PERSONNEL | 13 | 4 | 3 | | 4.734 | 1.332 | 1.812 | |
| OPERATING PERSONNEL | 21 | 0 | 0 | | 6.415 | 0.087 | 0 | |
| HEALTH PHYSICS PERSONNEL | 5 | 0 | 0 | | 1.098 | 0 | 0.048 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.112 | 0.007 | 0 | |
| ENGINEERING PERSONNEL | 4 | 2 | 6 | | 1.252 | 0.408 | 3.841 | |
| TOTAL | 43 | 6 | 9 | 58 | 13.611 | 1.834 | 5.701 | 21.146 |
| **TOTAL BY JOB FUNCTION** | | | | | | | | |
| MAINTENANCE PERSONNEL | 81 | 138 | 76 | 295 | 48.029 | 73.147 | 32.54 | 153.716 |
| OPERATING PERSONNEL | 74 | 0 | 1 | 75 | 50.132 | 0.216 | 0.131 | 50.479 |
| HEALTH PHYSICS PERSONNEL | 52 | 1 | 29 | 82 | 26.289 | 0.685 | 14.306 | 41.28 |
| SUPERVISORY PERSONNEL | 21 | 12 | 0 | 33 | 5.902 | 4.007 | 0.169 | 10.078 |
| ENGINEERING PERSONNEL | 11 | 7 | 14 | 32 | 3.69 | 1.733 | 8.039 | 13.462 |
| GRAND TOTALS | 239 | 158 | 120 | 517 | 134.042 | 79.788 | 55.185 | 269.015 |

*Workers may be counted in more than one category.

# APPENDIX D (cont)

## NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *BROWNS FERRY 1,2,3 TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 738 | 48 | 30 | | 35.749 | 3.931 | 2.306 | |
| OPERATING PERSONNEL | 77 | 2 | 0 | | 15.936 | 0.28 | 0 | |
| HEALTH PHYSICS PERSONNEL | 96 | 4 | 111 | | 26.681 | 0.859 | 42.411 | |
| SUPERVISORY PERSONNEL | 15 | 0 | 1 | | 2.131 | 0 | 0.015 | |
| ENGINEERING PERSONNEL | 133 | 12 | 44 | | 17.519 | 1.792 | 6.103 | |
| TOTAL | 1059 | 66 | 186 | 1311 | 98.016 | 6.862 | 50.835 | 155.713 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 854 | 44 | 94 | | 249.317 | 4.844 | 28.191 | |
| OPERATING PERSONNEL | 75 | 2 | 0 | | 5.654 | 0.007 | 0 | |
| HEALTH PHYSICS PERSONNEL | 92 | 3 | 109 | | 11.692 | 0.522 | 19.894 | |
| SUPERVISORY PERSONNEL | 13 | 1 | 2 | | 1.217 | 0 | 0.247 | |
| ENGINEERING PERSONNEL | 137 | 12 | 43 | | 25.903 | 0.865 | 2.604 | |
| TOTAL | 1171 | 62 | 248 | 1481 | 293.783 | 6.238 | 50.936 | 350.957 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 664 | 73 | 126 | | 175.136 | 41.738 | 98.323 | |
| OPERATING PERSONNEL | 31 | 0 | 0 | | 1.147 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 56 | 0 | 100 | | 4.44 | 0 | 29.805 | |
| SUPERVISORY PERSONNEL | 11 | 1 | 2 | | 2.559 | 0.314 | 0.14 | |
| ENGINEERING PERSONNEL | 96 | 5 | 22 | | 16.327 | 0.273 | 4.732 | |
| TOTAL | 858 | 79 | 250 | 1187 | 199.609 | 42.325 | 133 | 374.934 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 129 | 0 | 6 | | 4.613 | 0 | 0.56 | |
| OPERATING PERSONNEL | 13 | 0 | 0 | | 2.089 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 62 | 1 | 42 | | 1.859 | 0 | 0.813 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 1 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 3 | 0 | 4 | | 0.006 | 0 | 0.56 | |
| TOTAL | 207 | 1 | 53 | 261 | 8.567 | 0 | 1.933 | 10.5 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 88 | 0 | 0 | | 4.282 | 0 | 0 | |
| OPERATING PERSONNEL | 22 | 1 | 0 | | 0.891 | 0.004 | 0 | |
| HEALTH PHYSICS PERSONNEL | 15 | 0 | 21 | | 0.047 | 0 | 0.735 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 30 | 0 | 0 | | 0.464 | 0 | 0 | |
| TOTAL | 156 | 1 | 21 | 178 | 5.684 | 0.004 | 0.735 | 6.423 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 2473 (870) | 165 (73) | 256 (151) | 2894 (1094) | 469.097 | 50.513 | 129.38 | 648.99 |
| OPERATING PERSONNEL | 218 (76) | 5 (2) | 0 (0) | 223 (78) | 25.717 | 0.291 | 0 | 26.008 |
| HEALTH PHYSICS PERSONNEL | 321 (96) | 8 (4) | 383 (110) | 712 (210) | 44.719 | 1.381 | 93.658 | 139.758 |
| SUPERVISORY PERSONNEL | 40 (16) | 2 (1) | 6 (2) | 48 (19) | 5.907 | 0.314 | 0.402 | 6.623 |
| ENGINEERING PERSONNEL | 399 (131) | 29 (8) | 113 (46) | 541 (185) | 60.219 | 2.93 | 13.999 | 77.148 |
| GRAND TOTALS | 3451 (1189) | 209 (88) | 758 (309) | 4418 (1586) | 605.659 | 55.429 | 237.439 | 898.527 |

*Workers may be counted in more than one category. Numbers in parentheses are total numbers of individuals

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *BRUNSWICK 1,2 TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 1 | 0 | 1 | | 1.096 | 0.01 | 4.387 | |
| OPERATING PERSONNEL | 92 | 0 | 0 | | 74.176 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 26 | 0 | 11 | | 23.284 | 0 | 9.475 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.835 | 0.06 | 0.035 | |
| ENGINEERING PERSONNEL | 12 | 0 | 1 | | 3.718 | 0.04 | 0.568 | |
| TOTAL | 132 | 0 | 13 | 145 | 103.109 | 0.11 | 14.465 | 117.684 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 262 | 75 | 387 | | 235.527 | 72.429 | 384.043 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 15 | 0 | 22 | | 13.97 | 0 | 18.946 | |
| SUPERVISORY PERSONNEL | 4 | 0 | 11 | | 0.967 | 0.01 | 7.22 | |
| ENGINEERING PERSONNEL | 23 | 4 | 131 | | 8.234 | 1.361 | 106.593 | |
| TOTAL | 304 | 79 | 551 | 934 | 258.698 | 73.8 | 516.802 | 849.3 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 39 | 15 | 67 | | 17.646 | 4.042 | 55.138 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 10 | 0 | 22 | | 9.323 | 0 | 18.716 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 11 | 0 | 74 | | 5.447 | 0.368 | 45.923 | |
| TOTAL | 60 | 15 | 163 | 238 | 32.416 | 4.41 | 119.777 | 156.603 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 129 | 3 | 745 | | 99.715 | 1.655 | 989.035 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 36 | 0 | 134 | | 32.597 | 0 | 113.684 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 11 | | 0.084 | 0 | 8.272 | |
| ENGINEERING PERSONNEL | 23 | 11 | 204 | | 8.58 | 6.28 | 149.894 | |
| TOTAL | 188 | 14 | 1094 | 1296 | 140.976 | 7.935 | 1260.885 | 1409.796 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 39 | 13 | 63 | | 27.793 | 8.195 | 42.951 | |
| OPERATING PERSONNEL | 11 | 0 | 9 | | 8.727 | 0 | 8.18 | |
| HEALTH PHYSICS PERSONNEL | 11 | 0 | 21 | | 9.32 | 0 | 18.947 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0.035 | |
| ENGINEERING PERSONNEL | 1 | 0 | 1 | | 0.54 | 0.07 | 0.415 | |
| TOTAL | 62 | 13 | 94 | 169 | 46.38 | 8.265 | 70.528 | 125.173 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 31 | 24 | 67 | | 20.935 | 6.656 | 30.336 | |
| OPERATING PERSONNEL | 5 | 0 | 8 | | 4.363 | 0 | 6.692 | |
| HEALTH PHYSICS PERSONNEL | 5 | 0 | 11 | | 4.65 | 0 | 9.705 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.18 | 0 | 0.03 | |
| ENGINEERING PERSONNEL | 2 | 0 | 17 | | 0.765 | 0.125 | 9.58 | |
| TOTAL | 44 | 24 | 103 | 171 | 30.893 | 6.781 | 56.343 | 94.017 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 501 | 130 | 1330 | 1961 | 402.712 | 92.987 | 1505.89 | 2001.589 |
| OPERATING PERSONNEL | 108 | 0 | 17 | 125 | 87.266 | 0 | 14.872 | 102.138 |
| HEALTH PHYSICS PERSONNEL | 103 | 0 | 221 | 324 | 93.144 | 0 | 189.473 | 282.617 |
| SUPERVISORY PERSONNEL | 6 | 0 | 22 | 28 | 2.066 | 0.07 | 15.592 | 17.728 |
| ENGINEERING PERSONNEL | 72 | 15 | 428 | 515 | 27.284 | 8.244 | 312.973 | 348.501 |
| GRAND TOTALS | 790 | 145 | 2018 | 2953 | 612.472 | 101.301 | 2038.8 | 2752.573 |

*Workers may be counted in more than one category.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: CALLAWAY TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0.003 | 0.719 | 0.468 | |
| OPERATING PERSONNEL | 0 | 15 | 1 | | 0.029 | 5.777 | 1.285 | |
| HEALTH PHYSICS PERSONNEL | 0 | 20 | 1 | | 0 | 6.304 | 0.003 | |
| SUPERVISORY PERSONNEL | 0 | 1 | 0 | | 0.028 | 1.082 | 0.029 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.002 | 0.11 | 0.109 | |
| TOTAL | 0 | 36 | 2 | 38 | 0.062 | 13.992 | 1.894 | 15.948 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 36 | 15 | | 0.041 | 9.98 | 4.668 | |
| OPERATING PERSONNEL | 0 | 2 | 1 | | 0.012 | 1.405 | 0.215 | |
| HEALTH PHYSICS PERSONNEL | 0 | 10 | 0 | | 0 | 1.948 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 1 | 0 | | 0.002 | 0.246 | 0.017 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0.204 | 0.073 | |
| TOTAL | 0 | 49 | 16 | 65 | 0.055 | 13.783 | 4.973 | 18.811 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0.137 | 0.135 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.037 | 0.069 | 0.003 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0.002 | 0.008 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.004 | 0.023 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 1 | | 0.001 | 0.217 | 0.15 | |
| TOTAL | 0 | 0 | 1 | 1 | 0.042 | 0.448 | 0.296 | 0.786 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0.012 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0.272 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0.055 | 0.002 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0.078 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0.417 | 0.002 | 0.419 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 36 | 15 | 51 | 0.044 | 10.848 | 5.271 | 16.163 |
| OPERATING PERSONNEL | 0 | 17 | 2 | 19 | 0.078 | 7.523 | 1.503 | 9.104 |
| HEALTH PHYSICS PERSONNEL | 0 | 30 | 1 | 31 | 0 | 8.309 | 0.013 | 8.322 |
| SUPERVISORY PERSONNEL | 0 | 2 | 0 | 2 | 0.034 | 1.429 | 0.046 | 1.509 |
| ENGINEERING PERSONNEL | 0 | 0 | 1 | 1 | 0.003 | 0.531 | 0.332 | 0.866 |
| GRAND TOTALS | 0 | 85 | 19 | 104 | 0.159 | 28.64 | 7.165 | 35.964 |

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *CALVERT CLIFFS 1,2 TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 52 | 8 | 5 | | 10.849 | 1.019 | 1.25 | |
| OPERATING PERSONNEL | 68 | 0 | 1 | | 26.664 | 0 | 0.118 | |
| HEALTH PHYSICS PERSONNEL | 22 | 0 | 16 | | 10.895 | 0 | 6.664 | |
| SUPERVISORY PERSONNEL | 3 | 0 | 0 | | 0.703 | 0 | 0 | |
| ENGINEERING PERSONNEL | 3 | 0 | 0 | | 0.328 | 0 | 0 | |
| TOTAL | 148 | 8 | 22 | 178 | 49.439 | 1.019 | 8.032 | 58.49 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 42 | 8 | 7 | | 10.954 | 1.496 | 1.553 | |
| OPERATING PERSONNEL | 4 | 0 | 0 | | 0.602 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 6 | 0 | 5 | | 1.366 | 0 | 1.21 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.139 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 53 | 8 | 12 | 73 | 13.061 | 1.496 | 2.763 | 17.32 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 7 | 102 | 27 | | 6.813 | 97.199 | 8.363 | |
| OPERATING PERSONNEL | 4 | 0 | 0 | | 0.692 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 11 | 0 | 11 | | 3.754 | 0 | 2.225 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 2 | | 0.55 | 0 | 1.769 | |
| ENGINEERING PERSONNEL | 7 | 0 | 2 | | 4.51 | 0 | 0.347 | |
| TOTAL | 30 | 102 | 42 | 174 | 16.319 | 97.199 | 12.704 | 126.222 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 150 | 119 | 97 | | 96.99 | 51.92 | 30.487 | |
| OPERATING PERSONNEL | 15 | 4 | 0 | | 6.264 | 1.443 | 0 | |
| HEALTH PHYSICS PERSONNEL | 28 | 0 | 84 | | 14.851 | 0 | 36.102 | |
| SUPERVISORY PERSONNEL | 3 | 3 | 7 | | 0.784 | 0.502 | 2.303 | |
| ENGINEERING PERSONNEL | 13 | 3 | 9 | | 4.173 | 1.175 | 2.071 | |
| TOTAL | 209 | 129 | 197 | 535 | 123.062 | 55.04 | 70.963 | 249.065 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 2 | 11 | 3 | | 0.472 | 7.357 | 1.621 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 23 | 2 | 31 | | 19.704 | 0.378 | 20.397 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.25 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 26 | 13 | 34 | 73 | 20.426 | 7.735 | 22.018 | 50.179 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 59 | 46 | 3 | | 50.863 | 19.121 | 0.584 | |
| OPERATING PERSONNEL | 6 | 4 | 0 | | 2.622 | 1.102 | 0 | |
| HEALTH PHYSICS PERSONNEL | 16 | 0 | 20 | | 4.764 | 0 | 4.772 | |
| SUPERVISORY PERSONNEL | 2 | 0 | 0 | | 0.787 | 0 | 0 | |
| ENGINEERING PERSONNEL | 1 | 1 | 0 | | 0.311 | 0.769 | 0 | |
| TOTAL | 84 | 51 | 23 | 158 | 59.347 | 20.992 | 5.356 | 85.695 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 312 (181) | 294 (232) | 142 (125) | 748 | 176.941 | 178.112 | 43.858 | 398.911 |
| OPERATING PERSONNEL | 97 (92) | 8 (6) | 1 (1) | 106 | 36.844 | 2.545 | 0.118 | 39.507 |
| HEALTH PHYSICS PERSONNEL | 106 (49) | 2 (2) | 167 (123) | 275 | 55.334 | 0.378 | 71.37 | 127.082 |
| SUPERVISORY PERSONNEL | 11 (8) | 3 (3) | 9 (9) | 23 | 3.213 | 0.502 | 4.072 | 7.787 |
| ENGINEERING PERSONNEL | 24 (26) | 4 (3) | 11 (11) | 39 | 9.322 | 1.944 | 2.418 | 13.684 |
| GRAND TOTALS | 550 (356) | 311 (246) | 330 (269) | 1191 | 281.654 | 183.481 | 121.836 | 586.971 |

*Workers may be counted in more than one category. Numbers in parentheses are total numbers of individuals.

# APPENDIX D (cont)

## NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: CATAWBA TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 51 | 75 | 13 | | 2.005 | 1.795 | 0.24 | |
| OPERATING PERSONNEL | 50 | 4 | 17 | | 6.604 | 0.305 | 0.115 | |
| HEALTH PHYSICS PERSONNEL | 29 | 0 | 18 | | 5.755 | 0 | 1.84 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.1 | 0 | 0 | |
| ENGINEERING PERSONNEL | 12 | 11 | 2 | | 1.495 | 0.15 | 0.045 | |
| TOTAL | 143 | 90 | 50 | 283 | 15.959 | 2.25 | 2.24 | 20.449 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 51 | 93 | 14 | | 5.735 | 15.17 | 1.58 | |
| OPERATING PERSONNEL | 38 | 2 | 22 | | 3 | 0.285 | 4.505 | |
| HEALTH PHYSICS PERSONNEL | 29 | 0 | 18 | | 4.795 | 0 | 3.925 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.01 | 0 | 0 | |
| ENGINEERING PERSONNEL | 11 | 12 | 2 | | 1.45 | 1.385 | 0.27 | |
| TOTAL | 130 | 107 | 56 | 293 | 14.99 | 16.84 | 10.28 | 42.11 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 7 | 10 | 2 | | 0 | 0.21 | 0.02 | |
| OPERATING PERSONNEL | 15 | 1 | 7 | | 0.005 | 0 | 0.01 | |
| HEALTH PHYSICS PERSONNEL | 18 | 0 | 6 | | 0.175 | 0 | 0.095 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.07 | 0 | 0 | |
| ENGINEERING PERSONNEL | 1 | 0 | 1 | | 0 | 0 | 0.015 | |
| TOTAL | 42 | 11 | 16 | 69 | 0.25 | 0.21 | 0.14 | 0.6 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 25 | 21 | 6 | | 1.41 | 0.92 | 0.28 | |
| OPERATING PERSONNEL | 7 | 0 | 0 | | 0.11 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 18 | 0 | 11 | | 0.55 | 0 | 0.385 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 6 | 0 | 0 | | 0.075 | 0 | 0 | |
| TOTAL | 56 | 21 | 17 | 94 | 2.145 | 0.92 | 0.665 | 3.73 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 27 | 35 | 1 | | 0.375 | 0.125 | 0 | |
| OPERATING PERSONNEL | 9 | 2 | 22 | | 0.665 | 0.325 | 3.88 | |
| HEALTH PHYSICS PERSONNEL | 24 | 0 | 15 | | 0.43 | 0 | 0.49 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 3 | 5 | 0 | | 0.015 | 0.015 | 0 | |
| TOTAL | 64 | 42 | 38 | 144 | 1.485 | 0.465 | 4.37 | 6.32 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 1 | 1 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 2 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 3 | 1 | 0 | 4 | 0 | 0 | 0 | 0 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 162 (52) | 235 (93) | 36 (15) | 433 (160) | 9.525 | 18.22 | 2.12 | 29.865 |
| OPERATING PERSONNEL | 119 (52) | 9 (4) | 68 (22) | 196 (78) | 10.384 | 0.915 | 8.51 | 19.809 |
| HEALTH PHYSICS PERSONNEL | 118 (29) | 0 (0) | 68 (18) | 186 (65) | 11.705 | 0 | 6.735 | 18.44 |
| SUPERVISORY PERSONNEL | 4 (1) | 0 (0) | 0 (0) | 4 (1) | 0.18 | 0 | 0 | 0.18 |
| ENGINEERING PERSONNEL | 35 (16) | 28 (8) | 5 (2) | 68 (26) | 3.035 | 1.55 | 0.33 | 4.915 |
| GRAND TOTALS | 438 (150) | 272 (105) | 177 (57) | 887 (330) | 34.829 | 20.685 | 17.695 | 73.209 |

Numbers in parentheses are total numbers of individuals.

# APPENDIX D (cont)

## NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *COOK 1,2 TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 18 | 0 | 52 | | 3.12 | 0 | 19.266 | |
| OPERATING PERSONNEL | 85 | 0 | 13 | | 28.703 | 0 | 5.801 | |
| HEALTH PHYSICS PERSONNEL | 19 | 0 | 73 | | 4.36 | 0 | 17.638 | |
| SUPERVISORY PERSONNEL | 3 | 0 | 0 | | 0.481 | 0 | 0 | |
| ENGINEERING PERSONNEL | 1 | 1 | 2 | | 0.229 | 0.328 | 0.231 | |
| TOTAL | 126 | 1 | 140 | 267 | 36.893 | 0.328 | 42.936 | 80.157 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 114 | 0 | 488 | | 74.368 | 0 | 265.319 | |
| OPERATING PERSONNEL | 23 | 0 | 39 | | 5.487 | 0 | 24.879 | |
| HEALTH PHYSICS PERSONNEL | 17 | 0 | 101 | | 3.994 | 0 | 49.511 | |
| SUPERVISORY PERSONNEL | 10 | 0 | 1 | | 3.762 | 0 | 0.398 | |
| ENGINEERING PERSONNEL | 4 | 5 | 9 | | 0.83 | 0.877 | 3.086 | |
| TOTAL | 168 | 5 | 638 | 811 | 88.441 | 0.877 | 343.193 | 432.511 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 13 | 0 | 211 | | 4.55 | 0 | 88.436 | |
| OPERATING PERSONNEL | 14 | 0 | 17 | | 2.701 | 0 | 8.583 | |
| HEALTH PHYSICS PERSONNEL | 5 | 0 | 47 | | 0.653 | 0 | 13.026 | |
| SUPERVISORY PERSONNEL | 4 | 0 | 0 | | 0.721 | 0 | 0 | |
| ENGINEERING PERSONNEL | 2 | 4 | 4 | | 0.304 | 0.706 | 0.801 | |
| TOTAL | 38 | 4 | 279 | 321 | 8.929 | 0.706 | 110.846 | 120.481 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 22 | 0 | 174 | | 5.87 | 0 | 63.665 | |
| OPERATING PERSONNEL | 1 | 0 | 7 | | 0.192 | 0 | 1.431 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 14 | | 0 | 0 | 3.352 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.132 | 0 | 0 | |
| ENGINEERING PERSONNEL | 3 | 3 | 8 | | 0.886 | 0.391 | 1.531 | |
| TOTAL | 27 | 3 | 203 | 233 | 7.08 | 0.391 | 69.979 | 77.45 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 37 | 0 | 120 | | 10.343 | 0 | 68.615 | |
| OPERATING PERSONNEL | 1 | 0 | 1 | | 0.23 | 0 | 0.4 | |
| HEALTH PHYSICS PERSONNEL | 10 | 0 | 6 | | 2.699 | 0 | 1.074 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 2.501 | 0 | 0 | |
| ENGINEERING PERSONNEL | 1 | 0 | 0 | | 1.525 | 0 | 0 | |
| TOTAL | 50 | 0 | 127 | 177 | 17.298 | 0 | 70.089 | 87.387 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 5 | 0 | 43 | | 0.672 | 0 | 17.9 | |
| OPERATING PERSONNEL | 4 | 0 | 11 | | 0.802 | 0 | 2.578 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 2 | | 0 | 0 | 0.285 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 1 | | 0 | 0 | 0.14 | |
| TOTAL | 9 | 0 | 57 | 66 | 1.474 | 0 | 20.903 | 22.377 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 209 (121) | 0 (0) | 1088 (786) | 1297 (907) | 98.923 | 0 | 523.201 | 622.124 |
| OPERATING PERSONNEL | 128 (105) | 0 (0) | 88 (64) | 216 (169) | 38.115 | 0 | 43.672 | 81.787 |
| HEALTH PHYSICS PERSONNEL | 51 (31) | 0 (0) | 243 (106) | 294 (137) | 11.706 | 0 | 84.886 | 96.592 |
| SUPERVISORY PERSONNEL | 19 (17) | 0 (0) | 1 (1) | 20 (18) | 7.597 | 0 | 0.398 | 7.995 |
| ENGINEERING PERSONNEL | 11 (7) | 13 (10) | 24 (22) | 48 (39) | 3.774 | 2.302 | 5.789 | 11.865 |
| GRAND TOTALS | 418 (281) | 13 (10) | 1444 (979) | 1875 (1270) | 160.115 | 2.302 | 657.946 | 820.363 |

*Workers may be counted in more than one category. Numbers in parentheses are total numbers of individuals.

# APPENDIX D (cont)

## NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *COOPER TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 2 | 0 | 20 | | 0.315 | 0 | 2.284 | |
| OPERATING PERSONNEL | 57 | 0 | 0 | | 25.138 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 19 | 0 | 1 | | 7.786 | 0 | 0.056 | |
| SUPERVISORY PERSONNEL | 8 | 3 | 8 | | 1.559 | 0.95 | 1.083 | |
| ENGINEERING PERSONNEL | 15 | 5 | 10 | | 6.438 | 0.359 | 1.074 | |
| TOTAL | 101 | 8 | 39 | 148 | 41.236 | 1.309 | 4.497 | 47.042 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 120 | 0 | 102 | | 120.596 | 0 | 49.477 | |
| OPERATING PERSONNEL | 4 | 0 | 0 | | 0.113 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 11 | 0 | 0 | | 3.636 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 5 | 3 | 1 | | 1.283 | 0.211 | 0.952 | |
| ENGINEERING PERSONNEL | 1 | 9 | 31 | | 0.071 | 0.48 | 5.134 | |
| TOTAL | 141 | 12 | 134 | 287 | 125.699 | 0.691 | 55.563 | 181.953 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 10 | | 0 | 0 | 6.217 | |
| OPERATING PERSONNEL | 1 | 0 | 0 | | 0.002 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 1 | 0 | 0 | | 0.059 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 2 | 0 | 10 | 12 | 0.061 | 0 | 6.217 | 6.278 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 2 | 1 | 651 | | 3.485 | 0.191 | 823.412 | |
| OPERATING PERSONNEL | 6 | 0 | 0 | | 1.046 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 15 | 0 | 29 | | 11.496 | 0 | 24.509 | |
| SUPERVISORY PERSONNEL | 7 | 6 | 96 | | 0.568 | 5.288 | 133.685 | |
| ENGINEERING PERSONNEL | 3 | 15 | 11 | | 0.28 | 6.713 | 3.312 | |
| TOTAL | 33 | 22 | 787 | 842 | 16.875 | 12.192 | 984.918 | 1013.985 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 4 | 0 | 4 | | 0.034 | 0 | 0.422 | |
| OPERATING PERSONNEL | 30 | 0 | 0 | | 5.825 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 14 | 0 | 1 | | 5.203 | 0 | 0.405 | |
| SUPERVISORY PERSONNEL | 3 | 0 | 0 | | 0.119 | 0 | 0 | |
| ENGINEERING PERSONNEL | 4 | 0 | 0 | | 0.985 | 0 | 0 | |
| TOTAL | 55 | 0 | 5 | 60 | 12.166 | 0 | 0.827 | 12.993 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 13 | | 0 | 0 | 2.253 | |
| OPERATING PERSONNEL | 41 | 0 | 0 | | 8.407 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.001 | 0 | 0 | |
| ENGINEERING PERSONNEL | 4 | 0 | 0 | | 0.358 | 0 | 0 | |
| TOTAL | 46 | 0 | 13 | 59 | 8.766 | 0 | 2.253 | 11.019 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 128 (122) | 1 (1) | 800 (749) | 929 | 124.43 | 0.191 | 884.065 | 1008.686 |
| OPERATING PERSONNEL | 139 (59) | 0 (0) | 0 (0) | 139 | 40.531 | 0 | 0 | 40.531 |
| HEALTH PHYSICS PERSONNEL | 60 (19) | 0 (0) | 31 (29) | 91 | 28.18 | 0 | 24.97 | 53.15 |
| SUPERVISORY PERSONNEL | 24 (12) | 12 (6) | 105 (101) | 141 | 3.53 | 6.449 | 135.72 | 145.699 |
| ENGINEERING PERSONNEL | 27 (15) | 29 (16) | 52 (41) | 108 | 8.132 | 7.552 | 9.52 | 25.204 |
| GRAND TOTALS | 378 (227) | 42 (23) | 988 (913) | 1408 | 204.803 | 14.192 | 1054.275 | 1273.27 |

*Workers may be counted in more than one category. Numbers in parentheses are total numbers of individuals.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: CRYSTAL RIVER 3 TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 2 | 2 | | 0.159 | 0.857 | 0.723 | |
| OPERATING PERSONNEL | 0 | 36 | 8 | | 0 | 14.943 | 2.912 | |
| HEALTH PHYSICS PERSONNEL | 0 | 6 | 1 | | 0 | 1.167 | 1.242 | |
| SUPERVISORY PERSONNEL | 2 | 6 | 26 | | 0.736 | 2.459 | 12.169 | |
| ENGINEERING PERSONNEL | 2 | 1 | 6 | | 0.794 | 0.757 | 1.935 | |
| TOTAL | 4 | 51 | 43 | 98 | 1.689 | 20.183 | 18.981 | 40.853 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 129 | 217 | 479 | | 87.927 | 95.801 | 257.83 | |
| OPERATING PERSONNEL | 0 | 8 | 0 | | 0 | 4.396 | 0.025 | |
| HEALTH PHYSICS PERSONNEL | 0 | 18 | 83 | | 0 | 9.593 | 56.7 | |
| SUPERVISORY PERSONNEL | 2 | 1 | 9 | | 0.929 | 0.877 | 3.473 | |
| ENGINEERING PERSONNEL | 3 | 7 | 61 | | 1.124 | 2.718 | 36.908 | |
| TOTAL | 134 | 251 | 632 | 1017 | 89.98 | 113.385 | 354.936 | 558.301 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 3 | | 0.006 | .004 | 1.764 | |
| OPERATING PERSONNEL | 1 | 0 | 0 | | 0.869 | 0 | 0.002 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 2 | | 0.002 | 0 | 1.226 | |
| ENGINEERING PERSONNEL | 2 | 3 | 15 | | 1.644 | 2.109 | 9.582 | |
| TOTAL | 3 | 3 | 20 | 26 | 2.521 | 2.113 | 12.574 | 17.208 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 1 | 9 | | 0 | 1.502 | 5.962 | |
| OPERATING PERSONNEL | 0 | 4 | 1 | | 0 | 5.605 | 1.819 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 3 | 2 | | 0 | 4.164 | 2.533 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0.051 | 0 | |
| TOTAL | 0 | 8 | 12 | 20 | 0 | 11.322 | 10.314 | 21.636 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 4 | 12 | 0 | | 1.932 | 4.508 | 0.068 | |
| OPERATING PERSONNEL | 0 | 2 | 0 | | 0 | 0.79 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 1 | | 0 | 0.086 | 0.129 | |
| TOTAL | 4 | 14 | 1 | 19 | 1.932 | 5.384 | 0.197 | 7.513 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 133 | 232 | 493 | 858 | 90.024 | 102.672 | 266.347 | 459.043 |
| OPERATING PERSONNEL | 1 | 50 | 9 | 60 | 0.869 | 25.734 | 4.758 | 31.361 |
| HEALTH PHYSICS PERSONNEL | 0 | 24 | 84 | 108 | 0 | 10.76 | 57.942 | 68.702 |
| SUPERVISORY PERSONNEL | 4 | 10 | 39 | 53 | 1.667 | 7.5 | 19.401 | 28.568 |
| ENGINEERING PERSONNEL | 7 | 11 | 83 | 101 | 3.562 | 5.721 | 48.554 | 57.837 |
| GRAND TOTALS | 145 | 327 | 708 | 1180 | 96.122 | 152.387 | 397.002 | 645.511 |

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *DAVIS BESSE TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 17 | 1 | 68 | | 0.19 | 0.005 | 1.516 | |
| OPERATING PERSONNEL | 85 | 0 | 11 | | 4.483 | 0 | 0.282 | |
| HEALTH PHYSICS PERSONNEL | 12 | 0 | 3 | | 0.315 | 0 | 0.055 | |
| SUPERVISORY PERSONNEL | 28 | 1 | 4 | | 0.664 | 0.005 | 0.055 | |
| ENGINEERING PERSONNEL | 11 | 0 | 5 | | 0.21 | 0 | 0.149 | |
| TOTAL | 153 | 2 | 91 | 246 | 5.862 | 0.01 | 2.057 | 7.929 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 130 | 11 | 346 | | 7.074 | 0.322 | 18.122 | |
| OPERATING PERSONNEL | 20 | 0 | 0 | | 0.836 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 31 | 0 | 49 | | 4.366 | 0 | 9.465 | |
| SUPERVISORY PERSONNEL | 25 | 0 | 6 | | 0.593 | 0 | 0.26 | |
| ENGINEERING PERSONNEL | 28 | 1 | 21 | | 0.67 | 0.005 | 0.671 | |
| TOTAL | 234 | 12 | 422 | 668 | 13.539 | 0.327 | 28.518 | 42.384 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 48 | 4 | 198 | | 3.982 | 0.162 | 26.052 | |
| OPERATING PERSONNEL | 2 | 0 | 0 | | 0.035 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 9 | | 0 | 0 | 0.106 | |
| SUPERVISORY PERSONNEL | 2 | 0 | 1 | | 0.035 | 0 | 0.01 | |
| ENGINEERING PERSONNEL | 3 | 0 | 8 | | 0.385 | 0 | 0.682 | |
| TOTAL | 55 | 4 | 216 | 275 | 4.437 | 0.162 | 26.85 | 31.449 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 98 | 3 | 123 | | 7.05 | 0.23 | 7.798 | |
| OPERATING PERSONNEL | 8 | 0 | 0 | | 0.48 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 4 | 0 | 6 | | 0.04 | 0 | 0.055 | |
| SUPERVISORY PERSONNEL | 17 | 1 | 5 | | 0.56 | 0.02 | 0.055 | |
| ENGINEERING PERSONNEL | 11 | 1 | 17 | | 0.224 | 0.01 | 0.79 | |
| TOTAL | 138 | 5 | 151 | 294 | 8.354 | 0.26 | 8.698 | 17.312 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 4 | 0 | 13 | | 0.07 | 0 | 0.886 | |
| OPERATING PERSONNEL | 3 | 0 | 0 | | 0.035 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 14 | 0 | 13 | | 6.279 | 0 | 0.455 | |
| SUPERVISORY PERSONNEL | 3 | 0 | 1 | | 1.19 | 0 | 0.055 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 24 | 0 | 27 | 51 | 7.574 | 0 | 1.396 | 8.97 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 5 | 0 | 5 | | 0.195 | 0 | 0.095 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 2 | 0 | 0 | | 0.065 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.005 | 0 | 0 | |
| ENGINEERING PERSONNEL | 1 | 0 | 0 | | 0.015 | 0 | 0 | |
| TOTAL | 9 | 0 | 5 | 14 | 0.28 | 0 | 0.095 | 0.375 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 302 | 19 | 753 | 1074 | 18.561 | 0.719 | 54.469 | 73.749 |
| OPERATING PERSONNEL | 118 | 0 | 11 | 129 | 5.869 | 0 | 0.282 | 6.151 |
| HEALTH PHYSICS PERSONNEL | 63 | 0 | 80 | 143 | 11.065 | 0 | 10.136 | 21.201 |
| SUPERVISORY PERSONNEL | 76 | 2 | 17 | 95 | 3.047 | 0.025 | 0.435 | 3.507 |
| ENGINEERING PERSONNEL | 54 | 2 | 51 | 107 | 1.504 | 0.015 | 2.292 | 3.811 |
| GRAND TOTALS | 613 | 23 | 912 | 1548 | 40.046 | 0.759 | 67.614 | 108.419 |

*Workers may be counted in more than one category.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: DIABLO CANYON 1,2 TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0.039 | 0.252 | 0.311 | |
| OPERATING PERSONNEL | 0 | 1 | 1 | | 0.068 | 2.134 | 0.522 | |
| HEALTH PHYSICS PERSONNEL | 0 | 5 | 24 | | 0.011 | 2.669 | 6.039 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.015 | 0.211 | 0.019 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.038 | 0.267 | 0.002 | |
| TOTAL | 0 | 6 | 25 | 31 | 0.171 | 5.533 | 6.893 | 12.597 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 1 | 19 | 24 | | 0.491 | 6.645 | 12.325 | |
| OPERATING PERSONNEL | 0 | 0 | 1 | | 0.054 | 1.184 | 0.682 | |
| HEALTH PHYSICS PERSONNEL | 0 | 3 | 8 | | 0.002 | 1.091 | 2.818 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0.018 | 0.008 | |
| ENGINEERING PERSONNEL | 0 | 1 | 0 | | 0.035 | 0.366 | 0.004 | |
| TOTAL | 1 | 23 | 33 | 57 | 0.582 | 9.304 | 15.837 | 25.723 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0.025 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.002 | 0.044 | 0.008 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0.026 | 0.038 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0.001 | 0.047 | |
| TOTAL | 0 | 0 | 0 | 0 | 0.002 | 0.071 | 0.118 | 0.191 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0.036 | 0.012 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.002 | 0.003 | 0.013 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0.019 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0.001 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0.002 | 0.04 | 0.044 | 0.086 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0.007 | 0.012 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.009 | 0.04 | 0.001 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 2 | | 0 | 0.281 | 0.29 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0.001 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0.004 | 0 | |
| TOTAL | 0 | 0 | 2 | 2 | 0.009 | 0.332 | 0.304 | 0.645 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0.013 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.002 | 0.001 | 0.008 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0.009 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0.002 | 0.01 | 0.021 | 0.033 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 1 | 19 | 24 | 44 | 0.53 | 6.94 | 12.698 | 20.168 |
| OPERATING PERSONNEL | 0 | 1 | 2 | 3 | 0.137 | 3.406 | 1.234 | 4.777 |
| HEALTH PHYSICS PERSONNEL | 0 | 8 | 34 | 42 | 0.013 | 4.067 | 9.204 | 13.284 |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | 0 | 0.015 | 0.229 | 0.028 | 0.272 |
| ENGINEERING PERSONNEL | 0 | 1 | 0 | 1 | 0.073 | 0.648 | 0.053 | 0.774 |
| GRAND TOTALS | 1 | 29 | 60 | 90 | 0.768 | 15.29 | 23.217 | 39.275 |

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *DUANE ARNOLD TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 49 | 1 | 136 | | 2.99 | 0.02 | 5.576 | |
| OPERATING PERSONNEL | 69 | 1 | 21 | | 42.42 | 0.03 | 0.1698 | |
| HEALTH PHYSICS PERSONNEL | 23 | 0 | 73 | | 2.656 | 0 | 5.09 | |
| SUPERVISORY PERSONNEL | 24 | 5 | 72 | | 1.223 | 0.029 | 5.354 | |
| ENGINEERING PERSONNEL | 9 | 30 | 51 | | 0.347 | 0.905 | 1.109 | |
| TOTAL | 174 | 37 | 353 | 564 | 49.636 | 0.984 | 17.2988 | 67.9188 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 134 | 3 | 545 | | 57.748 | 0.403 | 119.772 | |
| OPERATING PERSONNEL | 38 | 0 | 40 | | 1.638 | 0 | 4.604 | |
| HEALTH PHYSICS PERSONNEL | 29 | 0 | 111 | | 8.199 | 0 | 11.592 | |
| SUPERVISORY PERSONNEL | 17 | 4 | 74 | | 0.814 | 0.016 | 4.411 | |
| ENGINEERING PERSONNEL | 23 | 15 | 105 | | 1.156 | 0.67 | 8.09 | |
| TOTAL | 241 | 22 | 875 | 1138 | 69.555 | 1.089 | 148.469 | 219.113 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 68 | 0 | 540 | | 7.608 | 0 | 366.816 | |
| OPERATING PERSONNEL | 6 | 0 | 13 | | 0.272 | 0 | 0.464 | |
| HEALTH PHYSICS PERSONNEL | 28 | 2 | 118 | | 3.289 | 0.08 | 24.547 | |
| SUPERVISORY PERSONNEL | 16 | 3 | 71 | | 0.929 | 0.137 | 9.397 | |
| ENGINEERING PERSONNEL | 21 | 29 | 168 | | 4.647 | 4.488 | 100.551 | |
| TOTAL | 139 | 34 | 910 | 1083 | 16.745 | 4.705 | 501.775 | 523.225 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 116 | 9 | 711 | | 23.507 | 0.32 | 442.987 | |
| OPERATING PERSONNEL | 24 | 1 | 22 | | 0.59 | 0.005 | 1.067 | |
| HEALTH PHYSICS PERSONNEL | 33 | 3 | 146 | | 8.101 | 0.035 | 40.448 | |
| SUPERVISORY PERSONNEL | 31 | 6 | 124 | | 1.634 | 0.044 | 33.919 | |
| ENGINEERING PERSONNEL | 31 | 43 | 207 | | 6.881 | 5.158 | 53.665 | |
| TOTAL | 235 | 62 | 1210 | 1507 | 40.713 | 5.562 | 572.086 | 618.361 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 62 | 1 | 102 | | 7.828 | 0.005 | 8.288 | |
| OPERATING PERSONNEL | 19 | 0 | 33 | | 6.941 | 0 | 7.516 | |
| HEALTH PHYSICS PERSONNEL | 6 | 0 | 36 | | 1.955 | 0 | 3.245 | |
| SUPERVISORY PERSONNEL | 2 | 0 | 18 | | 0.157 | 0 | 2.747 | |
| ENGINEERING PERSONNEL | 5 | 1 | 8 | | 0.2 | 0.015 | 0.095 | |
| TOTAL | 94 | 2 | 197 | 293 | 17.081 | 0.02 | 21.891 | 38.992 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 67 | 3 | 192 | | 5.686 | 0.06 | 31.888 | |
| OPERATING PERSONNEL | 51 | 2 | 6 | | 2.344 | 0.06 | 0.085 | |
| HEALTH PHYSICS PERSONNEL | 23 | 0 | 58 | | 2.343 | 0 | 7.756 | |
| SUPERVISORY PERSONNEL | 24 | 1 | 26 | | 0.415 | 0.02 | 2.424 | |
| ENGINEERING PERSONNEL | 17 | 13 | 72 | | 0.748 | 0.252 | 11.091 | |
| TOTAL | 182 | 19 | 354 | 555 | 11.536 | 0.392 | 53.244 | 65.172 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 496 (199) | 17 (14) | 2226 (863) | 2739 | 105.367 | 0.808 | 975.327 | 1081.502 |
| OPERATING PERSONNEL | 207 (93) | 4 (4) | 135 (103) | 346 | 54.205 | 0.095 | 13.9058 | 68.2058 |
| HEALTH PHYSICS PERSONNEL | 142 (53) | 5 (5) | 542 (213) | 689 | 26.543 | 0.115 | 92.678 | 119.336 |
| SUPERVISORY PERSONNEL | 114 (67) | 19 (15) | 385 (255) | 518 | 5.172 | 0.246 | 58.252 | 63.67 |
| ENGINEERING PERSONNEL | 106 (61) | 131 (76) | 611 (358) | 848 | 13.979 | 11.488 | 174.601 | 200.068 |
| GRAND TOTALS | 1065 (473) | 176 (114) | 3899 (1792) | 5140 | 205.266 | 12.752 | 1314.763 | 1532.781 |

*Workers may be counted in more than one category. Numbers in parentheses are total numbers of individuals.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *FARLEY 1,2 TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | | |
| MAINTENANCE PERSONNEL | 64 | 0 | 50 | | | 1.467 | 0 | 4.343 | |
| OPERATING PERSONNEL | 160 | 8 | 17 | | | 44.967 | 0.178 | 0.78 | |
| HEALTH PHYSICS PERSONNEL | 64 | 7 | 130 | | | 28.979 | 1.093 | 49.46 | |
| SUPERVISORY PERSONNEL | 174 | 9 | 22 | | | 12.269 | 0.43 | 1.327 | |
| ENGINEERING PERSONNEL | 42 | 10 | 161 | | | 2.351 | 0.529 | 9.34 | |
| TOTAL | 504 | 34 | 380 | 918 | | 90.033 | 2.23 | 65.25 | 157.513 |
| ROUTINE MAINTENANCE | | | | | | | | | |
| MAINTENANCE PERSONNEL | 176 | 1 | 56 | | | 38.109 | 0.02 | 2.632 | |
| OPERATING PERSONNEL | 86 | 7 | 2 | | | 35.226 | 0.366 | 0.12 | |
| HEALTH PHYSICS PERSONNEL | 9 | 0 | 12 | | | 0.921 | 0 | 0.383 | |
| SUPERVISORY PERSONNEL | 46 | 1 | 2 | | | 4.17 | 0.02 | 0.054 | |
| ENGINEERING PERSONNEL | 16 | 10 | 278 | | | 0.287 | 0.231 | 14.438 | |
| TOTAL | 333 | 19 | 350 | 702 | | 78.713 | 0.637 | 17.627 | 96.977 |
| IN-SERVICE INSPECTION | | | | | | | | | |
| MAINTENANCE PERSONNEL | 6 | 0 | 77 | | | 0.159 | 0 | 22.443 | |
| OPERATING PERSONNEL | 4 | 0 | 0 | | | 0.088 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 5 | 0 | 2 | | | 0.176 | 0 | 0.239 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 1 | | | 0 | 0 | 0.13 | |
| ENGINEERING PERSONNEL | 11 | 2 | 125 | | | 0.697 | 0.612 | 32.485 | |
| TOTAL | 26 | 2 | 205 | 233 | | 1.12 | 0.612 | 55.297 | 57.029 |
| SPECIAL MAINTENANCE | | | | | | | | | |
| MAINTENANCE PERSONNEL | 167 | 1 | 482 | | | 132.626 | 0.03 | 183.332 | |
| OPERATING PERSONNEL | 89 | 5 | 2 | | | 19.249 | 0.376 | 0.05 | |
| HEALTH PHYSICS PERSONNEL | 29 | 2 | 50 | | | 5.205 | 0.037 | 4.437 | |
| SUPERVISORY PERSONNEL | 53 | 2 | 6 | | | 10.168 | 0.84 | 0.241 | |
| ENGINEERING PERSONNEL | 22 | 12 | 718 | | | 4.112 | 0.865 | 107.117 | |
| TOTAL | 360 | 22 | 1258 | 1640 | | 171.36 | 2.148 | 295.177 | 468.685 |
| WASTE PROCESSING | | | | | | | | | |
| MAINTENANCE PERSONNEL | 1 | 0 | 2 | | | 0.007 | 0 | 1.098 | |
| OPERATING PERSONNEL | 24 | 0 | 0 | | | 4.8 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 9 | 0 | 4 | | | 0.453 | 0 | 2.025 | |
| SUPERVISORY PERSONNEL | 7 | 0 | 0 | | | 3.196 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 1 | 4 | | | 0 | 0.004 | 0.074 | |
| TOTAL | 41 | 1 | 10 | 52 | | 8.456 | 0.004 | 3.197 | 11.657 |
| REFUELING | | | | | | | | | |
| MAINTENANCE PERSONNEL | 10 | 0 | 36 | | | 0.132 | 0 | 4.666 | |
| OPERATING PERSONNEL | 6 | 0 | 0 | | | 0.14 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 2 | 0 | 8 | | | 1.007 | 0 | 0.211 | |
| SUPERVISORY PERSONNEL | 7 | 0 | 1 | | | 0.477 | 0 | 0.088 | |
| ENGINEERING PERSONNEL | 3 | 2 | 3 | | | 0.052 | 0.119 | 0.114 | |
| TOTAL | 28 | 2 | 48 | 78 | | 1.808 | 0.119 | 5.079 | 7.006 |
| TOTAL BY JOB FUNCTION | | | | | | | | | |
| MAINTENANCE PERSONNEL | 424 | 2 | 703 | 1129 | | 172.5 | 0.05 | 218.514 | 391.064 |
| OPERATING PERSONNEL | 369 | 20 | 21 | 410 | | 104.47 | 0.92 | 0.95 | 106.34 |
| HEALTH PHYSICS PERSONNEL | 118 | 9 | 206 | 333 | | 36.741 | 1.13 | 56.755 | 94.626 |
| SUPERVISORY PERSONNEL | 287 | 12 | 32 | 331 | | 30.28 | 1.29 | 1.84 | 33.41 |
| ENGINEERING PERSONNEL | 94 | 37 | 1289 | 1420 | | 7.499 | 2.36 | 163.568 | 173.427 |
| GRAND TOTALS | 1292 | 80 | 2251 | 3623 | | 351.49 | 5.75 | 441.627 | 798.867 |

*Workers may be counted in more than one category.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: FERMI-2 TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0.474 | 0 | 0.51 | |
| OPERATING PERSONNEL | 0 | 0 | 1 | | 1.407 | 0.043 | 0.98 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0.171 | 0 | 0.307 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.117 | 0 | 0.091 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.445 | 0.03 | 1.22 | |
| TOTAL | 0 | 0 | 1 | 1 | 2.614 | 0.073 | 3.108 | 5.795 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0.456 | 0.002 | 1.878 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.004 | 0 | 0.1 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0.008 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.003 | 0 | 0.093 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.101 | 0 | 0.2 | |
| TOTAL | 0 | 0 | 0 | 0 | 0.572 | 0.002 | 2.271 | 2.845 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0.005 | 0 | 0.004 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0.015 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0.015 | |
| TOTAL | 0 | 0 | 0 | 0 | 0.005 | 0 | 0.034 | 0.039 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0.134 | 0 | 0.221 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.015 | 0 | 0.124 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0.045 | 0 | 0.058 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.017 | 0 | 0.008 | |
| ENGINEERING PERSONNEL | 0 | 0 | 2 | | 0.022 | 0 | 0.485 | |
| TOTAL | 0 | 0 | 2 | 2 | 0.233 | 0 | 0.896 | 1.129 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0.084 | 0 | 0.022 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.023 | 0 | 0.493 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0.007 | 0 | 0.058 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.015 | 0 | 0.012 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0.129 | 0 | 0.585 | 0.714 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0.002 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.005 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0.001 | 0 | 0.001 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.008 | 0 | 0.009 | |
| TOTAL | 0 | 0 | 0 | 0 | 0.016 | 0 | 0.01 | 0.026 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | 0 | 1.155 | 0.002 | 2.635 | 3.792 |
| OPERATING PERSONNEL | 0 | 0 | 1 | 1 | 1.454 | 0.043 | 1.697 | 3.194 |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | 0 | 0.232 | 0 | 0.439 | 0.671 |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | 0 | 0.152 | 0 | 0.204 | 0.356 |
| ENGINEERING PERSONNEL | 0 | 0 | 2 | 2 | 0.576 | 0.03 | 1.929 | 2.535 |
| GRAND TOTALS | 0 | 0 | 3 | 3 | 3.569 | 0.075 | 6.904 | 10.548 |

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *FORT CALHOUN TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY CONTRACT | TOTAL | | TOTAL PERSON-REM STATION | UTILITY CONTRACT | TOTAL | |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 3 | 1 | 5 | | 1.614 | 0.978 | 3.771 | |
| OPERATING PERSONNEL | 6 | 3 | 7 | | 2.064 | 1.435 | 2.254 | |
| HEALTH PHYSICS PERSONNEL | 3 | 0 | 0 | | 0.59 | 0.016 | 0 | |
| SUPERVISORY PERSONNEL | 30 | 1 | 0 | | 12.886 | 0.289 | 0 | |
| ENGINEERING PERSONNEL | 18 | 0 | 27 | | 15.114 | 0.007 | 23.31 | |
| TOTAL | 60 | 5 | 39 | 104 | 32.268 | 2.725 | 29.335 | 64.328 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 43 | 42 | 108 | | 20.801 | 13.487 | 53.768 | |
| OPERATING PERSONNEL | 5 | 0 | 16 | | 1.828 | 0.694 | 5.472 | |
| HEALTH PHYSICS PERSONNEL | 1 | 0 | 0 | | 0.35 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.592 | 0 | 0 | |
| ENGINEERING PERSONNEL | 1 | 0 | 20 | | 0.433 | 0 | 20.83 | |
| TOTAL | 50 | 42 | 144 | 236 | 24.004 | 14.181 | 80.07 | 118.255 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 1 | 1 | 45 | | 0.33 | 0.265 | 28.623 | |
| OPERATING PERSONNEL | 0 | 1 | 1 | | 0.061 | 0.707 | 0.207 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0.005 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.153 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 1 | | 0 | 0 | 0.12 | |
| TOTAL | 2 | 2 | 47 | 51 | 0.549 | 0.972 | 28.95 | 30.471 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 33 | 45 | 144 | | 12.338 | 19.061 | 96.367 | |
| OPERATING PERSONNEL | 8 | 12 | 16 | | 2.815 | 4.59 | 8.383 | |
| HEALTH PHYSICS PERSONNEL | 1 | 0 | 0 | | 0.211 | 0.03 | 0.078 | |
| SUPERVISORY PERSONNEL | 6 | 0 | 0 | | 1.823 | 0.008 | 0 | |
| ENGINEERING PERSONNEL | 6 | 0 | 7 | | 2.376 | 0 | 2.073 | |
| TOTAL | 54 | 57 | 167 | 278 | 19.563 | 23.689 | 106.901 | 150.153 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 10 | 2 | 22 | | 3.67 | 0.881 | 11.695 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.265 | 0.062 | 0.008 | |
| HEALTH PHYSICS PERSONNEL | 3 | 0 | 0 | | 2.57 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.962 | 0.002 | 0 | |
| ENGINEERING PERSONNEL | 5 | 0 | 7 | | 7.955 | 0 | 3.69 | |
| TOTAL | 19 | 2 | 29 | 50 | 15.422 | 0.945 | 15.393 | 31.76 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 16 | 38 | 31 | | 6.572 | 17.57 | 14.179 | |
| OPERATING PERSONNEL | 3 | 1 | 10 | | 1.665 | 0.24 | 2.47 | |
| HEALTH PHYSICS PERSONNEL | 5 | 0 | 0 | | 1.088 | 0 | 0.025 | |
| SUPERVISORY PERSONNEL | 32 | 2 | 0 | | 8.423 | 0.469 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 1 | | 0.125 | 0 | 0.31 | |
| TOTAL | 56 | 41 | 42 | 139 | 17.873 | 18.279 | 16.984 | 53.136 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 106 | 129 | 355 | 590 | 45.325 | 52.242 | 208.403 | 305.97 |
| OPERATING PERSONNEL | 22 | 17 | 50 | 89 | 8.698 | 7.728 | 18.794 | 35.22 |
| HEALTH PHYSICS PERSONNEL | 13 | 0 | 0 | 13 | 4.814 | 0.046 | 0.103 | 4.963 |
| SUPERVISORY PERSONNEL | 70 | 3 | 0 | 73 | 24.839 | 0.768 | 0 | 25.607 |
| ENGINEERING PERSONNEL | 30 | 0 | 63 | 93 | 26.003 | 0.007 | 50.333 | 76.343 |
| GRAND TOTALS | 241 | 149 | 468 | 858 | 109.679 | 60.791 | 277.633 | 448.103 |

*Workers may be counted in more than one category.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: FT. ST. VRAIN TYPE: HTGR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0.03 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 6 | 0 | 2 | | 0.82 | 0 | 0.4 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 56 | | 0 | 0 | 24.51 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 6 | 0 | 58 | 64 | 0.82 | 0 | 24.94 | 25.76 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 2 | 0 | 2 | | 0.34 | 0 | 0.37 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 2 | 0 | 2 | 4 | 0.34 | 0 | 0.37 | 0.71 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 2 | 0 | 2 | 4 | 0.34 | 0 | 0.4 | 0.74 |
| OPERATING PERSONNEL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HEALTH PHYSICS PERSONNEL | 6 | 0 | 2 | 8 | 0.82 | 0 | 0.4 | 1.22 |
| SUPERVISORY PERSONNEL | 0 | 0 | 56 | 56 | 0 | 0 | 24.51 | 24.51 |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTALS | 8 | 0 | 60 | 68 | 1.16 | 0 | 25.31 | 26.47 |

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *GINNA TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 131 | 42 | 143 | | 18.184 | 6.889 | 21.978 | |
| OPERATING PERSONNEL | 1 | 26 | 0 | | 0.248 | 11.763 | 0 | |
| HEALTH PHYSICS PERSONNEL | 38 | 17 | 2 | | 8.91 | 5.782 | 0 | |
| SUPERVISORY PERSONNEL | 39 | 21 | 11 | | 6.297 | 5.179 | 0.876 | |
| ENGINEERING PERSONNEL | 11 | 1 | 6 | | 0.321 | 0.01 | 0.246 | |
| TOTAL | 220 | 107 | 162 | 489 | 33.96 | 29.623 | 23.1 | 86.683 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 150 | 40 | 132 | | 15.778 | 8.556 | 11.724 | |
| OPERATING PERSONNEL | 1 | 20 | 0 | | 0.003 | 0.215 | 0 | |
| HEALTH PHYSICS PERSONNEL | 40 | 17 | 2 | | 8.777 | 2.238 | 0.425 | |
| SUPERVISORY PERSONNEL | 40 | 19 | 9 | | 2.847 | 1.547 | 0.488 | |
| ENGINEERING PERSONNEL | 14 | 1 | 6 | | 2.665 | 0 | 0.047 | |
| TOTAL | 245 | 97 | 149 | 491 | 30.07 | 12.556 | 12.684 | 55.31 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 79 | 37 | 83 | | 7.281 | 4.544 | 8.183 | |
| OPERATING PERSONNEL | 0 | 5 | 0 | | 0 | 0.062 | 0 | |
| HEALTH PHYSICS PERSONNEL | 31 | 3 | 0 | | 1.59 | 0.2 | 0 | |
| SUPERVISORY PERSONNEL | 25 | 11 | 10 | | 1.56 | 0.664 | 2.916 | |
| ENGINEERING PERSONNEL | 0 | 1 | 5 | | 0 | 0.01 | 0.177 | |
| TOTAL | 135 | 57 | 98 | 290 | 10.431 | 5.48 | 11.276 | 27.187 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 164 | 41 | 146 | | 39.347 | 10.631 | 117.59 | |
| OPERATING PERSONNEL | 0 | 7 | 0 | | 0 | 0.144 | 0 | |
| HEALTH PHYSICS PERSONNEL | 39 | 17 | 2 | | 4.624 | 1.746 | 0.01 | |
| SUPERVISORY PERSONNEL | 42 | 18 | 8 | | 11.209 | 1.761 | 2.827 | |
| ENGINEERING PERSONNEL | 0 | 1 | 6 | | 0 | 0.12 | 0.231 | |
| TOTAL | 245 | 84 | 162 | 491 | 55.18 | 14.402 | 120.658 | 190.24 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 36 | 25 | 18 | | 2.4 | 2.132 | 1.352 | |
| OPERATING PERSONNEL | 0 | 6 | 0 | | 0 | 0.576 | 0 | |
| HEALTH PHYSICS PERSONNEL | 36 | 13 | 2 | | 6.295 | 1.895 | 0.485 | |
| SUPERVISORY PERSONNEL | 9 | 14 | 0 | | 2.301 | 1.488 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 81 | 58 | 20 | 159 | 10.996 | 6.091 | 1.837 | 18.924 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 41 | 18 | 18 | | 9.941 | 2.816 | 2.285 | |
| OPERATING PERSONNEL | 0 | 2 | 0 | | 0 | 0.41 | 0 | |
| HEALTH PHYSICS PERSONNEL | 16 | 1 | 0 | | 1.058 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 15 | 5 | 1 | | 1.441 | 1.249 | 0.002 | |
| ENGINEERING PERSONNEL | 15 | 0 | 4 | | 10.768 | 0 | 5.688 | |
| TOTAL | 87 | 26 | 23 | 136 | 23.208 | 4.475 | 7.975 | 35.658 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 601 (180) | 203 (43) | 540 (146) | 1344 (369) | 92.931 | 35.568 | 163.112 | 291.611 |
| OPERATING PERSONNEL | 2 (1) | 66 (26) | 0 (0) | 68 (27) | 0.251 | 13.17 | 0 | 13.421 |
| HEALTH PHYSICS PERSONNEL | 200 (42) | 68 (17) | 8 (2) | 276 (61) | 31.254 | 11.861 | 0.92 | 44.035 |
| SUPERVISORY PERSONNEL | 170 (43) | 88 (22) | 39 (11) | 297 (76) | 25.655 | 11.888 | 7.109 | 44.652 |
| ENGINEERING PERSONNEL | 40 (15) | 4 (1) | 27 (6) | 71 (22) | 13.754 | 0.14 | 6.389 | 20.283 |
| GRAND TOTALS | 1013 (281) | 429 (109) | 614 (165) | 2056 (555) | 163.845 | 72.627 | 177.53 | 414.002 |

*Workers may be counted in more than one category. Numbers in parentheses are total numbers of individuals.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: HADDAM NECK TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0.19 | 0.01 | 0.27 | |
| OPERATING PERSONNEL | 24 | 0 | 2 | | 14.72 | 0.01 | 1.1 | |
| HEALTH PHYSICS PERSONNEL | 16 | 0 | 0 | | 5.97 | 0.05 | 0.8 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.22 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.51 | 0.18 | 0.04 | |
| TOTAL | 41 | 0 | 2 | 43 | 21.61 | 0.25 | 2.21 | 24.07 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 46 | 0 | 15 | | 21.88 | 0.59 | 9.93 | |
| OPERATING PERSONNEL | 9 | 0 | 0 | | 2.5 | 0 | 0.15 | |
| HEALTH PHYSICS PERSONNEL | 23 | 0 | 1 | | 11.49 | 0.01 | 2.53 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.04 | 0 | 0 | |
| ENGINEERING PERSONNEL | 2 | 0 | 0 | | 0.87 | 0.53 | 0.21 | |
| TOTAL | 80 | 0 | 16 | 96 | 36.78 | 1.13 | 12.82 | 50.73 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 1 | | 0.02 | 0 | 0.53 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.23 | 0 | 0.01 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0.14 | 0 | 0.03 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 3 | 0 | 0 | | 0.71 | 0.08 | 0 | |
| TOTAL | 3 | 0 | 1 | 4 | 1.1 | 0.08 | 0.57 | 1.75 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 7 | 0 | 3 | | 2.97 | 0.1 | 1.57 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.17 | 0.05 | 0.01 | |
| HEALTH PHYSICS PERSONNEL | 6 | 0 | 0 | | 1.57 | 0 | 0.1 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 1 | 7 | | 0.12 | 0.39 | 4.7 | |
| TOTAL | 13 | 1 | 10 | 24 | 4.83 | 0.54 | 6.38 | 11.75 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 2 | 0 | 1 | | 0.42 | 0 | 0.36 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.23 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 21 | 0 | 6 | | 24.11 | 0 | 2.71 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.17 | 0.01 | 0.09 | |
| TOTAL | 23 | 0 | 7 | 30 | 24.93 | 0.01 | 3.16 | 28.1 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0.05 | 0 | 0.01 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0.03 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0.08 | 0 | 0.01 | 0.09 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 55 | 0 | 20 | 75 | 25.53 | 0.7 | 12.67 | 38.9 |
| OPERATING PERSONNEL | 33 | 0 | 2 | 35 | 17.85 | 0.06 | 1.27 | 19.18 |
| HEALTH PHYSICS PERSONNEL | 66 | 0 | 7 | 73 | 43.31 | 0.06 | 6.17 | 49.54 |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | 1 | 0.26 | 0 | 0 | 0.26 |
| ENGINEERING PERSONNEL | 5 | 1 | 7 | 13 | 2.38 | 1.19 | 5.04 | 8.61 |
| GRAND TOTALS | 160 | 1 | 36 | 197 | 89.33 | 2.01 | 25.15 | 116.49 |

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: HATCH 1,2 TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 8 | 5 | | 0.013 | 2.323 | 1.541 | |
| OPERATING PERSONNEL | 0 | 87 | 0 | | 0.03 | 43.476 | 0.136 | |
| HEALTH PHYSICS PERSONNEL | 1 | 95 | 84 | | 0.13 | 64.117 | 41.49 | |
| SUPERVISORY PERSONNEL | 0 | 32 | 0 | | 0.603 | 13.958 | 0.255 | |
| ENGINEERING PERSONNEL | 0 | 40 | 6 | | 0.395 | 13.29 | 1.973 | |
| TOTAL | 1 | 262 | 95 | 358 | 1.171 | 137.164 | 45.395 | 183.73 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 170 | 166 | | 0.143 | 94.081 | 53.156 | |
| OPERATING PERSONNEL | 0 | 23 | 0 | | 0 | 13.015 | 0.089 | |
| HEALTH PHYSICS PERSONNEL | 0 | 25 | 12 | | 0.01 | 11.608 | 3.696 | |
| SUPERVISORY PERSONNEL | 0 | 16 | 3 | | 0.108 | 5.915 | 1.011 | |
| ENGINEERING PERSONNEL | 1 | 6 | 7 | | 0.203 | 2.893 | 2.898 | |
| TOTAL | 1 | 240 | 188 | 429 | 0.464 | 127.512 | 60.85 | 188.826 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 70 | | 0 | 0.376 | 30.697 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0.054 | 0.057 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0.074 | 0.012 | |
| SUPERVISORY PERSONNEL | 0 | 1 | 8 | | 0.019 | 0.181 | 3.218 | |
| ENGINEERING PERSONNEL | 0 | 1 | 18 | | 0 | 0.161 | 10.408 | |
| TOTAL | 0 | 2 | 96 | 98 | 0.019 | 0.846 | 44.392 | 45.257 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 71 | 688 | | 0.045 | 27.482 | 306.723 | |
| OPERATING PERSONNEL | 0 | 5 | 1 | | 0 | 2.2 | 0.625 | |
| HEALTH PHYSICS PERSONNEL | 0 | 10 | 17 | | 0.014 | 3.246 | 10.415 | |
| SUPERVISORY PERSONNEL | 0 | 2 | 17 | | 0.074 | 0.834 | 7.704 | |
| ENGINEERING PERSONNEL | 0 | 11 | 83 | | 0.141 | 5.789 | 29.977 | |
| TOTAL | 0 | 99 | 806 | 905 | 0.274 | 39.551 | 355.444 | 395.269 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 9 | | 0 | 0 | 3.2 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0.035 | 0.057 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 2 | | 0 | 0.074 | 2.493 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.019 | 0.005 | 0.015 | |
| ENGINEERING PERSONNEL | 0 | 0 | 1 | | 0 | 0.003 | 0.319 | |
| TOTAL | 0 | 0 | 12 | 12 | 0.019 | 0.117 | 6.084 | 6.22 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 19 | 4 | | 0 | 5.342 | 1.142 | |
| OPERATING PERSONNEL | 0 | 1 | 0 | | 0 | 1.044 | 0.057 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0.115 | 0.078 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.019 | 0.053 | 0.015 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.021 | 0.267 | 0.086 | |
| TOTAL | 0 | 20 | 4 | 24 | 0.04 | 6.821 | 1.378 | 8.239 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 268 | 942 | 1210 | 0.201 | 129.604 | 396.459 | 526.264 |
| OPERATING PERSONNEL | 0 | 116 | 1 | 117 | 0.03 | 59.824 | 1.021 | 60.875 |
| HEALTH PHYSICS PERSONNEL | 1 | 130 | 115 | 246 | 0.154 | 79.234 | 58.184 | 137.572 |
| SUPERVISORY PERSONNEL | 0 | 51 | 28 | 79 | 0.842 | 20.946 | 12.218 | 34.006 |
| ENGINEERING PERSONNEL | 1 | 58 | 115 | 174 | 0.76 | 22.403 | 45.661 | 68.824 |
| GRAND TOTALS | 2 | 623 | 1201 | 1826 | 1.987 | 312.011 | 513.543 | 827.541 |

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: HUMBOLDT BAY TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 7 | 0 | 0 | | 2.6 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 2 | 0 | 0 | | 1.4 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 9 | 0 | 0 | 9 | 4 | 0 | 0 | 4 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 12.5 | 1 | 0 | | 6.1 | 0.1 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 12.5 | 1 | 0 | 13.5 | 6.1 | 0.1 | 0 | 6.2 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 6.5 | 0 | 6 | | 4.3 | 0 | 1 | |
| OPERATING PERSONNEL | 9 | 0 | 0 | | 5.1 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 11 | | 0 | 0 | 7.8 | |
| SUPERVISORY PERSONNEL | 2 | 0 | 1 | | 0.6 | 0 | 0.4 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 17.5 | 0 | 18 | 35.5 | 10 | 0 | 9.2 | 19.2 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 7 | 0 | 11 | | 2.6 | 0 | 4.4 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 4 | | 0 | 0 | 6 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.2 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 8 | 0 | 15 | 23 | 2.8 | 0 | 10.4 | 13.2 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 19 | 1 | 6 | 26 | 10.4 | 0.1 | 1 | 11.5 |
| OPERATING PERSONNEL | 23 | 0 | 11 | 34 | 10.3 | 0 | 4.4 | 14.7 |
| HEALTH PHYSICS PERSONNEL | 2 | 0 | 15 | 17 | 1.4 | 0 | 13.8 | 15.2 |
| SUPERVISORY PERSONNEL | 3 | 0 | 1 | 4 | 0.8 | 0 | 0.4 | 1.2 |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTALS | 47 | 1 | 33 | 81 | 22.9 | 0.1 | 19.6 | 42.6 |

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *INDIAN POINT 3 TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 2 | 0 | 4 | | 0.39 | 0 | 1.13 | |
| OPERATING PERSONNEL | 41 | 1 | 1 | | 16.94 | 0.26 | 0.11 | |
| HEALTH PHYSICS PERSONNEL | 12 | 0 | 9 | | 7.23 | 0 | 1.52 | |
| SUPERVISORY PERSONNEL | 8 | 0 | 0 | | 4.46 | 0 | 0 | |
| ENGINEERING PERSONNEL | 1 | 0 | 3 | | 0.12 | 0 | 0.46 | |
| TOTAL | 64 | 1 | 17 | 82 | 29.14 | 0.26 | 3.22 | 32.62 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 19 | 0 | 95 | | 4.77 | 0 | 67.99 | |
| OPERATING PERSONNEL | 2 | 4 | 6 | | 1.18 | 1.87 | 1.36 | |
| HEALTH PHYSICS PERSONNEL | 12 | 0 | 39 | | 10.61 | 0 | 29.15 | |
| SUPERVISORY PERSONNEL | 4 | 0 | 0 | | 2.19 | 0 | 0 | |
| ENGINEERING PERSONNEL | 1 | 0 | 2 | | 0.44 | 0 | 0.15 | |
| TOTAL | 38 | 4 | 142 | 184 | 19.19 | 1.87 | 98.65 | 119.71 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 3 | 0 | 41 | | 0.78 | 0 | 19.04 | |
| OPERATING PERSONNEL | 4 | 4 | 8 | | 1.06 | 1.63 | 2 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 1 | | 0 | 0 | 0.16 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.18 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 8 | 4 | 50 | 62 | 2.02 | 1.63 | 21.2 | 24.85 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 32 | 0 | 298 | | 22.74 | 0 | 254.05 | |
| OPERATING PERSONNEL | 18 | 4 | 15 | | 7.37 | 2.48 | 5.93 | |
| HEALTH PHYSICS PERSONNEL | 3 | 0 | 12 | | 0.86 | 0 | 3.28 | |
| SUPERVISORY PERSONNEL | 10 | 0 | 1 | | 5.07 | 0 | 0.13 | |
| ENGINEERING PERSONNEL | 2 | 0 | 1 | | 0.55 | 0 | 0.11 | |
| TOTAL | 65 | 4 | 327 | 396 | 36.59 | 2.48 | 263.5 | 302.57 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 6 | 0 | 30 | | 5.82 | 0 | 12.29 | |
| OPERATING PERSONNEL | 1 | 0 | 2 | | 0.58 | 0 | 0.52 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 3 | 0 | 0 | | 2.01 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 10 | 0 | 32 | 42 | 8.41 | 0 | 12.81 | 21.22 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 6 | 0 | 26 | | 0.97 | 0 | 18.89 | |
| OPERATING PERSONNEL | 4 | 1 | 0 | | 0.56 | 0.11 | 0 | |
| HEALTH PHYSICS PERSONNEL | 1 | 0 | 2 | | 0.26 | 0 | 0.17 | |
| SUPERVISORY PERSONNEL | 5 | 0 | 0 | | 1.84 | 0 | 0 | |
| ENGINEERING PERSONNEL | 2 | 1 | 1 | | 0.27 | 0.16 | 0.11 | |
| TOTAL | 18 | 2 | 29 | 49 | 3.9 | 0.27 | 19.17 | 23.34 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 68 | 0 | 494 | 562 | 35.47 | 0 | 373.39 | 408.86 |
| OPERATING PERSONNEL | 70 | 14 | 32 | 116 | 27.69 | 6.35 | 9.92 | 43.96 |
| HEALTH PHYSICS PERSONNEL | 28 | 0 | 63 | 91 | 18.96 | 0 | 34.28 | 53.24 |
| SUPERVISORY PERSONNEL | 31 | 0 | 1 | 32 | 15.75 | 0 | 0.13 | 15.88 |
| ENGINEERING PERSONNEL | 6 | 1 | 7 | 14 | 1.38 | 0.16 | 0.83 | 2.37 |
| GRAND TOTALS | 203 | 15 | 597 | 815 | 99.25 | 6.51 | 418.55 | 524.31 |

*Workers may be counted in more than one category.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: KEWAUNEE TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 2 | 0 | 11 | | 0.494 | 0 | 0.94 | |
| OPERATING PERSONNEL | 20 | 0 | 0 | | 5.314 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 8 | 2 | 0 | | 0.798 | 0.384 | 0 | |
| ENGINEERING PERSONNEL | 9 | 1 | 4 | | 0.598 | 0.338 | 0.393 | |
| TOTAL | 39 | 3 | 15 | 57 | 7.204 | 0.722 | 1.333 | 9.259 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 48 | 17 | 127 | | 13.862 | 3.736 | 44.912 | |
| OPERATING PERSONNEL | 16 | 0 | 2 | | 1.92 | 0 | 0.44 | |
| HEALTH PHYSICS PERSONNEL | 17 | 0 | 18 | | 10.345 | 0 | 9.068 | |
| SUPERVISORY PERSONNEL | 8 | 0 | 7 | | 0.592 | 0 | 3.517 | |
| ENGINEERING PERSONNEL | 8 | 0 | 5 | | 0.912 | 0 | 0.959 | |
| TOTAL | 97 | 17 | 159 | 273 | 27.631 | 3.736 | 58.896 | 90.263 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 12 | 1 | 35 | | 0.303 | 0.01 | 8.673 | |
| OPERATING PERSONNEL | 3 | 0 | 8 | | 0.593 | 0 | 3.857 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 2 | 0 | 2 | | 0.018 | 0 | 0 | |
| ENGINEERING PERSONNEL | 6 | 0 | 1 | | 0.68 | 0 | 0.902 | |
| TOTAL | 23 | 1 | 46 | 70 | 1.594 | 0.01 | 13.432 | 15.036 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 42 | 15 | 124 | | 7.253 | 1.65 | 33.198 | |
| OPERATING PERSONNEL | 7 | 0 | 1 | | 0.368 | 0 | 0.011 | |
| HEALTH PHYSICS PERSONNEL | 10 | 0 | 0 | | 0.377 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 4 | 0 | 0 | | 0.113 | 0 | 0 | |
| ENGINEERING PERSONNEL | 4 | 2 | 5 | | 0.075 | 0.371 | 0.87 | |
| TOTAL | 67 | 17 | 130 | 214 | 8.186 | 2.021 | 34.079 | 44.286 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 18 | 12 | 6 | | 0.4 | 1 | 0.547 | |
| OPERATING PERSONNEL | 3 | 0 | 0 | | 3.811 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 7 | 0 | 2 | | 3.314 | 0 | 0.91 | |
| SUPERVISORY PERSONNEL | 2 | 0 | 0 | | 1.069 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 1 | | 0 | 0 | 0.401 | |
| TOTAL | 30 | 12 | 9 | 51 | 8.594 | 1 | 1.858 | 11.452 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 8 | 4 | 12 | | 0.407 | 0.288 | 4.878 | |
| OPERATING PERSONNEL | 2 | 0 | 0 | | 0.001 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 3 | 0 | 2 | | 0.097 | 0 | 0 | |
| ENGINEERING PERSONNEL | 2 | 0 | 0 | | 0.028 | 0 | 0 | |
| TOTAL | 15 | 4 | 14 | 33 | 0.533 | 0.288 | 4.878 | 5.699 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 130 | 49 | 315 | 494 | 22.719 | 6.684 | 93.148 | 122.551 |
| OPERATING PERSONNEL | 51 | 0 | 11 | 62 | 12.007 | 0 | 4.308 | 16.315 |
| HEALTH PHYSICS PERSONNEL | 34 | 0 | 20 | 54 | 14.036 | 0 | 9.978 | 24.014 |
| SUPERVISORY PERSONNEL | 27 | 2 | 11 | 40 | 2.687 | 0.384 | 3.517 | 6.588 |
| ENGINEERING PERSONNEL | 29 | 3 | 16 | 48 | 2.293 | 0.709 | 3.525 | 6.527 |
| GRAND TOTALS | 271 | 54 | 373 | 698 | 53.742 | 7.777 | 114.476 | 175.995 |

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *LACROSSE TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 18 | 0 | 0 | | 7.437 | 0.137 | 0.259 | |
| OPERATING PERSONNEL | 21 | 0 | 1 | | 38.293 | 0 | 0.61 | |
| HEALTH PHYSICS PERSONNEL | 8 | 0 | 0 | | 11.305 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 12 | 0 | 0 | | 6.688 | 0.01 | 0.582 | |
| ENGINEERING PERSONNEL | 11 | 0 | 0 | | 4.479 | 0 | 0.159 | |
| TOTAL | 70 | 0 | 1 | 71 | 68.202 | 0.147 | 1.61 | 69.959 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 18 | 7 | 0 | | 15.638 | 4.655 | 0.004 | |
| OPERATING PERSONNEL | 3 | 0 | 0 | | 0.634 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 1 | 0 | 0 | | 0.284 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.08 | 0 | 0 | |
| ENGINEERING PERSONNEL | 2 | 0 | 0 | | 0.32 | 0 | 0 | |
| TOTAL | 24 | 7 | 0 | 31 | 16.956 | 4.655 | 0.004 | 21.615 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 3 | | 0.075 | 0.004 | 5.297 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.245 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 2 | 0 | 0 | | 0.667 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 2 | 0 | 1 | | 0.895 | 0 | 0.14 | |
| ENGINEERING PERSONNEL | 2 | 0 | 13 | | 2.092 | 0 | 11.281 | |
| TOTAL | 6 | 0 | 17 | 23 | 3.974 | 0.004 | 16.718 | 20.696 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 17 | 6 | 0 | | 9.918 | 3.431 | 0 | |
| OPERATING PERSONNEL | 10 | 0 | 0 | | 2.34 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 1 | 0 | 0 | | 0.526 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 4 | 0 | 0 | | 1.123 | 0 | 0.087 | |
| ENGINEERING PERSONNEL | 3 | 0 | 1 | | 0.903 | 0 | 0.24 | |
| TOTAL | 35 | 6 | 1 | 42 | 14.81 | 3.431 | 0.327 | 18.568 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 5 | 1 | 0 | | 1.328 | 0.164 | 0.008 | |
| OPERATING PERSONNEL | 6 | 0 | 0 | | 1.622 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 5 | 0 | 0 | | 3.835 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 2 | 0 | 0 | | 0.435 | 0 | 0 | |
| ENGINEERING PERSONNEL | 1 | 0 | 0 | | 0.985 | 0 | 0 | |
| TOTAL | 19 | 1 | 0 | 20 | 8.205 | 0.164 | 0.008 | 8.377 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 9 | 3 | 2 | | 4.254 | 2.449 | 1.42 | |
| OPERATING PERSONNEL | 20 | 0 | 0 | | 6.595 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 5 | 0 | 0 | | 0.943 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 4 | 0 | 1 | | 2.39 | 0.01 | 0.152 | |
| ENGINEERING PERSONNEL | 8 | 0 | 0 | | 2.393 | 0 | 0 | |
| TOTAL | 46 | 3 | 3 | 52 | 16.575 | 2.459 | 1.572 | 20.606 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 67 (20) | 17 (8) | 5 | 89 | 38.65 | 10.84 | 6.988 | 56.478 |
| OPERATING PERSONNEL | 60 (21) | 0 (0) | 1 | 61 | 49.729 | 0 | 0.61 | 50.339 |
| HEALTH PHYSICS PERSONNEL | 22 (8) | 0 (0) | 0 | 22 | 17.56 | 0 | 0 | 17.56 |
| SUPERVISORY PERSONNEL | 24 (15) | 0 (0) | 2 | 26 | 11.611 | 0.02 | 0.961 | 12.592 |
| ENGINEERING PERSONNEL | 27 (12) | 0 (0) | 14 | 41 | 11.172 | 0 | 11.68 | 22.852 |
| GRAND TOTALS | 200 (76) | 17 (8) | 22 | 239 | 128.722 | 10.86 | 20.239 | 159.821 |

*Workers may be counted in more than one category. Numbers in parentheses are total numbers of individuals.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: LIMERICK TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 12 | 1 | | 0 | 0.398 | 0.019 | |
| OPERATING PERSONNEL | 10 | 1 | 22 | | 0.568 | 0.02 | 1.153 | |
| HEALTH PHYSICS PERSONNEL | 24 | 0 | 17 | | 2.209 | 0 | 2.033 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 4 | | 0 | 0 | 0.086 | |
| ENGINEERING PERSONNEL | 6 | 2 | 3 | | 0.117 | 0.037 | 0.303 | |
| TOTAL | 40 | 15 | 47 | 102 | 2.894 | 0.455 | 3.594 | 6.943 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 104 | 41 | | 0 | 3.112 | 0.938 | |
| OPERATING PERSONNEL | 21 | 24 | 120 | | 0.543 | 0.648 | 3.125 | |
| HEALTH PHYSICS PERSONNEL | 16 | 1 | 10 | | 0.489 | 0.022 | 0.286 | |
| SUPERVISORY PERSONNEL | 2 | 7 | 8 | | 0.182 | 0.214 | 0.166 | |
| ENGINEERING PERSONNEL | 6 | 32 | 34 | | 0.166 | 0.876 | 0.921 | |
| TOTAL | 45 | 168 | 213 | 426 | 1.38 | 4.872 | 5.436 | 11.688 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 1 | | 0 | 0 | 0.004 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 1 | 1 | 0 | 0 | 0.004 | 0.004 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 1 | | 0 | 0 | 0.095 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 1 | 1 | 0 | 0 | 0.095 | 0.095 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 1 | 1 | | 0 | 0.006 | 0.02 | |
| OPERATING PERSONNEL | 0 | 2 | 14 | | 0 | 0.091 | 0.563 | |
| HEALTH PHYSICS PERSONNEL | 4 | 0 | 1 | | 0.089 | 0 | 0.04 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.044 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 1 | 0 | | 0 | 0.026 | 0 | |
| TOTAL | 5 | 4 | 16 | 25 | 0.133 | 0.123 | 0.623 | 0.879 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 117 | 44 | 161 | 0 | 3.516 | 0.981 | 4.497 |
| OPERATING PERSONNEL | 31 | 27 | 157 | 215 | 1.111 | 0.759 | 4.936 | 6.806 |
| HEALTH PHYSICS PERSONNEL | 44 | 1 | 28 | 73 | 2.787 | 0.022 | 2.359 | 5.168 |
| SUPERVISORY PERSONNEL | 3 | 7 | 12 | 22 | 0.226 | 0.214 | 0.252 | 0.692 |
| ENGINEERING PERSONNEL | 12 | 35 | 37 | 84 | 0.283 | 0.939 | 1.224 | 2.446 |
| GRAND TOTALS | 90 | 187 | 278 | 555 | 4.407 | 5.45 | 9.752 | 19.609 |

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *MAINE YANKEE TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 3 | 0 | 0 | | 1.275 | 0 | 0.27 | |
| OPERATING PERSONNEL | 29 | 0 | 0 | | 12.706 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 15 | 0 | 36 | | 7.315 | 0 | 27.51 | |
| SUPERVISORY PERSONNEL | 11 | 0 | 0 | | 3.008 | 0 | 0.582 | |
| ENGINEERING PERSONNEL | 13 | 0 | 3 | | 3.53 | 0 | 1.07 | |
| TOTAL | 71 | 0 | 39 | 110 | 27.834 | 0 | 29.432 | 57.266 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 28 | 0 | 29 | | 13.035 | 0.065 | 9.262 | |
| OPERATING PERSONNEL | 6 | 0 | 0 | | 1.895 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 6 | 0 | 2 | | 2.315 | 0 | 0.43 | |
| SUPERVISORY PERSONNEL | 8 | 0 | 7 | | 2.72 | 0 | 3.632 | |
| ENGINEERING PERSONNEL | 10 | 0 | 0 | | 3.355 | 0 | 0.42 | |
| TOTAL | 58 | 0 | 38 | 96 | 23.32 | 0.065 | 13.744 | 37.129 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 7 | 1 | 113 | | 3.28 | 0.5 | 101.038 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0.1 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 4 | 0 | 7 | | 1.01 | 0 | 8.19 | |
| ENGINEERING PERSONNEL | 4 | 0 | 36 | | 1.545 | 0 | 41.06 | |
| TOTAL | 15 | 1 | 156 | 172 | 5.935 | 0.5 | 150.288 | 156.723 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 3 | 0 | 72 | | 1.52 | 0 | 37.59 | |
| OPERATING PERSONNEL | 2 | 0 | 0 | | 0.61 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 4 | 0 | 0 | | 1.105 | 0 | 0.01 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 9 | | 0.825 | 0 | 3.16 | |
| ENGINEERING PERSONNEL | 4 | 0 | 3 | | 1.14 | 0 | 2.375 | |
| TOTAL | 14 | 0 | 84 | 98 | 5.2 | 0 | 43.135 | 48.335 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 1 | 0 | 6 | | 0.56 | 0 | 3.654 | |
| OPERATING PERSONNEL | 5 | 0 | 0 | | 1.635 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 6 | 0 | 0 | | 3.51 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 5 | 0 | 0 | | 3.64 | 0 | 0.065 | |
| ENGINEERING PERSONNEL | 1 | 0 | 0 | | 0.255 | 0 | 0.005 | |
| TOTAL | 18 | 0 | 6 | 24 | 9.6 | 0 | 3.724 | 13.324 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 36 | 7 | 244 | | 42.16 | 7.835 | 273.659 | |
| OPERATING PERSONNEL | 36 | 0 | 0 | | 32.072 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 3 | 0 | 14 | | 0.885 | 0 | 6.385 | |
| SUPERVISORY PERSONNEL | 19 | 0 | 34 | | 12.359 | 0 | 27.695 | |
| ENGINEERING PERSONNEL | 23 | 0 | 17 | | 12.92 | 0.01 | 10.379 | |
| TOTAL | 117 | 7 | 309 | 433 | 100.396 | 7.845 | 318.118 | 426.359 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 78 | 8 | 464 | 550 | 61.83 | 8.4 | 425.473 | 495.703 |
| OPERATING PERSONNEL | 78 | 0 | 0 | 78 | 48.918 | 0 | 0 | 48.918 |
| HEALTH PHYSICS PERSONNEL | 34 | 0 | 52 | 86 | 15.23 | 0 | 34.335 | 49.565 |
| SUPERVISORY PERSONNEL | 48 | 0 | 57 | 105 | 23.562 | 0 | 43.324 | 66.886 |
| ENGINEERING PERSONNEL | 55 | 0 | 59 | 114 | 22.745 | 0.01 | 55.309 | 78.064 |
| GRAND TOTALS | 293 | 8 | 632 | 933 | 172.285 | 8.41 | 558.441 | 739.136 |

*Workers may be counted in more than one category.

# APPENDIX D (cont)

## NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *MCGUIRE 1 TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 169 | 450 | 177 | | 7.294 | 5.7 | 3.325 | |
| OPERATING PERSONNEL | 119 | 6 | 14 | | 34.91 | 0.885 | 0.32 | |
| HEALTH PHYSICS PERSONNEL | 43 | 9 | 131 | | 9.93 | 1.43 | 32.03 | |
| SUPERVISORY PERSONNEL | 13 | 0 | 0 | | 1.7 | 0 | 0 | |
| ENGINEERING PERSONNEL | 84 | 22 | 19 | | 6.635 | 1.005 | 0.075 | |
| TOTAL | 428 | 487 | 341 | 1256 | 60.469 | 9.02 | 35.75 | 105.239 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 174 | 462 | 165 | | 59.665 | 82.39 | 55.95 | |
| OPERATING PERSONNEL | 113 | 5 | 43 | | 5.405 | 0.05 | 4.45 | |
| HEALTH PHYSICS PERSONNEL | 43 | 7 | 123 | | 4.8 | 0.61 | 23.445 | |
| SUPERVISORY PERSONNEL | 9 | 0 | 0 | | 0.68 | 0 | 0 | |
| ENGINEERING PERSONNEL | 85 | 20 | 24 | | 17.76 | 4.035 | 8.71 | |
| TOTAL | 424 | 494 | 355 | 1273 | 88.31 | 87.085 | 92.555 | 267.95 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 21 | 159 | 103 | | 1.375 | 45.765 | 36.895 | |
| OPERATING PERSONNEL | 5 | 0 | 18 | | 0.015 | 0 | 0.42 | |
| HEALTH PHYSICS PERSONNEL | 18 | 1 | 65 | | 2.385 | 0.005 | 12.625 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 33 | 8 | 7 | | 14.54 | 2.255 | 6.7 | |
| TOTAL | 77 | 168 | 193 | 438 | 18.315 | 48.025 | 56.64 | 122.98 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 140 | 396 | 157 | | 9.99 | 140.455 | 54.405 | |
| OPERATING PERSONNEL | 70 | 3 | 17 | | 3.725 | 0.18 | 0.67 | |
| HEALTH PHYSICS PERSONNEL | 35 | 4 | 100 | | 5.045 | 0.2 | 9.62 | |
| SUPERVISORY PERSONNEL | 8 | 0 | 0 | | 1.133 | 0 | 0 | |
| ENGINEERING PERSONNEL | 72 | 17 | 28 | | 11.615 | 2.525 | 10.86 | |
| TOTAL | 325 | 420 | 302 | 1047 | 31.508 | 143.36 | 75.555 | 250.423 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 76 | 98 | 52 | | 2.965 | 1.2 | 0.925 | |
| OPERATING PERSONNEL | 25 | 2 | 43 | | 0.57 | 0.15 | 22.855 | |
| HEALTH PHYSICS PERSONNEL | 42 | 8 | 100 | | 0.4 | 0.16 | 14.23 | |
| SUPERVISORY PERSONNEL | 4 | 0 | 0 | | 0.12 | 0 | 0 | |
| ENGINEERING PERSONNEL | 18 | 4 | 1 | | 0.43 | 0.06 | 0.01 | |
| TOTAL | 165 | 112 | 196 | 473 | 4.485 | 1.57 | 38.02 | 44.075 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 72 | 100 | 34 | | 9.925 | 49.205 | 2.365 | |
| OPERATING PERSONNEL | 76 | 3 | 23 | | 6.24 | 0.58 | 1.26 | |
| HEALTH PHYSICS PERSONNEL | 10 | 1 | 68 | | 0.27 | 0.02 | 9.88 | |
| SUPERVISORY PERSONNEL | 4 | 0 | 0 | | 0.235 | 0 | 0 | |
| ENGINEERING PERSONNEL | 34 | 5 | 14 | | 3.42 | 1.005 | 3.275 | |
| TOTAL | 196 | 109 | 139 | 444 | 20.09 | 50.81 | 16.78 | 87.68 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 652 (174) | 1665 (489) | 688 (211) | 3005 | 91.214 | 324.715 | 153.865 | 569.794 |
| OPERATING PERSONNEL | 408 (121) | 19 (6) | 158 (45) | 585 | 50.865 | 1.845 | 29.975 | 82.685 |
| HEALTH PHYSICS PERSONNEL | 191 (45) | 30 (10) | 587 (131) | 808 | 22.83 | 2.425 | 101.83 | 127.085 |
| SUPERVISORY PERSONNEL | 38 (12) | 0 (0) | 0 (0) | 38 | 3.868 | 0 | 0 | 3.868 |
| ENGINEERING PERSONNEL | 326 (86) | 76 (21) | 93 (47) | 495 | 54.4 | 10.885 | 29.63 | 94.915 |
| GRAND TOTALS | 1615 (438) | 1790 (526) | 1526 (434) | 4931 | 223.177 | 339.87 | 315.3 | 878.347 |

*Workers may be counted in more than one category. Numbers in parentheses are total numbers of individuals.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *NINE MILE POINT 1 TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 223 | 1 | 18 | | 12.96 | 0.005 | 0.866 | |
| OPERATING PERSONNEL | 200 | 17 | 23 | | 9.908 | 0.169 | 2.359 | |
| HEALTH PHYSICS PERSONNEL | 122 | 1 | 4 | | 22.605 | 0.001 | 0.755 | |
| SUPERVISORY PERSONNEL | 34 | 2 | 2 | | 3.475 | 0.037 | 0.022 | |
| ENGINEERING PERSONNEL | 19 | 7 | 19 | | 0.526 | 0.06 | 0.504 | |
| TOTAL | 598 | 28 | 66 | 692 | 49.474 | 0.272 | 4.506 | 54.252 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 279 | 2 | 68 | | 48.933 | 0.281 | 6.045 | |
| OPERATING PERSONNEL | 116 | 17 | 57 | | 9.297 | 0.173 | 12.679 | |
| HEALTH PHYSICS PERSONNEL | 59 | 2 | 3 | | 6.161 | 0.025 | 0.512 | |
| SUPERVISORY PERSONNEL | 43 | 1 | 2 | | 3.176 | 0.001 | 0.03 | |
| ENGINEERING PERSONNEL | 33 | 10 | 48 | | 1.295 | 0.153 | 2.559 | |
| TOTAL | 530 | 32 | 178 | 740 | 68.862 | 0.633 | 21.825 | 91.32 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 3 | 0 | 0 | | 0.019 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.008 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 4 | 0 | 0 | 4 | 0.027 | 0 | 0 | 0.027 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 328 | 1 | 12 | | 10.551 | 0.011 | 0.242 | |
| OPERATING PERSONNEL | 103 | 3 | 11 | | 4.12 | 0.073 | 3.404 | |
| HEALTH PHYSICS PERSONNEL | 74 | 0 | 3 | | 3.119 | 0 | 0.175 | |
| SUPERVISORY PERSONNEL | 26 | 1 | 0 | | 0.673 | 0.005 | 0 | |
| ENGINEERING PERSONNEL | 20 | 3 | 17 | | 0.567 | 0.06 | 1.287 | |
| TOTAL | 551 | 8 | 43 | 602 | 19.03 | 0.149 | 5.108 | 24.287 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 172 | 1 | 21 | | 33.577 | 0.06 | 0.811 | |
| OPERATING PERSONNEL | 58 | 4 | 12 | | 15.998 | 0.004 | 1.638 | |
| HEALTH PHYSICS PERSONNEL | 51 | 0 | 2 | | 8.609 | 0 | 0.861 | |
| SUPERVISORY PERSONNEL | 16 | 0 | 0 | | 0.714 | 0 | 0 | |
| ENGINEERING PERSONNEL | 7 | 2 | 5 | | 0.26 | 0.007 | 3.323 | |
| TOTAL | 304 | 7 | 40 | 351 | 59.158 | 0.071 | 6.633 | 65.862 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 37 | 0 | 4 | | 0.914 | 0 | 0.004 | |
| OPERATING PERSONNEL | 61 | 0 | 48 | | 0.54 | 0 | 0.255 | |
| HEALTH PHYSICS PERSONNEL | 11 | 0 | 0 | | 0.063 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 4 | 0 | 1 | | 0.02 | 0 | 0.002 | |
| ENGINEERING PERSONNEL | 4 | 0 | 3 | | 0.06 | 0 | 0.006 | |
| TOTAL | 117 | 0 | 56 | 173 | 1.597 | 0 | 0.267 | 1.864 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 1042 | 5 | 123 | 1170 | 106.954 | 0.357 | 7.968 | 115.279 |
| OPERATING PERSONNEL | 538 | 41 | 151 | 730 | 39.863 | 0.419 | 20.335 | 60.617 |
| HEALTH PHYSICS PERSONNEL | 317 | 3 | 12 | 332 | 40.557 | 0.026 | 2.303 | 42.886 |
| SUPERVISORY PERSONNEL | 124 | 4 | 5 | 133 | 8.066 | 0.043 | 0.054 | 8.163 |
| ENGINEERING PERSONNEL | 83 | 22 | 92 | 197 | 2.708 | 0.28 | 7.679 | 10.667 |
| GRAND TOTALS | 2104 | 75 | 383 | 2562 | 198.148 | 1.125 | 38.339 | 237.612 |

*Workers may be counted in more than one category.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *NORTH ANNA 1,2 TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 172 | 23 | 364 | | 22.462 | 0.8 | 24.532 | |
| OPERATING PERSONNEL | 230 | 0 | 19 | | 33.361 | 0 | 1.099 | |
| HEALTH PHYSICS PERSONNEL | 62 | 2 | 152 | | 31.361 | 0.066 | 14.613 | |
| SUPERVISORY PERSONNEL | 38 | 4 | 6 | | 2.301 | 0.03 | 0.048 | |
| ENGINEERING PERSONNEL | 51 | 19 | 70 | | 0.839 | 0.2 | 2.103 | |
| TOTAL | 553 | 48 | 611 | 1212 | 90.324 | 1.096 | 42.395 | 133.815 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 161 | 40 | 437 | | 94.033 | 9.391 | 97.43 | |
| OPERATING PERSONNEL | 111 | 3 | 10 | | 32.171 | 0.079 | 2.4 | |
| HEALTH PHYSICS PERSONNEL | 51 | 6 | 142 | | 14.686 | 0.39 | 50.332 | |
| SUPERVISORY PERSONNEL | 21 | 2 | 4 | | 2.588 | 0.05 | 0.02 | |
| ENGINEERING PERSONNEL | 33 | 7 | 56 | | 11.769 | 0.234 | 4.426 | |
| TOTAL | 377 | 58 | 649 | 1084 | 155.247 | 10.144 | 154.608 | 319.999 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 3 | 80 | | 0 | 0.171 | 67.535 | |
| OPERATING PERSONNEL | 6 | 0 | 1 | | 1.883 | 0 | 0.005 | |
| HEALTH PHYSICS PERSONNEL | 5 | 0 | 51 | | 0.2 | 0 | 6.614 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 3 | 4 | 11 | | 0.03 | 0.194 | 5.548 | |
| TOTAL | 14 | 7 | 143 | 164 | 2.113 | 0.365 | 79.702 | 82.18 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 49 | 35 | 497 | | 7.982 | 22.593 | 83.33 | |
| OPERATING PERSONNEL | 85 | 1 | 13 | | 2.929 | 0.005 | 0.41 | |
| HEALTH PHYSICS PERSONNEL | 25 | 0 | 115 | | 1.771 | 0 | 24.819 | |
| SUPERVISORY PERSONNEL | 17 | 1 | 1 | | 0.741 | 0.482 | 0.001 | |
| ENGINEERING PERSONNEL | 27 | 10 | 156 | | 2.499 | 0.261 | 79.751 | |
| TOTAL | 203 | 47 | 782 | 1032 | 15.922 | 23.341 | 188.311 | 227.574 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 41 | 0 | 11 | | 0.939 | 0 | 0.501 | |
| OPERATING PERSONNEL | 16 | 0 | 2 | | 3.007 | 0 | 0.135 | |
| HEALTH PHYSICS PERSONNEL | 27 | 0 | 10 | | 2.764 | 0 | 0.224 | |
| SUPERVISORY PERSONNEL | 2 | 0 | 1 | | 0.16 | 0 | 0.03 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 86 | 0 | 24 | 110 | 6.87 | 0 | 0.89 | 7.76 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 46 | 4 | 21 | | 11.07 | 0.235 | 1.718 | |
| OPERATING PERSONNEL | 31 | 0 | 0 | | 1.583 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 8 | 1 | 77 | | 0.598 | 0.125 | 5.951 | |
| SUPERVISORY PERSONNEL | 8 | 2 | 0 | | 0.265 | 0.635 | 0 | |
| ENGINEERING PERSONNEL | 2 | 5 | 19 | | 0.56 | 0.387 | 3.186 | |
| TOTAL | 95 | 12 | 117 | 224 | 14.076 | 1.382 | 10.855 | 26.313 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 469 | 105 | 1410 | 1984 | 136.486 | 33.19 | 275.046 | 444.722 |
| OPERATING PERSONNEL | 479 | 4 | 45 | 528 | 74.934 | 0.084 | 4.049 | 79.067 |
| HEALTH PHYSICS PERSONNEL | 178 | 9 | 547 | 734 | 51.38 | 0.581 | 102.553 | 154.514 |
| SUPERVISORY PERSONNEL | 86 | 9 | 12 | 107 | 6.055 | 1.197 | 0.099 | 7.351 |
| ENGINEERING PERSONNEL | 116 | 45 | 312 | 473 | 15.697 | 1.276 | 95.014 | 111.987 |
| GRAND TOTALS | 1328 | 172 | 2326 | 3826 | 284.552 | 36.328 | 476.761 | 797.641 |

*Workers may be counted in more than one category.

# APPENDIX D (cont)

## NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *OCONEE TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 197 | 434 | 166 | | 6.075 | 3.61 | 2.045 | |
| OPERATING PERSONNEL | 146 | 1 | 16 | | 70.522 | 1.335 | 0.605 | |
| HEALTH PHYSICS PERSONNEL | 62 | 0 | 119 | | 15.695 | 0 | 42.57 | |
| SUPERVISORY PERSONNEL | 31 | 0 | 0 | | 2.105 | 0 | 0 | |
| ENGINEERING PERSONNEL | 100 | 29 | 8 | | 11.525 | 1.065 | 1.02 | |
| TOTAL | 536 | 464 | 309 | 1309 | 105.922 | 6.01 | 46.24 | 158.172 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 208 | 586 | 245 | | 103.496 | 126.394 | 100.327 | |
| OPERATING PERSONNEL | 30 | 0 | 46 | | 0.44 | 0 | 14.425 | |
| HEALTH PHYSICS PERSONNEL | 57 | 0 | 118 | | 7.033 | 0 | 21.07 | |
| SUPERVISORY PERSONNEL | 20 | 0 | 0 | | 0.905 | 0 | 0 | |
| ENGINEERING PERSONNEL | 91 | 22 | 15 | | 17.63 | 2.915 | 3.825 | |
| TOTAL | 406 | 608 | 424 | 1438 | 129.504 | 129.309 | 139.647 | 398.46 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 38 | 215 | 119 | | 1.74 | 41.67 | 46.735 | |
| OPERATING PERSONNEL | 4 | 0 | 19 | | 0.055 | 0 | 0.56 | |
| HEALTH PHYSICS PERSONNEL | 16 | 0 | 83 | | 0.975 | 0 | 8.965 | |
| SUPERVISORY PERSONNEL | 2 | 0 | 0 | | 0.25 | 0 | 0 | |
| ENGINEERING PERSONNEL | 59 | 13 | 6 | | 13.84 | 2.82 | 4.195 | |
| TOTAL | 119 | 228 | 227 | 574 | 16.86 | 44.49 | 60.455 | 121.805 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 144 | 630 | 140 | | 48.215 | 360.025 | 52.81 | |
| OPERATING PERSONNEL | 57 | 2 | 31 | | 4.25 | 0.04 | 3.63 | |
| HEALTH PHYSICS PERSONNEL | 10 | 0 | 109 | | 6.37 | 0 | 28.135 | |
| SUPERVISORY PERSONNEL | 14 | 0 | 0 | | 0.755 | 0 | 0 | |
| ENGINEERING PERSONNEL | 79 | 34 | 5 | | 16.68 | 5.28 | 4.52 | |
| TOTAL | 304 | 666 | 285 | 1255 | 76.27 | 365.345 | 89.095 | 530.71 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 113 | 166 | 27 | | 13.095 | 13.405 | 0.21 | |
| OPERATING PERSONNEL | 78 | 1 | 47 | | 14.115 | 0.105 | 42.749 | |
| HEALTH PHYSICS PERSONNEL | 59 | 0 | 75 | | 11.95 | 0 | 11.235 | |
| SUPERVISORY PERSONNEL | 19 | 0 | 0 | | 2.88 | 0 | 0 | |
| ENGINEERING PERSONNEL | 42 | 4 | 0 | | 5.48 | 0 | 0 | |
| TOTAL | 311 | 171 | 149 | 631 | 47.52 | 13.51 | 54.194 | 115.224 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 77 | 188 | 55 | | 17.13 | 49.24 | 12.69 | |
| OPERATING PERSONNEL | 96 | 1 | 30 | | 11.52 | 0.165 | 5.765 | |
| HEALTH PHYSICS PERSONNEL | 21 | 0 | 78 | | 0.925 | 0 | 6.59 | |
| SUPERVISORY PERSONNEL | 10 | 0 | 0 | | 2.185 | 0 | 0 | |
| ENGINEERING PERSONNEL | 21 | 6 | 3 | | 3.205 | 0.555 | 0.865 | |
| TOTAL | 225 | 195 | 166 | 586 | 34.965 | 49.96 | 25.91 | 110.835 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 777 (215) | 2219 (714) | 752 (283) | 3748 (1212) | 189.751 | 594.344 | 214.817 | 998.912 |
| OPERATING PERSONNEL | 411 (153) | 5 (1) | 189 (51) | 605 (205) | 100.902 | 1.645 | 67.734 | 170.281 |
| HEALTH PHYSICS PERSONNEL | 225 (63) | 0 (0) | 582 (119) | 807 (182) | 42.948 | 0 | 118.565 | 161.513 |
| SUPERVISORY PERSONNEL | 96 (30) | 0 (0) | 0 (0) | 96 (30) | 9.08 | 0 | 0 | 9.08 |
| ENGINEERING PERSONNEL | 392 (113) | 108 (38) | 37 (16) | 537 (167) | 68.36 | 12.635 | 14.425 | 95.42 |
| GRAND TOTALS | 1901 (574) | 2332 (753) | 1560 (469) | 5793 (1796) | 411.041 | 608.624 | 415.541 | 1435.206 |

*Workers may be counted in more than one category. Numbers in parentheses are total numbers of individuals.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *OYSTER CREEK TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 164 | 1 | 240 | | 11.42 | 0.005 | 23.298 | |
| OPERATING PERSONNEL | 215 | 0 | 64 | | 61.775 | 0 | 0.932 | |
| HEALTH PHYSICS PERSONNEL | 48 | 0 | 31 | | 6.639 | 0 | 4.746 | |
| SUPERVISORY PERSONNEL | 64 | 1 | 11 | | 4.477 | 0.005 | 0.418 | |
| ENGINEERING PERSONNEL | 45 | 0 | 32 | | 3.393 | 0 | 3.245 | |
| TOTAL | 536 | 2 | 378 | 916 | 87.704 | 0.01 | 32.639 | 120.353 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 307 | 22 | 877 | | 145.989 | 0.687 | 108.351 | |
| OPERATING PERSONNEL | 402 | 1 | 165 | | 36.43 | 0.01 | 4.327 | |
| HEALTH PHYSICS PERSONNEL | 104 | 0 | 67 | | 33.139 | 0 | 10.901 | |
| SUPERVISORY PERSONNEL | 149 | 2 | 29 | | 27.286 | 0.109 | 1.64 | |
| ENGINEERING PERSONNEL | 170 | 0 | 142 | | 8.956 | 0 | 5.787 | |
| TOTAL | 1132 | 25 | 1280 | 2437 | 251.8 | 0.806 | 131.006 | 383.612 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 49 | 2 | 119 | | 1.5 | 0.012 | 13.837 | |
| OPERATING PERSONNEL | 21 | 1 | 9 | | 0.781 | 0 | 3.373 | |
| HEALTH PHYSICS PERSONNEL | 6 | 0 | 1 | | 0.113 | 0 | 0.015 | |
| SUPERVISORY PERSONNEL | 7 | 0 | 3 | | 0.358 | 0 | 0.301 | |
| ENGINEERING PERSONNEL | 6 | 0 | 10 | | 0.235 | 0 | 2.52 | |
| TOTAL | 89 | 3 | 142 | 234 | 2.987 | 0.012 | 20.046 | 23.045 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 155 | 19 | 429 | | 61.72 | 5.411 | 68.334 | |
| OPERATING PERSONNEL | 52 | 1 | 10 | | 7.754 | 0.005 | 1.344 | |
| HEALTH PHYSICS PERSONNEL | 46 | 0 | 16 | | 9.864 | 0 | 0.774 | |
| SUPERVISORY PERSONNEL | 31 | 2 | 9 | | 7.158 | 0.227 | 0.379 | |
| ENGINEERING PERSONNEL | 22 | 0 | 17 | | 1.769 | 0 | 0.848 | |
| TOTAL | 306 | 22 | 481 | 809 | 88.265 | 5.643 | 71.679 | 165.587 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 138 | 0 | 166 | | 3.711 | 0 | 59.523 | |
| OPERATING PERSONNEL | 62 | 0 | 13 | | 0.919 | 0 | 0.771 | |
| HEALTH PHYSICS PERSONNEL | 42 | 0 | 22 | | 2.742 | 0 | 2.396 | |
| SUPERVISORY PERSONNEL | 11 | 0 | 5 | | 0.546 | 0 | 0.136 | |
| ENGINEERING PERSONNEL | 4 | 0 | 10 | | 0.034 | 0 | 0.591 | |
| TOTAL | 257 | 0 | 216 | 473 | 7.952 | 0 | 63.417 | 71.369 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 55 | 0 | 62 | | 0.431 | 0 | 9.636 | |
| OPERATING PERSONNEL | 17 | 0 | 5 | | 0.189 | 0 | 0.024 | |
| HEALTH PHYSICS PERSONNEL | 15 | 0 | 9 | | 0.122 | 0 | 0.525 | |
| SUPERVISORY PERSONNEL | 4 | 0 | 0 | | 0.019 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 91 | 0 | 76 | 167 | 0.761 | 0 | 10.185 | 10.946 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 868 (317) | 44 (25) | 1893 | (969) 2805 (1311) | 224.771 | 6.115 | 282.979 | 513.865 |
| OPERATING PERSONNEL | 769 (420) | 3 (1) | 266 | (187) 1038 (608) | 107.848 | 0.015 | 10.771 | 118.634 |
| HEALTH PHYSICS PERSONNEL | 261 (104) | 0 (0) | 146 | (71) 407 (175) | 52.619 | 0 | 19.357 | 71.976 |
| SUPERVISORY PERSONNEL | 266 (153) | 5 (2) | 57 | (34) 328 (189) | 39.844 | 0.341 | 2.874 | 43.059 |
| ENGINEERING PERSONNEL | 247 (174) | 0 (0) | 211 | (151) 458 (325) | 14.387 | 0 | 12.991 | 27.378 |
| GRAND TOTALS | 2411 (1168) | 52 (28) | 2573 | (1912) 5036 (2608) | 439.469 | 6.471 | 328.972 | 774.912 |

*Workers may be counted in more than one category. Numbers in parentheses are total numbers of individuals.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *PALISADES TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 13 | 1 | 3 | | 3.433 | 0.491 | 1.707 | |
| OPERATING PERSONNEL | 60 | 0 | 30 | | 27.449 | 0.081 | 7.939 | |
| HEALTH PHYSICS PERSONNEL | 24 | 1 | 73 | | 12.246 | 0.263 | 31.665 | |
| SUPERVISORY PERSONNEL | 19 | 7 | 3 | | 5.768 | 1.741 | 0.351 | |
| ENGINEERING PERSONNEL | 9 | 7 | 3 | | 2.764 | 1.412 | 1.373 | |
| TOTAL | 125 | 16 | 112 | 253 | 51.66 | 3.988 | 43.035 | 98.683 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 81 | 80 | 82 | | 48.378 | 55.977 | 28.474 | |
| OPERATING PERSONNEL | 28 | 1 | 1 | | 6.228 | 0.848 | 0.347 | |
| HEALTH PHYSICS PERSONNEL | 18 | 0 | 42 | | 5.173 | 0 | 16.65 | |
| SUPERVISORY PERSONNEL | 12 | 9 | 2 | | 2.885 | 3.132 | 1.184 | |
| ENGINEERING PERSONNEL | 5 | 14 | 41 | | 2.296 | 7.946 | 42.121 | |
| TOTAL | 144 | 104 | 168 | 416 | 64.96 | 67.903 | 88.776 | 221.639 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 7 | 2 | 23 | | 1.539 | 0.373 | 9.097 | |
| OPERATING PERSONNEL | 6 | 0 | 0 | | 1.323 | 0 | 0.006 | |
| HEALTH PHYSICS PERSONNEL | 1 | 0 | 2 | | 0.29 | 0 | 0.657 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 1 | | 0.151 | 0.137 | 0.156 | |
| ENGINEERING PERSONNEL | 3 | 5 | 0 | | 0.667 | 1.106 | 0.007 | |
| TOTAL | 17 | 7 | 26 | 50 | 3.97 | 1.616 | 9.923 | 15.509 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 2 | 1 | 153 | | 0.567 | 0.221 | 62.944 | |
| OPERATING PERSONNEL | 0 | 0 | 7 | | 0.081 | 0 | 1.634 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 1 | | 0.133 | 0 | 0.317 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 4 | | 0.193 | 0.076 | 1.391 | |
| ENGINEERING PERSONNEL | 2 | 2 | 10 | | 0.836 | 0.603 | 3.59 | |
| TOTAL | 4 | 3 | 175 | 182 | 1.81 | 0.9 | 69.876 | 72.586 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 17 | 0 | 15 | | 5.039 | 0.305 | 8.237 | |
| OPERATING PERSONNEL | 0 | 1 | 0 | | 0.225 | 0.1 | 0.003 | |
| HEALTH PHYSICS PERSONNEL | 6 | 0 | 1 | | 4.079 | 0 | 0.321 | |
| SUPERVISORY PERSONNEL | 2 | 0 | 0 | | 0.674 | 0.007 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.073 | 0.067 | 0.001 | |
| TOTAL | 25 | 1 | 16 | 42 | 10.09 | 0.479 | 8.562 | 19.131 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 10 | 34 | 6 | | 5.136 | 29.73 | 0.898 | |
| OPERATING PERSONNEL | 10 | 0 | 0 | | 3.893 | 0.015 | 0.03 | |
| HEALTH PHYSICS PERSONNEL | 1 | 0 | 5 | | 0.325 | 0 | 0.68 | |
| SUPERVISORY PERSONNEL | 9 | 2 | 0 | | 2.406 | 1.669 | 0.076 | |
| ENGINEERING PERSONNEL | 6 | 0 | 6 | | 2.219 | 0.065 | 3.05 | |
| TOTAL | 36 | 36 | 17 | 89 | 13.979 | 31.479 | 4.734 | 50.192 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 130 | 118 | 282 | 530 | 64.092 | 87.097 | 111.357 | 262.546 |
| OPERATING PERSONNEL | 104 | 2 | 38 | 144 | 39.199 | 1.044 | 9.959 | 50.202 |
| HEALTH PHYSICS PERSONNEL | 50 | 1 | 124 | 175 | 22.246 | 0.263 | 50.29 | 72.799 |
| SUPERVISORY PERSONNEL | 42 | 18 | 10 | 70 | 12.077 | 6.762 | 3.158 | 21.997 |
| ENGINEERING PERSONNEL | 25 | 28 | 60 | 113 | 8.855 | 11.199 | 50.142 | 70.196 |
| GRAND TOTALS | 351 | 167 | 514 | 1032 | 146.469 | 106.365 | 224.906 | 477.74 |

*Workers may be counted in more than one category.

# APPENDIX D (cont)

## NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *PEACH BOTTOM 2,3 TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 8 | 290 | 1014 | | 1.466 | 43.044 | 83.628 | |
| OPERATING PERSONNEL | 91 | 40 | 261 | | 54.477 | 9.229 | 45.56 | |
| HEALTH PHYSICS PERSONNEL | 95 | 2 | 131 | | 69.046 | 0.036 | 31.61 | |
| SUPERVISORY PERSONNEL | 3 | 2 | 9 | | 0.376 | 0.563 | 1.244 | |
| ENGINEERING PERSONNEL | 74 | 30 | 18 | | 43.806 | 6.089 | 5.677 | |
| TOTAL | 271 | 364 | 1433 | 2068 | 169.171 | 58.961 | 167.719 | 395.851 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 10 | 728 | 2133 | | 0.615 | 351.898 | 1764.162 | |
| OPERATING PERSONNEL | 68 | 29 | 365 | | 3.184 | 1.303 | 142.597 | |
| HEALTH PHYSICS PERSONNEL | 76 | 2 | 166 | | 14.103 | 0.067 | 116.938 | |
| SUPERVISORY PERSONNEL | 1 | 9 | 12 | | 0.006 | 0.536 | 0.202 | |
| ENGINEERING PERSONNEL | 50 | 40 | 21 | | 3.658 | 4.199 | 4.582 | |
| TOTAL | 205 | 808 | 2697 | 3710 | 21.566 | 358.003 | 2028.481 | 2408.05 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 11 | 123 | | 0 | 5.573 | 40.745 | |
| OPERATING PERSONNEL | 1 | 0 | 15 | | 0.018 | 0 | 4.804 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 6 | | 0 | 0 | 0.205 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 3 | | 0 | 0 | 0.163 | |
| ENGINEERING PERSONNEL | 0 | 3 | 2 | | 0 | 0.533 | 0.75 | |
| TOTAL | 1 | 14 | 149 | 164 | 0.018 | 6.106 | 46.667 | 52.791 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 28 | 644 | | 0 | 1.163 | 357.073 | |
| OPERATING PERSONNEL | 1 | 0 | 58 | | 0.009 | 0 | 44.867 | |
| HEALTH PHYSICS PERSONNEL | 6 | 0 | 27 | | 0.372 | 0 | 1.358 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 1 | | 0 | 0 | 0.023 | |
| ENGINEERING PERSONNEL | 4 | 2 | 3 | | 0.079 | 0.024 | 0.864 | |
| TOTAL | 11 | 30 | 733 | 774 | 0.46 | 1.187 | 404.185 | 405.832 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 1 | 47 | 192 | | 0.009 | 1.82 | 18.447 | |
| OPERATING PERSONNEL | 5 | 1 | 30 | | 1.345 | 0.015 | 2.419 | |
| HEALTH PHYSICS PERSONNEL | 7 | 0 | 36 | | 0.429 | 0 | 2.961 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 8 | 4 | 1 | | 0.371 | 0.107 | 0.013 | |
| TOTAL | 21 | 52 | 259 | 332 | 2.154 | 1.942 | 23.84 | 27.936 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 55 | 250 | | 0 | 5.324 | 46.926 | |
| OPERATING PERSONNEL | 12 | 0 | 38 | | 1.097 | 0 | 1.739 | |
| HEALTH PHYSICS PERSONNEL | 20 | 1 | 36 | | 1.809 | 0.005 | 6.17 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 3 | | 0 | 0 | 0.225 | |
| ENGINEERING PERSONNEL | 7 | 3 | 5 | | 0.156 | 0.05 | 0.537 | |
| TOTAL | 39 | 59 | 332 | 430 | 3.062 | 5.379 | 55.597 | 64.038 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 19 (10) | 1159 (750) | 4356 (2363) | 5534 (3123) | 2.09 | 408.822 | 2310.981 | 2721.893 |
| OPERATING PERSONNEL | 178 (97) | 70 (45) | 767 (476) | 1015 (618) | 60.13 | 10.547 | 241.986 | 312.663 |
| HEALTH PHYSICS PERSONNEL | 204 (96) | 5 (4) | 402 (181) | 611 (281) | 85.759 | 0.108 | 159.242 | 245.109 |
| SUPERVISORY PERSONNEL | 4 (3) | 11 (10) | 28 (16) | 43 (29) | 0.382 | 1.099 | 1.857 | 3.338 |
| ENGINEERING PERSONNEL | 143 (75) | 82 (54) | 50 (29) | 275 (158) | 48.07 | 11.002 | 12.423 | 71.495 |
| GRAND TOTALS | 548 (281) | 1327 (863) | 5603 (3065) | 7478 (4209) | 196.431 | 431.578 | 2726.489 | 3354.498 |

*Workers may be counted in more than one category. Numbers in parentheses are total numbers of individuals.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *PILGRIM TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 26 | 0 | 47 | | 0.4 | 0 | 1.62 | |
| OPERATING PERSONNEL | 30 | 0 | 0 | | 0.83 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 24 | 0 | 52 | | 2.87 | 0 | 0.875 | |
| SUPERVISORY PERSONNEL | 9 | 0 | 0 | | 0.325 | 0 | 0 | |
| ENGINEERING PERSONNEL | 4 | 5 | 12 | | 0.155 | 0.17 | 0.295 | |
| TOTAL | 93 | 5 | 111 | 209 | 4.58 | 0.17 | 2.79 | 7.54 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 96 | 3 | 525 | | 36.945 | 0.22 | 296.575 | |
| OPERATING PERSONNEL | 55 | 0 | 0 | | 12.315 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 40 | 0 | 103 | | 12.43 | 0 | 34.13 | |
| SUPERVISORY PERSONNEL | 39 | 18 | 17 | | 4.415 | 0.28 | 1.655 | |
| ENGINEERING PERSONNEL | 24 | 13 | 87 | | 1.65 | 1.175 | 14.62 | |
| TOTAL | 254 | 34 | 732 | 1020 | 67.755 | 1.675 | 346.98 | 416.41 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 34 | 0 | 95 | | 0.235 | 0 | 1.275 | |
| OPERATING PERSONNEL | 18 | 0 | 0 | | 0.19 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 17 | 0 | 51 | | 0.465 | 0 | 0.81 | |
| SUPERVISORY PERSONNEL | 14 | 0 | 5 | | 0.085 | 0 | 0.145 | |
| ENGINEERING PERSONNEL | 13 | 0 | 28 | | 0.19 | 0 | 0.43 | |
| TOTAL | 96 | 0 | 179 | 275 | 1.165 | 0 | 2.66 | 3.825 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 31 | 0 | 208 | | 1.345 | 0 | 18.14 | |
| OPERATING PERSONNEL | 16 | 0 | 0 | | 0.145 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 12 | 0 | 47 | | 0.695 | 0 | 1.535 | |
| SUPERVISORY PERSONNEL | 7 | 0 | 3 | | 0.155 | 0 | 0.36 | |
| ENGINEERING PERSONNEL | 0 | 0 | 20 | | 0 | 0 | 1.89 | |
| TOTAL | 66 | 0 | 278 | 344 | 2.34 | 0 | 21.925 | 24.265 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 60 | 0 | 208 | | 4.195 | 0 | 45.495 | |
| OPERATING PERSONNEL | 39 | 0 | 0 | | 5.075 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 30 | 0 | 83 | | 3.255 | 0 | 10.54 | |
| SUPERVISORY PERSONNEL | 6 | 0 | 8 | | 0.175 | 0 | 0.5 | |
| ENGINEERING PERSONNEL | 6 | 0 | 14 | | 0.175 | 0 | 2.645 | |
| TOTAL | 141 | 0 | 313 | 454 | 12.875 | 0 | 59.18 | 72.055 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 247 | 3 | 1083 | 1333 | 43.12 | 0.22 | 363.105 | 406.445 |
| OPERATING PERSONNEL | 158 | 0 | 0 | 158 | 18.555 | 0 | 0 | 18.555 |
| HEALTH PHYSICS PERSONNEL | 123 | 0 | 336 | 459 | 19.715 | 0 | 47.89 | 67.605 |
| SUPERVISORY PERSONNEL | 75 | 18 | 33 | 126 | 5.155 | 0.28 | 2.66 | 8.095 |
| ENGINEERING PERSONNEL | 47 | 18 | 161 | 226 | 2.17 | 1.345 | 19.88 | 23.395 |
| GRAND TOTALS | 650 | 39 | 1613 | 2302 | 88.715 | 1.845 | 433.535 | 524.095 |

*Workers may be counted in more than one category. Numbers in parentheses are total numbers of individuals.

APPENDIX D (cont.)

NUMBER OF PERSONNEL AND PERSON-REM
BY WORK AND JOB FUNCTION
1985

PLANT: POINT BEACH 1,2

TYPE: PWR

| | GREATER THAN 100 mREM | TOTAL REM FOR WORK GROUP | JOB FUNCTION: REACTOR OPERATIONS & SURVEILLANCE | ROUTINE MAINTENANCE | INSPECTIONS | SPECIAL MAINTENANCE | WASTE PROCESSING | REFUELING |
|---|---|---|---|---|---|---|---|---|
| 1. Company Employees | | | | | | | | |
| Operations | 66 | 68.340 | 43.720 | ------- | 12.930 | ------- | 3.800 | 7.890 |
| Maintenance & Peak Maintenance | 94 | 111.810 | ------ | 16.850 | 8.960 | 44.110 | ------ | 41.890 |
| Chemistry & Health Physics | 27 | 27.170 | 21.540 | ------ | ------ | ------- | 2.310 | 3.320 |
| Instrumentation & Control | 15 | 8.640 | ------ | 0.990 | 0.710 | 6.040 | ------ | 0.900 |
| Reactor Engineering | 4 | 1.590 | ------ | ------ | 0.170 | ------ | ------ | 1.420 |
| Administration, Engineering Quality & Regulatory Services | 15 | 3.820 | 0.240 | ------ | 3.470 | ------ | ------ | 0.110 |
| 2. Contract Workers & Others | 285 | 222.680 | 0.140 | ------ | 14.320 | 193.760 | 14.460 | ------ |
| TOTALS | 506 | 444.050[1] | 65.640 | 17.840 | 40.560 | 243.910 | 20.570 | 55.530 |

[1] 75.385 man-Rem of the above total is related to an EPRI steam generator tubesheet research project on steam generators removed from Unit 1.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *RANCHO SECO TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 22 | 0 | 21 | | 17.926 | 0 | 17.131 | |
| OPERATING PERSONNEL | 52 | 0 | 1 | | 30.327 | 0 | 1.005 | |
| HEALTH PHYSICS PERSONNEL | 13 | 0 | 76 | | 8.374 | 0 | 67.398 | |
| SUPERVISORY PERSONNEL | 2 | 0 | 13 | | 0.333 | 0 | 4.815 | |
| ENGINEERING PERSONNEL | 15 | 0 | 50 | | 4.459 | 0 | 12.65 | |
| TOTAL | 104 | 0 | 161 | 265 | 61.419 | 0 | 102.999 | 164.418 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 53 | 0 | 115 | | 28.134 | 0 | 49.852 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.746 | 0 | 0.107 | |
| HEALTH PHYSICS PERSONNEL | 1 | 0 | 0 | | 1.389 | 0 | 1.475 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.097 | 0 | 0.349 | |
| ENGINEERING PERSONNEL | 1 | 0 | 7 | | 0.778 | 0 | 3.495 | |
| TOTAL | 56 | 0 | 122 | 178 | 31.144 | 0 | 55.278 | 86.422 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 2 | 0 | 69 | | 2.731 | 0 | 51.723 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0.01 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 4 | | 0.746 | 0 | 3.264 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 6 | | 0 | 0 | 2.539 | |
| ENGINEERING PERSONNEL | 8 | 0 | 12 | | 2.244 | 0 | 7.601 | |
| TOTAL | 10 | 0 | 91 | 101 | 5.721 | 0 | 65.137 | 70.858 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 36 | 0 | 295 | | 24.92 | 0 | 184.334 | |
| OPERATING PERSONNEL | 0 | 0 | 1 | | 0.258 | 0 | 1.068 | |
| HEALTH PHYSICS PERSONNEL | 4 | 0 | 3 | | 3.835 | 0 | 8.265 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 8 | | 0.11 | 0 | 2.503 | |
| ENGINEERING PERSONNEL | 4 | 0 | 45 | | 1.783 | 0 | 19.257 | |
| TOTAL | 45 | 0 | 352 | 397 | 30.906 | 0 | 215.427 | 246.333 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 2 | 0 | 74 | | 4.869 | 0 | 41.411 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.302 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 13 | 0 | 13 | | 12.34 | 0 | 11.293 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0.058 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.019 | 0 | 0.165 | |
| TOTAL | 15 | 0 | 87 | 102 | 17.53 | 0 | 52.927 | 70.457 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 5 | 0 | 23 | | 3.45 | 0 | 24.233 | |
| OPERATING PERSONNEL | 14 | 0 | 0 | | 4.177 | 0 | 0.311 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0.381 | 0 | 0.553 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 1 | | 0.15 | 0 | 0.93 | |
| ENGINEERING PERSONNEL | 1 | 0 | 6 | | 0.487 | 0 | 5.297 | |
| TOTAL | 21 | 0 | 30 | 51 | 8.645 | 0 | 31.324 | 39.969 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 120 | 0 | 597 | 717 | 82.03 | 0 | 368.684 | 450.714 |
| OPERATING PERSONNEL | 66 | 0 | 2 | 68 | 35.81 | 0 | 2.501 | 38.311 |
| HEALTH PHYSICS PERSONNEL | 31 | 0 | 96 | 127 | 27.065 | 0 | 92.248 | 119.313 |
| SUPERVISORY PERSONNEL | 5 | 0 | 28 | 33 | 0.69 | 0 | 11.194 | 11.884 |
| ENGINEERING PERSONNEL | 29 | 0 | 120 | 149 | 9.77 | 0 | 48.465 | 58.235 |
| GRAND TOTALS | 251 | 0 | 843 | 1094 | 155.365 | 0 | 523.092 | 678.457 |

*Workers may be counted in more than one category.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: RIVER BEND TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 1 | | 0 | 0 | 0.149 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 10 | 0 | 0 | | 0.582 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 10 | 0 | 1 | 11 | 0.582 | 0 | 0.149 | 0.731 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 1 | | 0 | 0 | 0.015 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 9 | 0 | 1 | | 0.276 | 0 | 0.03 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 9 | 0 | 2 | 11 | 0.276 | 0 | 0.045 | 0.321 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 8 | 0 | 0 | | 0.609 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 2 | | 0 | 0 | 0.347 | |
| TOTAL | 8 | 0 | 2 | 10 | 0.609 | 0 | 0.347 | 0.956 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 2 | | 0 | 0 | 0.468 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 6 | 0 | 1 | | 0.211 | 0 | 0.092 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 6 | 0 | 3 | 9 | 0.211 | 0 | 0.56 | 0.771 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 3 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 10 | 0 | 1 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 2 | | 0 | 0 | 0 | |
| TOTAL | 10 | 0 | 6 | 16 | 0 | 0 | 0 | 0 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 (0) | 0 (0) | 7 (3) | 7 (3) | 0 | 0 | 0.632 | 0.632 |
| OPERATING PERSONNEL | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 | 0 | 0 | 0 |
| HEALTH PHYSICS PERSONNEL | 43 (10) | 0 (0) | 3 (1) | 46 (11) | 1.678 | 0 | 0.122 | 1.8 |
| SUPERVISORY PERSONNEL | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 | 0 | 0 | 0 |
| ENGINEERING PERSONNEL | 0 (0) | 0 (0) | 4 (2) | 4 (2) | 0 | 0 | 0.347 | 0.347 |
| GRAND TOTALS | 43 (10) | 0 (0) | 14 (6) | 57 (16) | 1.678 | 0 | 1.101 | 2.779 |

Numbers in parentheses are total numbers of invididuals.

# APPENDIX D (cont)

## NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *ROBINSON 2 TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 12 | 0 | 24 | | 4.585 | 0.42 | 16.645 | |
| OPERATING PERSONNEL | 27 | 0 | 0 | | 8.53 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 34 | 0 | 8 | | 15.21 | 0.3 | 2.84 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.275 | 0.02 | 0.055 | |
| ENGINEERING PERSONNEL | 6 | 5 | 7 | | 2.62 | 1.7 | 1.95 | |
| TOTAL | 79 | 5 | 39 | 123 | 31.22 | 2.44 | 21.49 | 55.15 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 42 | 11 | 69 | | 34.375 | 4.68 | 37.5 | |
| OPERATING PERSONNEL | 9 | 0 | 0 | | 1.995 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 18 | 0 | 5 | | 13.04 | 0 | 2.505 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 1 | | 0.05 | 0.02 | 0.94 | |
| ENGINEERING PERSONNEL | 3 | 0 | 11 | | 0.755 | 0.135 | 3.45 | |
| TOTAL | 72 | 11 | 86 | 169 | 50.215 | 4.835 | 44.395 | 99.445 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0.07 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.125 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0.195 | 0 | 0 | 0.195 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 54 | 40 | 185 | | 23.95 | 14.805 | 78.425 | |
| OPERATING PERSONNEL | 1 | 0 | 0 | | 0.275 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 20 | 7 | 27 | | 8.69 | 1.4 | 8.86 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 1 | | 0.025 | 0 | 0.755 | |
| ENGINEERING PERSONNEL | 3 | 9 | 15 | | 0.89 | 2.715 | 5.8 | |
| TOTAL | 78 | 56 | 228 | 362 | 33.83 | 18.92 | 93.84 | 146.59 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 1 | 0 | 18 | | 0.48 | 0 | 10.805 | |
| OPERATING PERSONNEL | 13 | 0 | 0 | | 6.98 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 8 | 0 | 5 | | 6.52 | 0 | 2.565 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.005 | 0 | 0.005 | |
| ENGINEERING PERSONNEL | 2 | 0 | 4 | | 0.295 | 0 | 1.88 | |
| TOTAL | 24 | 0 | 27 | 51 | 14.28 | 0 | 15.255 | 29.535 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 109 | 51 | 296 | 456 | 63.46 | 19.905 | 143.375 | 226.74 |
| OPERATING PERSONNEL | 50 | 0 | 0 | 50 | 17.78 | 0 | 0 | 17.78 |
| HEALTH PHYSICS PERSONNEL | 80 | 7 | 45 | 132 | 43.46 | 1.7 | 16.77 | 61.93 |
| SUPERVISORY PERSONNEL | 0 | 0 | 2 | 2 | 0.355 | 0.04 | 1.755 | 2.15 |
| ENGINEERING PERSONNEL | 14 | 14 | 37 | 65 | 4.685 | 4.55 | 13.08 | 22.315 |
| GRAND TOTALS | 253 | 72 | 380 | 705 | 129.74 | 26.195 | 174.98 | 330.915 |

*Workers may be counted in more than one category.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: ST. LUCIE 1,2 TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 137 | 39 | 139 | | 50.528 | 11.838 | 44.519 | |
| OPERATING PERSONNEL | 73 | 2 | 65 | | 38.275 | 1.133 | 28.226 | |
| HEALTH PHYSICS PERSONNEL | 34 | 0 | 76 | | 39.782 | 0 | 72.758 | |
| SUPERVISORY PERSONNEL | 7 | 0 | 2 | | 5.95 | 0.285 | 0.915 | |
| ENGINEERING PERSONNEL | 8 | 5 | 4 | | 3.611 | 2.078 | 2.187 | |
| TOTAL | 259 | 46 | 286 | 591 | 138.146 | 15.334 | 148.605 | 302.085 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 124 | 47 | 103 | | 46.253 | 13.975 | 38.246 | |
| OPERATING PERSONNEL | 11 | 2 | 7 | | 4.78 | 0.555 | 4.435 | |
| HEALTH PHYSICS PERSONNEL | 2 | 0 | 1 | | 0.735 | 0 | 0.17 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.085 | 0.05 | 0.065 | |
| ENGINEERING PERSONNEL | 1 | 0 | 0 | | 0.617 | 0.045 | 0.115 | |
| TOTAL | 138 | 49 | 111 | 298 | 52.47 | 14.625 | 43.031 | 110.126 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 30 | 9 | 30 | | 18.313 | 5.29 | 16.65 | |
| OPERATING PERSONNEL | 4 | 1 | 50 | | 1.48 | 1.445 | 42.705 | |
| HEALTH PHYSICS PERSONNEL | 1 | 0 | 7 | | 2.01 | 0 | 9.165 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.115 | 0.055 | 0.13 | |
| ENGINEERING PERSONNEL | 3 | 0 | 16 | | 1.055 | 0.13 | 6.72 | |
| TOTAL | 38 | 10 | 103 | 151 | 22.973 | 6.92 | 75.37 | 105.263 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 158 | 101 | 211 | | 84.446 | 99.45 | 166.45 | |
| OPERATING PERSONNEL | 8 | 1 | 122 | | 3.845 | 1.035 | 110.761 | |
| HEALTH PHYSICS PERSONNEL | 17 | 0 | 6 | | 6.785 | 0 | 2.93 | |
| SUPERVISORY PERSONNEL | 11 | 2 | 3 | | 3.81 | 1.07 | 1.225 | |
| ENGINEERING PERSONNEL | 2 | 2 | 20 | | 0.86 | 1.05 | 16.515 | |
| TOTAL | 196 | 106 | 362 | 664 | 99.746 | 102.605 | 297.881 | 500.232 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 7 | 0 | 0 | | 2.02 | 0.045 | 0.355 | |
| OPERATING PERSONNEL | 0 | 0 | 2 | | 0.27 | 0 | 0.845 | |
| HEALTH PHYSICS PERSONNEL | 2 | 0 | 1 | | 1.03 | 0 | 0.195 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 9 | 0 | 3 | 12 | 3.32 | 0.045 | 1.395 | 4.76 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 83 | 46 | 157 | | 49.05 | 31.88 | 176.278 | |
| OPERATING PERSONNEL | 25 | 2 | 107 | | 8.107 | 1.195 | 75.681 | |
| HEALTH PHYSICS PERSONNEL | 1 | 0 | 1 | | 0.27 | 0 | 1.535 | |
| SUPERVISORY PERSONNEL | 8 | 2 | 0 | | 2.38 | 0.485 | 0.13 | |
| ENGINEERING PERSONNEL | 1 | 0 | 16 | | 0.24 | 0.17 | 13.125 | |
| TOTAL | 118 | 50 | 281 | 449 | 60.047 | 33.73 | 266.749 | 360.526 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 539 (221) | 242 (108) | 640 (517) | 1421 (846) | 250.61 | 162.478 | 442.498 | 855.586 |
| OPERATING PERSONNEL | 121 (81) | 8 (4) | 353 (244) | 482 (329) | 56.757 | 5.363 | 262.653 | 324.773 |
| HEALTH PHYSICS PERSONNEL | 57 (32) | 0 (0) | 92 (81) | 149 (113) | 50.612 | 0 | 86.753 | 137.365 |
| SUPERVISORY PERSONNEL | 26 (16) | 4 (3) | 5 (5) | 35 (24) | 12.34 | 1.945 | 2.465 | 16.75 |
| ENGINEERING PERSONNEL | 15 (7) | 7 (5) | 56 (34) | 78 (46) | 6.383 | 3.473 | 38.662 | 48.518 |
| GRAND TOTALS | 758 (357) | 261 (120) | 1146 (881) | 2165 (1358) | 376.702 | 173.259 | 833.031 | 1382.992 |

Numbers in parentheses are total numbers of individuals.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *SEQUOYAH 1,2 TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 613 | 4 | 2 | | 35.468 | 1.042 | 0.06 | |
| OPERATING PERSONNEL | 74 | 1 | 9 | | 14.256 | 0.005 | 0.585 | |
| HEALTH PHYSICS PERSONNEL | 65 | 25 | 14 | | 24.649 | 7.4 | 3.266 | |
| SUPERVISORY PERSONNEL | 33 | 21 | 2 | | 3.305 | 0.916 | 0.19 | |
| ENGINEERING PERSONNEL | 119 | 49 | 50 | | 17.799 | 3.104 | 0.792 | |
| TOTAL | 904 | 100 | 77 | 1081 | 95.477 | 12.467 | 4.893 | 112.837 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 642 | 2 | 2 | | 200.89 | 0.014 | 0.109 | |
| OPERATING PERSONNEL | 66 | 0 | 5 | | 1.224 | 0 | 2.922 | |
| HEALTH PHYSICS PERSONNEL | 64 | 23 | 11 | | 8.549 | 0.735 | 1.743 | |
| SUPERVISORY PERSONNEL | 31 | 15 | 2 | | 5.019 | 0.137 | 0.091 | |
| ENGINEERING PERSONNEL | 111 | 38 | 63 | | 18.693 | 5.536 | 46.645 | |
| TOTAL | 914 | 78 | 83 | 1075 | 234.375 | 6.422 | 51.51 | 292.307 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 303 | 5 | 18 | | 56.969 | 0.201 | 18.004 | |
| OPERATING PERSONNEL | 33 | 2 | 4 | | 0.599 | 0.057 | 0.055 | |
| HEALTH PHYSICS PERSONNEL | 48 | 19 | 9 | | 11.978 | 3.982 | 3.019 | |
| SUPERVISORY PERSONNEL | 17 | 17 | 3 | | 0.398 | 1.753 | 0.163 | |
| ENGINEERING PERSONNEL | 77 | 42 | 63 | | 7.84 | 34.478 | 42.012 | |
| TOTAL | 478 | 85 | 97 | 660 | 77.784 | 40.471 | 63.253 | 181.508 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 560 | 2 | 2 | | 164.383 | 0.037 | 0.333 | |
| OPERATING PERSONNEL | 52 | 0 | 3 | | 0.385 | 0 | 0.342 | |
| HEALTH PHYSICS PERSONNEL | 62 | 18 | 10 | | 5.784 | 2.742 | 2.037 | |
| SUPERVISORY PERSONNEL | 25 | 1 | 2 | | 1.52 | 0.005 | 0.008 | |
| ENGINEERING PERSONNEL | 108 | 31 | 109 | | 14.717 | 2.157 | 102.805 | |
| TOTAL | 807 | 52 | 126 | 985 | 186.789 | 4.941 | 105.525 | 297.255 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 306 | 0 | 0 | | 14.453 | 0 | 0 | |
| OPERATING PERSONNEL | 73 | 0 | 5 | | 11.417 | 0 | 2.548 | |
| HEALTH PHYSICS PERSONNEL | 63 | 9 | 5 | | 4.451 | 0.054 | 0.265 | |
| SUPERVISORY PERSONNEL | 17 | 0 | 0 | | 1.179 | 0 | 0 | |
| ENGINEERING PERSONNEL | 43 | 2 | 1 | | 0.182 | 0.022 | 0.306 | |
| TOTAL | 502 | 11 | 11 | 524 | 31.682 | 0.076 | 3.119 | 34.877 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 315 | 2 | 2 | | 70.886 | 1.85 | 1.5 | |
| OPERATING PERSONNEL | 46 | 3 | 2 | | 6.563 | 0.328 | 2.335 | |
| HEALTH PHYSICS PERSONNEL | 39 | 15 | 5 | | 1.469 | 2.965 | 1.423 | |
| SUPERVISORY PERSONNEL | 16 | 0 | 2 | | 7.39 | 0 | 0.023 | |
| ENGINEERING PERSONNEL | 70 | 21 | 4 | | 11.379 | 1.153 | 0.056 | |
| TOTAL | 486 | 41 | 15 | 542 | 97.687 | 6.296 | 5.337 | 109.32 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 2739 | 15 | 26 | 2780 | 543.049 | 3.144 | 20.006 | 566.199 |
| OPERATING PERSONNEL | 344 | 6 | 28 | 378 | 34.444 | 0.39 | 8.787 | 43.621 |
| HEALTH PHYSICS PERSONNEL | 341 | 109 | 54 | 504 | 56.88 | 17.878 | 11.753 | 86.511 |
| SUPERVISORY PERSONNEL | 139 | 54 | 11 | 204 | 18.811 | 2.811 | 0.475 | 22.097 |
| ENGINEERING PERSONNEL | 528 | 183 | 290 | 1001 | 70.61 | 46.45 | 192.616 | 309.676 |
| GRAND TOTALS | 4091 | 367 | 409 | 4867 | 723.794 | 70.673 | 233.637 | 1028.104 |

*Workers may be counted in more than one category.

# APPENDIX D (cont.)

## NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: SHOREHAM TYPE: BWR

| Work and Job Function[1] | Number of Personnel (>100 mrem) | | | Total Man-Rem (2) | | |
|---|---|---|---|---|---|---|
| | Station Employee | Utility Employees | Contract Worker and Others | Station Employees | Utility Employees | Contract Worker and Others |
| **Reactor Operations and Surveillance** | | | | | | |
| Maintenance Personnel | | | | | | |
| a) Maintenance | 3 | None | 3 | 1.568 | Insignificant | 3.214 |
| b) Instrument & Control | - | None | 1 | 0.525 | Insignificant | 0.448 |
| c) Computer Engineering | - | None | - | 0.030 | Insignificant | - |
| Operations Personnel | | | | | | |
| a) Operations | 1 | None | - | 1.109 | Insignificant | 0.076 |
| b) Reactor Engineering | - | None | 10 | 0.212 | Insignificant | 3.545 |
| c) Systems Engineering | - | None | - | 0.144 | Insignificant | 0.068 |
| Radiological Controls | | | | | | |
| a) Health Physics | 11 | None | 8 | 3.73 | Insignificant | 2.04 |
| b) Radiochemistry | - | None | - | 0.06 | Insignificant | 0.13 |
| c) Radwaste | 1 | None | - | 0.17 | Insignificant | - |
| Supervisory/Management | - | None | 1 | 0.16 | Insignificant | 0.410 |
| Engineering (Not Operations) | | | | | | |
| a) Rad. Protection | - | None | - | 0.070 | Insignificant | - |
| b) Nuclear Systems | - | None | - | 0.140 | Insignificant | 0.010 |
| c) Project Engineering | - | None | - | 0.140 | Insignificant | 0.290 |
| Outage/Modifications | | | | | | |
| a) Outage Planning | - | None | - | - | Insignificant | - |
| b) Planning & Scheduling | - | None | - | 0.010 | Insignificant | - |
| c) Modifications | - | None | - | 0.050 | Insignificant | 0.10 |
| Nuclear Operations Support Department | | | | | | |
| a) QA/QC | - | None | - | 0.116 | Insignificant | 0.012 |
| b) Security | - | None | - | 0.010 | Insignificant | 0.430 |
| c) Training | - | None | - | 0.07 | Insignificant | 0.110 |
| Function Total | | | | | | |
| Maintenance | 3 | None | 4 | 2.12 | Insignificant | 3.66 |
| Operations | 1 | None | 10 | 1.47 | Insignificant | 3.69 |
| Radiological Controls (includes H.P.) | 12 | None | 8 | 3.96 | Insignificant | 2.17 |
| Supervisory/Management | - | None | 1 | 0.16 | Insignificant | 0.41 |
| Engineering (not Operations) | - | None | - | 0.35 | Insignificant | 0.30 |
| Outage/Modifications | - | None | - | 0.06 | Insignificant | 0.10 |
| Nuclear Operations Support | - | None | - | 0.19 | Insignificant | 0.56 |
| GRAND TOTAL | 16 | | 23 | 8.32 | | 10.89 |

(1) Doses associated with low power testing
(2) Represents 100% of cumulative man-rem exposures

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *SUMMER 1 TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 41 | 0 | 19 | | 0.582 | 0 | 0.229 | |
| OPERATING PERSONNEL | 72 | 0 | 43 | | 2.707 | 0 | 0.674 | |
| HEALTH PHYSICS PERSONNEL | 13 | 2 | 113 | | 0.514 | 0.04 | 4.571 | |
| SUPERVISORY PERSONNEL | 5 | 6 | 6 | | 0.077 | 0.039 | 0.055 | |
| ENGINEERING PERSONNEL | 5 | 16 | 12 | | 0.07 | 0.274 | 0.11 | |
| TOTAL | 136 | 24 | 193 | 353 | 3.95 | 0.353 | 5.639 | 9.942 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 137 | 2 | 267 | | 4.753 | 0.04 | 7.891 | |
| OPERATING PERSONNEL | 26 | 0 | 5 | | 0.445 | 0 | 0.046 | |
| HEALTH PHYSICS PERSONNEL | 5 | 0 | 59 | | 0.119 | 0 | 1.643 | |
| SUPERVISORY PERSONNEL | 4 | 3 | 0 | | 0.03 | 0.036 | 0 | |
| ENGINEERING PERSONNEL | 2 | 25 | 56 | | 0.03 | 1.04 | 0.993 | |
| TOTAL | 174 | 30 | 387 | 591 | 5.377 | 1.116 | 10.573 | 17.066 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 25 | 0 | 54 | | 0.805 | 0 | 1.661 | |
| OPERATING PERSONNEL | 1 | 0 | 1 | | 0.005 | 0 | 0.01 | |
| HEALTH PHYSICS PERSONNEL | 3 | 0 | 30 | | 0.09 | 0 | 0.833 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 2 | 4 | 12 | | 0.01 | 0.11 | 0.386 | |
| TOTAL | 31 | 4 | 97 | 132 | 0.91 | 0.11 | 2.89 | 3.91 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 79 | 1 | 130 | | 3.05 | 0.02 | 5.41 | |
| OPERATING PERSONNEL | 14 | 0 | 0 | | 0.471 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 7 | 0 | 42 | | 0.3 | 0 | 1.702 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 2 | | 0.01 | 0 | 0.035 | |
| ENGINEERING PERSONNEL | 8 | 17 | 33 | | 0.345 | 0.668 | 1.099 | |
| TOTAL | 109 | 18 | 207 | 334 | 4.176 | 0.688 | 8.246 | 13.11 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 11 | 0 | 31 | | 0.141 | 0 | 0.764 | |
| OPERATING PERSONNEL | 1 | 0 | 0 | | 0.005 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 7 | 0 | 20 | | 0.07 | 0 | 0.506 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 19 | 0 | 51 | 70 | 0.216 | 0 | 1.27 | 1.486 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 17 | 0 | 60 | | 0.765 | 0 | 2.338 | |
| OPERATING PERSONNEL | 17 | 0 | 0 | | 0.635 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 3 | 0 | 37 | | 0.042 | 0 | 1.44 | |
| SUPERVISORY PERSONNEL | 3 | 0 | 0 | | 0.04 | 0 | 0 | |
| ENGINEERING PERSONNEL | 3 | 9 | 9 | | 0.095 | 0.186 | 0.201 | |
| TOTAL | 43 | 9 | 106 | 158 | 1.577 | 0.186 | 3.979 | 5.742 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 310 | 3 | 561 | 874 | 10.096 | 0.06 | 18.293 | 28.449 |
| OPERATING PERSONNEL | 131 | 0 | 49 | 180 | 4.268 | 0 | 0.73 | 4.998 |
| HEALTH PHYSICS PERSONNEL | 38 | 2 | 301 | 341 | 1.135 | 0.04 | 10.695 | 11.87 |
| SUPERVISORY PERSONNEL | 13 | 9 | 8 | 30 | 0.157 | 0.075 | 0.09 | 0.322 |
| ENGINEERING PERSONNEL | 20 | 71 | 122 | 213 | 0.55 | 2.278 | 2.789 | 5.617 |
| GRAND TOTALS | 512 | 85 | 1041 | 1638 | 16.206 | 2.453 | 32.597 | 51.256 |

*Workers may be counted in more than one category.

# APPENDIX D (cont)

## NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *SURRY 1,2 TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 35 | 15 | 142 | | 1.143 | 0.063 | 13.623 | |
| OPERATING PERSONNEL | 247 | 15 | 57 | | 141.84 | 1.355 | 3.89 | |
| HEALTH PHYSICS PERSONNEL | 66 | 7 | 240 | | 48.522 | 2.392 | 229.66 | |
| SUPERVISORY PERSONNEL | 36 | 2 | 0 | | 6.911 | 0.082 | 0 | |
| ENGINEERING PERSONNEL | 39 | 17 | 60 | | 4.579 | 0.243 | 6.068 | |
| TOTAL | 423 | 56 | 499 | 978 | 202.995 | 4.135 | 253.241 | 460.371 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 194 | 130 | 769 | | 194.431 | 35.942 | 278.052 | |
| OPERATING PERSONNEL | 81 | 8 | 45 | | 10.002 | 0.208 | 6.223 | |
| HEALTH PHYSICS PERSONNEL | 25 | 5 | 97 | | 4.617 | 1.975 | 25.981 | |
| SUPERVISORY PERSONNEL | 29 | 1 | 0 | | 11.575 | 0.02 | 0 | |
| ENGINEERING PERSONNEL | 22 | 3 | 54 | | 2.683 | 0.079 | 6.469 | |
| TOTAL | 351 | 147 | 965 | 1463 | 223.308 | 38.224 | 316.725 | 578.257 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 52 | 11 | 280 | | 4.788 | 0.465 | 74.671 | |
| OPERATING PERSONNEL | 20 | 4 | 9 | | 1.799 | 0.207 | 0.896 | |
| HEALTH PHYSICS PERSONNEL | 4 | 0 | 8 | | 0.484 | 0 | 1.107 | |
| SUPERVISORY PERSONNEL | 10 | 0 | 0 | | 1.602 | 0 | 0 | |
| ENGINEERING PERSONNEL | 12 | 1 | 16 | | 1.316 | 0.083 | 3.901 | |
| TOTAL | 98 | 16 | 313 | 427 | 9.989 | 0.755 | 80.575 | 91.319 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 58 | 14 | 551 | | 8.561 | 0.305 | 416.411 | |
| OPERATING PERSONNEL | 40 | 13 | 40 | | 8.981 | 1.77 | 16.55 | |
| HEALTH PHYSICS PERSONNEL | 17 | 3 | 16 | | 3.222 | 0.055 | 1.592 | |
| SUPERVISORY PERSONNEL | 6 | 0 | 0 | | 0.519 | 0 | 0 | |
| ENGINEERING PERSONNEL | 5 | 3 | 38 | | 0.23 | 0.024 | 5.926 | |
| TOTAL | 126 | 33 | 645 | 804 | 21.513 | 2.154 | 440.479 | 464.146 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 11 | 1 | 147 | | 0.038 | 0.001 | 6.784 | |
| OPERATING PERSONNEL | 26 | 1 | 3 | | 11.097 | 0.002 | 0.027 | |
| HEALTH PHYSICS PERSONNEL | 6 | 0 | 39 | | 2.349 | 0 | 9.828 | |
| SUPERVISORY PERSONNEL | 6 | 0 | 0 | | 0.547 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 2 | | 0 | 0 | 0.026 | |
| TOTAL | 49 | 2 | 191 | 242 | 14.031 | 0.003 | 16.665 | 30.699 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 34 | 1 | 40 | | 3.427 | 0.042 | 5.952 | |
| OPERATING PERSONNEL | 26 | 9 | 5 | | 4.821 | 0.452 | 0.655 | |
| HEALTH PHYSICS PERSONNEL | 2 | 0 | 5 | | 0.192 | 0 | 0.537 | |
| SUPERVISORY PERSONNEL | 5 | 0 | 0 | | 0.941 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 1 | | 0 | 0 | 0.026 | |
| TOTAL | 67 | 10 | 51 | 128 | 9.381 | 0.494 | 7.17 | 17.045 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 384 | 172 | 1929 | 2485 | 212.388 | 36.818 | 795.493 | 1044.699 |
| OPERATING PERSONNEL | 440 | 50 | 159 | 649 | 178.54 | 3.994 | 28.241 | 210.775 |
| HEALTH PHYSICS PERSONNEL | 120 | 15 | 405 | 540 | 59.386 | 4.422 | 268.705 | 332.513 |
| SUPERVISORY PERSONNEL | 92 | 3 | 0 | 95 | 22.095 | 0.102 | 0 | 22.197 |
| ENGINEERING PERSONNEL | 78 | 24 | 171 | 273 | 8.808 | 0.429 | 22.416 | 31.653 |
| GRAND TOTALS | 1114 | 264 | 2664 | 4042 | 481.217 | 45.765 | 1114.855 | 1641.837 |

*Workers may be counted in more than one category.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: SUSQUEHANNA TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 14 | 1 | 7 | | 4.339 | 0.122 | 1.08 | |
| OPERATING PERSONNEL | 60 | 2 | 6 | | 29.558 | 0.967 | 1.182 | |
| HEALTH PHYSICS PERSONNEL | 8 | 0 | 36 | | 5.035 | 0 | 25.938 | |
| SUPERVISORY PERSONNEL | 2 | 0 | 0 | | 1.007 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 84 | 3 | 49 | 136 | 39.939 | 1.089 | 28.2 | 69.228 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 73 | 169 | 125 | | 49.306 | 101.722 | 52.906 | |
| OPERATING PERSONNEL | 29 | 1 | 13 | | 14.98 | 0.73 | 5.735 | |
| HEALTH PHYSICS PERSONNEL | 12 | 0 | 44 | | 8.907 | 0 | 29.88 | |
| SUPERVISORY PERSONNEL | 10 | 0 | 2 | | 2.888 | 0 | 0.575 | |
| ENGINEERING PERSONNEL | 12 | 1 | 23 | | 3.667 | 0.232 | 15.381 | |
| TOTAL | 136 | 171 | 207 | 514 | 79.748 | 102.684 | 104.477 | 286.909 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 6 | 63 | 260 | | 2.114 | 38.247 | 240.982 | |
| OPERATING PERSONNEL | 1 | 1 | 18 | | 0.138 | 1.176 | 11.693 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 2 | 0 | 4 | | 0.958 | 0 | 1.657 | |
| ENGINEERING PERSONNEL | 4 | 2 | 23 | | 1.975 | 0.452 | 16.766 | |
| TOTAL | 13 | 66 | 305 | 384 | 5.185 | 39.875 | 271.098 | 316.158 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 2 | 18 | 439 | | 0.46 | 4.839 | 244.978 | |
| OPERATING PERSONNEL | 0 | 3 | 27 | | 0 | 0.587 | 11.022 | |
| HEALTH PHYSICS PERSONNEL | 2 | 0 | 15 | | 2.13 | 0 | 6.675 | |
| SUPERVISORY PERSONNEL | 2 | 1 | 11 | | 0.419 | 0.235 | 6.51 | |
| ENGINEERING PERSONNEL | 3 | 4 | 19 | | 0.524 | 0.793 | 14.996 | |
| TOTAL | 9 | 26 | 511 | 546 | 3.533 | 6.454 | 284.181 | 294.168 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 3 | 21 | | 0 | 1.266 | 5.087 | |
| OPERATING PERSONNEL | 2 | 0 | 13 | | 0.478 | 0 | 7.401 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 5 | | 0 | 0 | 2.417 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 2 | 3 | 39 | 44 | 0.478 | 1.266 | 14.905 | 16.649 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 1 | 0 | 0 | | 0.175 | 0 | 0 | |
| OPERATING PERSONNEL | 1 | 0 | 0 | | 0.23 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.12 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 3 | 0 | 0 | 3 | 0.525 | 0 | 0 | 0.525 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 96 | 254 | 852 | 1202 | 56.394 | 146.196 | 545.033 | 747.623 |
| OPERATING PERSONNEL | 93 | 7 | 77 | 177 | 45.384 | 3.46 | 37.033 | 85.877 |
| HEALTH PHYSICS PERSONNEL | 22 | 0 | 100 | 122 | 16.072 | 0 | 64.91 | 80.982 |
| SUPERVISORY PERSONNEL | 17 | 1 | 17 | 35 | 5.392 | 0.235 | 8.742 | 14.369 |
| ENGINEERING PERSONNEL | 19 | 7 | 65 | 91 | 6.166 | 1.477 | 47.143 | 54.786 |
| GRAND TOTALS | 247 | 269 | 1111 | 1627 | 129.408 | 151.368 | 702.861 | 983.637 |

# APPENDIX D (cont)

## NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *TROJAN TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 7 | 0 | 3 | | 1.82 | 0.07 | 1.14 | |
| OPERATING PERSONNEL | 22 | 0 | 0 | | 6.35 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 23 | 0 | 34 | | 8.15 | 0.05 | 13.79 | |
| SUPERVISORY PERSONNEL | 2 | 1 | 4 | | 0.6 | 0.33 | 2.41 | |
| ENGINEERING PERSONNEL | 2 | 0 | 0 | | 0.75 | 0.91 | 0.24 | |
| TOTAL | 56 | 1 | 41 | 98 | 17.67 | 1.36 | 17.58 | 36.61 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 70 | 66 | 152 | | 35.74 | 32.48 | 103.8 | |
| OPERATING PERSONNEL | 17 | 0 | 0 | | 4.38 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 30 | 2 | 70 | | 11.64 | 0.22 | 36.99 | |
| SUPERVISORY PERSONNEL | 7 | 9 | 4 | | 2.57 | 3.82 | 2.07 | |
| ENGINEERING PERSONNEL | 6 | 4 | 45 | | 2.34 | 1.79 | 53.94 | |
| TOTAL | 130 | 81 | 271 | 482 | 56.67 | 38.31 | 196.8 | 291.78 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 2 | 8 | 16 | | 0.93 | 1.86 | 6.31 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.02 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 4 | 0 | 0 | | 1.5 | 0 | 0.37 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.08 | 0.13 | 0.06 | |
| ENGINEERING PERSONNEL | 0 | 2 | 0 | | 0 | 0.34 | 0 | |
| TOTAL | 6 | 10 | 16 | 32 | 2.53 | 2.33 | 6.74 | 11.6 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 2 | 1 | 11 | | 0.61 | 0.39 | 4.79 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.21 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 31 | 2 | 19 | | 18.6 | 0.69 | 8.71 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.05 | 0 | 0.01 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 33 | 3 | 30 | 66 | 19.47 | 1.08 | 13.51 | 34.06 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 16 | 12 | 11 | | 14.27 | 14.2 | 2.65 | |
| OPERATING PERSONNEL | 12 | 0 | 0 | | 6.02 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 12 | 2 | 28 | | 3.34 | 0.73 | 9.85 | |
| SUPERVISORY PERSONNEL | 1 | 7 | 0 | | 1.14 | 1.27 | 0.06 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.18 | 0.08 | 0.06 | |
| TOTAL | 41 | 21 | 39 | 101 | 24.95 | 16.28 | 12.62 | 53.85 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 97 | 87 | 193 | 377 | 53.37 | 49 | 118.69 | 221.06 |
| OPERATING PERSONNEL | 51 | 0 | 0 | 51 | 16.98 | 0 | 0 | 16.98 |
| HEALTH PHYSICS PERSONNEL | 100 | 6 | 151 | 257 | 43.23 | 1.69 | 69.71 | 114.63 |
| SUPERVISORY PERSONNEL | 10 | 17 | 8 | 35 | 4.44 | 5.55 | 4.61 | 14.6 |
| ENGINEERING PERSONNEL | 8 | 6 | 45 | 59 | 3.27 | 3.12 | 54.24 | 60.63 |
| GRAND TOTALS | 266 | 116 | 397 | 779 | 121.29 | 59.36 | 247.25 | 427.9 |

*Workers may be counted in more than one category.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *TURKEY POINT TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 43 | 3 | 37 | | 16.59 | 2.465 | 13.875 | |
| OPERATING PERSONNEL | 33 | 0 | 1 | | 18.205 | 0 | 0.29 | |
| HEALTH PHYSICS PERSONNEL | 18 | 0 | 71 | | 8.445 | 0 | 20.49 | |
| SUPERVISORY PERSONNEL | 8 | 0 | 8 | | 3.43 | 0.295 | 2.61 | |
| ENGINEERING PERSONNEL | 24 | 2 | 36 | | 7.15 | 0.735 | 14.435 | |
| TOTAL | 126 | 5 | 153 | 284 | 53.82 | 3.495 | 51.7 | 109.015 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 209 | 36 | 134 | | 146.03 | 21.575 | 46.5 | |
| OPERATING PERSONNEL | 41 | 0 | 0 | | 14.8 | 0 | 0.1 | |
| HEALTH PHYSICS PERSONNEL | 23 | 0 | 99 | | 17.275 | 0.02 | 93.485 | |
| SUPERVISORY PERSONNEL | 15 | 2 | 8 | | 5.46 | 0.745 | 2.765 | |
| ENGINEERING PERSONNEL | 18 | 4 | 16 | | 8.325 | 2.22 | 3.82 | |
| TOTAL | 306 | 42 | 257 | 605 | 191.89 | 24.56 | 146.67 | 363.12 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 36 | 17 | 100 | | 14.595 | 3.75 | 66.515 | |
| OPERATING PERSONNEL | 1 | 0 | 1 | | 0.555 | 0 | 0.205 | |
| HEALTH PHYSICS PERSONNEL | 8 | 0 | 21 | | 2.14 | 0 | 7.6 | |
| SUPERVISORY PERSONNEL | 6 | 1 | 7 | | 2.535 | 1.125 | 1.905 | |
| ENGINEERING PERSONNEL | 2 | 13 | 6 | | 0.655 | 12.88 | 3.525 | |
| TOTAL | 53 | 31 | 135 | 219 | 20.48 | 17.755 | 79.75 | 117.985 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 49 | 1 | 662 | | 24.155 | 0.88 | 629.324 | |
| OPERATING PERSONNEL | 3 | 0 | 2 | | 1.915 | 0 | 0.56 | |
| HEALTH PHYSICS PERSONNEL | 11 | 0 | 26 | | 2.785 | 0.035 | 12.785 | |
| SUPERVISORY PERSONNEL | 3 | 2 | 43 | | 0.925 | 0.395 | 22.505 | |
| ENGINEERING PERSONNEL | 14 | 8 | 33 | | 5.995 | 3.35 | 18.93 | |
| TOTAL | 80 | 11 | 766 | 857 | 35.775 | 4.66 | 684.104 | 724.539 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 8 | 1 | 4 | | 2.385 | 0.275 | 2.075 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.01 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 13 | 0 | 1 | | 17.225 | 0 | 0.53 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.135 | 0 | 0.01 | |
| ENGINEERING PERSONNEL | 1 | 0 | 0 | | 0.165 | 0 | 0.09 | |
| TOTAL | 22 | 1 | 5 | 28 | 19.92 | 0.275 | 2.705 | 22.9 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 137 | 41 | 16 | | 84.655 | 40.35 | 7.165 | |
| OPERATING PERSONNEL | 49 | 0 | 2 | | 11.61 | 0.005 | 0.26 | |
| HEALTH PHYSICS PERSONNEL | 4 | 0 | 9 | | 1.93 | 0 | 3.595 | |
| SUPERVISORY PERSONNEL | 8 | 0 | 9 | | 3.955 | 0 | 2.61 | |
| ENGINEERING PERSONNEL | 10 | 1 | 2 | | 7.75 | 0.31 | 0.6 | |
| TOTAL | 208 | 42 | 38 | 288 | 109.9 | 40.665 | 14.23 | 164.795 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 482 (225) | 99 (45) | 953 (746) | 1534 (1016) | 288.41 | 69.295 | 765.454 | 1123.159 |
| OPERATING PERSONNEL | 127 (79) | 0 (0) | 6 (5) | 133 (84) | 47.095 | 0.005 | 1.415 | 48.515 |
| HEALTH PHYSICS PERSONNEL | 77 (29) | 0 (0) | 227 (119) | 304 (148) | 49.8 | 0.055 | 138.485 | 188.34 |
| SUPERVISORY PERSONNEL | 40 (22) | 5 (3) | 75 (52) | 120 (77) | 16.44 | 2.56 | 32.405 | 51.405 |
| ENGINEERING PERSONNEL | 69 (46) | 28 (23) | 93 (81) | 190 (150) | 30.04 | 19.495 | 41.4 | 90.935 |
| GRAND TOTALS | 795 (401) | 132 (71) | 1354 (1003) | 2281 (1475) | 431.785 | 91.41 | 979.159 | 1502.354 |

*Workers may be counted in more than one category. Numbers in parentheses are total numbers of individuals.

# APPENDIX D (cont)

## NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: VERMONT YANKEE 1 TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 4 | 6 | 59 | | 4.438 | 1.085 | 13.83 | |
| OPERATING PERSONNEL | 40 | 0 | 1 | | 23.6 | 0 | 0.087 | |
| HEALTH PHYSICS PERSONNEL | 21 | 0 | 148 | | 17.17 | 0 | 89.518 | |
| SUPERVISORY PERSONNEL | 9 | 0 | 0 | | 1.949 | 0 | 4.489 | |
| ENGINEERING PERSONNEL | 3 | 1 | 9 | | 5.214 | 0.209 | 1.86 | |
| TOTAL | 77 | 7 | 217 | 301 | 52.371 | 1.294 | 109.784 | 163.449 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 35 | 106 | 939 | | 39.993 | 27.09 | 339.68 | |
| OPERATING PERSONNEL | 11 | 0 | 0 | | 4.061 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 5 | 0 | 99 | | 4.176 | 0 | 47.367 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 1 | 0 | 1 | | 0.912 | 0 | 0.27 | |
| TOTAL | 52 | 106 | 1039 | 1197 | 49.142 | 27.09 | 387.317 | 463.549 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 14 | | 0.02 | 0 | 2.271 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.038 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0.02 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.023 | 0 | 0.009 | |
| TOTAL | 0 | 0 | 14 | 14 | 0.081 | 0 | 2.3 | 2.381 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 6 | 24 | 705 | | 6.336 | 5.008 | 383.599 | |
| OPERATING PERSONNEL | 2 | 0 | 0 | | 2.258 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 8 | | 0.186 | 0 | 3.388 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 4 | 0 | 2 | | 2.34 | 0 | 0.4 | |
| TOTAL | 12 | 24 | 715 | 751 | 11.12 | 5.008 | 387.387 | 403.515 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 21 | | 0.186 | 0.012 | 6.719 | |
| OPERATING PERSONNEL | 3 | 0 | 0 | | 5.473 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 1 | 0 | 12 | | 0.629 | 0 | 3.582 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.02 | 0 | 0 | |
| TOTAL | 4 | 0 | 33 | 37 | 6.308 | 0.012 | 10.301 | 16.621 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 3 | | 0.084 | 0.02 | 0.563 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.374 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 1 | | 0 | 0 | 0.255 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 1 | 0 | 0 | | 0.131 | 0 | 0.103 | |
| TOTAL | 1 | 0 | 4 | 5 | 0.589 | 0.02 | 0.921 | 1.53 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 45 | 136 | 1741 | 1922 | 51.057 | 33.215 | 746.662 | 830.934 |
| OPERATING PERSONNEL | 56 | 0 | 1 | 57 | 35.804 | 0 | 0.087 | 35.891 |
| HEALTH PHYSICS PERSONNEL | 27 | 0 | 268 | 295 | 22.161 | 0 | 144.13 | 166.291 |
| SUPERVISORY PERSONNEL | 9 | 0 | 0 | 9 | 1.949 | 0 | 4.489 | 6.438 |
| ENGINEERING PERSONNEL | 9 | 1 | 12 | 22 | 8.64 | 0.209 | 2.642 | 11.491 |
| GRAND TOTALS | 146 | 137 | 2022 | 2305 | 119.611 | 33.424 | 898.01 | 1051.045 |

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: WOLF CREEK TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0.178 | 0.055 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0.164 | 0.025 | |
| HEALTH PHYSICS PERSONNEL | 0 | 4 | 8 | | 0 | 1.015 | 2.622 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.005 | 0.066 | 0.019 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.003 | 0.046 | 0.079 | |
| TOTAL | 0 | 4 | 8 | 12 | 0.008 | 1.469 | 2.8 | 4.277 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0.472 | 0.567 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0.056 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0.217 | 0.398 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0.07 | 0.077 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0.091 | 0.058 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0.906 | 1.1 | 2.006 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0.118 | 0.19 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0.011 | 0.005 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0.011 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.005 | 0.079 | 0.05 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.003 | 0.038 | 0.005 | |
| TOTAL | 0 | 0 | 0 | 0 | 0.008 | 0.246 | 0.261 | 0.515 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0.084 | 0.059 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0.007 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0.048 | 0.093 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0.007 | 0.006 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0.005 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0.151 | 0.158 | 0.309 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0.017 | 0.022 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0.004 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0.025 | 0.019 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0.046 | 0.041 | 0.087 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | 0 | 0 | 0.869 | 0.893 | 1.762 |
| OPERATING PERSONNEL | 0 | 0 | 0 | 0 | 0 | 0.242 | 0.03 | 0.272 |
| HEALTH PHYSICS PERSONNEL | 0 | 4 | 8 | 12 | 0 | 1.305 | 3.143 | 4.448 |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | 0 | 0.01 | 0.222 | 0.152 | 0.384 |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | 0 | 0.006 | 0.18 | 0.142 | 0.328 |
| GRAND TOTALS | 0 | 4 | 8 | 12 | 0.016 | 2.818 | 4.36 | 7.194 |

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: WNP-2 TYPE: BWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 26.298 | 0 | 3.418 | | 5.526 | 0 | 0.939 | |
| OPERATING PERSONNEL | 24.476 | 1.14 | 0.443 | | 8.645 | 0.407 | 0.439 | |
| HEALTH PHYSICS PERSONNEL | 8.863 | 0 | 16.581 | | 6.545 | 0 | 6.946 | |
| SUPERVISORY PERSONNEL | 6.186 | 0.101 | 0 | | 1.611 | 0.081 | 0 | |
| ENGINEERING PERSONNEL | 2.621 | 1.347 | 2.624 | | 0.754 | 0.838 | 1.268 | |
| TOTAL | 68.444 | 2.588 | 23.066 | 94.098 | 23.081 | 1.326 | 9.592 | 33.999 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 26.454 | 0 | 34.406 | | 8.002 | 0 | 10.389 | |
| OPERATING PERSONNEL | 7.929 | 0 | 0 | | 2.788 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 3.703 | 0 | 3.164 | | 3.294 | 0 | 1.777 | |
| SUPERVISORY PERSONNEL | 2.211 | 0.043 | 0 | | 1.227 | 0.034 | 0 | |
| ENGINEERING PERSONNEL | 1.922 | 1.407 | 3.113 | | 0.46 | 0.526 | 0.448 | |
| TOTAL | 42.219 | 1.45 | 40.683 | 84.352 | 15.771 | 0.56 | 12.614 | 28.945 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 1.881 | 0 | 1.931 | | 0.401 | 0 | 0.48 | |
| OPERATING PERSONNEL | 0.422 | 0 | 0.02 | | 0.135 | 0 | 0.02 | |
| HEALTH PHYSICS PERSONNEL | 1.035 | 0 | 1.194 | | 0.816 | 0 | 0.625 | |
| SUPERVISORY PERSONNEL | 0.302 | 0.4 | 0 | | 0.097 | 0.321 | 0 | |
| ENGINEERING PERSONNEL | 1.411 | 1.208 | 3.708 | | 0.639 | 1.159 | 0.905 | |
| TOTAL | 5.051 | 1.608 | 6.853 | 13.512 | 2.088 | 1.48 | 2.03 | 5.598 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 38.287 | 0 | 20.471 | | 11.148 | 0 | 6.387 | |
| OPERATING PERSONNEL | 2.143 | 0 | 0 | | 0.715 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 2.737 | 0 | 3.78 | | 2.266 | 0 | 2.036 | |
| SUPERVISORY PERSONNEL | 1.04 | 0.456 | 0 | | 0.458 | 0.366 | 0 | |
| ENGINEERING PERSONNEL | 2.4 | 2.829 | 3.131 | | 0.911 | 1.451 | 0.443 | |
| TOTAL | 46.607 | 3.285 | 27.382 | 77.274 | 15.498 | 1.817 | 8.866 | 26.181 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 1.994 | 0 | 0 | | 0.48 | 0 | | |
| OPERATING PERSONNEL | 0 | 0 | 0.16 | | 0 | 0 | 0.159 | |
| HEALTH PHYSICS PERSONNEL | 0.143 | 0 | 0.178 | | 0.114 | 0 | 0.15 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | | |
| ENGINEERING PERSONNEL | 0 | 0.209 | 0.081 | | 0 | 0.073 | 0.089 | |
| TOTAL | 2.137 | 0.209 | 0.419 | 2.765 | 0.594 | 0.073 | 0.398 | 1.065 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0 | 0 | 0 | |
| TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 94.914 | 0 | 60.226 | 155.14 | 25.557 | 0 | 18.195 | 43.752 |
| OPERATING PERSONNEL | 34.97 | 1.14 | 0.623 | 36.733 | 12.283 | 0.407 | 0.618 | 13.308 |
| HEALTH PHYSICS PERSONNEL | 16.481 | 0 | 24.897 | 41.378 | 13.035 | 0 | 11.534 | 24.569 |
| SUPERVISORY PERSONNEL | 9.739 | 1 | 0 | 10.739 | 3.393 | 0.802 | 0 | 4.195 |
| ENGINEERING PERSONNEL | 8.354 | 7 | 12.657 | 28.011 | 2.764 | 4.047 | 3.153 | 9.964 |
| GRAND TOTALS | 164.458 | 9.14 | 98.403 | 272.001 | 57.032 | 5.256 | 33.5 | 95.788 |

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *YANKEE-ROWE TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 1 | 1 | 0 | | 1.067 | 0.495 | 0.035 | |
| OPERATING PERSONNEL | 27 | 0 | 0 | | 10.507 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 12 | 0 | 1 | | 7.03 | 0 | 0.195 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.04 | 0 | 0.06 | |
| ENGINEERING PERSONNEL | 0 | 2 | 0 | | 0.185 | 0.485 | 0.15 | |
| TOTAL | 40 | 3 | 1 | 44 | 18.829 | 0.98 | 0.44 | 20.249 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 21 | 33 | 10 | | 6.402 | 9.25 | 2.765 | |
| OPERATING PERSONNEL | 2 | 0 | 0 | | 0.705 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 7 | 0 | 36 | | 5.345 | 0 | 17.353 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.055 | 0 | 0.025 | |
| ENGINEERING PERSONNEL | 0 | 2 | 0 | | 0.035 | 0.575 | 0.11 | |
| TOTAL | 30 | 35 | 46 | 111 | 12.542 | 9.825 | 20.253 | 42.62 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 9 | 29 | 16 | | 3.423 | 9.345 | 12.708 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.29 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 2 | 0 | 2 | | 2.51 | 0 | 1.025 | |
| SUPERVISORY PERSONNEL | 4 | 0 | 0 | | 4.215 | 0 | 0.005 | |
| ENGINEERING PERSONNEL | 7 | 1 | 0 | | 8.185 | 0.34 | 0.045 | |
| TOTAL | 22 | 30 | 18 | 70 | 18.623 | 9.685 | 13.783 | 42.091 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 16 | 54 | 58 | | 7.63 | 21.91 | 42.703 | |
| OPERATING PERSONNEL | 0 | 0 | 0 | | 0.23 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 3 | 0 | 5 | | 1.205 | 0 | 1.945 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.63 | 0 | 0.015 | |
| ENGINEERING PERSONNEL | 0 | 6 | 0 | | 0.265 | 2.384 | 0.085 | |
| TOTAL | 20 | 60 | 63 | 143 | 9.96 | 24.294 | 44.748 | 79.002 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 0 | 2 | 0 | | 0.485 | 1.36 | 0.045 | |
| OPERATING PERSONNEL | 8 | 0 | 0 | | 4.525 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 5 | 0 | 25 | | 7.09 | 0 | 9.65 | |
| SUPERVISORY PERSONNEL | 0 | 0 | 0 | | 0.01 | 0 | 0.01 | |
| ENGINEERING PERSONNEL | 0 | 0 | 0 | | 0.06 | 0.045 | 0.04 | |
| TOTAL | 13 | 2 | 25 | 40 | 12.17 | 1.405 | 9.745 | 23.32 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 19 | 56 | 6 | | 5.433 | 19.843 | 1.88 | |
| OPERATING PERSONNEL | 27 | 0 | 0 | | 9.265 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 2 | 0 | 13 | | 0.515 | 0.015 | 4.47 | |
| SUPERVISORY PERSONNEL | 3 | 0 | 0 | | 0.725 | 0 | 0.105 | |
| ENGINEERING PERSONNEL | 4 | 4 | 4 | | 0.89 | 1.197 | 1.846 | |
| TOTAL | 55 | 60 | 23 | 138 | 16.828 | 21.055 | 8.301 | 46.184 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 66 | 175 | 90 | 331 | 24.44 | 62.203 | 60.136 | 146.779 |
| OPERATING PERSONNEL | 64 | 0 | 0 | 64 | 25.522 | 0 | 0 | 25.522 |
| HEALTH PHYSICS PERSONNEL | 31 | 0 | 82 | 113 | 23.695 | 0.015 | 34.638 | 58.348 |
| SUPERVISORY PERSONNEL | 8 | 0 | 0 | 8 | 5.675 | 0 | 0.22 | 5.895 |
| ENGINEERING PERSONNEL | 11 | 15 | 4 | 30 | 9.62 | 5.026 | 2.276 | 16.922 |
| GRAND TOTALS | 180 | 190 | 176 | 546 | 88.952 | 67.244 | 97.27 | 253.466 |

*Workers may be counted in more than one category.

# NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1985

PLANT: *ZION TYPE: PWR

| WORK AND JOB FUNCTION | NUMBER OF PERSONNEL (>100 mREM) STATION | UTILITY | CONTRACT | TOTAL | TOTAL PERSON-REM STATION | UTILITY | CONTRACT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| REACTOR OPS & SURV | | | | | | | | |
| MAINTENANCE PERSONNEL | 10 | 0 | 14 | | 1.615 | 0 | 6.718 | |
| OPERATING PERSONNEL | 62 | 0 | 7 | | 16.992 | 0 | 2.821 | |
| HEALTH PHYSICS PERSONNEL | 9 | 0 | 2 | | 6.551 | 0 | 1.436 | |
| SUPERVISORY PERSONNEL | 10 | 0 | 0 | | 0.753 | 0 | 0 | |
| ENGINEERING PERSONNEL | 4 | 0 | 4 | | 0.307 | 0 | 0.227 | |
| TOTAL | 95 | 0 | 27 | 122 | 26.218 | 0 | 11.202 | 37.42 |
| ROUTINE MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 81 | 0 | 616 | | 113.914 | 0 | 301.228 | |
| OPERATING PERSONNEL | 41 | 0 | 0 | | 11.991 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 27 | 0 | 140 | | 27.332 | 0 | 106.596 | |
| SUPERVISORY PERSONNEL | 58 | 0 | 0 | | 29.66 | 0 | 0 | |
| ENGINEERING PERSONNEL | 53 | 0 | 280 | | 20.991 | 0 | 36.908 | |
| TOTAL | 260 | 0 | 1036 | 1296 | 203.888 | 0 | 444.732 | 648.62 |
| IN-SERVICE INSPECTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 7 | 0 | 211 | | 0.961 | 0 | 103.792 | |
| OPERATING PERSONNEL | 2 | 0 | 0 | | 0.488 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 1 | 0 | 9 | | 0.032 | 0 | 9.672 | |
| SUPERVISORY PERSONNEL | 7 | 0 | 0 | | 0.563 | 0 | 0 | |
| ENGINEERING PERSONNEL | 16 | 0 | 19 | | 6.566 | 0 | 4.642 | |
| TOTAL | 33 | 0 | 239 | 272 | 8.61 | 0 | 118.106 | 126.716 |
| SPECIAL MAINTENANCE | | | | | | | | |
| MAINTENANCE PERSONNEL | 1 | 145 | 23 | | 0.01 | 10.737 | 10.094 | |
| OPERATING PERSONNEL | 25 | 0 | 0 | | 6.418 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 3 | 0 | 1 | | 1.46 | 0 | 0.034 | |
| SUPERVISORY PERSONNEL | 1 | 0 | 0 | | 0.004 | 0 | 0 | |
| ENGINEERING PERSONNEL | 4 | 231 | 7 | | 0.67 | 2.868 | 0.634 | |
| TOTAL | 34 | 376 | 31 | 441 | 8.562 | 13.605 | 10.762 | 32.929 |
| WASTE PROCESSING | | | | | | | | |
| MAINTENANCE PERSONNEL | 18 | 0 | 301 | | 25.817 | 0 | 146.644 | |
| OPERATING PERSONNEL | 3 | 0 | 0 | | 0.615 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 1 | 0 | 8 | | 0.266 | 0 | 9.838 | |
| SUPERVISORY PERSONNEL | 15 | 0 | 0 | | 5.141 | 0 | 0 | |
| ENGINEERING PERSONNEL | 13 | 0 | 0 | | 5.24 | 0 | 0 | |
| TOTAL | 50 | 0 | 309 | 359 | 37.079 | 0 | 156.482 | 193.561 |
| REFUELING | | | | | | | | |
| MAINTENANCE PERSONNEL | 39 | 0 | 7 | | 47.507 | 0 | 2.939 | |
| OPERATING PERSONNEL | 7 | 0 | 0 | | 3.323 | 0 | 0 | |
| HEALTH PHYSICS PERSONNEL | 2 | 0 | 5 | | 1.189 | 0 | 2.09 | |
| SUPERVISORY PERSONNEL | 14 | 0 | 0 | | 7.234 | 0 | 0 | |
| ENGINEERING PERSONNEL | 8 | 0 | 1 | | 2.815 | 0 | 0.061 | |
| TOTAL | 70 | 0 | 13 | 83 | 62.068 | 0 | 5.09 | 67.158 |
| TOTAL BY JOB FUNCTION | | | | | | | | |
| MAINTENANCE PERSONNEL | 156 | 145 | 1172 | 1473 | 189.824 | 10.737 | 571.415 | 771.976 |
| OPERATING PERSONNEL | 140 | 0 | 7 | 147 | 39.827 | 0 | 2.821 | 42.648 |
| HEALTH PHYSICS PERSONNEL | 43 | 0 | 165 | 208 | 36.83 | 0 | 129.666 | 166.496 |
| SUPERVISORY PERSONNEL | 105 | 0 | 0 | 105 | 43.355 | 0 | 0 | 43.355 |
| ENGINEERING PERSONNEL | 98 | 231 | 311 | 640 | 36.589 | 2.868 | 42.472 | 81.929 |
| GRAND TOTALS | 542 | 376 | 1655 | 2573 | 346.425 | 13.605 | 746.374 | 1106.404 |

*Workers may be counted in more than one category.

# APPENDIX E

## Summary of Annual Whole Body Dose Distributions by Year and Reactor Type

## 1981-1985

# APPENDIX E*
# SUMMARY OF ANNUAL WHOLE BODY DOSE DISTRIBUTIONS BY YEAR AND REACTOR TYPE
# 1981-1985

| YEAR AND REACTOR TYPE | Number of Individuals with Whole Body Doses in the Ranges (rems or cSv) | | | | | | | | | | | | | | | | | TOTAL NUMBER MONI-TORED | NUMBER WITH MEAS. EXPOSURE | COLLEC-TIVE DOSE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No Meas-urable | 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 | 4.0-5.0 | 5-6.0 | 6-7.0 | 7-8.0 | 8-9.0 | 9-10 | 10-12 | >12 | | | |
| 1985 - BWR's | 22,061 | 14,446 | 5,957 | 5,218 | 3,107 | 2,295 | 4,973 | 1,731 | 468 | 42 | | | | | | | | 60,298 | 38,237 | 20,572 |
| 1985 - PWR's | 42,409 | 25,545 | 8,158 | 6,761 | 4,107 | 2,602 | 5,584 | 1,586 | 248 | 42 | | | | | | | | 97,042 | 54,633 | 22,470 |
| 1985 - LWR's | 64,470 | 39,991 | 14,115 | 11,979 | 7,214 | 4,897 | 10,557 | 3,317 | 716 | 84 | | | | | | | | 157,340 | 92,870 | 43,042 |
| 1984 - BWR's | 21,741 | 14,997 | 6,165 | 4,907 | 3,033 | 2,398 | 5,679 | 2,714 | 994 | 218 | | | | | | | | 62,846 | 41,105 | 27,074 |
| 1984 - PWR's | 37,875 | 24,887 | 8,599 | 6,585 | 4,133 | 2,998 | 6,774 | 2,253 | 681 | 77 | | | | | | | | 94,862 | 56,987 | 28,140 |
| 1984 - LWR's | 59,616 | 39,884 | 14,764 | 11,492 | 7,166 | 5,396 | 12,453 | 4,967 | 1,675 | 295 | | | | | | | | 157,708 | 98,092 | 55,214 |
| 1983 - BWR's | 17,721 | 10,475 | 4,317 | 4,036 | 2,607 | 1,925 | 5,659 | 2,890 | 1,252 | 299 | 63 | 16 | 4 | | | | | 51,264 | 33,543 | 27,455 |
| 1983 - PWR's | 33,350 | 21,425 | 7,894 | 6,260 | 3,863 | 2,783 | 6,512 | 2,421 | 698 | 315 | 2 | | | | | | | 85,523 | 52,173 | 29,016 |
| 1983 - LWR's | 51,071 | 31,900 | 12,211 | 10,296 | 6,470 | 4,708 | 12,171 | 5,311 | 1,950 | 544 | 65 | 16 | 4 | | | | | 136,717 | 85,646 | 56,471 |
| 1982 - BWR's | 15,661 | 9,944 | 4,431 | 4,403 | 2,839 | 2,046 | 4,794 | 2,358 | 1,183 | 230 | 7 | | | | | | | 47,896 | 32,235 | 24,437 |
| 1982 - PWR's | 29,232 | 21,536 | 8,262 | 6,411 | 3,900 | 2,749 | 6,061 | 2,328 | 631 | 202 | 49 | 13 | 4 | 0 | 1 | | | 81,379 | 52,147 | 27,753 |
| 1982 - LWR's | 44,893 | 31,480 | 12,693 | 10,814 | 6,739 | 4,795 | 10,855 | 4,686 | 1,814 | 432 | 56 | 13 | 4 | 0 | 1 | | | 129,275 | 84,382 | 52,190 |
| 1981 - BWR's | 15,345 | 11,130 | 4,869 | 4,536 | 2,939 | 2,326 | 5,373 | 2,485 | 911 | 224 | 32 | 4 | 2 | 0 | 0 | 0 | 1 | 50,177 | 34,832 | 25,471 |
| 1981 - PWR's | 26,978 | 18,202 | 7,348 | 5,790 | 3,686 | 2,577 | 6,393 | 2,061 | 882 | 262 | 61 | 77 | 9 | 2 | 1 | | | 74,329 | 47,351 | 28,671 |
| 1981 - LWR's | 42,323 | 29,332 | 12,217 | 10,326 | 6,625 | 4,903 | 11,766 | 4,546 | 1,793 | 486 | 93 | 81 | 11 | 2 | 1 | 0 | 1 | 124,506 | 82,183 | 54,142 |

* Figures contained herein are uncorrected for multiple reporting of transient individuals.

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13. ABSTRACT (200 words or less)

This report summarizes the occupational radiation exposure information that has been reported to the NRC's Radiation Exposure Information Reporting System (REIRS) by nuclear power facilities and certain other categories of NRC licensees during the years 1969 through 1985. The bulk of the data presented in the report was obtained from annual radiation exposure reports submitted in accordance with the requirements of 10 CFR 20.407. Data on workers terminating their employment at certain NRC licensed facilities were obtained from reports submitted pursuant to 10 CFR 20.408. The 1985 annual reports submitted by about 500 licensees indicated that approximately 216,000 individuals were monitored, 94,000 of whom were monitored by nuclear power facilities. They incurred an average individual dose of 0.22 rem (cSv) and an average measureable dose of 0.43 rem (cSv). Termination radiation exposure reports were analyzed to reveal that about 77,300 individuals completed their employment with one or more of the 500 covered licensees during 1984. Some 73,200 of these individuals terminated from power reactor facilities, and about 7,400 of them were considered to be transient workers who received an average dose of 1.05 rem (cSv).

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