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Occupational Radiation Exposure at Commercial Nuclear Power Reactors And Other Facilities 1984

Seventeenth Annual Report

U.S. Nuclear Regulatory Commission

Office of Nuclear Regulatory Research

B. G. Brooks

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Division of Regulatory Applications
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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 Vol. 1 Occupational Radiation Exposure at Commercial Nuclear Power Reactors, 1979, U.S. Nuclear Regulatory Commission, March 1981.

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

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

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

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

Previous reports in the NUREG-0714 series, which will now be 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 Reports 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 Vol. 1 Twelfth Annual Occupational Radiation Exposure Report for 1979, U.S. Nuclear Regulatory Commission, August 1982.

NUREG-0714 Vols. 2 and 3 Occupational Radiation Exposure, Thirteenth and Fourteenth Annual Reports, 1980 and 1981, U.S. Nuclear Regulatory Commission, October 1983.

NUREG-0714 Vols. 4 and 5 Occupational Radiation Exposure, Fifteenth and Sixteenth Annual Reports, 1982 and 1983, U.S. Nuclear Regulatory Commission, October 1985.

EDITOR'S NOTE

For the past 10 years, the NRC has published two annual reports that summarized occupational radiation exposure data reported by certain types of NRC licensees. Each report has kept its same report number since 1979. NUREG-0713, Vols. 1 through 5, contained data reported by commercial nuclear power facilities only. NUREG-0714, Vols. 1 through 5, contained exposure information reported by several different types of NRC licensees. As a cost-reduction measure, these two reports are now being combined into one document, NUREG-0713, Vol. 6. From this time forward, the data that would have been presented in NUREG-0714 will be contained in subsequent volumes of NUREG-0713; additional volumes of NUREG-0714 will not be published. It is hoped that this change will not cause any confusion.

ABSTRACT

This report summarizes the occupational exposure data that are maintained in the U.S. Nuclear Regulatory Commission's Radiation Exposure Information and Reports System (REIRS). The bulk of the information contained in the report was extracted from the 1984 annual statistical reports submitted by seven categories* of NRC licensees subject to the reporting requirements of 10 CFR §20.407. These seven categories of licensees also submit personal identification and exposure information for terminating employees pursuant to 10 CFR §20.408, and some analysis of these "termination" data are also presented in this report.

Annual reports for 1984 were received from a total of 504 NRC licensees, 88 of whom were licensed nuclear power reactors. Compilations of these reports indicated that some 193,200 individuals were monitored, 108,500 of whom received a measurable dose. The collective dose incurred by these individuals was calculated to be 59,400 person-rems (person-cSv)** which represents a slight (4%) increase over the 1983 value. Since the number of workers receiving a measurable dose increased by 13%, the average measurable dose decreased to 0.55 rem (cSv).

About 20% of the monitored individuals were found to have received doses greater than 0.50 rem (cSv) as had been the case in the previous three years. However, the number of individuals receiving doses greater than five rems (cSv) continued to decrease.

Some 230,000 termination reports were submitted to the NRC which contained personal identification and exposure information for about 67,500 individuals who had completed their work assignment or employment with a covered category of NRC licensees during 1984. This is about the same as the number of persons terminating during each of the previous two years. The total number of monitored individuals for whom personal identification and exposure information has been incorporated into REIRS during the 16 years that it has been operating is now about 350,000, some 300,000 of whom terminated from nuclear power facilities.

Analyses of these data indicate that about 6,000 individuals completed work assignments at two or more nuclear reactor facilities during calendar year 1984 and received an average dose of 0.91 rem (cSv). Approximately 2,000 of these individuals worked at two or more reactor facilities during one calendar quarter and received an average dose of 0.40 rem (cSv). Both averages declined somewhat from those found for 1983. However, these figures may have to be revised because the termination data for about 15% of the individuals terminating during 1984 or 1983 were not computerized by the date of this publication.

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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; 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.

PREFACE

A number of NRC Licensees have inquired 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 permit evaluation of the radiological risk associated with certain categories of NRC-licensed activities, including the size of the workforce and the collective dose.

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

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

5. The data are considered in reviews of inspection frequencies that are programmed for various categories of licensees.

6. The data may influence licensing action decisions.

7. The data are used for comparative analyses of radiation protection performance: US/foreign, BWRs/PWRs, civilian/military, plant/plant, nuclear industry/other industries, etc.

8. The data are used for justification of the expenditure of resources in the annual budget process.

9. 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?).

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

11. The data help in the evaluation of the effectiveness of dose-reduction measures (e.g., methods for reducing individuals' doses that may increase the collective dose).

12. 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.

13. The data provide information that can 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
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TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF TABLES

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

LIST OF FIGURES

TABLE OF CONTENTS (Continued)

Occupational Radiation Exposure
at Commercial Nuclear Power Reactors and Other Facilities
Seventeenth Annual Report, 1984

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 and Environmental Safety at Germantown, Maryland.

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*Commercial nuclear power reactors; industrial radiographers; fuel processors, fabricators, and reprocessors; and 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 its 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 Service, 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 less than the midpoint. Thus, the collective doses presented in this report may be 10% higher than the sum of the actual individual doses.

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 is provided in Section 5.

Another fact that should be kept in mind before drawing any conclusions from the annual statistical data is that all of the personnel included in the reports 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.

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 eighteen dose ranges specified by 10 CFR § 20.407(b) among which the doses are to be 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.

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 collective dose is used in this report to mean 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 submitted pursuant to 10 CFR § 20.407, but NRC staff

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†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-rems become person-cSv.

*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.

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 their § 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 others' 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 for 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 licenses; 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 1984.

Table 3.1
ANNUAL EXPOSURE DATA FOR CERTAIN CATEGORIES OF LICENSEES
1973 - 1984

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	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	5,489	2,652	0.27	0.48	0.48
	1980	292	11,102	6,556	2,979	0.27	0.45	0.57
	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
	1975	291	9,178	4,693	2,796	0.30	0.60	0.53
	1974	319	8,792	4,943	2,938	0.33	0.59	0.51
	1973	341	8,206	5,328	3,354	0.41	0.63	
Manufacturing and Distribution	1984	38	5,009	1,932	642	0.13	0.33	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
	1975	19	3,367	1,859	1,188	0.35	0.64	0.64
	1974	24	3,340	1,827	1,050	0.31	0.57	0.63
	1973	34	4,251	1,925	1,177	0.28	0.61	
Low-Level Waste Disposal	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 Fuel Storage	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	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
	1975	24	11,614	5,602	3,175	0.27	0.57	0.54
	1974	26	11,064	4,728	2,836	0.26	0.60	0.61
	1973	27	10,610	5,056	2,400	0.23	0.47	
**Commercial Light Water Reactors	1984	88	169,242*	94,996*	55,353	0.32	0.58	0.55
	1983	80	139,895*	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
	1975	54	54,763	28,034	21,270	0.39	0.76	0.64
	1974	53	62,044	21,904	14,083	0.23	0.64	0.62
	1973	41	44,795	16,558	14,337	0.32	0.87	
Grand Totals and Averages	1984	504	193,154*	108,475*	59,392	0.30	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
	1975	388	78,922	40,188	28,429	0.36	0.71	0.62
	1974	422	85,240	33,402	20,907	0.25	0.63	0.60
	1973	443	67,862	28,867	21,268	0.31	0.74	

+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, but excludes the gas-cooled reactor.

3.2 Annual Whole Body Dose Distributions

Table 3.2 is a compilation of the statistical summary reports submitted by six categories of licensees. One can see that in nearly every category some 40%-70% of the doses are less than measurable. About 90% of the reported individuals were monitored by nuclear power facilities where they received about 90% of the total collective dose in 1984.

The "Adjusted Total" shown in Table 3.2 for the dose distribution of individuals monitored by commercial power reactors in 1984 reflects corrections that were made to the compilation of the annual reports to account for the counting of transient workers more than one time. This adjusted total was also used in the calculation of the "Grand Total" at the bottom of the table. Further discussion of the data and methodology used in making these corrections is given in Section 5.

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 overexposure 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 during the past 16 years is presented in Table 3.3. About 95% of the exposures have consistently remained less than two rems (cSv), and 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 last three years.

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, aircraft and ship parts, and other high-stress alloy parts. Some firms are licensed to conduct such activities in one location, usually in a plant, and others perform radiography at multiple sites in the field. As shown in Table 3.1, annual reports were received for 361 radiography licenses in 1984, which is about the same number as reported in 1982 and 1983.

Table 3.2
DISTRIBUTION OF ANNUAL WHOLE BODY DOSES BY LICENSE CATEGORY
1984

LICENSE CATEGORY	Number of Individuals with Whole Body Doses in the Following Ranges (Rems or cSv)																	Total Number Monitored	Number with Measurable Dose	Total Collective Dose (person-rems/person-cSv)
	No Measurable Exposure	Measurable but <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	10.0–11.0 & 10.0–12.0	>12.0			
INDUSTRIAL RADIOGRAPHY																				
Single Location	1,077	432	118	68	19	11	31	18	3	1								1,778	701	196
Multiple Locations	1,935	2,160	713	596	345	263	443	125	64	23	8	2	0	0	1	2	0	6,680	4,745	2,294
Total	3,012	2,592	831	664	364	274	474	143	67	24	8	2	0	0	1	2	0	8,458	5,446	2,490
MANUFACTURING & DISTRIB.																				
Broad	2,909	1,093	192	122	77	51	111	45	24	1								4,625	1,716	594
Other	168	110	60	25	9	4	6	2										384	216	48
Total	3,077	1,203	252	147	86	55	117	47	24	1								5,009	1,932	642
LOW-LEVEL WASTE DISPOSAL																				
Total	628	174	49	31	15	13	15											925	297	72
INDEP. SPENT FUEL STORAGE																				
Total	0	6	11	4	4	6	1											32	32	13
FUEL FABRICATION																				
Uranium Fuel Process.	3,632	4,121	823	399	262	98	44											9,379	5,747	815
Decommiss. of U and Pu Fuel Facilities	84	15	8	2														109	25	3
Total	3,716	4,136	831	401	262	98	44											9,488	5,772	818
****COMMERCIAL POWER REACT.**																				
Boiling Water Reactors	30,316	15,698	6,267	4,953	3,040	2,399	5,679	2,714	994	218								72,278	41,962	27,146
Press. Water Reactors	47,985	26,091	8,612	6,589	4,133	2,998	6,774	2,253	681	77								106,193	58,208	28,207
High Temp. Gas Reactors	1,616	62	8															1,686	70	3
Total	79,917	41,851	14,887	11,542	7,173	5,397	12,453	4,967	1,675	295								180,157	100,240	55,356
Adjusted Total	75,862	39,404	13,964	10,693	6,631	4,998	11,806	5,182	1,997	380	9	2						170,928	95,066	55,356
†GRAND TOTALS	86,295	47,515	15,938	11,940	7,362	5,444	12,457	5,372	2,088	405	17	4	0	0	1	2	0	194,840	108,545	59,391

*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 are adjusted to account for the multiple counting of transient reactor workers, but the adjustment may not be complete because all of the 1984 termination data have not been computerized.

Table 3.3

SUMMARY OF ANNUAL DOSE DISTRIBUTIONS
FOR CERTAIN NRC LICENSEES

1968-1984

Year	Total Number of Monitored Persons Compiled Number	(Adjusted* 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		95.3%	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	204,069	(194,840)**	95.91*	0.1%*	0

*Based on the distribution of individual doses after adjusting for the multiple counting of transient reactor workers (see Section 5).
**The termination data for about 15% of the individuals terminating during 1983 or 1984 have not been entered into the REIR System.

Table 3.4 summarizes the reported data for the two types of radiography licenses for 1984 and for the previous two years for comparison purposes. The table shows that both the number of workers (701) receiving measurable doses and the collective dose (196) of workers at the single-location facilities decreased by about 9%. This resulted in the average measurable dose remaining at 0.28 rem (cSv). The number of workers at firms having multiple-location licenses increased by about 8% while the collective dose increased only about 6%. This resulted in the average measurable dose decreasing slightly to 0.48 rem (cSv). Overall, one finds that the average measurable dose for radiography workers continues to remain at about 0.50 rem (cSv), as it has for the last eight years, and that 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 1984 is presented in alphabetical order in Appendix A.

Table 3.4

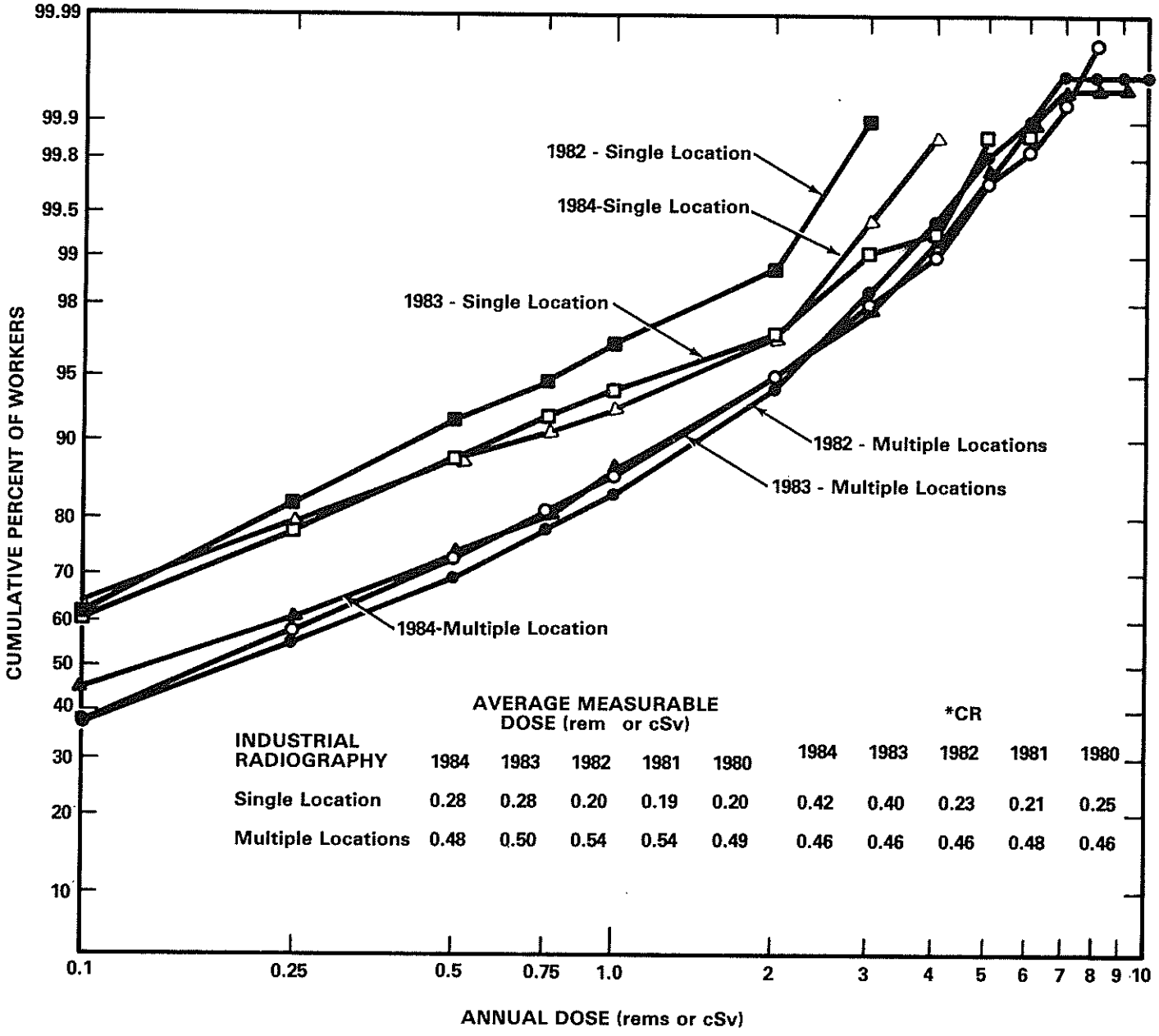
ANNUAL EXPOSURE INFORMATION FOR INDUSTRIAL RADIOGRAPHERS
1982-1984

Type of License	Year	No. of Licen-ses	Number of Monitored Individuals	Workers with Measurable Doses	Collective Dose (person-rems or person-cSv)	Average Measurable Dose (rems or cSv)
Single location		129	1,778	701	196	0.28
Multiple locations	1984	232	6,680	4,745	2,294	0.48
Total		361	8,458	5,446	2,490	0.46
Single location		128	1,714	773	213	0.28
Multiple locations	1983	210	6,910	4,358	2,171	0.50
Total		338	8,624	5,131	2,384	0.46
Single location		126	1,977	942	187	0.20
Multiple locations	1982	227	7,258	5,218	2,811	0.54
Total		353	9,235	6,160	2,998	0.49

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 the data. 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, 1983, and 1984. 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 workers at multiple-location facilities, form fairly straight lines and usually lie above those of the multiple-location facilities. One feature of these types of graphs is that several comparisons of various dose distributions can be quickly made. For example, one can easily see that in 1984 about 85% of the workers monitored by firms licensed for radiography at multiple locations received doses that were less than one rem (cSv), while some 92% 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. For example, the position of the 1983 and 1984 plot of the dose distribution of workers at single-location facilities below that of the 1982 plot indicates an increase in the average dose and in CR (as shown at the bottom of the graph). This is due to the fact that there were more workers with doses that exceeded three rems (cSv) in 1983 and 1984. The 1984 plot of the multiple-location licensees is quite close to those for 1982 and 1983, and one finds similar average doses and values of CR each year.

*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 on a logarithmic scale.

Figure 3.1
ANNUAL DOSE DISTRIBUTION OF WORKERS
AT INDUSTRIAL RADIOGRAPHY FACILITIES
1982-1984



INDUSTRIAL RADIOGRAPHY	AVERAGE MEASURABLE DOSE (rem or cSv)					*CR				
	1984	1983	1982	1981	1980	1984	1983	1982	1981	1980
Single Location	0.28	0.28	0.20	0.19	0.20	0.42	0.40	0.23	0.21	0.25
Multiple Locations	0.48	0.50	0.54	0.54	0.49	0.46	0.46	0.46	0.48	0.46

*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 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

These licenses are issued to allow the manufacture and distribution of radionuclides in various forms for a number of diverse purposes. Broad licenses are issued to large facilities having a comprehensive radiological protection program, and 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 1984 and the previous two years. The total number of workers receiving measurable doses as reported by these types of licensees continued to decline somewhat to 1,932 workers in 1984. The collective dose decreased by about 22% or 200 person-rems (person-cSv), and the average dose declined to 0.33 rem (cSv). This reduction was primarily due to the fact that one fairly large broad-scope licensee ceased its manufacturing and distribution activities. 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. 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 1984.

Table 3.5

ANNUAL EXPOSURE INFORMATION FOR MANUFACTURERS AND DISTRIBUTORS
1982-1984

Type of License	Year	No. of Licen-sees	Number of Monitored Individuals	Workers with Measurable Doses	Collective Dose (person-rems or person-cSv)	Average Measurable Dose (rems or cSv)
M & D-Broad		13	4,625	1,716	594	0.35
M & D-Other	1984	25	384	216	48	0.22
Total		38	5,009	1,932	642	0.33
M & D-Broad		16	4,332	1,744	767	0.44
M & D-Other	1983	17	719	259	57	0.22
Total		33	5,051	2,003	824	0.41
M & D-Broad		18	4,610	1,892	821	0.43
M & D-Other	1982	16	843	307	69	0.22
Total		34	5,453	2,199	890	0.40

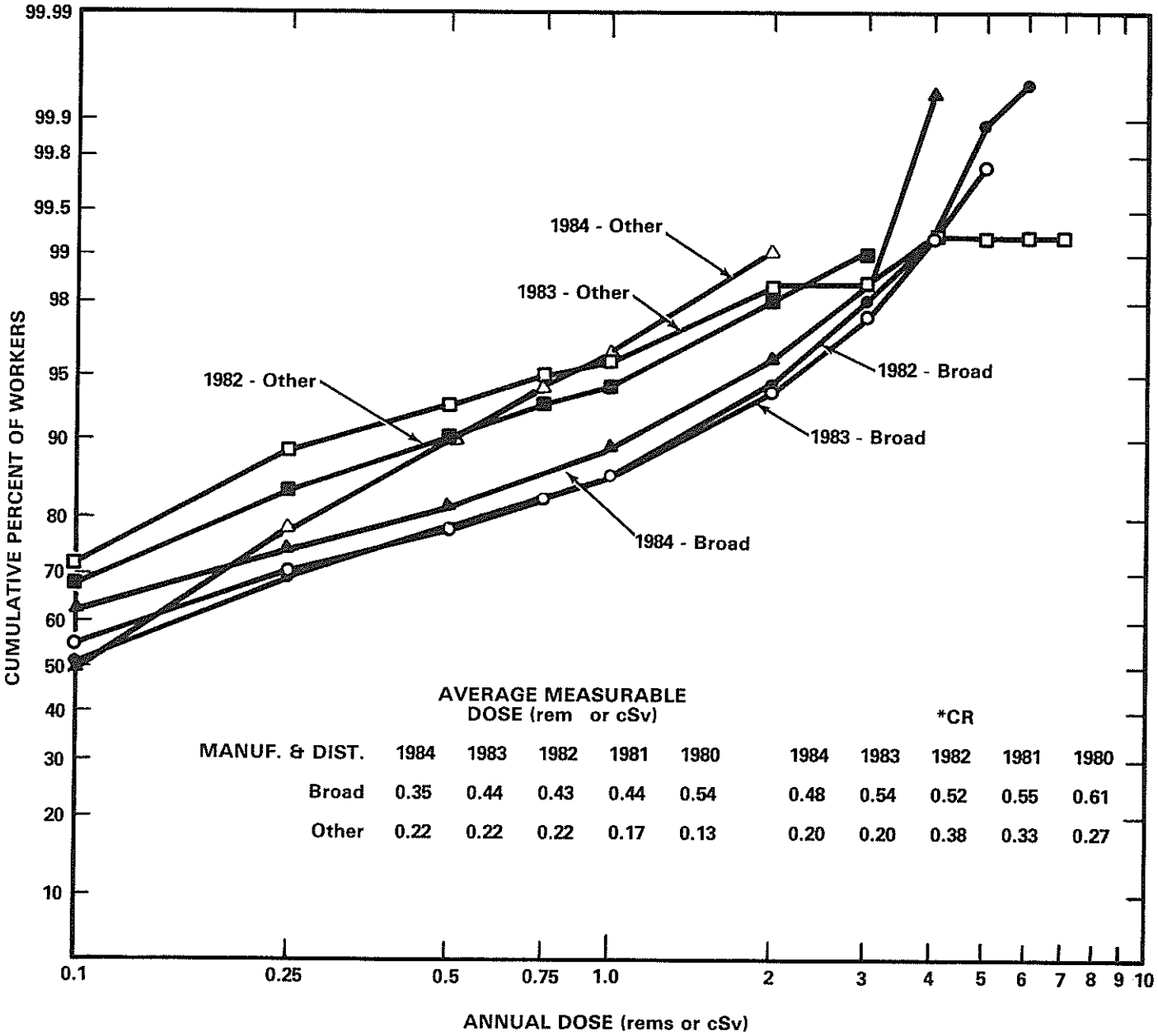
Figure 3.2 displays log probability plots of the doses incurred by workers under the two types of manufacturing and distribution licenses for the years 1982 through 1984. The position of the curves plotted for the other licenses above those plotted for the broad licenses indicates that a larger portion 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 86% of workers monitored by the broad licensees received doses that were less than one rem (cSv), while about 95% of the workers monitored by the other licensees received such doses in 1984.

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 equipment to pick up wastes from such places as hospitals and laboratories, and transport them to a proper facility for storage and burial.

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, while in 1982 and 1983 there was only one licensee in this category. Table 3.1 summarizes the data reported for 1982 through 1984. In 1984, the total number of monitored individuals increased because a second licensee

Figure 3.2
ANNUAL DOSE DISTRIBUTION OF WORKERS
AT MANUFACTURING & DISTRIBUTION FACILITIES
1982-1984



	AVERAGE MEASURABLE DOSE (rem or cSv)					*CR				
MANUF. & DIST.	1984	1983	1982	1981	1980	1984	1983	1982	1981	1980
Broad	0.35	0.44	0.43	0.44	0.54	0.48	0.54	0.52	0.55	0.61
Other	0.22	0.22	0.22	0.17	0.13	0.20	0.20	0.38	0.33	0.27

*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.

was included in this category. However, the collective dose, 72 person-rems (person-cSv), remained about the same as that found for 1983 because the collective dose calculated for the one licensee that reported in 1983 declined by about the same amount as that calculated for the licensee included for the first time in 1984. The number of workers receiving measurable doses also decreased slightly so that the average measurable dose rose somewhat to 0.24 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 1984. One can quickly see that the distributions are quite similar, with all of the doses being less than two rems (cSv) and about 90% of the doses being less than 0.75 rem (cSv) each year. However, the position of the plot for 1984 below that for 1983 is indicative of the slight increase in the average dose and CR. Appendix A summarizes the exposure information reported by these licensees in 1984.

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.

Table 3.1 summarizes the data submitted for 1982 through 1984 by the only licensed ISFSI. Only about 35 individuals have been monitored at the facility each year. However, in 1984 the collective dose increased by about 50% to a value of 13 person-rems (person-cSv). The average measurable dose also increased from 0.30 rem (cSv) to 0.41 rem (cSv). These increases were primarily due to a significant increase in the amount of incoming spent fuel in 1984.

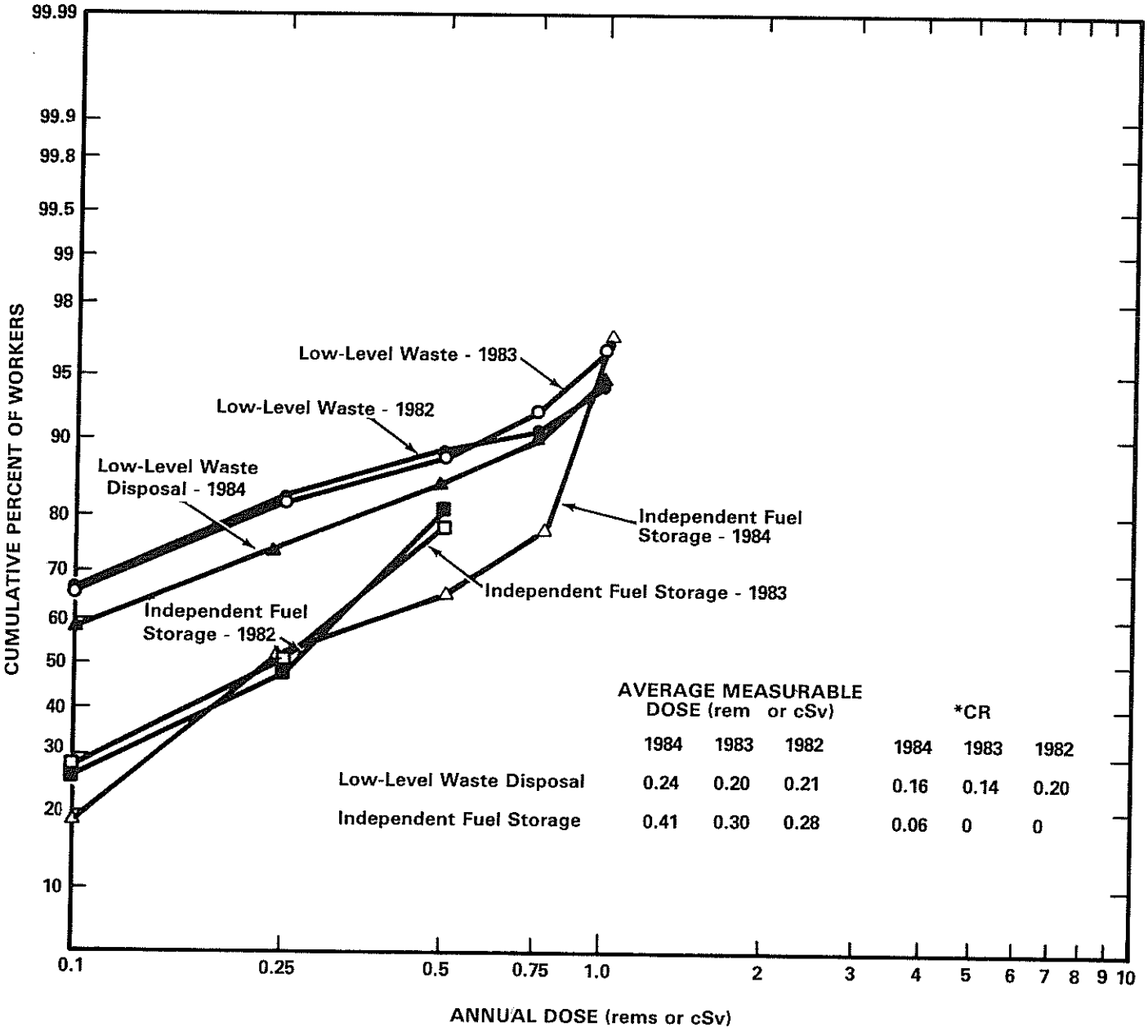
Figure 3.3 displays log probability plots of the doses incurred by workers at the ISFSI for the years 1982 through 1984. The plots are quite similar for 1982 and 1983 when all doses were less than 0.75 rem so the value of CR was zero each year. The plot of the 1984 data lies below that of the previous two years, which indicates that there were doses in higher ranges than before, but all doses were less than 2 rems (cSv) as reflected in the low value (0.06) of CR.

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 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 are primarily engaged in decommissioning activities,

Figure 3.3
ANNUAL DOSE DISTRIBUTION OF WORKERS AT LOW-LEVEL WASTE DISPOSAL FACILITIES AND AT AN INDEPENDENT SPENT FUEL STORAGE FACILITY
1982-1984



	AVERAGE MEASURABLE DOSE (rem or cSv)			*CR		
	1984	1983	1982	1984	1983	1982
Low-Level Waste Disposal	0.24	0.20	0.21	0.16	0.14	0.20
Independent Fuel Storage	0.41	0.30	0.28	0.06	0	0

*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.

and the information that they provided for these years is shown as "Pu Decommissioning" in Table 3.6.

Table 3.6

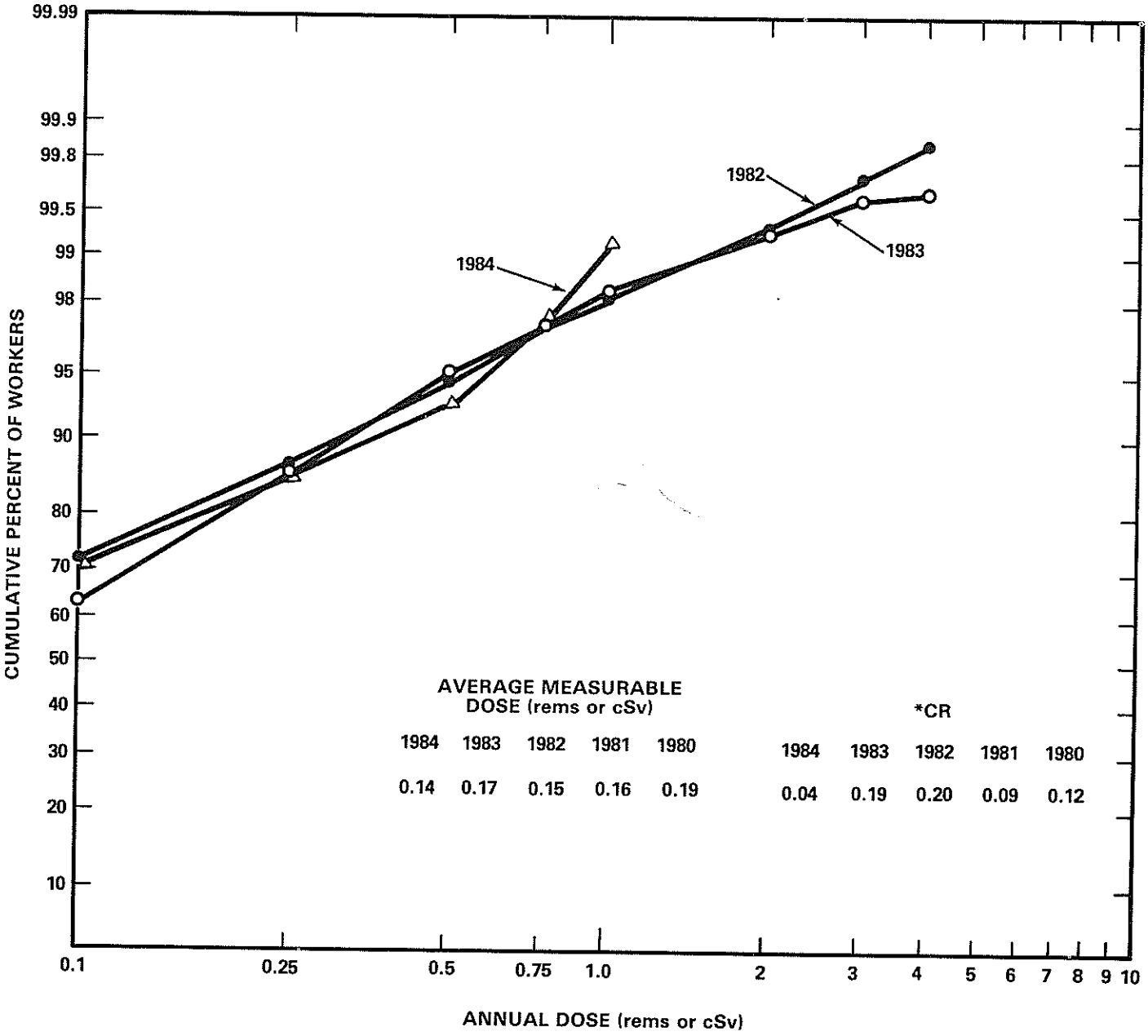
ANNUAL EXPOSURE INFORMATION FOR FUEL FABRICATORS
1982-1984

Type of License	Year	No. of Licensees	Number of Monitored Individuals	Workers with Measurable Doses	Collective Dose (person-rems or person-cSv)	Average Measurable Dose(rems or cSv)
Uranium Fuel Fab		11	9,379	5,947	815	0.14
Pu Decommissioning	1984	3	109	25	3	0.12
Total		14	9,488	5,772	818	0.14
Uranium Fuel Fab		11	8,440	4,746	748	0.16
Pu Decommissioning	1983	4	583	267	87	0.33
Total		15	9,023	5,013	835	0.17
Uranium Fuel Fab		11	8,652	5,117	724	0.14
Pu Decommissioning	1982	5	1,156	316	107	0.34
Total		16	9,808	5,433	831	0.15

Table 3.6 shows that the number of workers involved in decommissioning activities decreased sharply in 1984, as did the collective dose. The major reason for this is that there was one licensee involved in both decommissioning activities and the analysis of post-irradiated fuel in 1982 and 1983. The decommissioning is now complete and the licensee is no longer included in the fuel fabrication category. However, it should be pointed out that three of the eleven licensees primarily engaged in uranium fuel fabrication in 1982 and 1983 were also involved in the decommissioning of plutonium facilities, and the report submitted by each one covered both activities. Therefore, for comparison with data submitted for previous years, the data in the "Total" row should be used because decommissioning activities were also being conducted during previous years and were not shown separately. Appendix A lists the number of persons monitored, the number of workers receiving measurable doses, and the collective dose for each of these licensees in alphabetical order by licensee name for 1984.

Figure 3.4 consists of the log probability plots of the dose distributions of workers at fuel fabrication facilities for the years 1982 through 1984. The plots for 1982 and 1983 are quite similar, with all doses being less than five rems (cSv) and about 99.3% 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, there were no doses greater than two rems (cSv) so that the value of CR fell to 0.04.

Figure 3.4
ANNUAL DOSE DISTRIBUTION OF WORKERS
AT FUEL FABRICATORS AND PROCESSORS
1982-1984



AVERAGE MEASURABLE DOSE (rems or cSv)					*CR				
1984	1983	1982	1981	1980	1984	1983	1982	1981	1980
0.14	0.17	0.15	0.16	0.19	0.04	0.19	0.20	0.09	0.12

*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.

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 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 Water-Cooled Power Reactor Licenses

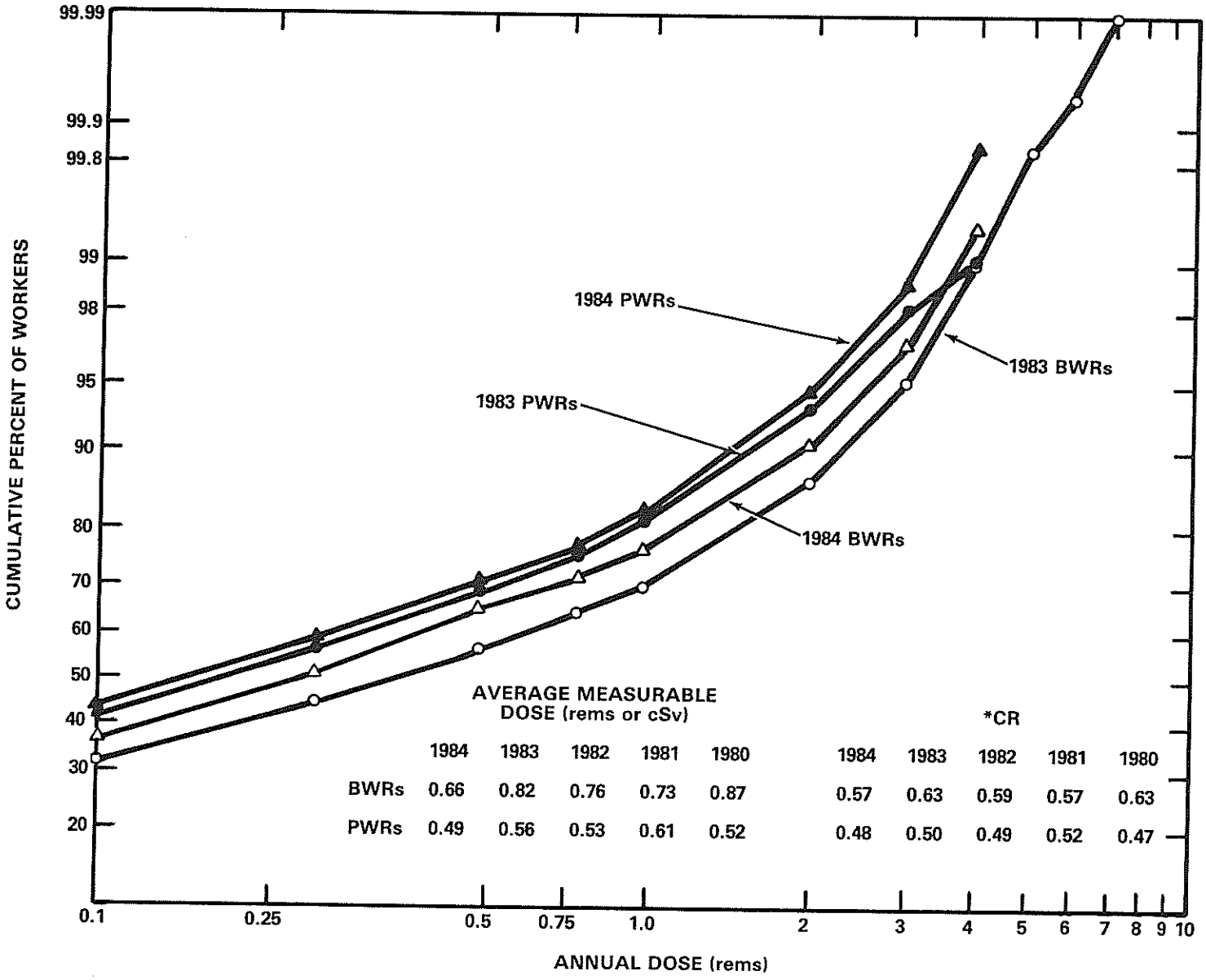
These licenses are issued to utilities to allow them to use special nuclear material in a reactor to produce heat to generate electricity to be sold to consumers. There are two major types of commercial reactors in the United States - pressurized water reactors (PWRs) and boiling water reactors (BWRs)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

As shown in Table 3.1, annual reports were received from nuclear power facilities for 88 licensed reactors where 169,242 individuals were monitored for exposure to radiation in 1984. Of this number 94,996 workers received a measurable dose and incurred a collective dose of 55,353 person-rems (person-cSv). It appears that the collective dose is beginning to level off or decrease somewhat, while the number of workers continues to increase. This has resulted in the average measurable dose decreasing to 0.58 rem (cSv). The dose distributions 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 and 1984. One can quickly see that about 73% of the workers receiving measurable doses at BWRs received doses that were less than one rem (cSv) while about 82% of such workers at PWRs received doses of less than one rem (cSv). 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 CR for the last five years. These show that a larger portion of the collective dose (about 60%) at BWRs continues to be due to workers receiving doses greater than 1.5 rems (cSv) than at PWRs, where CR is usually about 0.50. 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 & 1984



AVERAGE MEASURABLE DOSE (rems or cSv)

	1984	1983	1982	1981	1980
BWRs	0.66	0.82	0.76	0.73	0.87
PWRs	0.49	0.56	0.53	0.61	0.52

*CR

	1984	1983	1982	1981	1980
BWRs	0.57	0.63	0.59	0.57	0.63
PWRs	0.48	0.50	0.49	0.52	0.47

*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 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 has ever exceeded an annual dose of 0.25 rem (cSv), and the average dose per worker is usually less than 0.05 rem (cSv).

Table 3.7

ANNUAL EXPOSURE INFORMATION FOR FORT ST. VRAIN
1974-1984

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 (rems or cSv)
	No Measurable Dose	Measurable Dose <0.10	0.10-0.25				
1974	1,597	63	1	1,661	3.3	0.0	0.05
1975	1,263	0	0	1,263	0.0	0.0	0.00
1976	1,362	25	0	1,387	1.3	2.8	0.05
1977	946	55	1	1,002	2.9	29.8	0.05
1978	896	34	0	930	1.7	75.7	0.05
1979	1,149	120	2	1,271	6.4	28.6	0.05
1980	902	57	1	960	3.0	83.2	0.05
1981	1,096	31	0	1,127	1.0	93.6	0.03
1982	978	22	0	1,000	0.4	72.6	0.02
1983	965	48	0	1,013	1.0	94.4	0.02
1984	1,616	62	8	1,686	3.0	10.9	0.04

4 COMMERCIAL LIGHT WATER REACTORS - FURTHER ANALYSIS

4.1 Introduction

Since general trends in occupational radiation exposures at nuclear power reactors are best evaluated within the context of other pertinent information, 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.

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 total light-water-cooled reactors (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 conservative values are yielded for the averages. 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 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.

4.2.4 Average Rated Capacity

The 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

Table 4.1

SUMMARY OF ANNUAL INFORMATION REPORTED BY
COMMERCIAL BOILING WATER REACTORS

1973-1984

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	10,655	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

*Two plants have been shut down continuously for a number of years but have been included in the count of reactors used to compute various averages per reactor in this report. One may wish to calculate these averages without counting these reactors each year: Dresden 1 - shut down since 10/78; Humboldt Bay - shut down since 7/76. (See Appendix B)

†In 1984 it was decided that Humboldt Bay 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

1973-1984

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	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

*Three plants have been shut down continuously for a number of years but have been included in the count of reactors used to compute various averages per reactor in this report. One may wish to calculate these averages without counting these reactors each year: Indian Point 1 - shut down since 10/78; Three Mile Island 1 and 2 - shut down since 3/79. (See Appendix B)

†In 1984, it was decided that Indian Point 1 would not be put in commercial operation again, and it is not included in this count of reactors.

Table 4.3
SUMMARY OF ANNUAL INFORMATION REPORTED BY
COMMERCIAL LIGHT WATER COOLED REACTORS*
1973-1984

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 MW-Yrs 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

*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.

**Five plants have been shut down continuously for a number of years but the data they reported has been used in the compilation of various totals and averages shown in this report. One may wish to calculate these figures without including these reactors each year: Dresden 1 - shut down since 10/78; Humboldt Bay - shut down since 7/76; Indian Point 1 - shut down since 10/78; Three Mile Island 1 and 2 - shut down since 3/79. (See Appendix B)

†In 1984, it was decided that Humboldt Bay and Indian Point 1 would not be put in commercial operation again, and they are not included in compilations in this report.

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 commercial LWRs during each of the years 1973 through 1984. 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 1984 is shown in Appendix B. The table shows that the number of monitored individuals continues to increase while the collective dose appears to be leveling off. However, the values of CR* show that the percentage of the collective dose due to individual doses greater than 1.5 rems (cSv), has shown a general decrease from its 1973 value of 72% to about 55% in 1984. The distributions shown in Table 4.4 have been adjusted for the number of individuals that may have been reported by more than one site (see Section 5 for a discussion of the methodology). Appendix D provides unadjusted dose distributions for BWRs and PWRs separately for the years 1980 through 1984.

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 1984 the average number of workers per reactor reached an all-time high at both BWRs and PWRs, which resulted in lower average doses at both types of facilities.

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 the number of workers and electricity generated, decreased somewhat from last year's values. In looking at these figures and the fluctuations in the parameters for the years following the incident at the Three Mile Island Plant in 1979, one suspects that they reflect some of the impact that this incident had on the nuclear power industry.

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 1984. 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

*See definition in Section 3.1.8.

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

Table 4.4

SUMMARY DISTRIBUTION OF
ANNUAL WHOLE BODY DOSES AT COMMERCIAL LIGHT WATER REACTORS
1973 - 1984

YEAR	Number of Individuals with Whole Body Doses in the Ranges (rems or cSv)																	Total Number Monitored	Number with Measurable Exposure	**Total Collective Dose (person-rems or person-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	0.61
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	47,537	29,552	11,341	9,487	5,949	4,344	11,442	5,292	2,237	697	114	37	8	2				128,041	80,804	56,471	0.60
1984	55,561	37,437	13,841	10,643	6,624	4,997	11,806	5,182	1,997	380	9	2						148,479	92,918	55,214	0.55

*Summary of reports submitted in accordance with 10 CFR 20.407 by plants that had been in commerical 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 multiple reporting of transient individuals (see Section 5).

**The collective dose and CR were not reported by the facilities but were calculated by the NRC staff using methods described in this document.

***CR is the ratio of the annual collecive 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 - 1984

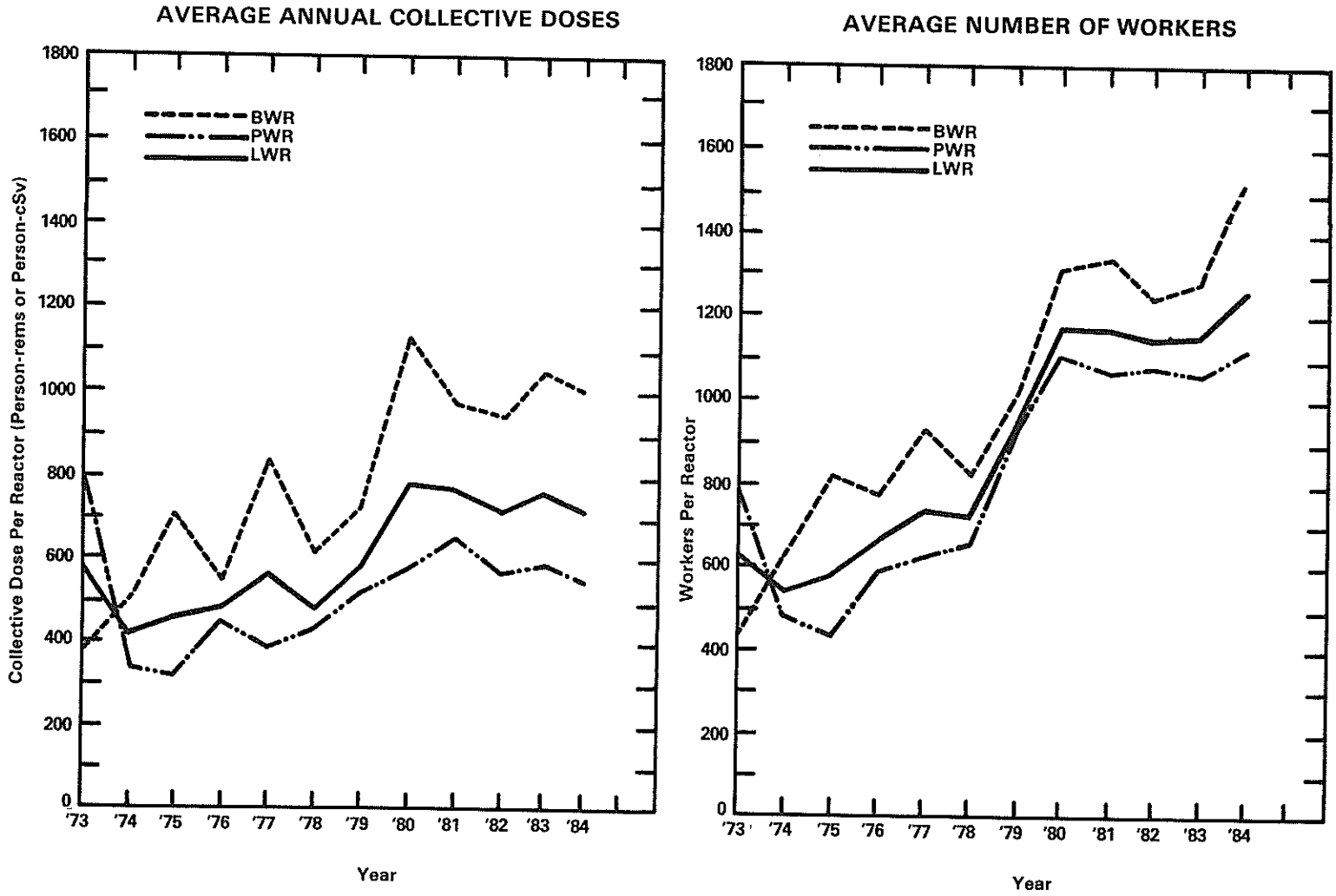


Figure 4.2
ANNUAL VALUES AT BWRs AND PWRs
1973 - 1984

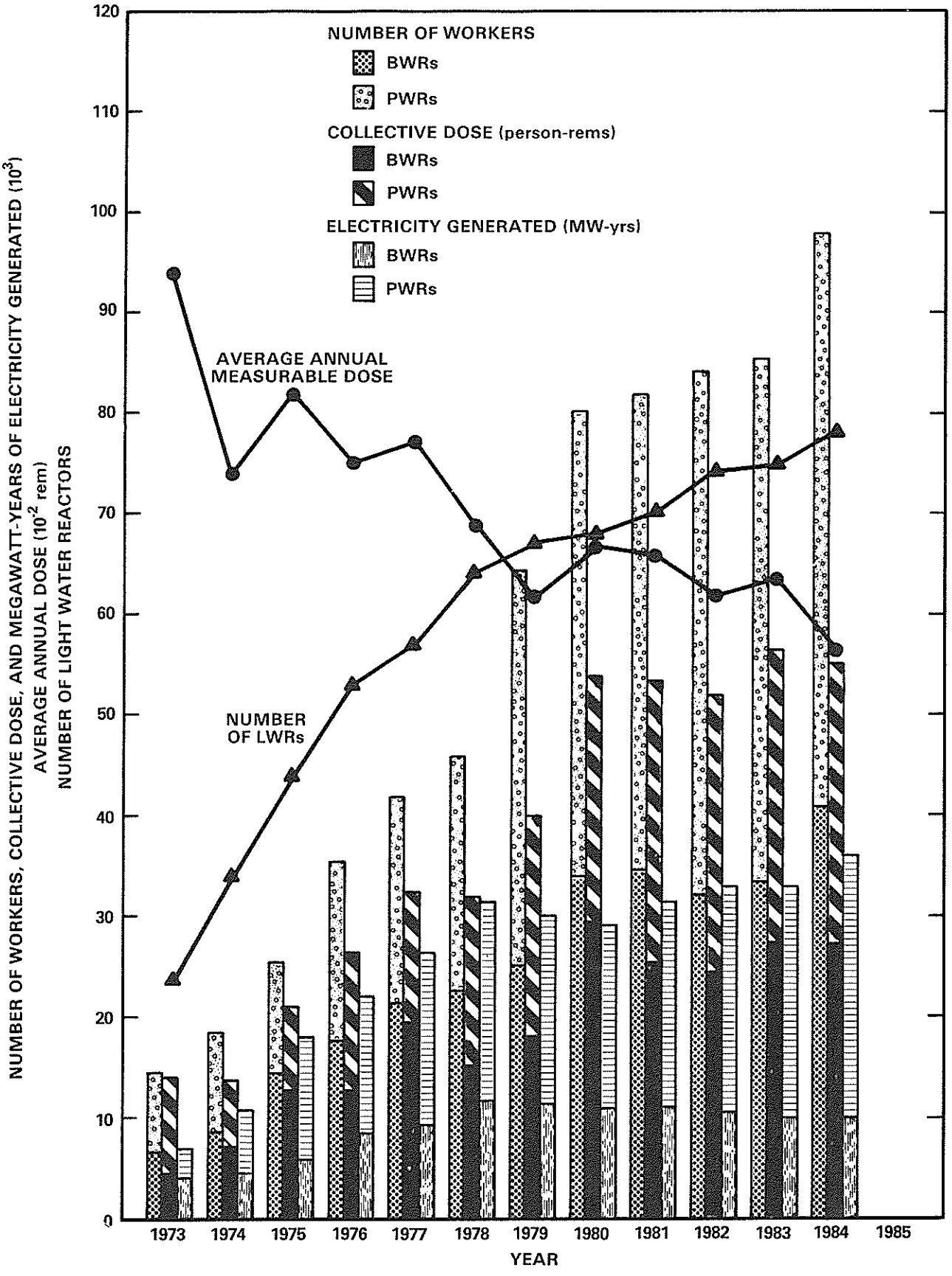


Figure 4.3
AVERAGE ANNUAL VALUES AT LWRs
1973 - 1984

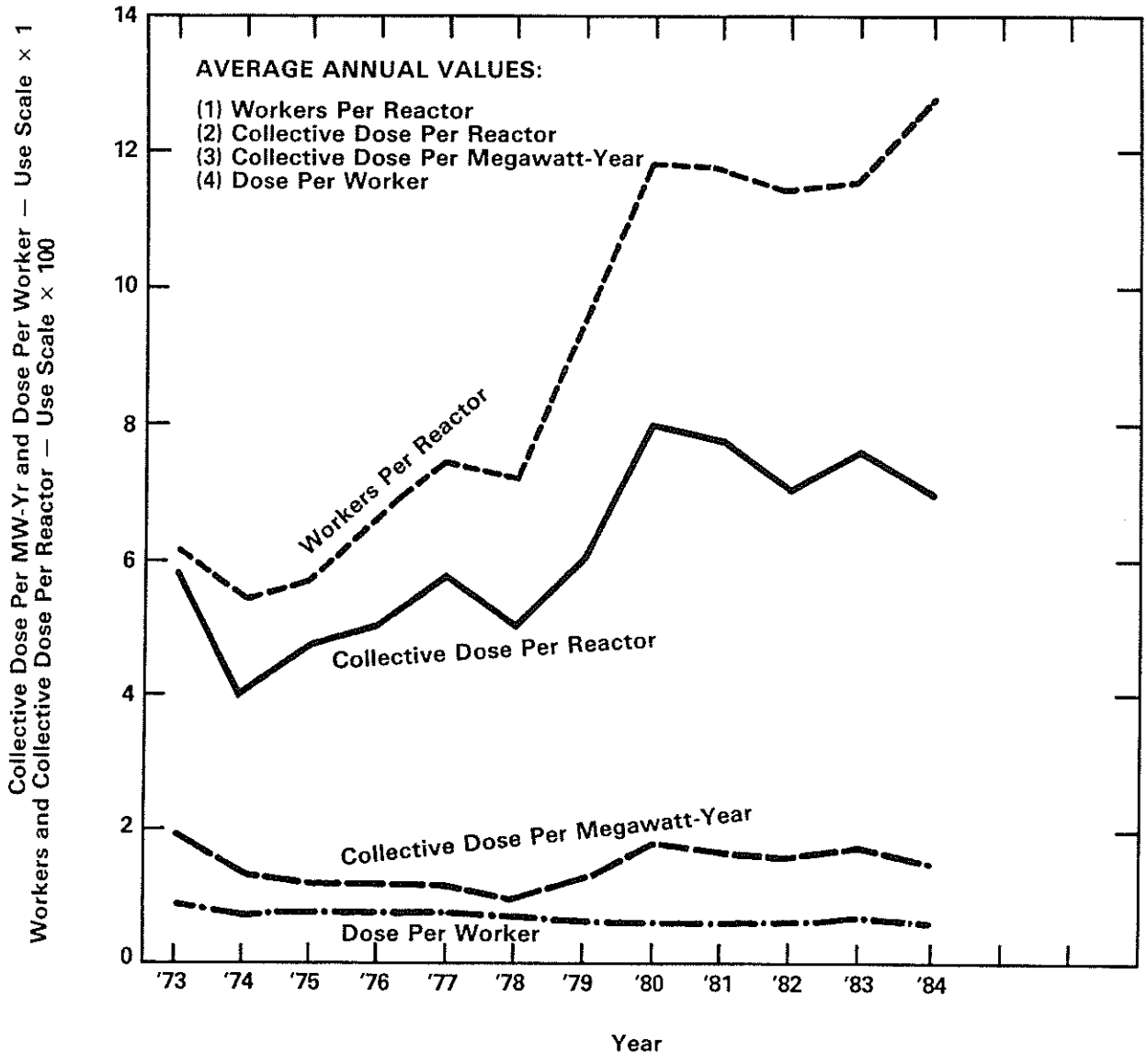
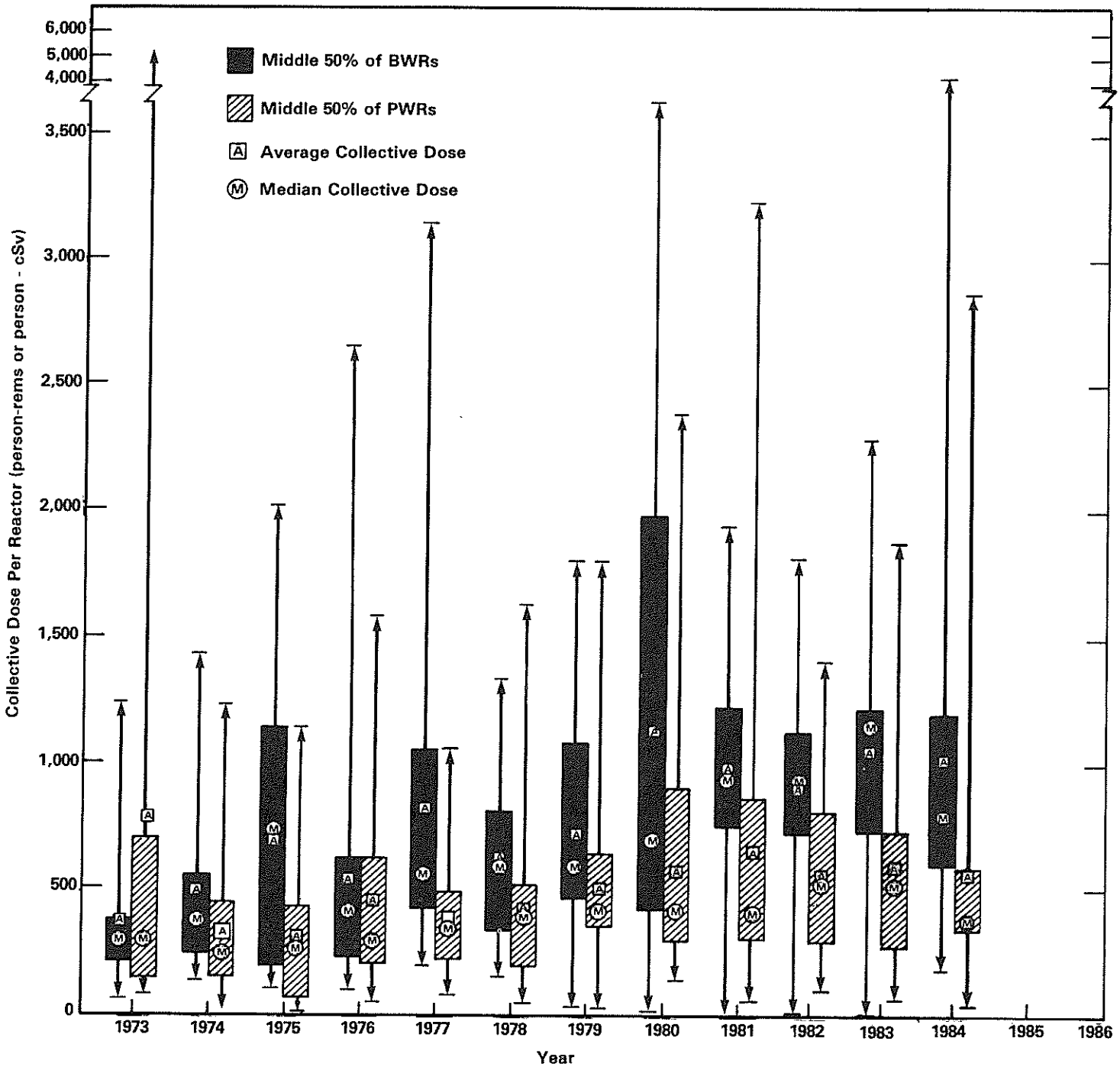


Figure 4.4

AVERAGE, MEDIAN AND EXTREME VALUES OF THE COLLECTIVE DOSE PER REACTOR 1973 - 1984



person-rems (person-cSv). At BWRs the median fluctuates more from year to year, and in 1984 the median decreased to 790 person-rems (person-cSv), which was still nearly twice that found for PWRs (395 person-rems (person-cSv)). Figure 4.4 also shows that in 1984 fifty percent of the PWRs reported collective doses between 340 and 570 person-rems (person-cSv) while fifty percent of the BWRs reported collective doses between 590 and 1,170 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 1980 through 1984. Two other parameters, dose per worker and collective dose per megawatt-year, are also given for each plant and could have been used in listing 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 1984 the value of CR for about 65% of the U.S. plants 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 0.87.

Table 4.7 lists the plants that had been in commercial operation for at least five years as of December 31, 1984, 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 125 reactor-years of operation accumulated by the 25 BWR sites listed, the average annual collective dose per reactor was found to be 1,067 person-rems (person-cSv), the average measurable dose was 0.80 rems (cSv), and the average collective dose per megawatt-year was 2.7. Based on the 170 reactor-years of operation by the 34 PWR sites listed, these averages were found to be 569 person-rems (person-cSv), 0.59 rem and 1.3, respectively.

In 1984, there were five BWR units where collective doses that exceeded 1,500 person-rems (person-cSv) were accumulated. Although these five units represented only 18.5% of the 27 BWRs operating in 1984, they contributed nearly 44% of the total collective dose incurred at BWRs in 1984. Most of the collective dose accumulated at the BWR site with the highest collective dose (4,082 person-rems (person-cSv)) was attributed to the replacement of all the recirculation system piping.

At PWRs, there were five units where the collective dose exceeded 1,100 person-rem (person-cSv). Although representing less than 10% of the 51 PWRs operating in 1984, they contributed nearly 32% of the total collective dose at PWRs in 1984. The plant with the highest collective dose (2,880 person-rems (person-cSv)) in 1984 accumulated most of the dose during the replacement of steam generators.

Table 4.5

BOILING WATER REACTORS LISTED IN ASCENDING ORDER OF COLLECTIVE DOSE PER REACTOR 1980-1984

1980				1981					1982					1983					1984				
Site Name	[1]Coll. Dose per Site	Dose per Worker (rems or cSv)	Coll. Dose per MW-Yr	Site Name	[1]Coll. Dose per Site	Dose per Worker (rems or cSv)	Coll. Dose per MW-Yr	[2]CR	Site Name	[1]Coll. Dose per Site	Dose per Worker (rems or cSv)	Coll. Dose per MW-Yr	[2]CR	Site Name	[1]Coll. Dose per Site	Dose per Worker (rems or cSv)	Coll. Dose per MW-Yr	[2]CR	Site Name	[1]Coll. Dose per Site	Dose per Worker (rems or cSv)	Coll. Dose per MW-Yr	[2]CR
Humboldt Bay	22	0.15	-	Humboldt Bay	9	0.12	-	0.00	Humboldt Bay	19	0.27	-	0.08	Humboldt Bay	17	0.20	-	0.09	Big Rock Point	155	0.52	3.1	0.52
La Crosse	218	1.76	8.3	La Crosse	123	0.66	4.2	0.68	La Crosse	205	1.39	11.9	0.81	Monticello	121	0.29	0.2	0.16	Duane Arnold	189	0.31	0.6	0.19
Hatch 1,2	449	0.23	0.4	Big Rock Point	160	0.33	2.8	0.47	Vermont Yankee	205	0.43	0.4	0.24	Millstone Point 1	244	0.79	0.4	0.66	La Salle	252	0.20	0.4	0.07
Big Rock Point	354	0.59	7.2	Cooper Station	579	0.62	1.3	0.45	Duane Arnold	227	0.44	0.8	0.48	Big Rock Point	263	0.53	6.0	0.46	La Crosse	252	0.87	6.5	0.87
Monticello	531	0.48	1.3	Hatch 1,2	1,337	0.46	1.5	0.35	Big Rock Point	328	0.63	7.5	0.58	La Crosse	313	1.96	12.6	0.90	Susquehanna 1	308	0.11	0.4	0.02
Nine Mile Point	591	0.50	1.1	Vermont Yankee	731	0.58	1.7	0.45	Cooper Station	542	0.73	0.9	0.52	Hatch 1,2	1,299	0.38	1.4	0.29	Dresden 1,2,3	1,774	0.78	2.2	0.54
Browns Ferry 1,2,3	1,825	0.67	0.8	Duane Arnold	790	0.61	2.8	0.50	Hatch 1,2	1,460	0.43	1.9	0.33	Nine Mile Point	860	0.61	2.6	0.45	Vermont Yankee	603	0.63	1.5	0.39
Duane Arnold	671	0.61	2.0	Browns Ferry 1,2,3	2,380	0.70	1.1	0.49	Browns Ferry 1,2,3	2,220	0.68	1.1	0.51	Fitzpatrick	1,090	0.64	2.0	0.58	Browns Ferry 1,2,3	1,940	0.66	1.4	0.51
Dresden 1,2,3	2,105	0.77	2.0	Oyster Creek	917	0.54	2.9	0.40	Oyster Creek	865	0.68	3.6	0.51	Browns Ferry 1,2,3	3,363	1.02	2.0	0.68	Quad Cities 1,2	1,579	0.94	1.6	0.63
Cooper Station	859	1.09	1.9	Dresden 1,2,3	2,820	1.16	2.7	0.76	Millstone Point 1	929	0.68	1.9	0.48	Duane Arnold	1,135	0.77	4.0	0.53	Cooper Station	799	0.50	1.9	0.53
Peach Bottom 2,3	2,302	0.83	1.7	Monticello	1,004	0.69	2.6	0.52	Dresden 1,2,3	2,923	1.14	2.7	0.73	Pilgrim	1,162	0.50	2.1	0.47	Hillstone Point 1	836	0.42	1.6	0.31
Vermont Yankee	1,338	0.93	3.7	Peach Bottom 2,3	2,506	0.88	2.2	0.56	Peach Bottom 2,3	1,977	0.72	1.2	0.48	Dresden 1,2,3	3,582	1.26	3.9	0.75	Nine Mile Point	890	0.58	2.1	0.50
Oyster Creek	1,733	0.88	7.4	Brunswick 1,2	2,638	0.68	2.9	0.66	Monticello	993	0.76	3.4	0.57	Quad Cities 1,2	2,491	1.38	2.3	0.77	Fitzpatrick	971	0.60	1.7	0.57
Brunswick 1,2	3,870	1.02	5.6	Fitzpatrick	1,425	0.57	2.5	0.44	Fitzpatrick	1,190	0.51	2.0	0.37	Cooper Station	1,293	0.93	3.3	0.68	Hatch 1,2	2,218	0.54	3.4	0.44
Fitzpatrick	2,040	0.99	4.0	Millstone 1	1,496	0.60	4.9	0.44	Nine Mile Point	1,264	0.93	9.5	0.66	Peach Bottom 2,3	2,963	0.95	3.6	0.67	Peach Bottom 2,3	2,450	0.74	2.1	0.57
Millstone Point 1	2,158	0.71	5.3	Quad Cities 1,2	3,146	1.40	2.7	0.81	Pilgrim	1,539	0.54	3.9	0.42	Vermont Yankee	1,527	1.16	4.4	0.61	Brunswick 1,2	3,260	0.66	4.3	0.62
Quad Cities 1,2	4,838	1.57	5.6	Nine Mile Point	1,592	0.78	4.1	0.59	Quad Cities 1,2	3,757	1.62	3.7	0.79	Brunswick 1,2	3,475	0.62	5.5	0.63	Oyster Creek	2,054	0.87	55.4	0.60
Pilgrim	3,626	1.02	10.1	Pilgrim	1,836	0.66	4.5	0.44	Brunswick 1,2	3,792	0.76	6.5	0.70	Oyster Creek	2,257	0.98	80.9	0.63	Monticello	2,462	1.32	73.1	0.79
Averages per Reactor	1,136	0.87	2.7	Averages per Reactor	980	0.73	2.3	0.57	Averages per Reactor	940	0.76	2.3	0.59	Averages per Reactor	1,056	0.82	2.8	0.56	Pilgrim	4,082	0.90	-	0.65
																			Averages per Reactor	1,003	0.66	2.7	0.57

[1]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.
[2]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
1980-1984

1980				1981					1982					1983					1984				
Site names	[1]Coll. Dose per Site	Dose per Worker (rems or cSv)	Coll. Dose per MW-yr	Site names	[1]Coll. Dose per Site	Dose per Worker (rems or cSv)	Coll. Dose per MW-yr	[2]CR	Site names	[1]Coll. Dose per Site	Dose per Worker (rems or cSv)	Coll. Dose per MW-yr	[2]CR	Site names	[1]Coll. Dose per Site	Dose per Worker (rems or cSv)	Coll. Dose per MW-yr	[2]CR	Site Name	[1]Coll. Dose per Site	Dose per Worker (rems or cSv)	Coll. Dose per MW-yr	[2]CR
Davis Besse	154	0.12	0.1	Davis Besse	58	0.10	0.1	0.04	Kewaunee	101	0.29	0.2	0.11	Yankee Rowe	68	0.17	0.4	0.20	Crystal River	49	0.09	0.1	0.00
Kewaunee	165	0.41	0.4	Kewaunee	141	0.37	0.3	0.18	Prairie Island 1,2	229	0.36	0.2	0.16	Davis Besse	80	0.11	0.1	0.04	Prairie Island 1,2	147	0.27	0.2	0.16
Prarie Island 1,2	363	0.36	0.4	Prairie Island 1,2	329	0.39	0.4	0.30	Haddam Neck	126	0.23	0.2	0.27	Prairie Island 1,2	233	0.35	0.3	0.24	Millstone Point 2	120	0.42	0.2	0.33
Three Mile Island 1,2	394	0.17	-	Three Mile Island 1,2	376	0.18	-	0.06	Davis Besse	164	0.12	0.4	0.06	San Onofre 1	155	0.09	-	0.13	Kewaunee	139	0.29	0.3	0.15
Yankee Rowe	213	0.42	6.0	Beaver Valley	229	0.19	0.4	0.13	McGuire	169	0.11	0.3	0.03	Maine Yankee	164	0.28	0.2	0.14	Davis Besse	177	0.16	0.3	0.07
North Anna 1	218	0.10	0.3	Salem 1	254	0.15	0.3	0.09	Crystal River	177	0.23	0.3	0.13	Kewaunee	165	0.37	0.4	0.24	Rancho Seco	222	0.28	0.5	0.22
Cook 1,2	493	0.37	0.3	Point Beach 1,2	596	0.77	0.8	0.46	Fort Calhoun	217	0.36	0 5	0.42	Indian Point 1,2	486	0.46	0.7	0.46	Indian Point 3	230	0.35	0.3	0.22
Point Beach 1,2	598	1.07	0.8	Yankee Rowe	302	0.59	2.8	0.43	Farley 1,2	484	0.33	0.4	0.18	Sequoyah 1,2	491	0.28	0.3	0.14	Calvert Cliffs 1,2	479	0.35	0.3	0.33
Indian Point 3	308	0.32	0.8	Calvert Cliffs 1,2	607	0.39	0.4	0.19	St. Lucie	272	0.26	0.3	0.18	Salem 1,2	581	0.24	0.8	0.16	Sumner	295	0.26	0.6	0.11
Calvert Cliffs 1,2	677	0.45	0.5	Cook 1,2	655	0.49	0.4	0.29	Point Beach 1,2	609	0.79	0.8	0.50	Trojan	307	0.32	0.6	0.25	Salem 1,2	681	0.70	1.0	0.39
Arkansas 1	342	0.28	0.8	North Anna 1,2	680	0.28	0.5	0.37	Palisades	330	0.21	0.8	0.20	Cook 1,2	658	0.46	0.5	0.33	Three Mile Island 1,2	688	0.64	-	0.45
Oconee 1,2,3	1,055	0.50	0.6	Indian Point 3	364	0.54	1.0	0.36	Rancho Seco	337	0.44	0.8	0.36	North Anna 1,2	665	0.30	0.5	0.38	Yankee Rowe	348	0.53	2.8	0.44
Rancho Seco	412	0.46	0.8	Rancho Seco	402	0.52	1.3	0.28	Cook 1,2	699	0.46	0.5	0.27	Calvert Cliffs 1,2	668	0.35	0.5	0.32	Oconee 1,2,3	1,106	0.53	0.5	0.29
Trojan	421	0.36	0.6	Oconee 1,2,3	1,211	0.50	0.7	0.45	Arkansas 1,2	803	0.50	0.9	0.43	Oconee 1,2,3	1,207	0.63	0.6	0.46	Cook 1,2	762	0.49	0.5	0.32
Palisades	424	0.32	1.5	Crystal River 3	408	0.36	0.8	0.23	Trojan	419	0.42	0.7	0.35	Fort Calhoun	433	0.50	1.3	0.39	Zion 1,2	786	0.71	0.6	0.47
Farley	435	0.33	0.8	Main Yankee	424	0.49	0.7	0.29	Yankee Rowe	474	0.58	4.4	0.54	Farley 1,2	1,021	0.53	0.8	0.42	Point Beach 1,2	789	0.56	1.0	0.50
Salem 1	449	0.26	0.7	Fort Calhoun	458	0.56	1.8	0.50	Three Mile Island 1,2	1,004	0.47	-	0.44	McGuire 1	521	0.30	0.9	0.32	Ginna	395	0.55	1.0	0.39
Zion 1,2	920	0.68	0.6	Farley	511	0.38	1.6	0.28	Calvert Cliffs 1,2	1,057	0.59	0.8	0.40	Crystal River	552	0.32	1.2	0.18	Arkansas 1,2	806	0.46	0.6	0.37
Main Yankee	462	0.63	0.9	Millstone Point 2	531	0.60	0.7	0.44	Sequoyah	570	0.29	1.0	0.18	Three Mile Island 1,2	1,159	0.73	-	0.57	Trojan	433	0.42	0.8	0.34
Indian Point 1*,2	971	0.62	1.9	Arkansas 1,2	1,102	0.50	1.0	0.39	Oconee 1,2,3	1,792	0.73	1.4	0.58	Indian Point 3	607	0.65	77.8	0.52	Farley 1,2	902	0.44	0.6	0.38
St. Lucie	532	0.50	0.9	Trojan	509	0.46	0.8	0.33	Salem 1,2	1,203	0.37	0.8	0.29	Zion 1,2	1,311	1.02	1.1	0.62	San Onofre 1,2	986	0.13	1.5	0.14
Beaver Valley	553	0.30	13.9	Ginna	655	0.71	1.6	0.45	Main Yankee	619	0.48	1.1	0.32	Arkansas 1,2	1,397	0.66	1.5	0.65	Beaver Valley	504	0.36	0.9	0.32
Crystal River	625	0.59	1.6	Robinson 2	733	0.50	1.7	0.51	Beaver Valley	599	0.34	1.8	0.26	Point Beach 1,2	1,403	0.82	2.2	0.53	McGuire 1	507	0.30	0.7	0.26
Millstone Point 2	636	0.71	1.1	Zion 1,2	1,720	0.98	1.3	0.69	Surry 1,2	1,490	0.79	1.1	0.73	Beaver Valley	772	0.52	1.4	0.42	Sequoyah 1,2	1,117	0.47	0.8	0.36
Fort Calhoun	668	0.75	2.8	Palisades	902	0.42	2.2	0.41	Indian Point 1*,2	1,635	0.76	3.1	0.52	Rancho Seco	787	0.59	2.3	0.39	Fort Calhoun	563	0.62	2.0	0.47
Ginna	708	0.66	1.9	St. Lucie	929	0.63	1.6	0.43	San Onofre	832	0.27	13.5	0.35	Ginna	855	0.68	2.3	0.55	Palisades	573	0.43	5.8	0.41
Turkey Point 3,4	1,651	0.92	1.7	Haddam Neck	1,036	0.67	2.1	0.52	North Anna 1,2	1,915	0.67	2.5	0.67	Robinson	923	0.41	2.3	0.44	Turkey Point 3,4	1,255	0.62	1.3	0.53
Haddam Neck	1,353	0.73	3.2	Turkey Point 3,4	2,251	0.77	3.4	0.51	Zion 1,2	2,103	1.34	1.8	0.76	Palisades	977	0.45	2.2	0.54	St Lucie 1,2	1,263	0.60	1.1	0.49
Robinson 2	1,852	0.92	4.8	Indian Point 1*,2	2,731	1.05	7.4	0.65	Turkey Point 3,4	2,119	0.72	2.3	0.48	St. Lucie	1,204	0.54	4.2	0.47	Maine Yankee	884	0.70	1.5	0.47
Surry 1,2	3,836	0.72	6.8	Surry 1,2	4,244	1.13	4.7	0.77	Ginna	1,140	1.02	3.9	0.65	Turkey Point 1,2	2,681	0.92	3.1	0.60	North Anna 1,2	1,945	0.54	1.9	0.59
San Onofre 1	2,387	0.78	24.5	San Onofre	3,223	1.11	33.6	0.72	Indian Point 3	1,226	0.83	7.1	0.59	Haddam Neck	1,384	0.84	3.1	0.57	Surry 1,2	2,247	0.70	2.2	0.61
Averages per reactor:	578	0.52	1.3	Averages per reactor:	652	0.61	1.4	0.52	Millstone Point 2	1,413	0.68	2.4	0.48	Surry 1,2	3,220	1.17	3.5	0.78	Haddam Neck	1,216	0.85	3.0	0.66
									[illegible] 2	1,426	0.71	5.1	0.65	Millstone Point 2	1,881	0.79	6.4	0.67	Indian Point 2	2,644	0.91	6.3	0.61
									s per reactor:	578	0.53	1.3	0.49	Averages per reactor	592	0.56	1.3	0.40	Robinson 2	2,680	0.70	-	0.69
																			Averages per reactor:	552	0.49	1.1	0.48

[1]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.
[2]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
1980-1984

BWRs **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	1,111	907	1.22	136.5	8.1
Big Rock Point	1,260	2,389	0.53	242.0	5.2
Duane Arnold	3,014	4,997	0.60	1,507.7	2.0
Hatch 1,2	6,763	15,785	0.43	3,231.5	2.1
Browns Ferry 1,2,3	11,728	15,632	0.75	9,413.3	1.2
Cooper	4,072	5,444	0.13	2,336.2	1.7
Dresden 1,2,3	13,186	12,812	1.02	4,898.0	2.7
Vermont Yankee	4,404	5,758	0.76	2,032.1	2.2
Monticello	5,111	6,155	0.83	1,620.5	3.2
Nine Mile Point	5,197	7,490	0.69	1,809.2	2.9
Millstone Point 1	5,663	3,749	1.51	2,356.5	2.4
Peach Bottom 2,3	12,198	14,785	0.83	6,109.8	2.0
Fitzpatrick	6,716	10,193	0.66	2,788.4	2.4
Oyster Creek	7,826	9,597	0.82	855.4	9.1
Quad Cities 1,2	15,811	11,129	1.42	5,125.6	3.1
Brunswick 1,2	17,035	23,247	0.73	3,550.7	4.8
Pilgrim (125 reactor-years)	12,245	16,065	0.76	1,719.0	7.1
Grand Totals and Averages	133,340	166,000	0.80	49,722.7	2.7
Averages per Reactor-year	1,067	1,328		397.8	

Table 4.7b

FIVE-YEAR TOTALS AND AVERAGES LISTED IN ASCENDING ORDER OF COLLECTIVE DOSE PER PWR
1980-1984

PWRs **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	633	5,017	0.13	2,289.2	0.3
Prairie Island 1,2	1,291	3,648	0.35	4,484.0	0.3
Kewaunee	711	2,064	0.34	2,243.0	0.3
Yankee Rowe	1,405	2,880	0.49	541.5	2.6
Cook 1,2	3,267	7,190	0.45	7,553.8	0.4
Calvert Cliffs 1,2	3,488	8,140	0.43	5,404.6	0.7
Maine Yankee	1,753	4,752	0.37	2,976.5	0.6
Three Mile Island 1,2	3,621	9,225	0.39	0.0	-
Crystal River	1,811	5,222	0.35	2,708.6	1.9
Point Beach 1,2	3,995	5,175	0.77	3,682.0	1.1
Oconee 1,2,3	6,371	11,001	0.58	9,042.7	0.7
Rancho Seco	2,160	4,568	0.47	2,069.5	1.0
Trojan	2,189	5,458	0.40	3,143.8	1.4
Fort Calhoun	2,339	4,090	0.57	1,530.8	1.5
Beaver Valley	2,657	7,687	0.35	2,077.8	1.3
Indian Point 3	2,735	4,730	0.58	1,626.8	1.7
Palisades	3,206	8,523	0.38	1,663.9	1.9
Zion 1,2	6,840	7,087	0.97	6,576.7	1.0
Ginna	3,752	4,797	0.78	1,801.6	2.1
Millstone Point 2	4,581	6,533	0.70	2,974.3	1.5
Turkey Point 3,4	9,957	11,639	0.86	4,385.4	2.3
Haddam Neck	5,115	7,048	0.73	2,315.9	2.2
Surry 1,2	15,037	16,900	0.89	4,742.0	3.2
Robinson 2 (170 reactor-years)	7,814	11,853	0.66	1,529.2	5.1
Grand Totals and Averages	96,728	165,227	0.59	77,363.6	1.3
Averages per Reactor-year	569	972		455.1	

*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 12/31/84 are not included.

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 and Susquehanna, three reactors that have been operating for 10 or 11 years, have experienced lower collective doses than many newer 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 1984 included replacement of recirculation system piping, inspection for intergranular stress corrosion cracking (IGSCC), IGSCC repair, Mark I torus modifications, and reactor vessel component inservice inspection. The PWR facilities reporting high values for these two parameters during the last few years generally have been involved in extensive tube inspection, sleeving, and plugging related to the repair of steam generators. It should be noted that the differences in nuclear plant designs and the ages of plants [Ref. 15], even between plants of a given type, affect the nature of these parameters as well, and one should be careful 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. The report submitted for each reactor site, after undergoing any necessary standardization, is provided in Appendix D. Summaries of the collective doses shown in these reports are given in Tables 4.8, 4.9, and 4.10. 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 plants do not use the official dosimeter results in compiling the data.

Table 4.8 provides a detailed summary of the distribution of collective dose by work function and personnel types for BWRs, PWRs, and all LWRs. It shows that contract workers performing special maintenance at LWRs continue to incur the largest portion (35%) of the collective dose. Table 4.9 presents a more general summary of these data for the last ten years, and one can see that the collective dose incurred during routine and special maintenance activities has ranged between 67% and 77% during these years. Figure 4.5 graphically shows the trends in the collective dose by work function and type of personnel for the years 1979 through 1984 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 and that the figures are fairly stable from year to year. Because of this stability and the fact that a number of these reports are not submitted in a standard format, summaries of these data will not be presented in future reports of these NUREG series.

Table 4.8

ANNUAL COLLECTIVE DOSE BY WORK FUNCTION AND PERSONNEL TYPE

1984

WORK FUNCTION	STATION EMPLOYEES PERSON-REM	% OF TOTAL	UTILITY EMPLOYEES PERSON-REM	% OF TOTAL	CONTRACT WORKERS & OTHERS PERSON-REM	% OF TOTAL	TOTAL PER FUNCTION PERSON-REM	% OF TOTAL
BOILING WATER REACTORS								
REACTOR OPERATIONS & SURVEILLANCE	1494.190	5.7 %	188.650	0.7 %	1139.668	4.3 %	2822.508	10.7 %
ROUTINE MAINTENANCE	2350.776	8.9 %	1028.623	3.9 %	4997.430	19.0 %	8376.829	31.9 %
INSERVICE INSPECTION	217.526	0.8 %	114.967	0.4 %	1158.467	4.4 %	1490.960	5.7 %
SPECIAL MAINTENANCE	1244.152	4.7 %	1537.676	5.9 %	9190.503	35.0 %	11972.331	45.6 %
WASTE PROCESSING	455.392	1.7 %	30.866	0.1 %	441.481	1.7 %	927.739	3.5 %
REFUELING	352.897	1.3 %	65.153	0.2 %	274.714	1.0 %	692.764	2.6 %
TOTALS	6114.933	23.3 %	2965.935	11.3 %	17202.263	65.4 %	26283.131	100.0 %
* PRESSURIZED WATER REACTORS								
REACTOR OPERATIONS & SURVEILLANCE	1647.331	6.0 %	149.729	0.5 %	1486.936	5.4 %	3283.996	12.0 %
ROUTINE MAINTENANCE	2355.534	8.6 %	472.006	1.7 %	3226.830	11.8 %	6054.370	22.1 %
INSERVICE INSPECTION	319.122	1.2 %	286.057	1.0 %	1295.760	4.7 %	1900.939	6.9 %
SPECIAL MAINTENANCE	1658.680	6.1 %	1283.824	4.7 %	9446.879	34.5 %	12389.383	45.3 %
WASTE PROCESSING	437.662	1.6 %	34.341	0.1 %	520.618	1.9 %	992.621	3.6 %
** REFUELING	1013.627	3.7 %	343.006	1.3 %	1400.592	5.1 %	2757.225	10.1 %
TOTALS	7431.956	27.1 %	2568.963	9.4 %	17377.615	63.5 %	27378.534	100.0 %
* ALL LIGHT WATER REACTORS								
REACTOR OPERATIONS & SURVEILLANCE	3141.521	5.9 %	338.379	0.6 %	2626.604	4.9 %	6106.504	11.4 %
ROUTINE MAINTENANCE	4706.310	8.8 %	1500.629	2.8 %	8224.260	15.3 %	14431.199	26.9 %
INSERVICE INSPECTION	536.648	1.0 %	401.024	0.7 %	2454.227	4.6 %	3391.899	6.3 %
SPECIAL MAINTENANCE	2902.832	5.4 %	2821.500	5.3 %	18637.382	34.7 %	24361.714	45.4 %
WASTE PROCESSING	893.054	1.7 %	65.207	0.1 %	962.099	1.8 %	1920.360	3.6 %
** REFUELING	1366.524	2.5 %	408.159	0.8 %	1675.306	3.1 %	3449.989	6.4 %
TOTALS	13546.889	25.2 %	5534.898	10.3 %	34579.878	64.4 %	53661.665	100.0 %

* Table does not include results from the PWRs at Point Beach 1,2 (737 man-rems) because of formatting problems.

** These values are higher than usual because the dose incurred during various maintenance activities while Salem 1 was refueling was attributed to the refueling work function.

Table 4.9

PERCENTAGES OF ANNUAL COLLECTIVE DOSE AT LWRS BY WORK FUNCTION

Work Function	Percent of Collective Dose Each Year									
	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Reactor operations and surveillance	10.8%	10.2%	10.5%	13.3%	12.2%	9.5%	8.9%	9.4%	10.1%	11.4%
Routine maintenance	52.6%	31.0%	28.1%	31.5%	29.2%	35.5%	36.1%	27.9%	29.7%	26.9%
Inservice inspection	3.0%	6.0%	6.4%	7.7%	9.0%	5.5%	5.3%	6.5%	7.6%	6.3%
Special maintenance	19.0%	40.0%	42.5%	35.9%	39.4%	40.6%	40.5%	46.8%	43.9%	45.4%
Waste processing	6.9%	5.0%	5.8%	5.0%	3.6%	3.0%	4.2%	5.0%	4.6%	3.6%
Refueling	7.7%	7.9%	6.7%	6.6%	6.6%	6.1%	5.0%	4.4%	4.1%	6.4%
BWR	12,611	12,626	13,042	15,096	18,322	23,530	25,471	24,437	23,455	23,074
PWR	8,268				21,659	24,266	25,671	27,753	29,012	28,140

Table 4.10

ANNUAL COLLECTIVE DOSE
BY OCCUPATION AND PERSONNEL TYPE

1984

OCCUPATION	STATION EMPLOYEES PERSON-REM	% OF TOTAL	UTILITY EMPLOYEES PERSON-REM	% OF TOTAL	CONTRACT WORKERS & OTHERS PERSON-REM	% OF TOTAL	TOTAL PER FUNCTION PERSON-REM	% OF TOTAL
BOILING WATER REACTORS								
MAINTENANCE	3218.862	12.2 %	2641.490	10.1 %	13536.407	51.5 %	19396.759	73.8 %
OPERATIONS	1504.276	5.7 %	10.630	0.0 %	368.562	1.4 %	1883.468	7.2 %
HEALTH PHYSICS	714.376	2.7 %	11.882	0.0 %	1387.125	5.3 %	2113.383	8.0 %
SUPERVISORY	373.535	1.4 %	135.557	0.5 %	867.998	3.3 %	1377.090	5.2 %
ENGINEERING	303.884	1.2 %	166.376	0.6 %	1042.171	4.0 %	1512.431	5.8 %
TOTALS	6114.933	23.3 %	2965.935	11.3 %	17202.263	65.4 %	26283.131	100.0 %
* PRESSURIZED WATER REACTORS								
MAINTENANCE	3809.596	13.9 %	2200.794	8.0 %	12475.201	45.6 %	18485.591	67.5 %
OPERATIONS	1552.086	5.7 %	15.535	0.1 %	182.413	0.7 %	1750.034	6.4 %
HEALTH PHYSICS	1135.637	4.1 %	26.570	0.1 %	2654.018	9.7 %	3816.225	13.9 %
SUPERVISORY	459.872	1.7 %	80.809	0.3 %	291.019	1.1 %	831.700	3.0 %
ENGINEERING	474.765	1.7 %	245.255	0.9 %	1774.964	6.5 %	2494.984	9.1 %
TOTALS	7431.956	27.1 %	2568.963	9.4 %	17377.615	63.5 %	27378.534	100.0 %
* ALL LIGHT WATER REACTORS								
MAINTENANCE	7028.458	13.1 %	4842.284	9.0 %	26011.608	48.5 %	37882.350	70.6 %
OPERATIONS	3056.362	5.7 %	26.165	0.0 %	550.975	1.0 %	3633.502	6.8 %
HEALTH PHYSICS	1850.013	3.4 %	38.452	0.1 %	4041.143	7.5 %	5929.608	11.0 %
SUPERVISORY	833.407	1.6 %	216.366	0.4 %	1159.017	2.2 %	2208.790	4.1 %
ENGINEERING	778.649	1.5 %	411.631	0.8 %	2817.135	5.2 %	4007.415	7.5 %
TOTALS	13546.889	25.2 %	5534.898	10.3 %	34579.878	64.4 %	53661.665	100.0 %

* Table does not include results from the PWRs at Point Beach (737 person-rems) because of formatting problems.

Figure 4.5

COLLECTIVE DOSE BY WORK FUNCTION AND PERSONNEL TYPE
AT BWRs and PWRs, 1979-1984

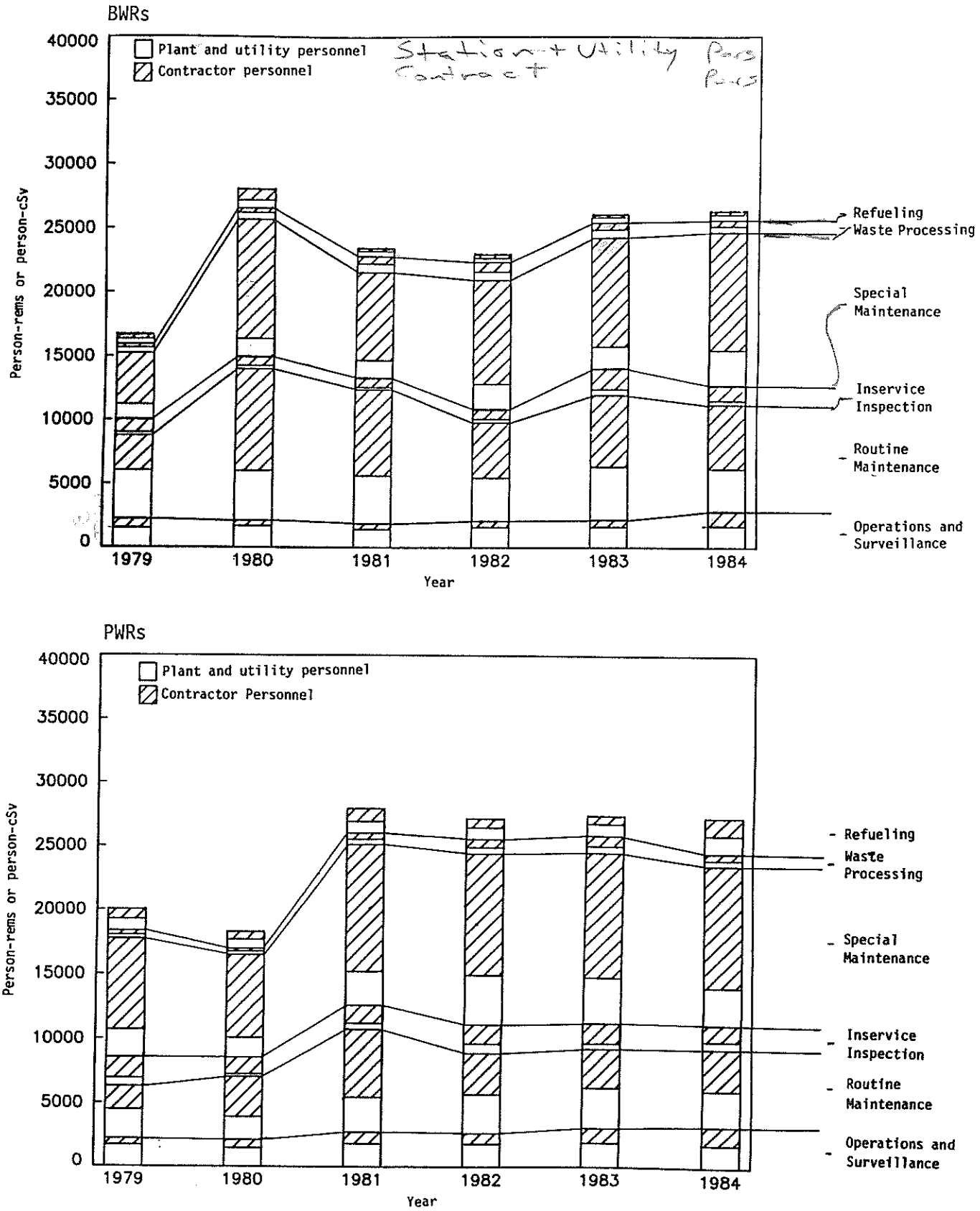


Table 4.10 presents the distribution of the collective dose for 1984 at all LWRs among five occupations. As expected, maintenance personnel incurred the majority (70.6%) of the collective dose with contractor maintenance personnel receiving about twice as much as the station and utility maintenance employees combined. This is about the same as that reported for 1983. Supervisory personnel received 4.1% of the dose, compared to 2.7% in 1983, while workers in the remaining three occupations--operations, health physics, and engineering--received 6.8%, 11.0%, and 7.5%, respectively, of the collective dose. None of these values changed very much from those found for 1982 either. 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 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

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 59,400 person-rems (person-cSv) (Table 3.1) and the 108,500 workers who received measurable exposures in 1984. 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 twelve.* 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 108,500 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 0.55 rem (cSv) or the maximum dose of eight or nine rems (cSv) during 1984. The estimated increased cancer death risk is about one chance in 10,000 for the average dose and about one chance in 1,000 for the maximum dose. Should a worker receive 0.55 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 59,400 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 108,500 exposed* workers would, according to the 1980 NAS report, be an increase of four 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 ionizing radiation at Hiroshima and Nagasaki, Japan.

*Assuming that, on the average, each exposed person will have one child in the future, i.e., 108,500 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 in the licensee's 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 1,500,000 termination records have been received for approximately 350,000 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. Table 5.1 provides a breakdown of this information for individuals terminating during each of 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. One can see that 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 monitored contractor employee at the end of 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, (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.

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*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.

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	189,762	72,603	181,327	67,482
1982	177,610	65,347	171,836	62,101
1983**	196,731	69,647	190,957	67,098
1984**	231,317	67,408	228,983	66,360

*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; independent spent fuel storage installations; and geologic high-level waste repositories.

**The termination data for about 15% of the individuals terminating during 1983 or 1984 have not been entered into the REIR System.

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 twentyfold during the five years 1972 through 1976, but has remained between 2,350 and 2,550 since 1981. The top part of Table 5.2 also shows that the average individual dose (which is close to being a quarterly dose for these workers) continues to decrease, dropping to an average dose of 0.26 rem (cSv) in 1984.

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 or more licensees received higher average doses than those terminated by two employers every year until 1982. From that year onward, the average dose of workers terminated from three or more facilities has been about the same or less than the average dose of the workers terminating from two nuclear power licensees.

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

Since the number of transient workers per calendar quarter comprise only a 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 6,000 in 1984. However, after reaching a high of about 6,000 person-rems (person-cSv) in 1980, the collective dose incurred by these workers decreased to about 5,500 person-rems (person-cSv) in 1984. The average dose also decreased somewhat in 1984 to a value of 0.91 rem (cSv).

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 or 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 or 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	1063	0.45	1980	2,218	1033	0.47
1981	2,344	955	0.41	1981	2,335	952	0.41
1982	2,325	900	0.39	1982	2,294	879	0.38
1983*	2,437	776	0.32	1983*	2,401	755	0.31
1984*	2,544	674	0.26	1984*	2,519	654	0.26

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	1,960	761	0.39	276	106	0.38	58	12	0.21
1983*	2,032	663	0.32	290	76	0.26	79	16	0.20
1984*	2,136	542	0.25	286	79	0.27	97	11	0.11

*Figures for these years may be incomplete because the termination data for about 15% of the individuals terminating during 1983 or 1984 have not been entered into the REIR System.

Table 5.3

TRANSIENT WORKERS PER CALENDER 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 or or 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	5,672	5,935	1.05
1984*	79	6,024	5,489	0.91

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*	3,882	3,350	0.86	1,092	1,522	1.39	698	1,063	1.52
1984*	4,219	3,350	0.81	1,066	1,236	1.16	739	856	1.16

*Figures for these years may be incomplete because the termination data for about 15% of the individuals terminating during 1983 or 1984 have not been entered into the REIR system.

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. In 1984 there were sharp decreases in the collective and average doses of workers terminated by more than two facilities. This is probably due to the utilities' increased efforts to keep the annual doses of all workers less than five rems (cSv). This is further borne out by the fact that, as shown in Table 5.4a, the distribution of the doses of these transient workers was such that there were only 11 workers with doses greater than five rems (cSv) in 1984. Table 5.4a shows that in prior years, there were usually between 50 and 100 transient workers with annual doses greater than five rems (cSv).

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 actual distribution of these transient workers' doses as determined from the above-described termination reports and compares it with the distribution of the doses of these workers as they would have appeared in a compilation 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 compilations 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 compiled annual reports indicated that 85,694 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 adjusted distribution indicated that there were only 80,552 workers that received a measurable dose and that 163 of them received doses greater than five rems (cSv). This resulted in an average measurable dose of 0.70 rem (cSv) rather than the 0.66 rem (cSv) obtained from the compiled reports.

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 adjusted statistical distribution indicates that the number of workers who received doses greater than five rems (cSv) was between 50 and 80 more than the number found in the compiled statistical distribution each year until 1984. This is more clearly shown in Table 5.5, where it can also be seen that in 1984 the number of workers receiving doses greater than five rems (cSv) was found to be 11 workers. Most of this reduction

Table 5.4 a

ACTUAL AND COMPILED 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)																Total Individuals	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	5.00-6.00	6.00-7.00	7.00-8.00	8.00-9.00	9.00-10.00	>10				
Actual Distribution of Transients - 1978	308	885	317	282	177	131	463	307	168	107	42	13	1	0	1		3,202	[b]3,231	1.01	1.12
Compiled Distribution of Transients - 1978	2,079	2,423	918	788	488	382	873	262	51	11	0	2					8,277	[b]3,231	0.39	0.52
Actual Distribution of Transients - 1979	373	883	398	358	281	240	678	410	195	71	32	14	4	1			3,938	[b]3,888	0.99	1.09
Compiled Distribution of Transients - 1979	2,130	2,676	1,259	1,048	673	460	1,040	313	46	13	1						9,649	[b]3,888	0.40	0.52
Actual Distribution of Transients - 1980	533	1,175	565	482	388	277	829	595	353	174	47	25	15	4	1		5,463	[b]6,028	1.10	1.22
Compiled Distribution of Transients - 1980	3,207	3,910	1,639	1,398	900	661	1,632	503	74	29	4	4	4				13,955	[b]6,028	0.43	0.56
Actual Distribution of Transients - 1981	562	1,271	482	422	380	310	954	614	275	107	30	17	0	1			5,425	[b]5,381	0.99	1.08
Compiled Distribution of Transients - 1981	3,640	3,767	1,473	1,418	963	716	1,550	349	69	8	1	1					13,955	[b]5,381	0.39	0.52
Actual Distribution of Transients - 1982	623	1,226	452	397	332	286	867	536	339	184	42	18	1	0	0	1	5,303	[b]5,610	1.06	1.20
Compiled Distribution of Transients - 1982	3,803	3,480	1,432	1,308	842	661	1,502	506	87	20	1						13,642	[b]5,610	0.41	0.57
Actual Distribution of Transients - 1983	838	1,306	441	410	318	298	864	565	381	166	56	23	4	2			5,672	[b]5,935	1.05	1.16
Compiled Distribution of Transients - 1983	4,372	3,654	1,311	1,219	839	662	1,593	584	94	13	5	2					14,348	[b]5,935	0.41	0.59
Actual Distribution of Transients - 1984	998	1,462	444	419	341	297	928	662	380	92	9	2					6,024	[b]5,489	0.91	1.09
Compiled Distribution of Transients - 1984	5,043	3,909	1,367	1,268	883	696	1,575	447	58	7	0						15,253	[b]5,489	0.36	0.54

[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 actual from the compiled distribution shown in Table 5.4a and then subtracting this difference from the compiled 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	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	5.00-6.00	6.00-7.00	7.00-8.00	8.00-9.00	9.00-10.00	>10				
[a]Compiled 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]Adjusted 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]Compiled 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]Adjusted 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]Compiled 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]Adjusted 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]Compiled 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]Adjusted 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]Compiled 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]Adjusted 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]Compiled Statistical Distribution - 1983	52,036	31,948	12,211	10,296	6,470	4,708	12,171	5,311	1,950	544	65	16	4				137,730	56,472	0.41	0.66
[c]Adjusted Statistical Distribution - 1983	48,502	29,600	11,341	9,487	5,949	4,344	11,442	5,292	2,237	697	116	37	8	2			129,054	56,472	0.44	0.70
[a]Compiled Statistical Distribution - 1984	59,616	39,884	14,764	11,492	7,166	5,396	12,453	4,976	1,675	295							157,708	55,214	0.35	0.56
[c]Adjusted Statistical Distribution - 1984	55,561	37,437	13,841	10,643	6,624	4,997	11,806	5,182	1,997	380	9	2					148,479	55,214	0.37	0.59

[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 actual from the compiled distribution shown inTable 5.4a and then subtracting this difference from the compiled statistical distribution shown in Table 5.4b.

is probably due to the fact, as stated in the footnote, that not all of the 1984 termination reports had yet been processed. After discussions with several firms that provided contract personnel to work at nuclear power facilities during 1984, it was determined that 110 would be a more realistic estimate of the number of workers with annual doses greater than five rems.

Table 5.5

ANNUAL WHOLE BODY DOSES EXCEEDING FIVE REMS (cSv)

Year	Compiled Number >5 Rems (cSv)	Adjusted 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	163	0.2
1984*	0	11(110)**	<0.1(0.1)**

*Figures for these years may be incomplete because the termination data for about 15% of the individuals terminating during 1983 or 1984 have not been entered into the REIR system.

**Estimate based on discussions with firms providing contract personnel.

5.5 Temporary Workers per Calendar Year

To complete the exmination 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 some 64% 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 27%. 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 remains at about 0.60 rem (cSv). Comparison of these figures with those in Table 5.4b reveals that these workers comprised 28% of the total number of workers (92,918) receiving a measurable dose in 1984, while their collective dose was only 26% of the total collective dose. Their average measurable dose was also slightly less than the overall average of 0.59 rem (cSv).

Table 5.6

TEMPORARY WORKERS PER CALENDAR YEAR
(Individuals Terminated by Only One Employer)

Year	No. of Reactors	Number of Temps. Monitored	Number with Measurable Doses	Collective Dose (person-rems or 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	47,428	24,144	14,902	0.31	0.62
1984*	79	47,622	26,188	14,653	0.31	0.56

*Figures for these years may be incomplete because the termination data for about 15% of the individuals terminating during 1983 or 1984 have not been entered into the REIR System.

5.6 Dose Distribution by Sex

In 1980 the sex of terminating individuals was first entered into the REIR System, along with the usual identification and dose data that have always been entered. Since the sex of the individual is not normally indicated on the termination reports, the sex was determined by examining the first name or salutation of each individual for whom either one was shown. The REIR System now contains the sex of about 65% of the individuals terminating since 1980.

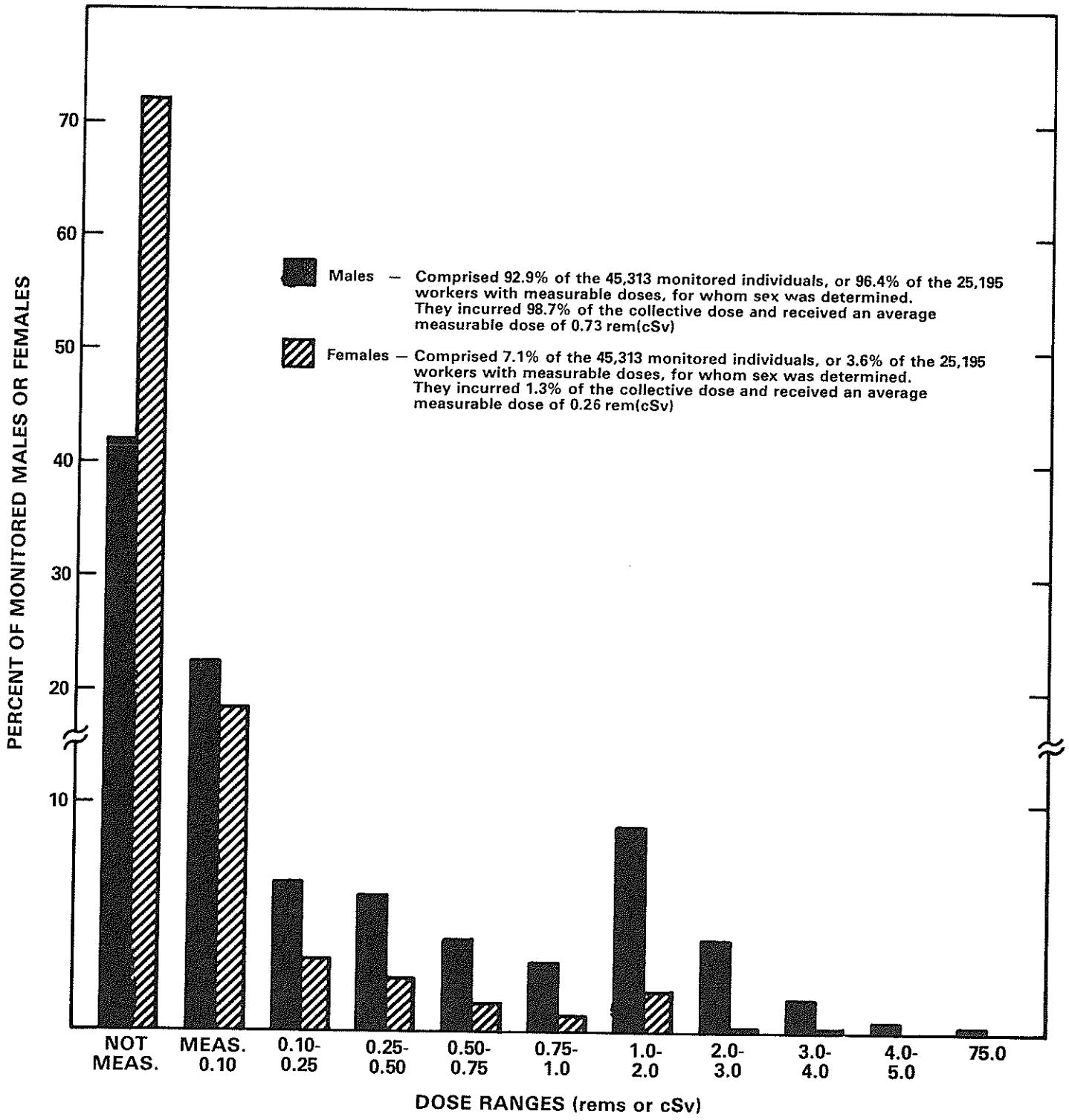
Table 5.7 summarizes the results of several analyses of the termination data submitted for individuals for whom the sex had been entered in the REIR System. Females comprise between 5% and 8% of the total number of the annual transients (individuals beginning and ending one or more periods of employment during the year). Table 5.7 also shows that the collective dose incurred by these females is only about 1.3% of the total collective dose incurred by the total number of annual transients. Consequently, the average measurable dose for female workers was found to be 0.26 rem (cSv) while it was 0.73 rem (cSv) for the male workers terminating in 1983. Figure 5.1 shows the distribution of doses of these workers, and one can quickly see that some 90% of the females received doses that were less than 0.10 rem (cSv); only 65% of the males received such doses. There were no females in this population that received a dose greater than five rems (cSv), but there were about 100 male workers that received doses between five and nine rems (cSv) in 1983, the last year for which this analysis was done.

Table 5.7

SEX VS DOSE PROFILES OF TERMINATED INDIVIDUALS

	1980 Females	1980 Males	1981 Females	1981 Males	1982 Females	1982 Males	1983 Females	1983 Males
Number of individuals monitored	3,901	42,844	2,930	40,462	2,281	39,065	3,207	42,106
Percentage of total monitored	8.3%	91.7%	6.6%	93.4%	5.5%	94.5%	7.1%	92.9%
Percentage of workers with measurable doses	3.6%	96.4%	3.8%	96.2%	2.2%	97.8%	3.6%	96.4%
Percentage of total collective dose	1.0%	99.0%	1.1%	98.9%	1.2%	98.8%	1.3%	98.7%
Average individual dose (rems or cSv)	0.05	0.46	0.07	0.46	0.08	0.41	0.07	0.42
Average measurable dose (rems or cSv)	0.19	0.70	0.20	0.69	0.21	0.67	0.26	0.73
Highest annual dose (rems or cSv)	4-5	8-9	3-4	8-9	2-3	6-7	4-5	8-9

Figure 5.1
Dose Distribution of Males and Females Terminating from LWRs
1983



5.7 Age Distribution

Since the REIR System contains birth dates for about 60% of the approximately 300,000 individuals that have terminated from nuclear power facilities since 1969, it is possible to examine the age distribution of these terminated workers. Table 5.8 shows the percentage of these individuals in each of twelve age groups, ranging from 20 years old to 79 years old as of the year 1985. There is a small portion of the workers less than 25 or older than 65 with the vast majority (63.8%) being between 25 and 45 years of age.

Table 5.8

AGE DISTRIBUTION OF TERMINATED REACTOR WORKERS
AS OF 1985

Age Range (Years)	Percent in Range
20-24	2.0
25-29	12.4
30-34	18.1
35-39	19.1
40-44	14.1
45-49	10.0
50-54	7.8
55-59	6.7
60-64	5.3
65-69	3.1
70-74	1.2
75-79	0.2
$\geq$ 80	0.1

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(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) - 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 an individual to radiation or concentrations of radioactive material that exceeds any applicable quarterly limit in Part 20 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 1977 through 1984. For 1982, 1983, and 1984, it shows the number of individuals that exceeded various limits while employed by one of several types of licensees. For the years 1977 through 1981, only the overexposures reported by licensed industrial radiography firms are shown separately. Most of the occurrences included in the "Others" category come from research

Table 6.1

PERSONNEL OVEREXPOSURES TO EXTERNAL RADIATION

1977 - 1984

Year	License Category	Persons and Doses (rems or cSv)	Types of Overexposures and Doses								
			Whole Body (rems or cSv)			Skin (rems or cSv)			Extremity (rems or cSv)		
			<5.00	≥5 <25	≥25	>7.5<30	≥30<150	≥150	>18.75<75	≥75<375	>375
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							
	Power Reactors	No. of Persons	1	1							
		Sum of Doses	5.0	9.4							
	Medical Facilities	No. of Persons	2								
		Sum of Doses	1.9								
	Marketing & Manufact.	No. of Persons	1[b]								
		Sum of Doses	1.3								
	Others	No. of Persons	1						15	2	
		Sum of Doses	4.3						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					56.0		
	All Others	No. of Persons	84						3		3
		Sum of Doses	285.4						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		
1977	Industrial Radiography	No. of Persons	7	2[h]							1
		Sum of Doses	23.7	23.2							630
	All Others	No. of Persons	38		1	3[i]			10		
		Sum of Doses	75.0		220	40.0			224		

[a]This person simultaneously received an extremity overexposure of 61 rems (cSv) that is not shown.
[b]This person 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.
[h]This person simultaneously received an extremity overexposure of 18 rems (cSv) that is not shown.
[i]This person simultaneously received an extremity overexposure of 26.9 rems (cSv) that is not shown.

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 is the lowest number reported during the years shown. The highest whole body dose in 1984 was 8.2 rems (cSv). In each of the years from 1977 through 1983, the highest whole body doses were 220, 27.3, 17.0, 7.7, 9.4, and 25 rems (cSv), respectively.

There were two incidents in 1984 in which external exposures of the magnitude described in Category A or B were received. In one incident, a radiographer received a whole body dose of 8.2 rems (cSv) while performing radiography in a field site in Utah. The radiographer failed to perform adequate radiation surveys after making radiographic exposures and did not realize that the radiographic source had not returned to the fully retracted and shielded position.

In the second incident, the dosimeter worn by a nuclear medicine student indicated a whole body dose of 5.2 rems (cSv) for the month of December. Investigation failed to find the cause of exposure, and it was assumed that the student incurred the dose. Although both of these doses are all in excess of NRC limits, they are below the level where observable medical effects would be expected.

There were two instances in 1984 in which the estimated intake of radioactive material exceeded the quarterly intake limit, equivalent to exposure for 520 hours at the maximum permissible concentrations (MPC-hours). Both incidents involved thyroid uptakes of iodine-125 in which one individual received an estimated thyroid dose of 2,000 rems (cSv) or less and the other received a thyroid dose of 300 rems (cSv) or less. Both individuals were involved in research activities, and their excessive thyroid burdens were discovered during routine bioassays. It is doubtful that either was the result of excessive airborne concentrations of iodine-125, but exactly how the uptakes actually occurred was never discovered. No change in thyroid function was observed in either individual.

There was one report of personnel exposure to airborne concentrations of soluble uranium in excess of the applicable limit equivalent to exposure for 40 hours at the maximum permissible concentration in 1984. The report indicated that an uptake equal to 90 MPC-hours may have been incurred by an employee while working in a ventilation dust collection unit.

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APPENDIX A

Alphabetical Listing of Annual Exposure Data Compiled for Certain NRC Licensees

1984

APPENDIX A

INDUSTRIAL RADIOGRAPHERS

Single Location 1984

Licensee Name	License Number	Total Individuals Monitored	Workers with Measurable Dose	Collective Dose (man-rems)	Average Meas'ble Dose (rems or cSv)
ABEX CORPORATION	29-01208-02	6	0	0	0.00
ABEX CORPORATION - NPC	29-01208-03	0	0	0	0.00
AIR PRODUCTS AND CHEMICALS	37-05105-05	15	12	1	0.12
ALLOY CRAFTS COMPANY	13-17511-01	4	2	0	0.11
ALLONSO & CARUS IRON WORKS	52-21350-01	2	2	0	0.18
AMOCO OIL COMPANY	12-06708-01	4	0	0	0.00
ANCHOR/DARLING VALVE COMPANY	37-15476-01	6	5	0	0.08
ARMY, DEPARTMENT OF THE	13-18235-01	39	11	1	0.05
ARMY, DEPARTMENT OF THE	29-00047-06	170	23	1	0.05
ARROW TANK & ENGINEERING CO.	22-13253-01	5	0	0	0.00
ASSOCIATED PIPING & ENGINEERIN	43-15119-01	9	8	1	0.12
ATLANTIC RESEARCH CORPORATION	45-02808-04	15	15	4	0.27
BABCOCK & WILCOX COMPANY	34-02160-03	46	32	2	0.05
BELOIT CORPORATION	48-02412-02	2	0	0	0.00
BORG-WARNER CORPORATION	37-16828-01	10	0	0	0.00
BRAND EXAMINATION SERVICES	06-17156-01	36	32	48	1.51
BRIGHTON CORP.	34-21480-01	3	3	4	1.29
BUCKEYE INTERNATIONAL	34-06627-01	4	2	0	0.05
BUCYRUS-ERIE CO.	48-06390-01	0	0	0	0.00
CALUMET TESTING SERVICES INC.	13-16347-01	33	23	21	0.92
CAPITOL STEEL CORPORATION	35-16365-01	3	2	1	0.28
CARIBE SHELL & TUBE, INC.	52-19438-01	6	5	1	0.10
CATERPILLAR TRACTOR COMPANY	12-18023-01	6	2	0	0.05
CHICAGO BRIDGE AND IRON CO.	12-05639-01	7	5	0	0.05
CHICAGO BRIDGE AND IRON CO.	43-05337-02	15	6	1	0.17
CULT INDUSTRIES OPERATING CORP.	48-02387-03	5	0	0	0.00
COMBUSTION ENGINEERING	35-02325-02	12	10	1	0.13
CONSECO INC.	48-16774-01	0	0	0	0.00
CONSOLIDATED FOUNDRIES & MFG.	34-04657-02	0	0	0	0.00
CONSOLIDATED X-RAY SERVICE	29-21452-01	88	88	85	0.97
CONSTRUCTION ENGINEERING CO.	37-18456-01	28	7	1	0.13
COPES-VULCAN	37-19530-01	1	1	1	0.63
COUNTER & CO.	29-21308-01	0	0	0	0.00
CRANE COMPANY - INDIAN ORCHARD	20-00518-02	4	0	0	0.00
DAY AND ZIMMERMANN INC.	42-15051-02	3	3	0	0.05
DEPT. OF ARMY	35-19189-02	39	1	0	0.18
DEPT. OF NAVY, USS	04-18082-01	20	3	0	0.05
DEPT. OF THE NAVY, NONDESTRUCT	04-06145-03	9	0	0	0.00
CONNECTICUT, STATE OF	06-06472-03	37	2	0	0.05
DODGE FOUNDRY AND MACHINE CO.	37-15324-01	4	3	0	0.13
DRAVO CORPORATION	34-00850-02	5	3	0	0.13
DUNCAN FOYNDRY & MACHINE WORKS	12-09687-01	0	0	0	0.00
DURALOY COMPANY (THE)	37-02279-02	10	5	2	0.39

APPENDIX A (cont.)
INDUSTRIAL RADIOGRPHERS

Single Location -1984

Licensee Name	License Number	Total Individuals Monitored	Workers with Measurable Dose	Collective Dose (man-rems)	Average Meas'ble Dose (rems or cSv)
DURIRON COMPANY INCORPORATED	34-06398-01	5	5	2	0.31
E. I. DU PONT DE NEMOURS & CO.	07-00455-30	5	1	0	0.05
EMPIRE STEEL CASTINGS, INC.	37-02448-01	3	1	0	0.38
EXXON COMPANY U. S. A.	25-03375-02	6	0	0	0.00
GENERAL ELECTRIC COMPANY	20-00815-05	12	6	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	4	0	0.05
GENERAL MOTORS CORPORATION	21-02392-01	3	0	0	0.00
GENERAL MOTORS CORPORATION	34-15315-02	24	0	0	0.00
GLOBE X-RAY SERVICES INC.	35-15194-01	33	33	29	0.89
GRADE FOUNDRIES INCORPORATED	48-02844-01	3	1	0	0.05
HARRISON STEEL CASTINGS CO	13-02141-01	6	4	1	0.16
HESS OIL VIRGIN ISLAND CORP.	55-15533-02	11	3	0	0.13
HIGH STEEL STRUCTURES INC.	37-17534-01	9	3	0	0.05
INGERSOLL-RAND COMPANY	29-02015-02	2	2	1	0.40
INTERIOR, DEPARTMENT OF THE	24-02619-02	7	3	0	0.05
INTERIOR, DEPARTMENT OF THE	36-01142-03	6	1	0	0.05
JOHN DEERE FOUNDRY	12-09111-01	3	3	0	0.05
KAST METALS CORPORATION	14-07206-01	6	2	0	0.05
KELSEY-HAYES COMPANY INC.	12-02360-02	4	0	0	0.00
KOMOKO TUBE CO.	13-21248-01	0	0	0	0.00
LABARGE INC.	35-15514-01	2	2	0	0.21
LUKENS STEEL COMPANY	37-02827-01	9	0	0	0.00
LYNCHBURG FOUNDRY COMPANY	45-17464-01	9	2	0	0.18
MAGNAFLUX CORPORATION	12-00622-07	435	334	288	0.86
MARATHON OIL COMPANY	34-01541-02	46	9	1	0.05
MASON & HANGER-SILAS MASON CO.	16-17692-01	92	2	0	0.05
MASSILLON STEEL CASTING CO.	34-02605-01	0	0	0	0.00
MAYNARD ELECTRIC STEEL CASTING	46-07080-01	4	4	2	0.46
MCMANUS INSPECTION SERVICE	48-14158-01	3	3	1	0.18
MINNEAPOLIS ELECTRIC STEEL CAS	22-03572-02	2	0	0	0.00
MISSOURI STEEL CASTINGS CO.	25-15152-01	4	0	0	0.00
NATIONAL AERONAUTICS AND SPACE	34-00507-04	49	12	1	0.05
NATIONAL AERONAUTICS AND SPACE	45-03886-02	6	6	0	0.05
NAVY, DEPARTMENT OF USS H.	31-17677-01	10	9	2	0.25
NAVY, DEPARTMENT OF THE	04-00145-01	45	11	1	0.05
NAVY, DEPARTMENT OF THE	04-09369-01	109	3	0	0.05
NAVY, DEPARTMENT OF THE	28-01012-02	52	50	5	0.10
NAVY, DEPARTMENT OF THE	37-00314-06	67	16	2	0.12
NAVY, DEPARTMENT OF THE	39-00126-01	57	49	6	0.11
NAVY, DEPARTMENT OF THE	29-19047-01	8	0	0	0.00

APPENDIX A (cont.)

INDUSTRIAL RADIOGRAPHERS

Single Location - 1984

Licensee Name	License Number	Total Individuals Monitored	Workers with Measurable Dose	Collective Dose (man-rems	Average Meas'ble Dose (rems or cSv)
NAVY, DEPARTMENT OF THE	46-09611-01	3	0	0	0.00
NAVY, DEPARTMENT OF THE	46-19259-01	24	24	1	0.05
NAVY, DEPARTMENT OF THE	53-06007-01	24	23	2	0.08
NAVY, DEPT OF THE	29-14031-02	6	0	0	0.00
NAVY, DEPT. OF, USS FRANK C.	21-19283-01	9	9	1	0.11
NILES STEEL TANK COMPANY	21-04741-01	4	1	0	0.05
NORTHWEST AIRLINES INC.	22-12080-01	27	3	0	0.05
OKLAHOMA STEEL CASTING CO.	35-21159-01	6	3	0	0.13
OZARK AIR LINES, INC.	24-13591-01	24	1	1	0.63
P. X. ENGINEERING COMPANY INC.	20-15102-01	2	2	0	0.05
PILTON CASTEEL INC.	48-02869-02	3	3	0	0.05
PENNSYLVANIA SHIPBUILDING CO.	37-21067-01	6	5	0	0.05
PITTSBURGH-DES MOINES CORP.	43-19915-01	2	2	0	0.05
PROFESSIONAL SERVICES INDUS.	12-21501-01	7	3	0	0.05
QUAKER ALLOY CASTING COMPANY	37-03671-01	22	17	3	0.18
REFINERY PRODUCTS CORPORATION	48-03665-02	3	1	1	0.63
RICHMOND ENGINEERING COMPANY	45-02884-01	16	3	1	0.20
SAWYER RESEARCH PRODUCT INC.	34-02044-01	7	1	0	0.05
SHAFER VALVE CO.	34-21198-01	4	0	0	0.00
SIVYER STEEL CASTING COMPANY	14-02407-01	4	1	0	0.18
SOUTHWESTERN ENGINEERING CO.	24-19500-01	3	3	1	0.24
ST. LOUIS STEEL CASTING, INC.	24-01587-01	3	3	0	0.05
STRUTHERS WELLS CORPORATION	37-11152-01	7	4	0	0.05
TAYLOR AND FENN COMPANY	06-02024-01	3	0	0	0.00
TELEDYNE UNITCAST	34-00412-03	0	0	0	0.00
THIOKOL CHEMICAL CORPORATION	01-00856-02	7	0	0	0.00
THIOKOL CHEMICAL CORPORATION—	43-03227-01	16	8	0	0.05
THIOKOL CORPORATION	17-16380-01	54	24	2	0.08
TRANS WORLD AIRLINES INC.	24-05151-05	23	5	2	0.35
U.S.A. WORTHINGTON PUMP CORP	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	2	0	0.05
WAUKESHA FOUNDRY COMPANY INC.	48-13776-01	6	4	0	0.05
WEATHERLY FOUNDRY AND MANUFACT.	37-09859-01	2	0	0	0.00
WEHR STEEL COMPANY	48-02005-02	4	3	1	0.20
WESTERN ZIRCONIUM	43-18296-01	11	1	0	0.05
WESTINGHOUSE ELECTRIC CORP.	37-03632-01	16	7	1	0.07
WESTINGHOUSE ELECTRIC CORP.	37-05809-02	5	3	3	0.87
WHITING CORPORATION	12-04921-01	6	0	0	0.00
WILLIAM POWELL COMPANY (THE)	34-02963-01	6	5	0	0.05
WISCONSIN CENTRIFUGAL INCORP.	48-11641-01	4	4	2	0.37
WISCONSIN INDUSTRIAL TESTING	48-17480-01	30	25	16	0.66
WURD INDUSTRIES PIPE FABRICAT.	35-15458-01	5	4	5	1.36
YUBA HEAT TRANSFER CORPORATION	35-13735-01	3	3	2	0.61

03320

APPENDIX A

INDUSTRIAL RADIOGRAPHERS

Multiple Locations-1984

Licensee Name	License Number	Total Individuals Monitored	Workers with Measurable Dose	Collective Dose (man-rems)	Average Meas'ble Dose (rems or cSv)
A-1 INSPECTION, INC.	49-21496-01	4	4	5	1.20
ABC TESTING	20-19778-01	10	10	3	0.29
ADVEX CORPORATION	45-16452-01	15	12	12	1.03
AIR FORCE, DEPARTMENT OF THE	09-15149-01	6	6	0	0.05
ALASKA INDUSTRIAL X-RAY	50-16084-01	7	6	4	0.62
ALASKA WELDING CENTER	50-19202-01	59	56	52	0.93
ALLEGHENY LABS.	37-20734-01	3	2	0	0.11
ALLIED INSPECTION SERVICES INC.	21-18428-01	11	9	7	0.72
ALLIS-CHALMERS CORPORATION	37-16280-03	20	1	0	0.05
AMERICAN AIRLINES INC.	35-13964-01	76	29	5	0.16
AMERICAN OIL COMPANY (THE)	13-00155-10	21	16	1	0.05
AMERICAN TESTING & INSPECTION	12-21101-01	7	7	2	0.23
AMOCO OIL COMPANY	45-01378-02	13	2	0	0.05
ARMY, DEPARTMENT OF THE	30-02405-05	7	6	0	0.05
ARNOLD GREENE TESTING LAB.	20-01074-02	39	30	5	0.18
ASTROTECH INC	37-09928-01	13	9	4	0.46
BABCOCK & WILCOX CO. (THE)	34-02160-04	133	44	8	0.18
BAKER TESTING SERVICES INC.	20-19067-01	4	4	0	0.05
BASIN INDUSTRIAL X-RAY, INC.	42-19906-01	0	0	0	0.00
BATH IRON WORKS CORPORATION	18-00828-04	17	3	0	0.05
BENJAMIN F. SHAW COMPANY	39-13318-01	2	2	0	0.18
BILL MILLER INC.	35-19048-01	18	13	10	0.77
BRANCH RADIOGRAPHIC LAB	29-03405-02	49	49	6	0.11
BRAUN ENGINEERING TESTING, INC.	22-16537-02	0	0	0	0.00
BRIGGS ENGINEERING & TESTING	20-16401-01	5	5	3	0.64
BRISTOL STEEL AND IRON WORKS	45-16947-01	6	5	1	0.21
BOOTHE-TWINING, INC.	04-19522-01	88	82	81	0.99
C & R LABORATORIES	53-19179-01	4	4	0	0.05
CAPITAL X-RAY SERVICE	35-11114-01	25	25	66	2.65
CARROLL ENGINEERS	20-13042-01	5	1	0	0.18
CATALYTIC INC.	37-12931-02	3	0	0	0.00
CATERPILLAR TRACTOR COMPANY	12-00013-02	16	2	0	0.18
CERTIFIED TESTING LABORATORIES	29-14150-01	6	6	0	0.05
CHLINE CONTRACTING CORPORATION	22-18342-01	15	13	5	0.34
CHICAGO BRIDGE AND IRON CO.	42-13553-02	115	112	59	0.52
CLEVELAND X-RAY INSPECTION INC	35-15205-01	51	51	48	0.94
COLBY AND THIELMEIER TESTING	24-13737-01	5	5	5	0.94
COLONIAL GAS CO.	20-15003-01	5	0	0	0.00
COLUMBIA GAS TRANSMISSION CORP.	47-16060-01	6	4	1	0.14
COMBUSTION ENGINEERING INC.	06-04154-01	16	11	1	0.13
CONSOLIDATED TESTING LABS	31-01545-03	5	5	4	0.81
CONSOLIDATED X-RAY SERVICE CO.	42-06456-02	92	91	64	0.70
CONSUMERS POWER COMPANY	21-06606-03	20	18	5	0.28

INDUSTRIAL RADIOGRAPHERS
Multiple Locations-1984

Licensee Name	License Number	Total Individuals Monitored	Workers with Measurable Dose	Collective Dose (man-rems)	Average Meas'ble Dose (rems or cSv)
CORPORACION GEOTEC	52-21486-01	0	0	0	0.00
CRANE COMPANY	24-00563-02	9	9	5	0.53
CTL ENGINEERING INC.	34-06331-01	2	2	1	0.50
D & S TESTING, INC.	34-21458-01	14	12	12	0.95
DANIEL INTERNATIONAL CORP	39-01261-02	44	31	19	0.61
DAYTON X-RAY COMPANY	34-06943-01	12	10	4	0.35
DEPT. OF NAVY, MARE ISLAND NAV,	04-00364-06	52	45	3	0.07
DEPT. OF NAVY, NAVAL EXPLOSIVE	19-00318-03	25	0	0	0.00
DEPT. OF NAVY, USS A,	04-17872-01	20	0	0	0.00
DEPT. OF NAVY, USS D,	04-17976-01	16	15	1	0.05
DEPT. OF NAVY, USS H,	04-16130-01	23	0	0	0.00
DEPT. OF NAVY, USS J,	04-17765-01	11	0	0	0.00
DEPT. OF NAVY, USS P,	04-18013-01	10	0	0	0.00
DEPT. OF NAVY, USS P,	04-18041-01	19	19	2	0.09
DEPT. OF THE NAVY	09-21465-01	13	8	1	0.10
DEPT. OF THE NAVY	31-17825-02	13	4	0	0.05
DEPT. OF THE NAVY,	04-04484-03	6	8	1	0.10
DEPT. OF THE NAVY,	38-05314-05	7	0	0	0.00
DEPT. OF THE NAVY, USS S,	09-19770-01	16	1	0	0.05
DUQUESNE LIGHT COMPANY	37-17507-01	14	12	2	0.13
E. L. CONWELL & COMPANY	37-17637-01	2	0	0	0.00
EASTERN TESTING AND INSPECTION	29-09814-01	27	24	20	0.83
EBASCO SERVICES INC.	29-07056-03	51	31	10	0.33
EG & G FLORIDA, INC.	09-21233-01	25	22	3	0.14
EL PASO NATURAL GAS COMPANY	42-03201-02	4	4	1	0.29
EQUITABLE GAS COMPANY	37-17491-01	7	0	0	0.00
EXAM COMPANY	35-16191-01	429	429	56	0.13
FACTORY MUTUAL RESEARCH CORPOR	20-04007-02	6	2	0	0.05
FINLAY TESTING LABORATORIES	53-17854-01	7	5	4	0.84
FOSTER WHEELER ENERGY CORP.	31-01776-05	32	14	5	0.36
FRANKLIN RESEARCH CENTER	37-00637-11	16	1	0	0.05
FROEHLING & ROBERTSON INC.	45-06890-01	10	8	3	0.39
GAMMA FIELD RADIOGRAPHIC FACIL,	12-13858-01	25	20	15	0.73
GAMMA SCAN COMPANY	07-19528-01	0	0	0	0.00
GENERAL DYNAMICS CORPORATION	06-01781-08	106	94	23	0.24
GENERAL DYNAMICS CORPORATION	20-11915-01	21	9	1	0.10
GLI CONSTRUCTION TESTING	04-00616-04	241	186	58	0.31
GLADSTONE LABS. INC. (THE)	34-01764-02	5	3	0	0.13
GREAT LAKES TESTING CORP.	13-21306-01	0	0	0	0.00
GRINNELL COMPANY, INC.	38-02839-01	30	12	3	0.26
H. C. NUTTING CO.	34-14924-01	4	4	0	0.08
H. R. INSPECTION SERVICE INC.	15-06209-01	8	8	6	0.73
HUH X-RAY SERVICES INC.	17-19236-01	6	6	7	1.10

APPENDIX A (cont.)

INDUSTRIAL RADIOGRPHERS

Multiple Locations 1984

Licensee Name	License Number	Total Individuals Monitored	Workers with Measurable Dose	Collective Dose (man-rems)	Average Meas'ble Dose (rems or cSv)
HARDY ASSOCIATES LTD.	50-19946-01	6	3	1	0.31
HURRON TESTING LABORATORY INC.	34-00681-03	8	8	1	0.14
HOUSTON INSPECTION SERVICE	42-23150-01	20	20	62	3.10
HUTCHINSON AREA VO-TECH INSTIT.	22-15554-01	279	31	2	0.05
INDEPENDENT INSPECTION	42-19441-01	3	2	3	1.69
INDEPENDENT TESTING LAB.	03-15981-02	57	49	25	0.51
INDUSTRIAL GAMMA INSPECTION	24-19850-01	1	0	0	0.00
INDUSTRIAL INSPECTION	34-14071-01	47	43	30	0.69
INDUSTRIAL LABORATORIES INC.	41-04226-02	6	6	5	0.79
INDUSTRIAL NDT COMPANY	45-19494-01	11	9	4	0.43
INDUSTRIAL NDT SERVICES	13-06147-04	7	6	2	0.30
INDUSTRIAL TESTING LABORATORY	37-16406-01	13	1	0	0.05
INSPECTION & TESTING COMPANY	11-19921-01	23	23	26	1.11
INSPECTION SERVICE CORP OF PEN.	37-11636-01	8	5	7	1.32
INSPECTION SERVICE, INC.	41-21154-01	34	25	13	0.53
INTERMOUNTAIN TESTING COMPANY	05-07872-01	25	25	31	1.22
INTERNATIONAL TESTING LABS.	29-14027-01	8	2	0	0.11
J.T. COLLEN COMPANY INC.	12-15025-01	6	4	3	0.73
JACKSONVILLE SHIPYARDS INC.	09-15611-01	10	7	1	0.20
JAN X-RAY SERVICES INC.	21-16560-01	16	15	13	0.88
JONES, OTHO	35-21425-01	34	30	15	0.51
LAKEHEAD TESTING LABORATORY	22-14897-01	6	2	1	0.40
LATY INSPECTION SERVICE	37-21473-01	2	0	0	0.00
LAW ENGINEERING TESTING CO.	10-00346-03	243	196	22	0.11
LEHIGH TESTING LABORATORIES	07-01173-03	8	8	5	0.56
LOCKHEED SHIPBUILDING & CONSTR.	46-00926-02	11	4	0	0.05
MAGNA CHEM INC.	21-19111-01	27	15	4	0.24
MASSACHUSETTS MATERIALS RES.	20-19130-01	7	4	0	0.08
MATERIALS TESTING LABORATORY	45-17151-01	9	9	10	1.16
MATTINGLY & OIRILLY SERVICE	25-21479-01	0	0	0	0.00
MET LAB INC.	45-09963-01	7	7	2	0.23
MET-CHEM ENGINEERING LAB.	43-19652-01	37	36	22	0.62
MET-CHEM ENGINEERING LAB.	43-11213-02	11	9	9	1.03
METALOGIC, INC.	02-19728-01	94	81	39	0.48
METALSALES INC.	43-17142-01	6	4	3	0.64
METILS INC.	42-16534-01	26	9	5	0.53
MID-CON INSPECTION	49-16670-01	93	93	44	0.48
MIDLAND-ROSS CORPORATION	34-01115-02	5	0	0	0.00
MIDWEST INSPECTION SERVICE LTD.	48-16296-01	15	9	8	0.83
MINNOTTE MANUFACTURING CORP.	37-11460-01	1	0	0	0.00
MONROE X-RAY CO.	17-12201-02	4	4	3	0.69
MONTANA X-RAY INC.	25-21134-01	1	1	3	2.50
MORRISON-KNUDSEN COMPANY INC.	11-15946-01	14	13	3	0.26

APPENDIX A (cont.)

INDUSTRIAL RADIOGRAPHERS

Multiple Locations - 1984

Licensee Name	License Number	Total Individuals Monitored	Workers with Measurable Dose	Collective Dose (man-rems)	Average Meas'ble Dose (rems or cSv)
NATIONAL INSPECTION & CONSUL.	09-21289-01	0	0	0	0.00
NAVY DEPT. NAVAL SUB BASE	03-10226-01	27	1	0	0.05
NAVY DEPT. USS ACADIA	04-19846-01	22	22	1	0.05
NAVY, DEPARTMENT OF USS F	31-18014-01	9	9	1	0.05
NAVY, DEPARTMENT OF USS L	31-17970-01	14	14	2	0.11
NAVY, DEPARTMENT OF USS O	31-18096-01	13	0	0	0.00
NAVY, DEPARTMENT OF USS P	31-17928-01	26	2	0	0.05
NAVY, DEPARTMENT OF USS Y	31-17802-01	7	0	0	0.00
NAVY, DEPARTMENT OF THE	04-03141-01	24	1	0	0.05
NAVY, DEPARTMENT OF THE	04-13252-01	18	0	0	0.00
NAVY, DEPARTMENT OF THE	06-07150-01	18	17	2	0.11
NAVY, DEPARTMENT OF THE	45-04052-03	80	72	6	0.09
NAVY, DEPARTMENT OF THE	45-15650-02	14	0	0	0.00
NAVY, DEPARTMENT OF THE	46-03078-01	82	79	12	0.15
NAVY, DEPT. OF THE, (USS C,	09-19932-01	11	11	1	0.05
NAVY, DEPT. OF THE, USS M.	04-19966-01	17	17	1	0.05
NAVY, DEPT. OF THE, USS S.	04-21246-01	16	7	0	0.05
NDE SERVICES, INC.	05-19821-01	15	15	11	0.72
NDT CORROSION & CONTROL SERV	42-21135-01	0	0	0	0.00
NEW YORK TESTING LABORATORIES	31-02933-01	7	5	2	0.37
NEWPORT NEWS INDUSTRIAL CORP.	34-16805-01	4	3	0	0.05
NEWPORT NEWS INDUSTRIAL CORP	45-11569-01	0	0	0	0.00
NEWPORT NEWS SHIPBUILDING	45-09428-02	95	89	34	0.38
NIC TESTING SERVICE	37-18348-02	13	3	1	0.20
NONDESTRUCTIVE INSPECTION SERV.	47-11883-01	11	11	8	0.68
NONDESTRUCTIVE TESTING CORP.	29-19742-01	24	24	5	0.21
NOOTER CORPORATION	24-03783-01	18	13	1	0.06
NORFOLK SHIPBUILDING AND DRYDO	45-12042-01	17	11	1	0.07
NORTH AMERICAN INSPECTION, INC.	37-23370-01	24	21	14	0.66
NORTHEASTERN RESEARCH & TEST	29-18006-01	0	0	0	0.00
NUCLEAR ENERGY SERVICE INC.	42-16559-01	128	88	61	0.69
NUCLEAR INSTALLATION SERV. CO.	09-23042-01	6	2	0	0.05
NWI INTERNATIONAL	12-17506-01	5	3	0	0.05
OKLAHOMA TESTING LABORATORIES	35-10577-01	14	7	1	0.13
OLD DOMINION IRON & STEEL CORP.	45-15581-01	3	3	0	0.13
PANHANDLE EASTERN PIPE LINE CO	15-17729-01	9	9	1	0.09
PARKER INDUSTRIAL X-RAY LAB.	06-01337-03	13	8	3	0.35
PATZIG TESTING LABS INC.	14-18897-02	15	6	1	0.19
PDM LATIN AMERICA, LTD.	10-19980-01	0	0	0	0.00
PENN INSPECTION CO.	35-21144-01	9	9	7	0.74
PERINI CORP.	20-21490-01	0	0	0	0.00
PHOTON FIELD INSPECTION, INC.	21-21010-01	3	1	0	0.05
PITTSBURGH DES MOINES STEEL CO.	14-01837-04	10	4	1	0.11

APPENDIX A (cont.)

INDUSTRIAL RADIOGRAPHERS
Multiple Locations -1984

Licensee Name	License Number	Total Individuals Monitored	Workers with Measurable Dose	Collective Dose (man-rems)	Average Meas'ble Dose (rems or cSv)
PITTSBURGH DES MOINES STEEL CO	37-02607-02	13	7	2	0.27
PITTSBURGH TESTING LABORATORY	37-00276-25	526	323	176	0.55
PLANT INSPECTION CO.	04-21032-01	9	0	0	0.00
PORTABLE ATOMIC X-RAY COMPANY	35-07488-03	2	1	1	0.63
POWER INSPECTION, INC.	37-21428-01	0	0	0	0.00
POWER PIPING COMPANY	37-09945-01	4	4	1	0.31
PRECISION COMPONENTS CORP.	37-16280-01	53	25	2	0.07
PROGRESS SERVICES, INC.	34-19592-01	11	8	2	0.21
PROGRESSIVE FABRICATORS	24-21200-01	0	0	0	0.00
PULLMAN POWER PRODUCTS	37-08042-01	94	50	16	0.32
Q.C. LABORATORIES INC.	09-11579-03	27	25	9	0.34
QUAD CITY TESTING LABORATORY	14-17989-01	6	6	4	0.58
QUALITY ASSURANCE LABORATORIES	18-19078-01	7	4	2	0.61
RADIOGRAPHY INSPECTION, INC.	15-21451-01	26	24	12	0.49
REACTOR CONTROLS INC.	04-15365-01	14	6	1	0.13
RELIANCE TESTING LABORATORIES	19-17176-01	18	10	3	0.31
RICHARD KRUEGEL, DBA GENERAL T	34-09037-01	5	5	8	1.58
ROCKWELL INTERNATIONAL	04-17624-03	0	0	0	0.00
S & S INSPECTION COMPANY	12-19780-01	19	13	7	0.54
SMITH-EMERY COMPANY	04-19467-01	13	11	2	0.17
SOUTHWEST X-RAY CORP.	03-21354-01	36	36	40	1.12
SPACE SCIENCE SERVICES INC.	09-07550-01	41	28	20	0.72
SPECTRUM LABORATORIES INC.	29-07266-01	4	3	0	0.05
SSW INSPECTION SERVICES	14-19899-01	0	0	0	0.00
ST. LOUIS TESTING LABORATORIES	24-00188-02	15	14	19	1.35
STONE & WEBSTER ENGINEERING CO.	20-05600-02	90	42	10	0.23
SUN RAY TESTING INTERNATIONAL	04-19810-01	0	0	0	0.00
SUPERIOR INDUSTRIAL X-RAY CO.	12-02370-01	12	6	1	0.09
TENNECO INC.	42-09073-02	25	24	6	0.26
TENNESSEE VALLEY AUTHORITY	41-06832-06	35	21	3	0.13
TERLX CORPORATION	34-19607-01	5	0	0	0.00
TESTING INSTITUTE OF ALASKA	50-17446-01	5	4	2	0.37
TOWNSEND AND BOTTUM INC.	21-17095-01	0	0	0	0.00
TRANS-EASTERN INSPECTION SERV	37-14855-01	85	74	61	0.82
TRANS-WORLD TESTING LABS., INC.	04-23360-01	11	11	4	0.34
TRI-STATE INSPECTION & CONSUL.	37-19640-01	0	0	0	0.00
TRUTOM LTD.	06-20755-01	20	13	9	0.69
TULSA GAMMA RAY INC.	35-17178-01	15	14	19	1.33

APPENDIX A (cont.)

INDUSTRIAL RADIOGRAPHERS
Multiple Locations - 1984

Licensee Name	License Number	Total Individuals Monitored	Workers with Measurable Dose	Collective Dose (man-rems)	Average Meas'ble Dose (rems or cSv)
TULSA INSPECTION SERVICE, INC.	35-23362-01	43	40	22	0.54
TWIN CITY TESTING AND ENG.	22-01376-02	43	28	18	0.64
TWIN PORTS TESTING, INC.	48-23476-01	11	8	10	1.22
U.S. TESTING CO., INC.	29-02477-09	0	0	0	0.00
ULRA TECHNOLOGY, INC.	50-23363-01	0	0	0	0.00
UNION BOILER COMPANY	47-16182-01	21	20	12	0.61
UNITED INSPECTION, INC.	35-23436-01	16	14	6	0.41
UNITED STATES TESTING COMPANY	37-15445-02	82	41	11	0.26
UNITED TECHNOLOGIES CORP	06-07522-05	0	0	0	0.00
UNIVERSAL TECHNICAL TESTING LA	37-00453-03	18	12	8	0.65
UNIVERSAL TESTING LABORATORIES	29-16397-01	27	6	1	0.15
VENEGAS INDUSTRIAL TESTING LAB	28-14847-02	5	3	2	0.56
VIRGINIA DEPARTMENT OF HIGHWAY	45-13380-02	2	0	0	0.00
W.M. KELLOGG CONSTRUCTORS, INC	42-16573-01	3	0	0	0.00
WESTERN INDUSTRIAL X-RAY	04-21380-01	49	39	37	0.94
WESTERN STRESS, INC.	49-23490-01	13	11	1	0.06
WESTERN X-RAY COMPANY	35-19993-01	13	9	5	0.51
X-R-I TESTING OF MICHIGAN	21-05472-01	52	23	5	0.23
X-RAY, INC.	46-03414-03	28	28	14	0.51
X-SCAN INSPECTION COMPANY	35-19507-01	5	5	6	1.16
ARMY, DEPARTMENT OF THE	29-00047-08	0	0	0	0.00
MELLOY LABORATORIES INC.	45-13733-04	0	0	0	0.00
WASHINGTON UNIVERSITY	24-00167-12	0	0	0	0.00

APPENDIX A (cont.)

MANUFACTURERS AND DISTRIBUTORS

1984

Licensee Name	License Number	Program Type	Total Individuals Monitored	Workers with Measurable Dose	Collective Dose (man-rems)	Average Meas'ble Dose (rems or cSv)
ABBOTT LABORATORIES	12-00621-03	BROAD	1310	175	12	0.07
ACCURAY CORPORATION	34-00255-03	BROAD	387	223	17	0.08
AMERSHAM CORPORATION	12-12836-01	BROAD	229	75	22	0.29
E. R. SQUIBB AND SONS INC.	29-00139-02	BROAD	406	234	41	0.18
HALLIBURTON COMPANY	35-00502-03	BROAD	57	57	10	0.17
MALLINCKRODT/NUCLEAR	24-04206-01	BROAD	356	326	184	0.56
NEW ENGLAND NUCLEAR CORP.	20-00320-09	BROAD	99	50	9	0.17
NEW ENGLAND NUCLEAR CORP.	20-11868-01	BROAD	626	227	123	0.54
NEW ENGLAND NUCLEAR CORP.	20-00320-13	BROAD	455	201	146	0.72
PITTWAY CORPORATION	12-15023-01	BROAD	36	0	0	0.00
RAMSEY ENGINEERING CO.	42-01485-04	BROAD	92	60	18	0.30
TECHNICAL OPERATIONS INC.	20-00277-03	BROAD	64	28	10	0.36
UPJOHN COMPANY	21-00182-03	BROAD	508	60	3	0.05
AIRCO INCORPORATED	29-02085-01	OTHER	27	1	0	0.18
ATOMIC ENERGY OF CANADA LTD.	54-00300-04	OTHER	0	0	0	0.00
ATOMIC ENERGY OF CANADA LTD.	54-00300-09	OTHER	28	25	6	0.25
ATOMIC ENERGY OF CANADA LTD.	54-00300-12	OTHER	0	0	0	0.00
CAMBRIDGE NUCLEAR CORP.	20-06799-02	OTHER	24	12	2	0.15
ELFRETH ALLEY APOTHECARY	37-18461-01	OTHER	28	21	4	0.18
GAMMA DIAGNOSTIC LABORATORIES	20-15215-01	OTHER	19	15	17	1.11
KAY-RAY INC.	12-11184-02	OTHER	0	0	0	0.00
MALLINCKRODT, INC.	24-04206-07	*OTHER	0	0	0	0.00
MALLINCKRODT, INC.	37-21345-01	*OTHER	0	0	0	0.00
MALLINCKRODT, INC.	37-23326-01	*OTHER	0	0	0	0.00
NEW ENGLAND NUCLEAR CORP.	20-00320-19	OTHER	4	4	0	0.05
NUCLEAR PHARMACY, INC.	37-21322-01	*OTHER	6	6	1	0.19
NUCLEAR PHARMACY	37-19566-01	*OTHER	18	6	1	0.13
NUCLEAR RESEARCH CORP.	37-02401-04	OTHER	0	0	0	0.00
PHARMATOPES INC.	21-19219-01	*OTHER	14	4	0	0.08
PHARMATOPES INC.	34-16654-01	*OTHER	20	19	4	0.21
PHARMATOPES INC.	34-19007-01	*OTHER	12	3	0	0.09
PHARMATOPES INC.	34-19008-01	*OTHER	10	5	0	0.08
PHARMATOPES & CO.	13-19451-01	*OTHER	6	0	0	0.00
SYNCOR CORP.	12-19333-01	*OTHER	40	35	4	0.12
SYNCOR CORP.	24-19360-01	*OTHER	19	17	3	0.17
SYNCOR CORP.	34-18467-01	*OTHER	14	3	0	0.05
SYNCOR CORP.	34-18484-01	*OTHER	12	5	2	0.31
SYNCOR CORP.	35-19583-01	*OTHER	9	6	0	0.07
SYNCOR CORP.	37-21092-01	*OTHER	15	4	1	0.18

*Activity includes distribution of radiopharmaceuticals

APPENDIX A (cont.)

FUEL FABRICATORS AND PROCESSORS

1984

Licensee Name	License Number	Total Individuals Monitored	Workers with Measurable Dose	Collective Dose (man-rems)	Average Meas'ble Dose (rems or cSv)
ATOMICS INTERNATIONAL	SNM-0021	1124	477	61	0.13
BABCOCK & WILCOX CO.	* SNM-0414	109	25	3	0.12
BABCOCK AND WILCOX	SNM-1168	179	121	46	0.38
BABCOCK AND WILCOX INC	SNM-0042	2431	1859	127	0.07
COMBUSTION ENGINEERING INC.	SNM-1067	212	96	29	0.29
COMBUSTION ENGINEERING, INC.	SNM-0033	69	36	3	0.09
EXXON NUCLEAR COMPANY INC,	SNM-1227	873	621	75	0.12
GENERAL ATOMIC COMPANY	SNM-0696	1500	412	42	0.10
GENERAL ELECTRIC CO.	SNM-1097	1225	787	109	0.14
NUCLEAR FUEL SERVICES INC.	SNM-0124	904	626	37	0.06
UNITED NUCLEAR CORP.	* SNM-0777	0	0	0	0.00
UNITED NUCLEAR CORPORATION	SNM-0368	126	64	4	0.06
WESTINGHOUSE ELECTRIC CORP	SNM-1107	738	646	283	0.44
WESTINGHOUSE ELECTRIC CORP	SNM-1120	0	0	0	0.00
LOW-LEVEL WASTE DISPOSAL FAC.					
CHEM-NUCLEAR SYSTEMS, INC.	46-19524-02	546	262	57	0.22
NUCLEAR ENGINEERING COMPANY	16-19204-01	379	35	16	0.44
INDEPENDENT SPENT FUEL STORAGE INSTALLATION					
GENERAL ELECTRIC COMPANY	SNM-2500	32	32	13	0.41

*Engaged primarily in decommissioning activities.

APPENDIX B

Annual Whole Body Doses at Licensed Nuclear Power Facilities

1984

Appendix B

ANNUAL WHOLE BODY DOSES AT LICENSED NUCLEAR POWER FACILITIES
CY 1984

PLANT NAME AND TYPE		Number of Individuals with Whole Body Doses in the Following Range (rems or cSv)																	Total Number Monitored	Number with Measurable Exposure	Collective Dose
		No Measurable Exposure	Measurable <0.10	0.10 - 0.25	0.25 - 0.50	0.50 - 0.75	0.75 - 1.0	1.0 - 2.0	2.0 - 3.0	3.0 - 4.0	4.0 - 5.0	5.0 - 6.0	6.0 - 7.0	7.0 - 8.0	8.0 - 9.0	9.0 - 10.0	10.0 - 12.0	> 12.0			
Arkansas 1, 2	PWR	956	671	311	268	147	94	195	46	9	1								2,698	1,742	806
Beaver Valley	PWR	1,166	588	281	187	110	85	110	32										2,559	1,393	504**
Big Rock Point	BWR	110	147	35	27	21	12	35	15	5									407	297	155
Browns Ferry 1,2,3	BWR	3,538	739	481	531	284	231	462	186	41	7								6,500	2,962	1,940**
Brunswick 1,2	BWR	1,288	2,273	467	433	300	268	766	428	111									6,334	5,046	3,260**
Calvert Cliffs 1,2	PWR	433	741	205	138	76	45	145	17	2									1,802	1,369	479
Cook 1,2	PWR	2,031	534	293	216	163	106	215	26	6									3,590	1,559	762
Cooper Station	BWR	1,840	833	142	139	98	82	193	109	2									3,438	1,598	799**
Crystal River 3	PWR	1,142	385	128	26	9	1												1,691	549	49**
Davis Besse	PWR	899	657	203	127	62	22	17											1,987	1,088	177**
Dresden 1,2,3	BWR	1,011	617	330	240	173	203	459	217	20	2								3,272	2,261	1,774
Duane Arnold	BWR	964	309	102	77	40	43	37	2	1									1,575	611	189
Farley 1,2	PWR	288	742	467	252	147	124	255	56	3									2,334	2,046	902**
Fitzpatrick	BWR	684	664	208	199	88	91	232	72	54	2								2,294	1,610	971**
Fort Calhoun	PWR	60	351	89	110	97	65	145	44	10	2								973	913	563
Ginna	PWR	594	239	114	102	76	53	102	18	8	1								1,307	713	394

Appendix B

ANNUAL WHOLE BODY DOSES AT LICENSED NUCLEAR POWER FACILITIES
CY 1984

PLANT NAME AND TYPE		Number of Individuals with Whole Body Doses in the Following Range (rems or cSv)																	Total Number Monitored	Number with Measurable Exposure	Collective Dose
		No Measurable Exposure	Measurable <0.10	0.10 - 0.25	0.25 - 0.50	0.50 - 0.75	0.75 - 1.0	1.0 - 2.0	2.0 - 3.0	3.0 - 4.0	4.0 - 5.0	5.0 - 6.0	6.0 - 7.0	7.0 - 8.0	8.0 - 9.0	9.0 - 10.0	10.0 - 12.0	> 12.0			
Haddam Neck	PWR	453	403	208	137	93	96	284	151	46	12								1,883	1,430	1,216**
Hatch 1,2	BWR	1,034	1,412	750	642	357	232	497	169	48	3								5,144	4,110	2,218
Indian Point 2	PWR	378	731	351	296	231	193	732	279	103	3								3,297	2,919	2,644**
Indian Point 3	PWR	671	269	147	92	59	33	55	2	1									1,329	658	230
Kewannee	PWR	332	194	95	75	65	34	16	2	1									814	482	139***
La Crosse	BWR	138	188	16	5	1	4	20	11	17	26								426	288	252
La Salle 1	BWR	1,141	690	256	168	80	27	24											2,386	1,245	252
Maine Yankee	PWR	228	425	141	120	99	111	289	69	8									1,490	1,262	884
McGuire 1	PWR	1,284	769	291	279	111	73	124	16										2,947	1,663	507
Millstone 1	BWR	831	779	310	288	210	148	220	32	5									2,823	1,992	836**
Millstone 2	PWR	119	112	43	41	30	21	32	5	1									404	285	120**
Monticello	BWR	1,025	432	217	162	135	113	281	230	197	105								2,897	1,872	2,462
Nine Mine Point	BWR	780	627	214	175	103	86	225	72	28									2,310	1,530	890
North Anna 1,2	PWR	958	1,474	260	257	208	154	432	177	76	24								4,020	3,062	1,945
Oconee 1,2,3	PWR	806	634	354	324	205	170	325	63	10									2,891	2,085	1,106**
Oyster Creek	BWR	1,559	564	325	327	243	162	428	211	107	2								3,928	2,369	2,054

Appendix B

ANNUAL WHOLE BODY DOSES AT LICENSED NUCLEAR POWER FACILITIES
CY 1984

PLANT NAME AND TYPE	Number of Individuals with Whole Body Doses in the Following Range (rems or cSv)																	Total Number Monitored	Number with Measurable Exposure	Collective Dose
	No Measurable Exposure	Measurable <0.10	0.10 - 0.25	0.25 - 0.50	0.50 - 0.75	0.75 - 1.0	1.0 - 2.0	2.0 - 3.0	3.0 - 4.0	4.0 - 5.0	5.0 - 6.0	6.0 - 7.0	7.0 - 8.0	8.0 - 9.0	9.0 - 10.0	10.0 - 12.0	> 12.0			
Palisades PWR	373	671	188	145	88	61	143	40	7	1								1,717	1,344	573
Peach Bottom 2,3 BWR	2,303	872	619	504	304	217	428	224	125	20								5,616	3,313	2,450
Pilgrim BWR	0	1,170	813	459	322	269	800	457	204	48								4,452	4,542	4,082
Point Beach 1,2 PWR	390	588	173	128	117	99	169	76	21	1								1,762	1,372	789
Prairie Island 1,2 PWR	377	244	126	80	39	28	28	1										916	539	147
Quad Cities 1,2 BWR	1,043	444	180	168	117	110	388	241	27	3								2,721	1,678	1,579
Rancho Seco 1 PWR	501	437	137	99	48	31	43	7										1,303	802	222
Robinson 2 PWR	1,183	1,939	379	295	201	189	579	341	204									5,310	4,127	2,880**
Salem 1,2 PWR	1,194	472	283	239	113	77	153	53	4	1								2,589	1,395	681
San Onofre 1 PWR	8,171	3,345	468	259	135	78	88	1										12,545	4,374	513*
San Onofre 2 PWR	3,484	2,124	486	266	133	57	68	6										6,624	3,140	473*
Sequoyah 1,2 PWR	1,496	723	436	418	242	188	311	51	4									3,869	2,373	1,117**
St. Lucie 1,2 PWR	1,440	682	368	295	183	116	290	143	13									3,530	2,090	1,263
Summer 1 PWR	854	498	225	185	104	67	40	1										1,974	1,120	295**
Surry 1,2 PWR	224	1,223	482	313	182	139	508	260	73	18								3,422	3,198	2,247
Susquehanna BWR	1,721	2,061	528	187	28	17	5	1										4,548	2,827	308
Three Mile Island 1,2 PWR	1,604	327	173	142	108	86	180	45	18									2,683	1,079	688

Appendix B

ANNUAL WHOLE BODY DOSES AT LICENSED NUCLEAR POWER FACILITIES
CY 1984

PLANT NAME AND TYPE	Number of Individuals with Whole Body Doses in the Following Range (rems or cSv)																	Total Number Monitored	Number with Measurable Exposure	Collective Dose
	No Measurable Exposure	Measurable <0.10	0.10 - 0.25	0.25 - 0.50	0.50 - 0.75	0.75 - 1.0	1.0 - 2.0	2.0 - 3.0	3.0 - 4.0	4.0 - 5.0	5.0 - 6.0	6.0 - 7.0	7.0 - 8.0	8.0 - 9.0	9.0 - 10.0	10.0 - 12.0	> 12.0			
Trojan PWR	326	401	174	168	101	61	111	25	1									1,368	1,042	433**
Turkey Point 3,4 PWR	1,042	714	306	294	156	101	273	128	31	7								3,052	2,010	1,255
Vermont Yankee BWR	731	176	172	176	129	83	179	37	2									1,685	954	603
Yankee Rowe PWR	1,512	272	65	64	57	52	119	25										2,166	654	348**
Zion 1,2 PWR	906	308	149	148	138	88	205	47	21	6								2,016	1,110	786
Totals - BWRs	21,741	14,997	6,165	4,907	3,033	2,398	5,679	2,714	994	218								62,846	41,105	27,074
Totals - PWRs	37,875	24,887	8,599	6,585	4,133	2,998	6,774	2,253	681	77								94,862	56,987	28,140
Grand Totals - LWRs	59,616	39,884	14764	11492	7,166	5,396	12,453	4,967	1675	295								157,708	98,092	55,214
Fort St. Vrain HTGR	1,616	62	8															1,686	70	3**

APPENDIX C

Personnel, Dose and Power Generation Summary

1969 - 1984

*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
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
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 - 70 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

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)											
	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
	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
BROWNS FERRY 1, 2, 3	1975	161.7	17.8	2380	325					0.14	2.0
Docket 50-259, 50-260, 50-296; DPR-33, -52, -68	1976	337.6	26.9	2207	234					0.11	0.7
1st commercial operation 8/74, 3/75, 3/77	1977	1327.5	73.0	1858	863	60	803	249	614	0.46	0.6
Type - BWRs	1978	1992.1	73.5	2376	1792	4	1788	259	1533	0.75	0.9
Capacity - 1065, 1065, 1065 MWe	1979	2393.0	79.1	2689	1667	0	1667	289	1378	0.62	0.7
	1980	2182.1	73.6	2712	1825	4	1821	49	1776	0.67	0.8
	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
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, 3/77	1978	1173.1	83.7	1458	1004	99	905	695	309	0.69	0.8
Type - BWR	1979	810.0	60.1	2891	2602	97	2505	2074	528	0.90	3.2
Capacity - 790, 790 MWe	1980	687.2	52.2	3788	3870	111	3759	3098	772	1.02	5.6
	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

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
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
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

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
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 - 874 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
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 - 197, 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

*Dresden 1 is shutdown, but it is still included in the count of commercial reactors shown elsewhere in the report.

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
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
Type - PWR	1981	310.2	41.4	1331	511	96	415	270	241	0.38	1.6
Capacity - 797, 809 MWe	1982	1271.5	79.2	1453	484	155	329	196	288	0.33	0.4
	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
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

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	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
	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
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

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)	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
	1982	543.9	93.4	559	126	46	80	22	104	0.23	0.2
	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
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

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		
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 - 63 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	-
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

[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.

*Indian Point 1 was defueled in 1975 and in 1984, it was decided that it would not be put 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		
INDIAN POINT 1,* 2	1979	574.0	71.4	1349	1279	209	1070	612	667	0.95	2.2
Docket 50-3, 50-247, DPR-5, -26	1980	510.8	64.8	1577	971	181	790	398	573	0.62	1.9
1st commercial operation 10/62, 8/73	1981	367.5	46.0	2595	2731	237	2494	1595	1137	1.05	7.4
Type - PWR	1982	532.4	65.4	2144	1635	343	1292	883	752	0.76	3.1
Capacity - 864 MWe	1983	702.6	84.0	1057	486	200	286	217	269	0.46	0.7
	1984	416.7	51.9	2919	2644	650	1994	1863	781	0.91	6.3
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
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
	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

*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		
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
LASALLE 1 *	1984	677.8	68.9	1245	252	30	222	86	166	0.20	0.4
Docket 50-373; NPF-11											
1st commercial operation 1/84											
Type - BWR											
Capacity - 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
	1980	527.0	72.2	735	462	117	345	277	185	0.63	0.9
	1981	624.2	78.2	968	424	11	413	308	116	0.49	0.7
	1982	542.5	69.1	1238	619	33	586	462	157	0.48	1.1

*LASSALE 1 was counted for the first time in 1984.

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)	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
MCGUIRE 1	1982	524.9	80.4	1560	169	26	143	29	140	0.11	0.3
Docket 50-369; NPF-9	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											
Capacity - 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
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 - 833 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
	1984	782.7	93.5	285	120	11	109	63	57	0.42	0.2

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		
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 - 525 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
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

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, 12/80	1981	1241.9	71.5	2416	680	188	492	343	337	0.28	0.5
Type - PWRs	1982	777.7	45.8	2872	1915	78	1837	1207	708	0.67	2.5
Capacity - 890, 890 MWe	1983	1338.4	76.1	2228	665	129	536	296	369	0.30	0.5
	1984	1021.3	58.8	3062	1945	154	1791	1416	529	0.54	1.9
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; DPR-38, -47, -55	1975	1838.3	75.5	829	497	72	425	90	407	0.60	0.3
1st commercial operation 7/73 9/74, 12/74	1976	1561.4	63.0	1215	1026	65	961	219	807	0.84	0.6
Type - PWRs	1977	1566.4	65.9	1595	1328	244	1084	294	1034	0.83	0.8
Capacity - 860, 860, 860 MWe	1978	1909.0	75.8	1636	1393	179	1214	340	1053	0.85	0.7
	1979	1708.0	67.7	2100	1001	123	878	181	820	0.48	0.6
	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
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

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		
OYSTER CREEK (Continued)											
	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
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 - 635 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
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

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	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 - 663 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
	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	-
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,	1973	693.7		501	588	72	516			1.17	0.8
10/72	1974	760.2	81.3	400	295	70	225	81	214	0.74	0.4
Type - PWRs	1975	801.2	82.9	339	459					1.35	0.6
Capacity - 485, 485 MWe	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
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,	1976	725.2	76.6	818	447	68	379	235	212	0.55	0.6
12/74	1977	922.9	87.2	718	300	73	227	60	240	0.42	0.3

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		
PRAIRIE ISLAND 1, 2 (Continued)											
Type - PWRs	1978	941.1	92.2	546	221	43	178	48	173	0.40	0.2
Capacity - 503, 500 MWe	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
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
	1977	970.1	84.0	907	1031	108	923	373	658	1.14	1.1
Type - BWRs	1978	1124.5	88.6	1207	1618	156	1462	722	896	1.34	1.4
Capacity - 769, 769 MWe	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
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

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	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
	1984	28.0	7.0	4127	2880	196	2684	2549	331	0.70	-
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
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

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		
SAN ONOFRE 1 (Continued)											
	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
SAN ONOFRE 2 * Docket 50-361; NPF-10 1st commercial operation 3/83 Type - PWR Capacity - 1070 MWe	1984	635.7	58.9	3140	473	38	435	398	75	0.15	0.7
SEQUOYAH 1, 2 Docket 50-327, -328; DPR-77, -79 1st commercial operation 7/81, 6/82 Type - PWR Capacity - 1148, 1148 MWe	1982	583.5	52.8	1965	570	67	503	57	513	0.29	1.0
	1983	1663.7	75.0	1772	491	74	417	46	445	0.28	0.3
	1984	1481.9	69.0	2373	1117	153	964	111	1006	0.47	0.8
ST. LUCIE 1, 2* Docket 50-335,-387;DPR-67;NPF-16 1st commercial oper. 12/76, 3/83 Type - PWRs Capacity - 822, 786 MWe	1977	649.1	84.7	445	152	26	126	92	60	0.34	0.2
	1978	606.4	76.5	797	337	15	322	140	197	0.42	0.6
	1979	592.0	74.0	907	438	25	413	209	229	0.48	0.7
	1980	627.9	77.5	1074	532	82	450	195	337	0.50	0.8
	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

*San Onofre 2 and St. Lucie 2 were counted for the first time in 1984.

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		
ST. LUCIE 1, 2 (Continued)											
	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
SUMMER 1 *	1984	504.6	61.1	1120	295	29	266	202	93	0.26	0.6
Docket 50-395; NPF-12											
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 - 775, 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
SUSQUEHANNA 1 *	1984	719.9	72.6	2827	308	71	237	128	180	0.11	0.4
Docket 50-387; NPF-14											
1st commercial operation 6/83											
Type - BWR											
Capacity - 1032 MWe											

* Susquehanna 1 was counted for the first time in 1984.

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		
*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	-
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
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, 9/73	1975	1003.7	74.9	1176	876	270	606	559	317	0.74	0.9
Type - PWRs	1976	974.2	71.2	1647	1184	89	1095	868	316	0.72	1.2
Capacity - 666, 666 MWe	1977	979.5	72.1	1319	1036	94	942	522	514	0.78	1.1
	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
	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	1010	1255	217	1038	876	379	0.62	1.3

*Three Mile Island 1 and 2 are shutdown. They are 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 Measurable Dose (rems or cSv)	Person-rems (-cSv)/ MW-Yr
						Opera-tions	Maint. & Others	Contrac-tor	Station & Utility		
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
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
	1984	124.8	71.4	654	348	15	333	141	207	0.53	2.8

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		
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
Type - PWRs	1977	1358.6	75.0	784	1003	43	960	561	442	1.28	0.7
Capacity - 1040, 1040 MWe	1978	1613.5	80.2	1104	1017	150	867	418	599	0.92	0.6
	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

APPENDIX D

Number of Personnel and Collective Dose by Work and Job Function

1984

Note: A '†' preceding a plant name indicates that the licensee's input was recategorized by NRC staff.

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

PLANT: *ARKANSAS 1,2 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL PERSON-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSON-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	25	0	48		5.782	0.000	11.401	
OPERATING PERSONNEL	62	0	0		25.863	0.000	0.000	
HEALTH PHYSICS PERSONNEL	44	0	62		14.642	0.000	17.892	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	2	1	9		0.249	0.109	1.707	
TOTAL	133	1	119	253	46.536	0.109	31.000	77.645
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	113	7	77		48.926	1.792	24.844	
OPERATING PERSONNEL	2	0	0		0.254	0.000	0.000	
HEALTH PHYSICS PERSONNEL	31	0	19		7.364	0.000	3.431	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	1	2		0.000	0.101	1.506	
TOTAL	146	8	98	252	56.544	1.893	29.781	88.218
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	0	49		0.133	0.000	23.822	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	5		1.405	0.000	0.622	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.000	0.182	
ENGINEERING PERSONNEL	1	0	5		0.347	0.000	0.777	
TOTAL	6	0	60	66	1.885	0.000	25.403	27.288
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	98	6	474		43.684	1.594	288.310	
OPERATING PERSONNEL	9	0	0		4.695	0.000	0.000	
HEALTH PHYSICS PERSONNEL	34	0	52		13.126	0.000	20.378	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	1	3	30		0.224	0.375	21.585	
TOTAL	142	9	556	707	61.729	1.969	330.273	393.971
WASTE PROCESSING								
MAINTENANCE PERSONNEL	4	0	29		2.918	0.000	18.788	
OPERATING PERSONNEL	3	0	0		0.502	0.000	0.000	
HEALTH PHYSICS PERSONNEL	22	0	5		14.703	0.000	0.866	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	29	0	34	63	18.123	0.000	19.654	37.777
REFUELING								
MAINTENANCE PERSONNEL	55	3	36		38.073	1.077	14.662	
OPERATING PERSONNEL	14	0	0		4.995	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	42		0.646	0.000	10.151	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	3	3	4		1.618	1.717	2.820	
TOTAL	75	6	82	163	45.332	2.794	27.633	75.759
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	296	16	713	1025	139.516	4.463	381.827	525.806
OPERATING PERSONNEL	90	0	0	90	36.309	0.000	0.000	36.309
HEALTH PHYSICS PERSONNEL	138	0	185	323	51.886	0.000	53.340	105.226
SUPERVISORY PERSONNEL	0	0	1	1	0.000	0.000	0.182	0.182
ENGINEERING PERSONNEL	7	8	50	65	2.438	2.302	28.395	33.135
GRAND TOTAL	531	24	949	1504	230.149	6.765	463.744	700.658

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: BEAVER VALLEY (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL PERSON-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSON-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	5	0	6		2.730	0.000	1.870	
OPERATING PERSONNEL	61	0	0		21.325	0.000	0.000	
HEALTH PHYSICS PERSONNEL	45	0	59		29.783	0.000	43.135	
SUPERVISORY PERSONNEL	14	0	1		4.880	0.000	0.135	
ENGINEERING PERSONNEL	22	0	17		9.022	0.000	6.740	
TOTAL	147	0	83	230	67.740	0.000	51.880	119.620
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	103	0	200		77.633	0.000	120.877	
OPERATING PERSONNEL	4	0	0		1.300	0.000	0.000	
HEALTH PHYSICS PERSONNEL	12	0	2		6.219	0.000	1.832	
SUPERVISORY PERSONNEL	9	0	3		5.316	0.000	1.685	
ENGINEERING PERSONNEL	11	0	13		6.190	0.000	10.630	
TOTAL	139	0	218	357	96.658	0.000	135.024	231.682
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	36		0.050	0.000	43.690	
OPERATING PERSONNEL	1	0	0		0.230	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.010	0.000	0.130	
SUPERVISORY PERSONNEL	1	0	0		0.175	0.000	0.000	
ENGINEERING PERSONNEL	3	0	4		1.510	0.000	5.580	
TOTAL	5	0	40	45	1.975	0.000	49.400	51.375
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	6	0	72		7.705	0.000	23.485	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.110	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.175	0.000	0.000	
ENGINEERING PERSONNEL	1	0	5		0.360	0.000	1.960	
TOTAL	7	0	77	84	8.350	0.000	25.445	33.795
WASTE PROCESSING								
MAINTENANCE PERSONNEL	1	0	4		0.410	0.000	1.675	
OPERATING PERSONNEL	2	0	0		1.165	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.050	0.000	0.225	
SUPERVISORY PERSONNEL	2	0	0		0.735	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.010	0.000	0.020	
TOTAL	5	0	4	9	2.370	0.000	1.920	4.290
REFUELING								
MAINTENANCE PERSONNEL	11	0	23		11.975	0.000	18.655	
OPERATING PERSONNEL	1	0	0		0.580	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.010	0.000	0.000	
SUPERVISORY PERSONNEL	2	0	3		0.860	0.000	2.335	
ENGINEERING PERSONNEL	4	0	4		3.720	0.000	6.555	
TOTAL	18	0	30	48	17.145	0.000	27.545	44.690
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	126	0	341	467	100.503	0.000	210.252	310.755
OPERATING PERSONNEL	69	0	0	69	24.600	0.000	0.000	24.600
HEALTH PHYSICS PERSONNEL	57	0	61	118	36.182	0.000	45.322	81.504
SUPERVISORY PERSONNEL	28	0	7	35	12.141	0.000	4.155	16.296
ENGINEERING PERSONNEL	41	0	43	84	20.812	0.000	31.485	52.297
GRAND TOTAL	321	0	452	773	194.238	0.000	291.214	485.452

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

*† PLANT: BIG ROCK POINT (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL PERSON-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSON-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	0	2	0		0.207	0.557	0.000	
OPERATING PERSONNEL	30	1	0		20.644	0.145	0.007	
HEALTH PHYSICS PERSONNEL	12	0	0		5.233	0.025	0.102	
SUPERVISORY PERSONNEL	3	0	0		0.775	0.075	0.023	
ENGINEERING PERSONNEL	1	3	0		0.401	0.929	0.003	
TOTAL	46	6	0	52	27.260	1.731	0.135	29.126
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	18	22	3		5.941	5.830	1.075	
OPERATING PERSONNEL	3	1	0		0.859	0.246	0.000	
HEALTH PHYSICS PERSONNEL	11	0	5		2.639	0.133	1.374	
SUPERVISORY PERSONNEL	6	0	0		5.732	0.083	0.013	
ENGINEERING PERSONNEL	0	0	0		0.005	0.000	0.000	
TOTAL	38	23	8	69	15.176	6.292	2.462	23.930
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	4	3		0.039	1.155	1.317	
OPERATING PERSONNEL	1	0	0		0.287	0.079	0.005	
HEALTH PHYSICS PERSONNEL	3	0	2		0.572	0.005	0.355	
SUPERVISORY PERSONNEL	0	0	0		0.050	0.000	0.000	
ENGINEERING PERSONNEL	1	1	0		0.182	0.335	0.007	
TOTAL	5	5	5	15	1.130	1.574	1.684	4.388
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	15	17	10		15.598	6.887	3.561	
OPERATING PERSONNEL	2	2	0		0.604	0.524	0.000	
HEALTH PHYSICS PERSONNEL	13	0	5		6.163	0.030	1.596	
SUPERVISORY PERSONNEL	7	0	0		1.761	0.051	0.000	
ENGINEERING PERSONNEL	1	1	2		0.359	0.188	0.853	
TOTAL	38	20	17	75	24.485	7.680	6.010	38.175
WASTE PROCESSING								
MAINTENANCE PERSONNEL	7	0	0		1.644	0.121	0.000	
OPERATING PERSONNEL	8	0	0		1.645	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	0		0.874	0.011	0.004	
SUPERVISORY PERSONNEL	0	0	0		0.280	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.053	
TOTAL	17	0	0	17	4.443	0.132	0.057	4.632
REFUELING								
MAINTENANCE PERSONNEL	11	1	0		3.204	0.157	0.000	
OPERATING PERSONNEL	22	0	0		7.135	0.000	0.351	
HEALTH PHYSICS PERSONNEL	4	0	0		0.910	0.013	0.075	
SUPERVISORY PERSONNEL	0	0	1		0.062	0.000	0.447	
ENGINEERING PERSONNEL	0	6	7		0.002	3.113	5.202	
TOTAL	37	7	8	52	11.313	3.283	6.075	20.671
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	51	46	16	113	26.633	14.707	5.953	47.293
OPERATING PERSONNEL	66	4	0	70	31.174	0.994	0.363	32.531
HEALTH PHYSICS PERSONNEL	45	0	12	57	16.391	0.217	3.506	20.114
SUPERVISORY PERSONNEL	16	0	1	17	8.660	0.209	0.483	9.352
ENGINEERING PERSONNEL	3	11	9	23	0.949	4.565	6.118	11.632
GRAND TOTAL	181	61	38	280	83.807	20.692	16.423	120.922

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

*† PLANT: BROWNS FERRY 1,2,3 (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL PERSON-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSON-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	45	43	0		8.200	12.400	0.000	
OPERATING PERSONNEL	121	0	0		30.300	0.000	0.000	
HEALTH PHYSICS PERSONNEL	62	3	95		29.000	0.500	60.500	
SUPERVISORY PERSONNEL	1	56	16		0.100	17.900	4.000	
ENGINEERING PERSONNEL	0	24	0		0.000	4.700	0.000	
TOTAL	229	126	111	466	67.600	35.500	64.500	167.600
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	452	557	0		252.000	317.400	0.000	
OPERATING PERSONNEL	95	0	0		24.300	0.000	0.000	
HEALTH PHYSICS PERSONNEL	49	2	96		14.300	0.300	53.900	
SUPERVISORY PERSONNEL	0	13	47		0.000	4.200	26.100	
ENGINEERING PERSONNEL	0	28	0		0.000	11.200	0.000	
TOTAL	596	600	143	1339	290.600	333.100	80.000	703.700
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	7	0	0		0.806	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	14	0		0.000	2.800	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	7	14	0	21	0.806	2.800	0.000	3.606
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	39	385	1		16.600	160.800	0.200	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	13	0	41		4.600	0.000	29.300	
SUPERVISORY PERSONNEL	1	61	177		0.100	79.200	216.300	
ENGINEERING PERSONNEL	0	13	0		0.000	4.300	0.000	
TOTAL	53	459	219	731	21.300	244.300	245.800	511.400
WASTE PROCESSING								
MAINTENANCE PERSONNEL	23	0	0		7.300	0.000	0.000	
OPERATING PERSONNEL	11	0	0		5.400	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	3		1.300	0.000	3.500	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	38	0	3	41	14.000	0.000	3.500	17.500
REFUELING								
MAINTENANCE PERSONNEL	2	31	0		1.200	6.200	0.000	
OPERATING PERSONNEL	15	0	0		4.200	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	7		0.000	0.000	1.500	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	1	0		0.000	0.100	0.000	
TOTAL	17	32	7	56	5.400	6.300	1.500	13.200
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	568	1016	1	1585	286.106	496.800	0.200	783.106
OPERATING PERSONNEL	242	0	0	242	64.200	0.000	0.000	64.200
HEALTH PHYSICS PERSONNEL	128	5	242	375	49.200	0.800	148.700	198.700
SUPERVISORY PERSONNEL	2	144	240	386	0.200	104.100	246.400	350.700
ENGINEERING PERSONNEL	0	66	0	66	0.000	20.300	0.000	20.300
GRAND TOTAL	940	1231	483	2654	399.706	622.000	395.300	1417.006

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: BRUNSWICK 1,2 (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL PERSON-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSON-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	1	0	3		0.903	0.000	1.204	
OPERATING PERSONNEL	111	0	0		105.533	0.035	0.200	
HEALTH PHYSICS PERSONNEL	31	0	15		18.914	0.000	16.927	
SUPERVISORY PERSONNEL	2	0	0		0.846	0.030	0.000	
ENGINEERING PERSONNEL	19	0	0		7.594	0.170	0.451	
TOTAL	164	0	18	182	133.790	0.235	18.782	152.807
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	260	20	357		263.671	23.355	239.597	
OPERATING PERSONNEL	0	0	19		0.000	0.000	8.763	
HEALTH PHYSICS PERSONNEL	11	0	28		14.977	0.000	30.997	
SUPERVISORY PERSONNEL	0	0	6		0.085	0.020	2.073	
ENGINEERING PERSONNEL	34	5	144		14.052	1.503	128.585	
TOTAL	305	25	554	884	292.785	24.878	410.015	727.678
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	15	1	57		5.572	1.557	30.691	
OPERATING PERSONNEL	0	0	1		0.000	0.000	0.570	
HEALTH PHYSICS PERSONNEL	6	0	15		7.806	0.000	16.156	
SUPERVISORY PERSONNEL	0	0	0		0.045	0.000	0.015	
ENGINEERING PERSONNEL	12	1	80		4.480	0.525	90.711	
TOTAL	33	2	153	188	17.903	2.082	138.143	158.128
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	267	99	1021		208.116	116.778	1404.156	
OPERATING PERSONNEL	0	0	101		0.000	0.000	132.460	
HEALTH PHYSICS PERSONNEL	32	0	83		43.551	0.000	90.136	
SUPERVISORY PERSONNEL	0	1	6		0.168	0.135	1.798	
ENGINEERING PERSONNEL	47	18	256		23.235	8.755	157.798	
TOTAL	346	118	1467	1931	275.070	125.668	1786.348	2187.086
WASTE PROCESSING								
MAINTENANCE PERSONNEL	35	4	53		14.486	4.671	32.949	
OPERATING PERSONNEL	24	0	0		14.705	0.000	0.142	
HEALTH PHYSICS PERSONNEL	15	0	5		12.154	0.000	5.011	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	1	0	3		0.175	0.100	1.099	
TOTAL	75	4	61	140	41.520	4.771	39.201	85.492
REFUELING								
MAINTENANCE PERSONNEL	25	8	69		17.952	9.342	102.055	
OPERATING PERSONNEL	6	0	0		5.554	0.000	0.085	
HEALTH PHYSICS PERSONNEL	6	0	15		7.730	0.000	15.998	
SUPERVISORY PERSONNEL	0	0	0		0.010	0.000	0.000	
ENGINEERING PERSONNEL	5	3	39		1.571	1.029	22.129	
TOTAL	42	11	123	176	32.817	10.371	140.267	183.455
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	603	132	1560	2295	510.700	155.703	1810.652	2477.055
OPERATING PERSONNEL	141	0	121	262	125.792	0.035	142.220	268.047
HEALTH PHYSICS PERSONNEL	101	0	161	262	105.132	0.000	175.225	280.357
SUPERVISORY PERSONNEL	2	1	12	15	1.154	0.185	3.886	5.225
ENGINEERING PERSONNEL	118	27	522	667	51.107	12.082	400.773	463.962
GRAND TOTAL	965	160	2376	3501	793.885	168.005	2532.756	3494.646

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT:*CALVERT CLIFFS 1,2 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL PERSON-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSON-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	5	7	0		0.896	1.352	0.000	
OPERATING PERSONNEL	61	0	0		25.060	0.000	0.000	
HEALTH PHYSICS PERSONNEL	22	2	26		8.684	0.609	10.728	
SUPERVISORY PERSONNEL	4	1	0		0.505	0.230	0.000	
ENGINEERING PERSONNEL	2	0	0		0.230	0.000	0.000	
TOTAL	94	10	26	130	35.375	2.191	10.728	48.294
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	129	49	32		39.631	10.566	7.235	
OPERATING PERSONNEL	30	0	1		8.403	0.000	0.280	
HEALTH PHYSICS PERSONNEL	36	3	34		19.116	0.326	12.138	
SUPERVISORY PERSONNEL	2	0	3		0.274	0.000	0.353	
ENGINEERING PERSONNEL	4	0	1		0.601	0.000	0.143	
TOTAL	201	52	71	324	68.025	10.892	20.149	99.066
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	18	36	16		11.093	40.042	7.046	
OPERATING PERSONNEL	1	0	0		0.194	0.000	0.000	
HEALTH PHYSICS PERSONNEL	10	3	4		1.812	0.322	0.686	
SUPERVISORY PERSONNEL	1	3	2		1.890	0.582	0.718	
ENGINEERING PERSONNEL	4	0	0		1.245	0.000	0.000	
TOTAL	34	42	22	98	16.234	40.946	8.450	65.630
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	92	35	22		42.711	9.129	4.884	
OPERATING PERSONNEL	9	0	0		4.275	0.000	0.000	
HEALTH PHYSICS PERSONNEL	8	4	5		3.581	1.578	1.897	
SUPERVISORY PERSONNEL	1	0	3		0.235	0.000	0.577	
ENGINEERING PERSONNEL	3	0	4		0.595	0.000	0.830	
TOTAL	113	39	34	186	51.397	10.707	8.188	70.292
WASTE PROCESSING								
MAINTENANCE PERSONNEL	4	0	2		1.322	0.000	0.656	
OPERATING PERSONNEL	2	0	0		0.281	0.000	0.000	
HEALTH PHYSICS PERSONNEL	28	10	24		21.683	2.430	9.461	
SUPERVISORY PERSONNEL	1	0	1		1.413	0.000	0.152	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	35	10	27	72	24.699	2.430	10.269	37.398
REFUELING								
MAINTENANCE PERSONNEL	52	41	6		30.050	19.036	1.308	
OPERATING PERSONNEL	8	0	0		1.429	0.000	0.000	
HEALTH PHYSICS PERSONNEL	7	6	12		1.438	1.145	2.864	
SUPERVISORY PERSONNEL	1	0	1		0.111	0.000	0.101	
ENGINEERING PERSONNEL	2	0	1		0.267	0.000	0.135	
TOTAL	70	47	20	137	33.295	20.181	4.408	57.884
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	300 (180)	168 (121)	78 (69)	546 (370)	125.703	80.125	21.129	226.957
OPERATING PERSONNEL	111 (95)	0 (1)	1 (1)	112 (97)	39.642	0.000	0.280	39.922
HEALTH PHYSICS PERSONNEL	111 (57)	28 (15)	105 (68)	244 (140)	56.314	6.410	37.774	100.498
SUPERVISORY PERSONNEL	10 (13)	4 (3)	10 (9)	24 (25)	4.428	0.812	1.901	7.141
ENGINEERING PERSONNEL	15 (16)	0 (0)	6 (6)	21 (22)	2.938	0.000	1.108	4.046
GRAND TOTAL	547 (361)	200 (140)	200 (153)	947 (654)	229.025	87.347	62.192	378.564

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

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: *COOK 1,2 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL PERSON-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSON-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	3	0	8		0.380	0.000	1.485	
OPERATING PERSONNEL	60	1	8		14.673	0.165	4.914	
HEALTH PHYSICS PERSONNEL	10	0	42		1.809	0.000	14.125	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	1	4	1		0.100	0.595	0.100	
TOTAL	74	5	59	138	16.962	0.760	20.624	38.346
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	106	5	311		77.885	2.404	166.632	
OPERATING PERSONNEL	26	0	10		7.713	0.000	2.959	
HEALTH PHYSICS PERSONNEL	27	0	43		7.674	0.000	11.035	
SUPERVISORY PERSONNEL	6	1	3		2.104	0.589	1.041	
ENGINEERING PERSONNEL	8	2	6		2.012	0.223	1.335	
TOTAL	173	8	373	554	97.388	3.216	183.002	283.606
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	16	1	141		5.629	0.703	77.451	
OPERATING PERSONNEL	19	0	8		3.671	0.000	1.356	
HEALTH PHYSICS PERSONNEL	7	0	43		0.881	0.000	12.509	
SUPERVISORY PERSONNEL	0	0	2		0.000	0.000	0.271	
ENGINEERING PERSONNEL	2	1	8		0.467	0.125	1.502	
TOTAL	44	2	202	248	10.648	0.828	93.089	104.565
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	9	3	246		1.521	0.663	171.518	
OPERATING PERSONNEL	3	0	22		0.479	0.000	5.685	
HEALTH PHYSICS PERSONNEL	2	0	28		0.235	0.000	6.742	
SUPERVISORY PERSONNEL	0	1	3		0.000	0.297	0.551	
ENGINEERING PERSONNEL	2	6	8		0.450	1.325	4.933	
TOTAL	16	10	307	333	2.685	2.285	189.429	194.399
WASTE PROCESSING								
MAINTENANCE PERSONNEL	14	0	44		5.144	0.000	16.505	
OPERATING PERSONNEL	0	0	1		0.000	0.000	0.570	
HEALTH PHYSICS PERSONNEL	4	0	5		0.629	0.000	2.172	
SUPERVISORY PERSONNEL	3	0	0		1.004	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.260	0.000	0.000	
TOTAL	22	0	50	72	7.037	0.000	19.247	26.284
REFUELING								
MAINTENANCE PERSONNEL	17	1	43		3.521	0.209	27.462	
OPERATING PERSONNEL	6	0	3		1.978	0.000	2.639	
HEALTH PHYSICS PERSONNEL	0	0	13		0.000	0.000	2.827	
SUPERVISORY PERSONNEL	1	0	0		0.404	0.000	0.000	
ENGINEERING PERSONNEL	3	0	1		0.406	0.000	0.165	
TOTAL	27	1	60	88	6.309	0.209	33.093	39.611
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	165 (111)	10 (6)	793 (581)	968 (698)	94.080	3.979	461.053	559.112
OPERATING PERSONNEL	114 (81)	1 (1)	52 (35)	167 (117)	28.514	0.165	18.123	46.802
HEALTH PHYSICS PERSONNEL	50 (35)	0 (0)	174 (73)	224 (108)	11.228	0.000	49.410	60.638
SUPERVISORY PERSONNEL	10 (9)	2 (1)	8 (5)	20 (15)	3.512	0.886	1.863	6.261
ENGINEERING PERSONNEL	17 (13)	13 (12)	24 (22)	54 (47)	3.695	2.268	8.035	13.998
GRAND TOTAL	356 (249)	26 (20)	1051 (716)	1433 (985)	141.029	7.298	538.484	686.811

*Workers may be counted in more than one category.

Appendix D (cont.)

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: COOPER STATION* (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	9	0	16		0.500	0.000	0.615	
OPERATING PERSONNEL	47	0	0		19.972	0.000	0.000	
HEALTH PHYSICS PERSONNEL	18	0	7		11.120	0.000	0.626	
SUPERVISORY PERSONNEL	16	3	6		3.410	0.208	0.092	
ENGINEERING PERSONNEL	18	7	16		4.729	0.146	1.386	
TOTAL	108	10	45	163	39.731	0.354	2.719	42.804
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	109	0	36		79.091	0.000	6.079	
OPERATING PERSONNEL	3	0	0		0.022	0.000	0.000	
HEALTH PHYSICS PERSONNEL	13	0	0		1.317	0.000	0.000	
SUPERVISORY PERSONNEL	5	1	6		0.924	0.002	1.380	
ENGINEERING PERSONNEL	3	6	12		0.475	0.424	1.158	
TOTAL	133	7	54	194	81.829	0.426	8.617	90.872
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	8		0.000	0.000	4.445	
OPERATING PERSONNEL	1	0	0		0.005	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	1		0.000	0.000	0.007	
SUPERVISORY PERSONNEL	2	0	0		0.101	0.000	0.000	
ENGINEERING PERSONNEL	0	1	1		0.000	0.052	0.160	
TOTAL	3	1	10	14	0.106	0.052	4.612	4.770
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	0	1	412		0.000	0.456	471.449	
OPERATING PERSONNEL	37	0	0		3.258	0.000	0.000	
HEALTH PHYSICS PERSONNEL	16	0	17		8.829	0.000	13.263	
SUPERVISORY PERSONNEL	3	4	68		0.438	1.331	83.680	
ENGINEERING PERSONNEL	6	9	12		0.429	2.049	5.171	
TOTAL	62	14	509	585	12.954	3.836	573.563	590.353
WASTE PROCESSING								
MAINTENANCE PERSONNEL	12	0	2		0.772	0.000	0.106	
OPERATING PERSONNEL	20	0	0		3.341	0.000	0.000	
HEALTH PHYSICS PERSONNEL	15	0	0		2.715	0.000	0.000	
SUPERVISORY PERSONNEL	3	0	0		0.154	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.108	0.000	0.000	
TOTAL	51	0	2	53	7.090	0.000	0.106	7.196
REFUELING								
MAINTENANCE PERSONNEL	0	0	1		0.000	0.000	0.091	
OPERATING PERSONNEL	40	0	0		5.863	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	0		0.018	0.000	0.000	
SUPERVISORY PERSONNEL	3	0	0		0.221	0.000	0.000	
ENGINEERING PERSONNEL	2	0	0		0.124	0.000	0.000	
TOTAL	46	0	1	47	6.226	0.000	0.091	6.317
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	130 (109)	1 (1)	475 (431)	606 (541)	80.363	0.456	482.785	563.604
OPERATING PERSONNEL	148 (50)	0 (0)	0 (0)	148 (50)	32.461	0.000	0.000	32.461
HEALTH PHYSICS PERSONNEL	63 (18)	0 (0)	25 (17)	88 (35)	23.999	0.000	13.896	37.895
SUPERVISORY PERSONNEL	32 (16)	8 (4)	80 (69)	120 (89)	5.248	1.541	85.152	91.941
ENGINEERING PERSONNEL	30 (18)	23 (10)	41 (22)	94 (50)	5.865	2.671	7.875	16.411
GRAND TOTAL	403 (211)	32 (15)	621 (539)	1056 (765)	147.936	4.668	589.708	742.312

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

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: CRYSTAL RIVER 3 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	1	0	0		0.316	0.071	0.110	
OPERATING PERSONNEL	25	0	0		6.934	0.000	0.480	
HEALTH PHYSICS PERSONNEL	0	0	0		0.263	0.084	0.000	
SUPERVISORY PERSONNEL	1	0	0		0.563	0.204	0.298	
ENGINEERING PERSONNEL	0	0	0		0.036	0.243	0.221	
TOTAL	27	0	0	27	8.112	0.602	1.109	9.823
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	33	3	61		9.837	1.103	14.949	
OPERATING PERSONNEL	0	0	0		0.377	0.015	0.000	
HEALTH PHYSICS PERSONNEL	12	0	17		2.921	0.036	4.283	
SUPERVISORY PERSONNEL	0	0	2		0.272	0.000	0.725	
ENGINEERING PERSONNEL	2	0	0		0.451	0.101	0.299	
TOTAL	47	3	80	130	13.858	1.255	20.256	35.369
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	0		0.019	0.000	0.002	
OPERATING PERSONNEL	0	0	0		0.000	0.091	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.032	0.000	
ENGINEERING PERSONNEL	0	1	0		0.132	0.225	0.054	
TOTAL	0	1	0	1	0.151	0.348	0.056	0.555
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	0	0	0.000	0.000	0.000	0.000
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	0		0.006	0.000	0.016	
OPERATING PERSONNEL	1	0	0		0.524	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	0		1.598	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	1		0.035	0.000	0.669	
ENGINEERING PERSONNEL	0	0	0		0.002	0.000	0.004	
TOTAL	4	0	1	5	2.165	0.000	0.689	2.854
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	0	0	0.000	0.000	0.000	0.000
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	34	3	61	98	10.178	1.174	15.077	26.429
OPERATING PERSONNEL	26	0	0	26	7.835	0.106	0.480	8.421
HEALTH PHYSICS PERSONNEL	15	0	17	32	4.782	0.120	4.283	9.185
SUPERVISORY PERSONNEL	1	0	3	4	0.870	0.236	1.692	2.798
ENGINEERING PERSONNEL	2	1	0	3	0.621	0.569	0.578	1.768
GRAND TOTAL	78	4	81	163	24.286	2.205	22.110	48.601

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: * DAVIS-BESSE (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	10	1	27		0.310	0.005	1.115	
OPERATING PERSONNEL	76	0	29		7.820	0.000	1.155	
HEALTH PHYSICS PERSONNEL	18	0	0		1.090	0.000	0.000	
SUPERVISORY PERSONNEL	15	0	16		0.615	0.000	0.550	
ENGINEERING PERSONNEL	14	1	0		0.435	0.005	0.000	
TOTAL	133	2	72	207	10.270	0.010	2.820	13.100
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	111	20	267		7.600	1.385	17.255	
OPERATING PERSONNEL	25	0	0		1.890	0.000	0.000	
HEALTH PHYSICS PERSONNEL	28	0	74		5.770	0.000	31.150	
SUPERVISORY PERSONNEL	18	0	11		1.280	0.000	0.510	
ENGINEERING PERSONNEL	16	1	1		1.005	0.065	0.025	
TOTAL	198	21	353	572	17.545	1.450	48.940	67.935
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	9	1	36		0.490	0.050	1.675	
OPERATING PERSONNEL	2	0	0		0.285	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	1		0.000	0.000	0.060	
SUPERVISORY PERSONNEL	4	0	2		0.240	0.000	0.035	
ENGINEERING PERSONNEL	2	0	2		0.170	0.000	0.020	
TOTAL	17	1	41	59	1.185	0.050	1.790	3.025
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	114	32	326		16.630	3.540	72.795	
OPERATING PERSONNEL	33	0	0		2.165	0.000	0.000	
HEALTH PHYSICS PERSONNEL	16	0	25		3.460	0.000	4.065	
SUPERVISORY PERSONNEL	25	0	10		5.490	0.000	2.545	
ENGINEERING PERSONNEL	31	0	2		1.060	0.000	0.055	
TOTAL	219	32	363	614	28.805	3.540	79.460	111.805
WASTE PROCESSING								
MAINTENANCE PERSONNEL	10	2	2		0.185	0.050	0.135	
OPERATING PERSONNEL	14	0	0		0.320	0.000	0.000	
HEALTH PHYSICS PERSONNEL	8	0	18		2.670	0.000	1.250	
SUPERVISORY PERSONNEL	2	0	0		0.040	0.000	0.000	
ENGINEERING PERSONNEL	2	0	0		0.015	0.000	0.000	
TOTAL	36	2	20	58	3.230	0.050	1.385	4.665
REFUELING								
MAINTENANCE PERSONNEL	35	4	122		2.915	0.660	29.045	
OPERATING PERSONNEL	23	0	0		1.125	0.000	0.000	
HEALTH PHYSICS PERSONNEL	8	0	9		1.570	0.000	3.140	
SUPERVISORY PERSONNEL	8	0	4		1.300	0.000	0.895	
ENGINEERING PERSONNEL	11	1	0		0.995	0.210	0.000	
TOTAL	85	5	135	225	7.905	0.870	33.080	41.855
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	289	60	780	1129	28.130	5.690	122.020	155.840
OPERATING PERSONNEL	173	0	29	202	13.605	0.000	1.155	14.760
HEALTH PHYSICS PERSONNEL	78	0	127	205	14.560	0.000	39.665	54.225
SUPERVISORY PERSONNEL	72	0	43	115	8.965	0.000	4.535	13.500
ENGINEERING PERSONNEL	76	3	5	84	3.680	0.280	0.100	4.060
GRAND TOTAL	688	63	984	1735	68.940	5.970	167.475	242.385

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: †DRESDEN 1,2,3 (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	30	8	0		37.110	4.870	0.000	
OPERATING PERSONNEL	65	0	1		80.980	0.000	0.610	
HEALTH PHYSICS PERSONNEL	3	0	0		3.930	0.000	0.000	
SUPERVISORY PERSONNEL	22	0	0		16.520	0.000	0.000	
ENGINEERING PERSONNEL	4	1	0		1.010	0.230	0.000	
TOTAL	124	9	1	134	139.550	5.100	0.610	145.260
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	200	99	405		247.380	60.340	533.620	
OPERATING PERSONNEL	28	0	0		34.980	0.000	0.000	
HEALTH PHYSICS PERSONNEL	38	0	5		43.260	0.000	9.690	
SUPERVISORY PERSONNEL	73	0	0		55.060	0.000	0.000	
ENGINEERING PERSONNEL	64	31	20		17.620	4.860	12.730	
TOTAL	403	130	430	963	398.300	65.200	556.040	1019.540
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	43	40	81		53.600	22.330	106.720	
OPERATING PERSONNEL	7	0	1		9.200	0.000	0.600	
HEALTH PHYSICS PERSONNEL	7	0	8		7.870	0.000	16.600	
SUPERVISORY PERSONNEL	10	0	0		7.710	0.000	0.000	
ENGINEERING PERSONNEL	14	1	15		3.770	0.230	9.260	
TOTAL	81	41	105	227	82.150	22.560	133.180	237.890
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	0	0	0.000	0.000	0.000	0.000
WASTE PROCESSING								
MAINTENANCE PERSONNEL	23	13	54		28.860	7.790	71.150	
OPERATING PERSONNEL	42	0	18		51.530	0.000	10.890	
HEALTH PHYSICS PERSONNEL	17	0	1		19.670	0.000	1.390	
SUPERVISORY PERSONNEL	29	0	0		22.020	0.000	0.000	
ENGINEERING PERSONNEL	5	2	2		1.510	0.290	1.160	
TOTAL	116	15	75	206	123.590	8.080	84.590	216.260
REFUELING								
MAINTENANCE PERSONNEL	37	0	0		45.350	0.000	0.000	
OPERATING PERSONNEL	6	0	0		7.360	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	0		3.930	0.000	0.000	
SUPERVISORY PERSONNEL	12	0	0		8.800	0.000	0.000	
ENGINEERING PERSONNEL	4	2	0		1.260	0.110	0.000	
TOTAL	63	2	0	65	66.700	0.110	0.000	66.810
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	333	160	540	1033	412.300	95.330	711.490	1219.120
OPERATING PERSONNEL	148	0	20	168	184.050	0.000	12.100	196.150
HEALTH PHYSICS PERSONNEL	69	0	14	83	78.660	0.000	27.680	106.340
SUPERVISORY PERSONNEL	146	0	0	146	110.110	0.000	0.000	110.110
ENGINEERING PERSONNEL	91	37	37	165	25.170	5.720	23.150	54.040
GRAND TOTAL	787	197	611	1595	810.290	101.050	774.420	1685.760

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT:* DUANE ARNOLD (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	34	0	18		0.498	0.000	0.246	
OPERATING PERSONNEL	50	2	12		22.347	0.056	1.482	
HEALTH PHYSICS PERSONNEL	22	0	12		1.982	0.000	1.167	
SUPERVISORY PERSONNEL	10	1	3		0.502	0.005	0.030	
ENGINEERING PERSONNEL	11	4	16		1.186	0.201	0.513	
TOTAL	127	7	61	195	26.515	0.262	3.438	30.215
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	65	0	118		22.688	0.000	29.113	
OPERATING PERSONNEL	12	0	11		0.230	0.000	0.144	
HEALTH PHYSICS PERSONNEL	37	0	20		3.305	0.000	1.887	
SUPERVISORY PERSONNEL	4	2	20		0.485	0.022	2.362	
ENGINEERING PERSONNEL	4	9	24		0.192	0.328	1.099	
TOTAL	122	11	193	326	26.900	0.350	34.605	61.855
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	12	0	78		0.120	0.000	13.826	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	25	0	21		3.088	0.000	2.821	
SUPERVISORY PERSONNEL	8	0	15		0.491	0.000	0.529	
ENGINEERING PERSONNEL	12	12	44		2.143	1.487	11.254	
TOTAL	57	12	158	227	5.842	1.487	28.430	35.759
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	57	0	131		8.726	0.000	39.598	
OPERATING PERSONNEL	14	0	7		0.231	0.000	0.105	
HEALTH PHYSICS PERSONNEL	23	0	22		3.302	0.000	4.644	
SUPERVISORY PERSONNEL	6	0	21		0.273	0.000	1.835	
ENGINEERING PERSONNEL	13	8	49		1.388	0.256	9.857	
TOTAL	113	8	230	351	13.920	0.256	56.039	70.215
WASTE PROCESSING								
MAINTENANCE PERSONNEL	22	0	6		0.488	0.000	0.065	
OPERATING PERSONNEL	20	0	14		2.987	0.000	4.228	
HEALTH PHYSICS PERSONNEL	13	0	8		0.213	0.000	0.596	
SUPERVISORY PERSONNEL	0	0	2		0.000	0.000	0.147	
ENGINEERING PERSONNEL	4	1	3		0.031	0.005	0.050	
TOTAL	59	1	33	93	3.719	0.005	5.086	8.810
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	0	0	0.000	0.000	0.000	0.000
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	190(78)	0 (0)	351 (166)	541(244)	32.520	0.000	82.848	115.368
OPERATING PERSONNEL	96(66)	2 (2)	44 (29)	142 (97)	25.795	0.056	5.959	31.810
HEALTH PHYSICS PERSONNEL	120(48)	0 (0)	83 (32)	203 (80)	11.890	0.000	11.115	23.005
SUPERVISORY PERSONNEL	28(19)	3 (3)	61 (37)	92 (59)	1.751	0.027	4.903	6.681
ENGINEERING PERSONNEL	44(23)	34 (15)	136 (62)	214(100)	4.940	2.277	22.773	29.990
GRAND TOTAL	478(234)	39 (20)	675 (326)	1192(580)	76.896	2.360	127.598	206.854

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

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: *FARLEY 1,2 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	58	5	41		2.824	0.280	3.210	
OPERATING PERSONNEL	146	6	12		42.249	2.925	0.900	
HEALTH PHYSICS PERSONNEL	93	8	103		37.148	1.421	46.913	
SUPERVISORY PERSONNEL	177	18	22		20.034	1.470	1.693	
ENGINEERING PERSONNEL	51	20	138		5.192	1.704	9.450	
TOTAL	525	57	316	898	107.447	7.800	62.166	177.413
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	160	8	80		27.830	1.081	15.160	
OPERATING PERSONNEL	120	6	0		45.318	0.194	0.000	
HEALTH PHYSICS PERSONNEL	44	1	38		7.225	0.004	1.426	
SUPERVISORY PERSONNEL	48	4	2		4.515	0.174	1.380	
ENGINEERING PERSONNEL	23	14	83		0.994	0.555	14.493	
TOTAL	395	33	303	731	85.882	2.008	32.459	120.349
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	2	1	21		0.104	0.020	1.675	
OPERATING PERSONNEL	2	0	0		0.120	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	6		0.002	0.000	0.236	
SUPERVISORY PERSONNEL	5	2	0		0.238	0.129	0.000	
ENGINEERING PERSONNEL	8	10	41		0.975	0.709	3.842	
TOTAL	19	13	68	100	1.439	0.858	5.753	8.050
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	144	8	398		115.054	2.871	274.741	
OPERATING PERSONNEL	120	6	1		32.465	0.198	0.060	
HEALTH PHYSICS PERSONNEL	49	2	53		14.843	0.085	9.115	
SUPERVISORY PERSONNEL	60	3	7		12.081	0.667	0.650	
ENGINEERING PERSONNEL	34	20	449		7.016	1.926	112.921	
TOTAL	407	39	908	1354	181.459	5.747	397.487	584.693
WASTE PROCESSING								
MAINTENANCE PERSONNEL	1	0	1		0.012	0.000	1.970	
OPERATING PERSONNEL	6	0	0		0.534	0.000	0.000	
HEALTH PHYSICS PERSONNEL	6	0	6		0.795	0.000	0.104	
SUPERVISORY PERSONNEL	3	0	0		0.821	0.000	0.000	
ENGINEERING PERSONNEL	0	0	3		0.000	0.000	0.047	
TOTAL	16	0	10	26	2.162	0.000	2.121	4.283
REFUELING								
MAINTENANCE PERSONNEL	9	0	49		0.947	0.000	3.138	
OPERATING PERSONNEL	1	0	0		0.028	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	6		0.604	0.000	0.451	
SUPERVISORY PERSONNEL	9	0	0		0.341	0.000	0.000	
ENGINEERING PERSONNEL	3	3	9		0.221	0.159	0.635	
TOTAL	25	3	64	92	2.141	0.159	4.224	6.524
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	374	22	590	986	146.771	4.252	299.894	450.917
OPERATING PERSONNEL	395	18	13	426	120.714	3.317	0.960	124.991
HEALTH PHYSICS PERSONNEL	197	11	212	420	60.617	1.510	58.245	120.372
SUPERVISORY PERSONNEL	302	27	31	360	38.030	2.440	3.723	44.193
ENGINEERING PERSONNEL	119	67	823	1009	14.398	5.053	141.388	160.839
GRAND TOTAL	1387	145	1669	3201	380.530	16.572	504.210	901.312

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: *† FITZPATRICK (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	50	0	10		5.932	0.000	0.888	
OPERATING PERSONNEL	108	0	31		23.549	0.000	1.614	
HEALTH PHYSICS PERSONNEL	34	0	0		21.740	0.000	25.940	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	19	0	5		2.351	0.000	0.041	
TOTAL	211	0	46	257	53.572	0.000	28.483	82.055
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	205	0	190		185.108	0.000	52.407	
OPERATING PERSONNEL	78	0	11		11.186	0.000	1.786	
HEALTH PHYSICS PERSONNEL	17	0	14		1.110	0.000	1.010	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	29	0	63		10.416	0.000	6.909	
TOTAL	329	0	278	607	207.820	0.000	62.112	269.932
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	83	0	84		5.805	0.000	5.986	
OPERATING PERSONNEL	98	0	5		7.545	0.000	0.453	
HEALTH PHYSICS PERSONNEL	11	0	6		0.412	0.000	0.165	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	35	0	88		6.020	0.000	44.424	
TOTAL	227	0	183	410	19.782	0.000	51.028	70.810
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	153	0	380		161.104	0.000	267.983	
OPERATING PERSONNEL	80	0	11		16.535	0.000	2.860	
HEALTH PHYSICS PERSONNEL	10	0	9		0.585	0.000	1.326	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	31	0	130		7.320	0.000	45.756	
TOTAL	274	0	530	804	185.544	0.000	317.925	503.469
WASTE PROCESSING								
MAINTENANCE PERSONNEL	144	0	19		26.613	0.000	2.124	
OPERATING PERSONNEL	40	0	2		9.770	0.000	3.218	
HEALTH PHYSICS PERSONNEL	9	0	4		0.996	0.000	0.255	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	2	0	9		0.024	0.000	1.894	
TOTAL	195	0	34	229	37.403	0.000	7.491	44.894
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	0	0	0.000	0.000	0.000	0.000
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	635	0	683	1318	384.562	0.000	329.388	713.950
OPERATING PERSONNEL	404	0	60	464	68.585	0.000	9.931	78.516
HEALTH PHYSICS PERSONNEL	81	0	33	114	24.843	0.000	28.696	53.539
SUPERVISORY PERSONNEL	0	0	0	0	0.000	0.000	0.000	0.000
ENGINEERING PERSONNEL	116	0	295	411	26.131	0.000	99.024	125.155
GRAND TOTAL	1236	0	1071	2307	504.121	0.000	467.039	971.160

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT:* FORT CALHOUN (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	5	1	20		1.750	0.775	17.893	
OPERATING PERSONNEL	30	0	0		13.578	0.160	0.000	
HEALTH PHYSICS PERSONNEL	17	0	0		19.585	0.000	22.035	
SUPERVISORY PERSONNEL	3	0	23		0.944	0.187	0.000	
ENGINEERING PERSONNEL	15	2	13		4.238	1.575	4.997	
TOTAL	70	3	56	129	40.095	2.697	44.925	87.717
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	31	49	42		13.531	24.685	26.563	
OPERATING PERSONNEL	0	0	0		0.092	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	2		0.250	0.000	2.429	
SUPERVISORY PERSONNEL	0	0	0		0.135	0.045	0.000	
ENGINEERING PERSONNEL	2	2	1		1.123	0.835	0.419	
TOTAL	34	51	45	130	15.131	25.565	29.411	70.107
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	4	11	42		1.998	4.212	37.564	
OPERATING PERSONNEL	0	0	0		0.083	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	3		1.052	0.000	0.880	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.044	0.000	
ENGINEERING PERSONNEL	5	6	6		2.532	2.662	4.546	
TOTAL	12	17	51	80	5.665	6.918	42.990	55.573
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	38	61	215		32.038	31.619	149.146	
OPERATING PERSONNEL	0	0	0		0.549	0.000	0.000	
HEALTH PHYSICS PERSONNEL	9	0	2		6.486	0.000	1.138	
SUPERVISORY PERSONNEL	3	1	1		1.001	0.775	0.060	
ENGINEERING PERSONNEL	15	18	12		14.350	11.150	5.811	
TOTAL	65	80	230	375	54.424	43.544	156.155	254.123
WASTE PROCESSING								
MAINTENANCE PERSONNEL	9	4	22		2.870	1.529	10.138	
OPERATING PERSONNEL	20	1	0		5.122	0.446	0.000	
HEALTH PHYSICS PERSONNEL	6	0	0		8.895	0.000	0.005	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.197	0.059	0.010	
TOTAL	35	5	22	62	17.084	2.034	10.153	29.271
REFUELING								
MAINTENANCE PERSONNEL	14	31	34		6.331	14.165	17.443	
OPERATING PERSONNEL	26	0	0		4.272	0.035	0.000	
HEALTH PHYSICS PERSONNEL	2	0	0		0.682	0.000	0.165	
SUPERVISORY PERSONNEL	8	0	0		1.452	0.000	0.000	
ENGINEERING PERSONNEL	2	0	6		1.344	0.230	1.710	
TOTAL	52	31	40	123	14.081	14.430	19.318	47.829
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	101	157	375	633	58.518	76.985	258.747	394.250
OPERATING PERSONNEL	76	1	0	77	23.696	0.641	0.000	24.337
HEALTH PHYSICS PERSONNEL	38	0	7	45	36.950	0.000	26.652	63.602
SUPERVISORY PERSONNEL	14	1	24	39	3.532	1.051	0.060	4.643
ENGINEERING PERSONNEL	39	28	38	105	23.784	16.511	17.493	57.788
GRAND TOTAL	268 (135)	187 (100)	444 (333)	899 (568)	146.480	95.188	302.952	544.620

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT:* GINNA (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	42	144	98		6.100	10.260	14.900	
OPERATING PERSONNEL	23	1	0		11.080	0.590	0.000	
HEALTH PHYSICS PERSONNEL	14	3	46		1.170	0.160	12.140	
SUPERVISORY PERSONNEL	20	8	20		4.730	0.850	1.490	
ENGINEERING PERSONNEL	1	2	29		0.030	0.000	2.430	
TOTAL	100	158	193	451	23.110	11.860	30.960	65.930
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	40	123	95		4.460	10.130	5.120	
OPERATING PERSONNEL	17	0	0		0.270	0.000	0.000	
HEALTH PHYSICS PERSONNEL	13	4	46		1.320	0.160	5.510	
SUPERVISORY PERSONNEL	20	10	19		1.590	1.700	2.560	
ENGINEERING PERSONNEL	1	1	17		0.010	0.010	5.850	
TOTAL	91	138	177	406	7.650	12.000	19.040	38.690
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	28	66	31		2.010	1.100	3.800	
OPERATING PERSONNEL	1	0	0		0.020	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	26		0.050	0.000	1.290	
SUPERVISORY PERSONNEL	11	7	15		0.770	0.430	1.080	
ENGINEERING PERSONNEL	0	2	4		0.000	0.040	0.070	
TOTAL	42	75	76	193	2.850	1.570	6.240	10.660
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	42	150	122		19.740	125.200	39.920	
OPERATING PERSONNEL	17	1	0		0.680	0.020	0.000	
HEALTH PHYSICS PERSONNEL	13	4	47		3.020	0.120	21.230	
SUPERVISORY PERSONNEL	19	10	19		3.880	3.840	12.200	
ENGINEERING PERSONNEL	1	2	41		0.020	0.560	5.880	
TOTAL	92	167	229	488	27.340	129.740	79.230	236.310
WASTE PROCESSING								
MAINTENANCE PERSONNEL	26	44	31		1.190	1.370	1.520	
OPERATING PERSONNEL	9	0	0		0.330	0.000	0.000	
HEALTH PHYSICS PERSONNEL	8	3	38		0.330	0.000	10.300	
SUPERVISORY PERSONNEL	9	3	10		0.200	0.560	1.250	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	52	50	79	181	2.050	1.930	13.070	17.050
REFUELING								
MAINTENANCE PERSONNEL	21	36	16		2.790	4.300	3.080	
OPERATING PERSONNEL	4	0	0		0.730	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	23		0.260	0.000	52.350	
SUPERVISORY PERSONNEL	4	5	6		0.000	0.560	19.600	
ENGINEERING PERSONNEL	0	1	21		0.000	0.000	0.240	
TOTAL	31	42	66	139	3.780	4.860	75.270	83.910
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	199 (43)	563 (151)	393 (136)	1155 (330)	36.290	152.360	68.340	256.990
OPERATING PERSONNEL	71 (23)	2 (1)	0 (0)	73 (24)	13.110	0.610	0.000	13.720
HEALTH PHYSICS PERSONNEL	52 (14)	14 (4)	226 (47)	292 (65)	6.150	0.440	102.820	109.410
SUPERVISORY PERSONNEL	83 (21)	43 (11)	89 (24)	215 (56)	11.170	7.940	38.180	57.290
ENGINEERING PERSONNEL	3 (1)	8 (2)	112 (42)	123 (45)	0.060	0.610	14.470	15.140
GRAND TOTAL	408 (102)	630 (169)	820 (249)	1858 (520)	66.780	161.960	223.810	452.550

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: HADDAM NECK (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	7	0	2		3.210	0.160	0.890	
OPERATING PERSONNEL	51	0	11		60.700	0.050	3.660	
HEALTH PHYSICS PERSONNEL	32	2	75		19.460	2.710	59.150	
SUPERVISORY PERSONNEL	3	0	0		0.640	0.000	0.000	
ENGINEERING PERSONNEL	3	3	0		1.380	1.100	0.130	
TOTAL	96	5	88	189	85.390	4.020	63.830	153.240
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	59	72	159		95.090	24.200	146.320	
OPERATING PERSONNEL	5	0	0		3.030	0.040	0.400	
HEALTH PHYSICS PERSONNEL	23	2	66		12.770	0.390	23.850	
SUPERVISORY PERSONNEL	1	0	0		0.290	0.000	0.020	
ENGINEERING PERSONNEL	12	16	18		3.660	5.190	11.470	
TOTAL	100	90	243	433	114.840	29.820	182.060	326.720
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	17	11	145		11.630	4.230	141.650	
OPERATING PERSONNEL	1	0	0		0.470	0.010	0.070	
HEALTH PHYSICS PERSONNEL	3	1	32		1.840	0.420	12.560	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	9	10	100		7.750	3.910	156.740	
TOTAL	30	22	277	329	21.690	8.570	311.020	341.280
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	31	49	158		38.120	46.850	93.000	
OPERATING PERSONNEL	2	0	1		0.860	0.010	0.260	
HEALTH PHYSICS PERSONNEL	8	0	24		2.580	0.260	10.710	
SUPERVISORY PERSONNEL	0	0	1		0.050	0.000	1.220	
ENGINEERING PERSONNEL	4	18	12		1.210	11.910	7.990	
TOTAL	45	67	196	308	42.820	59.030	113.180	215.030
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	2		0.310	0.070	0.890	
OPERATING PERSONNEL	0	0	0		0.370	0.000	0.000	
HEALTH PHYSICS PERSONNEL	16	1	46		22.490	0.240	39.970	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	1	2	0		0.340	0.480	0.150	
TOTAL	17	3	48	68	23.510	0.790	41.010	65.310
REFUELING								
MAINTENANCE PERSONNEL	26	3	62		13.020	1.530	74.760	
OPERATING PERSONNEL	0	0	2		0.430	0.010	2.600	
HEALTH PHYSICS PERSONNEL	7	0	20		3.370	0.000	5.740	
SUPERVISORY PERSONNEL	1	0	0		0.420	0.000	0.000	
ENGINEERING PERSONNEL	1	0	7		0.380	0.080	2.630	
TOTAL	35	3	91	129	17.620	1.620	85.730	104.970
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	140	135	528	803	161.380	77.040	457.510	695.930
OPERATING PERSONNEL	59	0	14	73	65.860	0.120	6.990	72.970
HEALTH PHYSICS PERSONNEL	89	6	263	358	62.510	4.020	151.980	218.510
SUPERVISORY PERSONNEL	5	0	1	6	1.400	0.000	1.240	2.640
ENGINEERING PERSONNEL	30	49	137	216	14.720	22.670	179.110	216.500
GRAND TOTAL	323	190	943	1456	305.870	103.850	796.830	1206.550

Appendix D (cont.)

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: HATCH 1,2 (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	13	0	49		4.882	0.025	22.571	
OPERATING PERSONNEL	104	0	0		57.466	0.020	0.034	
HEALTH PHYSICS PERSONNEL	47	1	139		28.685	0.389	118.967	
SUPERVISORY PERSONNEL	82	2	8		21.926	1.481	4.107	
ENGINEERING PERSONNEL	42	4	13		27.435	1.234	6.862	
TOTAL	288	7	209	504	140.394	3.149	152.541	296.084
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	158	3	197		137.595	1.680	135.182	
OPERATING PERSONNEL	30	0	1		17.870	0.000	0.109	
HEALTH PHYSICS PERSONNEL	22	0	40		11.223	0.034	43.343	
SUPERVISORY PERSONNEL	16	3	8		6.309	1.608	5.401	
ENGINEERING PERSONNEL	2	0	15		1.257	0.179	6.268	
TOTAL	228	6	261	495	174.254	3.501	190.303	368.058
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	47		0.099	0.005	26.963	
OPERATING PERSONNEL	0	0	0		0.227	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	4		0.154	0.046	1.354	
SUPERVISORY PERSONNEL	1	0	7		0.766	0.013	4.349	
ENGINEERING PERSONNEL	0	0	9		0.009	0.000	8.216	
TOTAL	1	0	67	68	1.255	0.064	40.882	42.201
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	13	0	1402		10.624	0.084	1166.354	
OPERATING PERSONNEL	1	0	1		1.048	0.000	0.272	
HEALTH PHYSICS PERSONNEL	0	0	45		0.157	0.000	43.244	
SUPERVISORY PERSONNEL	1	3	45		0.242	1.943	26.513	
ENGINEERING PERSONNEL	8	1	194		1.666	0.715	106.664	
TOTAL	23	4	1687	1714	13.737	2.742	1343.047	1359.526
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	47		0.070	0.005	22.043	
OPERATING PERSONNEL	0	0	0		0.173	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	8		0.174	0.000	7.510	
SUPERVISORY PERSONNEL	0	0	1		0.065	0.002	0.177	
ENGINEERING PERSONNEL	0	0	0		0.009	0.000	0.399	
TOTAL	0	0	56	56	0.491	0.007	30.129	30.627
REFUELING								
MAINTENANCE PERSONNEL	0	0	36		.074	0.005	13.163	
OPERATING PERSONNEL	0	0	0		.173	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	4		.154	0.000	1.283	
SUPERVISORY PERSONNEL	0	0	1		0.053	0.002	0.177	
ENGINEERING PERSONNEL	0	0	0		0.009	0.000	0.436	
TOTAL	0	0	41	41	0.463	0.007	15.059	15.529
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	184	3	778	1965	153.344	1.804	1386.276	1541.424
OPERATING PERSONNEL	135	0	2	137	76.957	0.020	0.415	77.392
HEALTH PHYSICS PERSONNEL	69	1	240	310	40.547	0.469	215.701	256.717
SUPERVISORY PERSONNEL	100	8	70	178	29.361	5.049	40.724	75.134
ENGINEERING PERSONNEL	52	5	231	288	30.385	2.128	128.845	161.358
GRAND TOTAL	540	17	2321	2878	330.594	9.470	1771.961	2112.025

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: INDIAN POINT 2 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	75	161	670		19.998	30.277	158.772	
OPERATING PERSONNEL	83	2	6		134.595	0.213	3.964	
HEALTH PHYSICS PERSONNEL	19	0	149		35.805	0.000	165.880	
SUPERVISORY PERSONNEL	54	29	58		24.872	6.842	8.369	
ENGINEERING PERSONNEL	50	43	28		20.260	9.739	13.189	
TOTAL	281	235	911	1427	235.530	47.071	350.174	632.775
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	71	141	321		73.757	28.921	64.324	
OPERATING PERSONNEL	29	1	2		5.041	0.005	0.510	
HEALTH PHYSICS PERSONNEL	5	0	53		0.075	0.000	1.920	
SUPERVISORY PERSONNEL	28	22	17		15.988	3.343	3.361	
ENGINEERING PERSONNEL	33	17	7		4.119	1.370	0.730	
TOTAL	166	181	400	747	98.980	33.639	70.845	203.464
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	33	57	81		2.090	4.029	12.240	
OPERATING PERSONNEL	5	1	1		0.270	0.045	0.010	
HEALTH PHYSICS PERSONNEL	4	0	6		0.220	0.000	0.220	
SUPERVISORY PERSONNEL	17	19	8		1.283	1.171	1.205	
ENGINEERING PERSONNEL	6	5	6		0.370	0.120	0.117	
TOTAL	65	82	102	249	4.233	5.365	13.792	23.390
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	73	205	1153		28.719	120.451	1000.461	
OPERATING PERSONNEL	70	2	8		15.101	0.810	1.250	
HEALTH PHYSICS PERSONNEL	18	0	130		3.228	0.000	40.174	
SUPERVISORY PERSONNEL	44	34	84		18.662	21.455	32.987	
ENGINEERING PERSONNEL	47	37	26		7.550	15.884	17.494	
TOTAL	252	278	1401	1931	73.260	158.600	1092.366	1324.226
WASTE PROCESSING								
MAINTENANCE PERSONNEL	38	53	321		8.096	1.315	137.532	
OPERATING PERSONNEL	39	0	3		1.467	0.000	2.592	
HEALTH PHYSICS PERSONNEL	8	0	41		0.147	0.000	10.375	
SUPERVISORY PERSONNEL	21	8	17		5.276	0.083	8.861	
ENGINEERING PERSONNEL	25	12	4		1.936	1.614	2.005	
TOTAL	131	73	386	590	16.922	3.012	161.365	181.299
REFUELING								
MAINTENANCE PERSONNEL	32	123	200		4.566	51.464	123.978	
OPERATING PERSONNEL	57	0	3		10.463	0.000	0.598	
HEALTH PHYSICS PERSONNEL	1	0	6		0.180	0.000	0.350	
SUPERVISORY PERSONNEL	17	13	4		3.808	8.733	0.280	
ENGINEERING PERSONNEL	10	13	6		3.925	1.164	0.269	
TOTAL	117	149	219	485	22.942	61.361	125.475	209.778
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	322 (79)	740 (211)	2746 (1295)	3808 (1585)	137.226	236.457	1497.307	1870.990
OPERATING PERSONNEL	283 (84)	6 (2)	23 (11)	312 (97)	166.937	1.073	8.924	176.934
HEALTH PHYSICS PERSONNEL	55 (19)	0 (2)	385 (162)	440 (183)	39.655	0.000	218.919	258.574
SUPERVISORY PERSONNEL	181 (57)	125 (37)	188 (91)	494 (185)	69.889	41.627	55.063	166.579
ENGINEERING PERSONNEL	171 (51)	127 (43)	77 (33)	375 (127)	38.160	29.891	33.804	101.855
GRAND TOTAL	1012 (290)	998 (295)	3419 (1592)	5429 (2177)	451.867	309.048	1814.017	2574.932

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

PLANT: *INDIAN POINT 3 (PWR)

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	15	1	1		3.746	0.331	0.104	
OPERATING PERSONNEL	41	0	2		14.476	0.000	0.166	
HEALTH PHYSICS PERSONNEL	19	0	8		11.316	0.000	1.600	
SUPERVISORY PERSONNEL	22	0	1		12.910	0.000	0.242	
ENGINEERING PERSONNEL	1	0	0		0.090	0.000	0.000	
TOTAL	98	1	12	111	42.538	0.331	2.112	44.981
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	33	0	28		8.901	0.000	15.911	
OPERATING PERSONNEL	23	1	2		3.202	0.076	1.250	
HEALTH PHYSICS PERSONNEL	17	0	34		5.141	0.000	0.700	
SUPERVISORY PERSONNEL	5	0	0		1.090	0.000	11.282	
ENGINEERING PERSONNEL	1	0	0		0.152	0.000	0.000	
TOTAL	79	1	64	144	18.486	0.076	29.143	47.705
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	1	0		0.000	0.076	0.000	
OPERATING PERSONNEL	15	2	5		1.773	0.366	0.725	
HEALTH PHYSICS PERSONNEL	0	0	1		0.000	0.000	0.083	
SUPERVISORY PERSONNEL	5	0	0		0.655	0.000	0.000	
ENGINEERING PERSONNEL	2	1	3		0.179	0.097	0.366	
TOTAL	22	4	9	35	2.607	0.539	1.174	4.320
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	45	0	177		21.438	0.000	77.314	
OPERATING PERSONNEL	18	1	8		4.623	0.076	1.408	
HEALTH PHYSICS PERSONNEL	1	0	0		0.124	0.000	0.000	
SUPERVISORY PERSONNEL	11	0	0		3.795	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	75	1	185	261	29.980	0.076	78.722	108.778
WASTE PROCESSING								
MAINTENANCE PERSONNEL	8	0	13		1.622	0.000	5.568	
OPERATING PERSONNEL	0	0	1		0.000	0.000	2.250	
HEALTH PHYSICS PERSONNEL	1	0	0		0.138	0.000	0.000	
SUPERVISORY PERSONNEL	1	0	0		0.518	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	10	0	14	24	2.278	0.000	7.818	10.096
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	0	0	0.000	0.000	0.000	0.000
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	101	2	219	322	35.707	0.407	98.897	135.011
OPERATING PERSONNEL	97	4	18	119	24.074	0.518	5.799	30.391
HEALTH PHYSICS PERSONNEL	38	0	43	81	16.719	0.000	2.383	19.102
SUPERVISORY PERSONNEL	44	0	1	45	18.968	0.000	11.524	30.492
ENGINEERING PERSONNEL	4	1	3	8	0.421	0.097	0.366	0.884
GRAND TOTAL	284	7	284	575	95.889	1.022	118.969	215.880

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: KEWAUNEE (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	3	0	9		0.144	0.000	1.687	
OPERATING PERSONNEL	13	0	1		3.787	0.000	0.035	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	3	0	0		0.340	0.000	0.000	
ENGINEERING PERSONNEL	5	2	2		0.460	0.141	0.454	
TOTAL	24	2	12	38	4.731	0.141	2.176	7.048
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	43	9	63		10.199	2.493	28.859	
OPERATING PERSONNEL	7	0	2		1.235	0.000	0.136	
HEALTH PHYSICS PERSONNEL	19	0	16		10.605	0.000	7.952	
SUPERVISORY PERSONNEL	2	0	2		0.290	0.000	0.662	
ENGINEERING PERSONNEL	1	2	5		0.096	0.247	1.643	
TOTAL	72	11	88	171	22.425	2.740	39.252	64.417
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	5	0	14		0.012	0.000	1.233	
OPERATING PERSONNEL	1	0	2		0.000	0.000	0.226	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.046	0.000	0.000	
TOTAL	7	0	16	23	0.058	0.000	1.459	1.517
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	43	6	100		7.467	0.260	34.803	
OPERATING PERSONNEL	10	0	0		0.316	0.000	0.000	
HEALTH PHYSICS PERSONNEL	5	0	0		0.382	0.000	0.000	
SUPERVISORY PERSONNEL	4	0	1		0.428	0.000	0.080	
ENGINEERING PERSONNEL	4	3	10		0.086	0.164	1.496	
TOTAL	66	9	111	186	8.679	0.424	36.379	45.482
WASTE PROCESSING								
MAINTENANCE PERSONNEL	19	4	6		0.479	1.197	0.774	
OPERATING PERSONNEL	2	0	0		3.204	0.000	0.000	
HEALTH PHYSICS PERSONNEL	5	0	1		2.363	0.000	0.321	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	26	4	7	37	6.046	1.197	1.095	8.338
REFUELING								
MAINTENANCE PERSONNEL	24	4	16		2.484	0.638	6.490	
OPERATING PERSONNEL	3	0	1		0.028	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	9		0.000	0.000	2.730	
ENGINEERING PERSONNEL	0	1	0		0.000	0.000	0.000	
TOTAL	27	5	26	58	2.512	0.638	9.220	12.370
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	137	23	208	368	20.785	4.588	73.846	99.219
OPERATING PERSONNEL	36	0	6	42	8.570	0.000	0.397	8.967
HEALTH PHYSICS PERSONNEL	29	0	17	46	13.350	0.000	8.273	21.623
SUPERVISORY PERSONNEL	9	0	12	21	1.058	0.000	3.472	4.530
ENGINEERING PERSONNEL	11	8	17	36	0.688	0.552	3.593	4.833
GRAND TOTAL	222	31	260	513	44.451	5.140	89.581	139.172

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: * LACROSSE (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	21	0	0		17.838	0.010	0.000	
OPERATING PERSONNEL	20	0	4		68.149	0.000	2.485	
HEALTH PHYSICS PERSONNEL	11	0	0		23.727	0.000	0.000	
SUPERVISORY PERSONNEL	19	0	0		18.392	0.032	0.317	
ENGINEERING PERSONNEL	8	0	3		5.704	0.121	1.132	
TOTAL	79	0	7	86	133.810	0.163	3.934	137.907
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	19	1	0		26.793	0.630	0.103	
OPERATING PERSONNEL	20	0	0		7.376	0.000	0.000	
HEALTH PHYSICS PERSONNEL	7	0	0		3.353	0.000	0.000	
SUPERVISORY PERSONNEL	14	0	0		9.931	0.000	0.000	
ENGINEERING PERSONNEL	6	0	0		7.148	0.030	0.000	
TOTAL	66	1	0	67	54.601	0.660	0.103	55.364
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	0	0	0.000	0.000	0.000	0.000
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	17	3	4		11.800	2.810	1.104	
OPERATING PERSONNEL	11	0	0		4.149	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	0		1.205	0.000	0.000	
SUPERVISORY PERSONNEL	17	0	0		11.533	0.000	0.000	
ENGINEERING PERSONNEL	3	0	0		0.794	0.050	0.000	
TOTAL	52	3	4	59	29.481	2.860	1.104	33.445
WASTE PROCESSING								
MAINTENANCE PERSONNEL	5	0	0		2.205	0.000	0.068	
OPERATING PERSONNEL	8	0	0		2.446	0.000	0.000	
HEALTH PHYSICS PERSONNEL	8	0	0		6.660	0.000	0.000	
SUPERVISORY PERSONNEL	6	0	0		6.414	0.000	0.000	
ENGINEERING PERSONNEL	3	0	0		1.165	0.000	0.000	
TOTAL	30	0	0	30	18.890	0.000	0.068	18.958
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.017	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.035	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.015	0.000	0.000	
TOTAL	0	0	0	0	0.067	0.000	0.000	0.067
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	62 (21)	4 (4)	4 (4)	70 (29)	58.636	3.450	1.275	63.361
OPERATING PERSONNEL	59 (20)	0 (0)	4 (4)	63 (24)	82.120	0.000	2.485	84.605
HEALTH PHYSICS PERSONNEL	30 (11)	0 (0)	0 (0)	30 (11)	34.962	0.000	0.000	34.962
SUPERVISORY PERSONNEL	56 (20)	0 (0)	0 (0)	56 (20)	46.305	0.032	0.317	46.654
ENGINEERING PERSONNEL	20 (8)	0 (0)	3 (3)	23 (11)	14.826	0.201	1.132	16.159
GRAND TOTAL	227 (80)	4 (4)	11 (11)	242 (95)	236.849	3.683	5.209	245.741

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

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT:†* LASALLE 1 (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	14	1	0		5.563	0.024	0.000	
OPERATING PERSONNEL	13	0	0		3.479	0.000	0.000	
HEALTH PHYSICS PERSONNEL	8	0	0		4.112	0.000	0.000	
SUPERVISORY PERSONNEL	39	0	0		4.515	0.000	0.000	
ENGINEERING PERSONNEL	43	7	8		4.897	0.664	1.499	
TOTAL	117	8	8	133	22.566	0.688	1.499	24.753
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	116	5	155		47.279	0.168	35.096	
OPERATING PERSONNEL	26	0	0		6.958	0.000	0.000	
HEALTH PHYSICS PERSONNEL	16	0	0		8.226	0.000	0.000	
SUPERVISORY PERSONNEL	39	0	0		4.515	0.000	0.000	
ENGINEERING PERSONNEL	0	7	50		0.000	0.664	8.991	
TOTAL	197	12	205	414	66.978	0.832	44.087	111.897
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	6	1	13		2.781	0.024	2.925	
OPERATING PERSONNEL	7	0	0		1.741	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	0		2.057	0.000	0.000	
SUPERVISORY PERSONNEL	20	0	0		3.762	0.000	0.000	
ENGINEERING PERSONNEL	43	16	4		4.896	1.331	0.749	
TOTAL	80	17	17	114	15.237	1.355	3.674	20.266
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	0	1	91		0.000	0.024	20.473	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	7	21		0.000	0.664	3.746	
TOTAL	0	8	112	120	0.000	0.688	24.219	24.907
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	87	0	0		22.614	0.000	0.000	
HEALTH PHYSICS PERSONNEL	12	0	0		6.170	0.000	0.000	
SUPERVISORY PERSONNEL	33	0	0		2.258	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	132	0	0	132	31.042	0.000	0.000	31.042
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	0	0	0.000	0.000	0.000	0.000
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	136	8	259	403	55.623	0.240	58.494	114.357
OPERATING PERSONNEL	133	0	0	133	34.792	0.000	0.000	34.792
HEALTH PHYSICS PERSONNEL	40	0	0	40	20.565	0.000	0.000	20.565
SUPERVISORY PERSONNEL	131	0	0	131	15.050	0.000	0.000	15.050
ENGINEERING PERSONNEL	86	37	83	206	9.793	3.323	14.985	28.101
GRAND TOTAL	526	45	342	913	135.823	3.563	73.479	212.865

*Workers may be counted in more than one category.

[a]NRC mandated work contributed 25 man-rems.

PLANT: *MAINE YANKEE (PWR) NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	0	0	0		0.160	0.000	0.395	
OPERATING PERSONNEL	17	0	0		4.500	0.000	0.000	
HEALTH PHYSICS PERSONNEL	8	0	0		1.920	0.000	0.030	
SUPERVISORY PERSONNEL	2	0	1		1.035	0.000	0.775	
ENGINEERING PERSONNEL	2	1	0		0.560	0.110	0.165	
TOTAL	29	1	1	31	8.175	0.110	1.365	9.650
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	21	0	18		9.110	0.000	5.821	
OPERATING PERSONNEL	7	0	0		2.275	0.000	0.000	
HEALTH PHYSICS PERSONNEL	5	0	0		2.265	0.000	0.030	
SUPERVISORY PERSONNEL	20	0	2		6.185	0.000	0.440	
ENGINEERING PERSONNEL	0	0	0		0.450	0.000	0.105	
TOTAL	53	0	20	73	20.285	0.000	6.396	26.681
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	10	0	118		4.230	0.010	76.260	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.010	
SUPERVISORY PERSONNEL	2	0	3		1.610	0.000	0.960	
ENGINEERING PERSONNEL	10	0	14		5.320	0.000	10.760	
TOTAL	22	0	135	157	11.160	0.010	87.990	99.160
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	15	0	338		7.975	0.420	333.261	
OPERATING PERSONNEL	4	0	0		1.060	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	2		0.370	0.000	2.270	
SUPERVISORY PERSONNEL	11	0	5		4.285	0.000	4.065	
ENGINEERING PERSONNEL	11	0	36		4.700	0.005	28.085	
TOTAL	41	0	381	422	18.390	0.425	367.681	386.496
WASTE PROCESSING								
MAINTENANCE PERSONNEL	2	0	5		0.525	0.000	2.050	
OPERATING PERSONNEL	1	0	0		1.230	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	0		3.260	0.000	0.000	
SUPERVISORY PERSONNEL	10	0	0		3.990	0.000	0.030	
ENGINEERING PERSONNEL	0	0	2		0.000	0.000	0.225	
TOTAL	17	0	7	24	9.005	0.000	2.305	11.310
REFUELING								
MAINTENANCE PERSONNEL	29	7	276		21.360	2.300	187.966	
OPERATING PERSONNEL	48	0	0		28.035	0.000	0.000	
HEALTH PHYSICS PERSONNEL	18	0	61		10.565	0.000	57.035	
SUPERVISORY PERSONNEL	59	0	27		50.167	0.025	16.075	
ENGINEERING PERSONNEL	24	1	28		10.690	0.205	12.040	
TOTAL	178	8	392	578	120.817	2.530	273.116	396.463
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	77	7	755	839	43.360	2.730	605.753	651.843
OPERATING PERSONNEL	77	0	0	77	37.100	0.000	0.000	37.100
HEALTH PHYSICS PERSONNEL	35	0	63	98	18.380	0.000	59.375	77.755
SUPERVISORY PERSONNEL	104	0	38	142	67.272	0.025	22.345	89.642
ENGINEERING PERSONNEL	47	2	80	129	21.720	0.320	51.380	73.420
GRAND TOTAL	340	9	936	1285	187.832	3.075	738.853	929.760

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: *MCGUIRE 1 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	131	324	35		3.395	4.523	0.500	
OPERATING PERSONNEL	97	10	21		16.211	0.775	0.215	
HEALTH PHYSICS PERSONNEL	64	0	108		7.959	0.000	6.245	
SUPERVISORY PERSONNEL	12	0	0		0.405	0.000	0.000	
ENGINEERING PERSONNEL	68	12	8		4.795	0.620	0.010	
TOTAL	372	346	172	890	32.765	5.918	6.970	45.653
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	138	313	43		23.683	37.295	5.297	
OPERATING PERSONNEL	91	8	39		14.880	2.095	23.204	
HEALTH PHYSICS PERSONNEL	63	0	107		16.575	0.000	24.889	
SUPERVISORY PERSONNEL	12	0	0		0.820	0.000	0.000	
ENGINEERING PERSONNEL	60	12	8		6.885	1.495	0.360	
TOTAL	364	333	197	894	62.843	40.885	53.750	157.478
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	30	116	21		1.035	45.180	12.555	
OPERATING PERSONNEL	9	0	14		0.060	0.000	0.360	
HEALTH PHYSICS PERSONNEL	38	0	60		6.540	0.000	7.655	
SUPERVISORY PERSONNEL	2	0	0		0.120	0.000	0.000	
ENGINEERING PERSONNEL	39	6	12		15.090	1.135	4.455	
TOTAL	118	122	107	347	22.845	46.315	25.025	94.185
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	131	339	60		41.150	137.100	15.534	
OPERATING PERSONNEL	57	7	23		2.685	0.105	0.510	
HEALTH PHYSICS PERSONNEL	53	0	85		11.855	0.000	14.130	
SUPERVISORY PERSONNEL	8	0	0		1.400	0.000	0.000	
ENGINEERING PERSONNEL	60	13	21		13.920	0.875	5.785	
TOTAL	309	359	189	857	71.010	138.080	35.959	245.049
WASTE PROCESSING								
MAINTENANCE PERSONNEL	18	19	0		0.350	0.085	0.000	
OPERATING PERSONNEL	22	2	13		0.320	0.000	1.950	
HEALTH PHYSICS PERSONNEL	33	0	23		12.175	0.000	1.265	
SUPERVISORY PERSONNEL	2	0	0		0.235	0.000	0.000	
ENGINEERING PERSONNEL	12	1	0		0.075	0.000	0.000	
TOTAL	87	22	36	145	13.155	0.085	3.215	16.455
REFUELING								
MAINTENANCE PERSONNEL	54	91	13		7.715	12.245	0.780	
OPERATING PERSONNEL	39	1	7		3.260	0.000	0.320	
HEALTH PHYSICS PERSONNEL	33	0	34		0.535	0.000	0.985	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	34	2	5		2.000	0.005	0.930	
TOTAL	160	94	59	313	13.510	12.250	3.015	28.775
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	502	1202	172	1876	77.328	236.428	34.666	348.422
OPERATING PERSONNEL	315	28	117	460	37.416	2.975	26.559	66.950
HEALTH PHYSICS PERSONNEL	284	0	417	701	55.639	0.000	55.169	110.808
SUPERVISORY PERSONNEL	36	0	0	36	2.980	0.000	0.000	2.980
ENGINEERING PERSONNEL	273	46	54	373	42.765	4.130	11.540	58.435
GRAND TOTAL	1410	1276	760	3446	216.128	243.533	127.934	587.595

*Workers may be counted in more than one category.

PLANT:* MILLSTONE 1 (BWR)

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	17	0	7		8.610	0.160	4.320	
OPERATING PERSONNEL	55	0	0		52.710	0.000	0.070	
HEALTH PHYSICS PERSONNEL	21	1	12		6.880	0.400	4.340	
SUPERVISORY PERSONNEL	1	0	0		0.020	0.000	0.140	
ENGINEERING PERSONNEL	1	4	3		0.600	1.490	1.360	
TOTAL	95	5	22	122	68.820	2.050	10.230	81.100
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	50	12	176		20.590	6.350	67.450	
OPERATING PERSONNEL	11	0	11		4.380	0.000	2.480	
HEALTH PHYSICS PERSONNEL	19	1	31		7.080	0.320	9.460	
SUPERVISORY PERSONNEL	0	0	1		0.060	0.000	0.420	
ENGINEERING PERSONNEL	8	13	22		2.580	3.810	5.590	
TOTAL	88	26	241	355	34.690	10.480	85.400	130.570
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	1	31		0.570	0.530	24.640	
OPERATING PERSONNEL	1	0	0		1.030	0.000	0.010	
HEALTH PHYSICS PERSONNEL	1	0	3		0.540	0.010	3.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	3	7	18		1.350	4.340	17.090	
TOTAL	5	8	52	65	3.490	4.880	44.740	53.110
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	75	64	506		49.010	20.520	300.720	
OPERATING PERSONNEL	16	0	8		5.820	0.060	2.970	
HEALTH PHYSICS PERSONNEL	20	0	52		8.650	0.090	21.670	
SUPERVISORY PERSONNEL	0	0	6		0.040	0.020	2.600	
ENGINEERING PERSONNEL	11	27	56		4.030	12.180	34.600	
TOTAL	122	91	628	841	67.550	32.870	362.560	462.980
WASTE PROCESSING								
MAINTENANCE PERSONNEL	4	0	21		1.490	0.000	16.490	
OPERATING PERSONNEL	8	0	0		2.930	0.000	0.020	
HEALTH PHYSICS PERSONNEL	11	0	8		6.980	0.010	3.940	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	2	0	3		0.550	0.000	0.090	
TOTAL	25	0	32	57	11.950	0.010	20.540	32.500
REFUELING								
MAINTENANCE PERSONNEL	57	44	24		32.980	15.230	9.050	
OPERATING PERSONNEL	38	0	0		16.970	0.000	0.160	
HEALTH PHYSICS PERSONNEL	5	0	17		2.060	0.200	5.070	
SUPERVISORY PERSONNEL	0	0	0		0.020	0.000	0.000	
ENGINEERING PERSONNEL	7	3	2		3.430	1.130	0.770	
TOTAL	107	47	43	197	55.460	16.560	15.050	87.070
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	203	121	765	1089	113.250	42.790	422.670	578.710
OPERATING PERSONNEL	129	0	19	148	83.840	0.060	5.710	89.610
HEALTH PHYSICS PERSONNEL	77	2	123	202	32.190	1.030	47.480	80.700
SUPERVISORY PERSONNEL	1	0	7	8	0.140	0.020	3.160	3.320
ENGINEERING PERSONNEL	32	54	104	190	12.540	22.950	59.500	94.990
GRAND TOTAL	442	177	1018	1637	241.960	66.850	538.520	847.330

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: MILLSTONE 2 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	1	0	0		0.540	0.000	0.050	
OPERATING PERSONNEL	16	0	0		4.710	0.000	0.030	
HEALTH PHYSICS PERSONNEL	10	0	2		4.130	0.020	0.660	
SUPERVISORY PERSONNEL	0	0	0		0.050	0.000	0.020	
ENGINEERING PERSONNEL	2	0	0		1.020	0.010	0.020	
TOTAL	29	0	2	31	10.450	0.030	0.780	11.260
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	54	0	15		26.260	0.030	5.070	
OPERATING PERSONNEL	2	0	0		1.070	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	3		1.130	0.030	0.770	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	3	0	1		1.070	0.160	0.670	
TOTAL	63	0	19	82	29.530	0.220	6.510	36.260
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.010	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.010	
ENGINEERING PERSONNEL	2	0	0		0.530	0.160	0.000	
TOTAL	2	0	0	2	0.540	0.160	0.010	0.710
SPECIAL MAINTENANCE[a]								
MAINTENANCE PERSONNEL	18	0	52		6.460	0.040	26.700	
OPERATING PERSONNEL	0	0	0		0.340	0.000	0.020	
HEALTH PHYSICS PERSONNEL	2	0	4		0.680	0.040	1.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	13		0.120	0.220	5.930	
TOTAL	20	0	69	89	7.600	0.300	33.650	41.550
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	29		0.110	0.000	13.180	
OPERATING PERSONNEL	6	0	0		1.850	0.000	0.000	
HEALTH PHYSICS PERSONNEL	6	0	6		5.840	0.000	3.470	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	2	0	5		1.190	0.000	1.430	
TOTAL	14	0	40	54	8.990	0.000	18.080	27.070
REFUELING								
MAINTENANCE PERSONNEL	0	0	2		0.130	0.000	0.530	
OPERATING PERSONNEL	0	0	0		0.080	0.000	0.010	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.110	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	16		0.020	0.090	3.580	
TOTAL	0	0	18	18	0.230	0.090	4.230	4.550
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	73	0	98	171	33.500	0.070	45.530	79.100
OPERATING PERSONNEL	24	0	0	24	8.050	0.000	0.060	8.110
HEALTH PHYSICS PERSONNEL	22	0	15	37	11.790	0.090	6.010	17.890
SUPERVISORY PERSONNEL	0	0	0	0	0.050	0.000	0.030	0.080
ENGINEERING PERSONNEL	9	0	35	44	3.950	0.640	11.630	16.220
GRAND TOTAL	128	0	148	276	57.340	0.800	63.260	121.400

[a]Includes sparger repair, flow restrictor replacement, steam generator modifications, decontamination, etc.

PLANT:*† MONTICELLO (BWR)

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	43	149	16		21.453	88.563	3.329	
OPERATING PERSONNEL	42	0	0		33.099	0.000	0.000	
HEALTH PHYSICS PERSONNEL	15	0	42		5.529	0.000	26.528	
SUPERVISORY PERSONNEL	22	8	45		5.202	1.373	12.797	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	122	157	103	382	65.283	89.936	42.654	197.873
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	31	252	111		20.989	118.721	35.254	
OPERATING PERSONNEL	4	0	0		0.682	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	16		0.529	0.000	5.316	
SUPERVISORY PERSONNEL	7	2	25		1.504	0.204	11.730	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	44	254	152	450	23.704	118.925	52.300	194.929
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	16	14		0.118	7.117	5.669	
OPERATING PERSONNEL	2	0	0		0.221	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	3	14		0.000	-0.584	5.618	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	3	19	28	50	0.339	7.701	11.287	19.327
SPECIAL MAINTENANCE[a]								
MAINTENANCE PERSONNEL	37	495	305		47.322	1007.766	338.123	
OPERATING PERSONNEL	48	0	1		43.130	0.000	0.355	
HEALTH PHYSICS PERSONNEL	9	0	65		6.559	0.000	64.553	
SUPERVISORY PERSONNEL	11	22	266		4.693	12.477	366.990	
ENGINEERING PERSONNEL	0	0	4		0.000	0.000	0.496	
TOTAL	105	517	641	1263	101.704	1020.243	770.517	1892.464
WASTE PROCESSING								
MAINTENANCE PERSONNEL	11	34	0		4.318	14.330	0.000	
OPERATING PERSONNEL	2	0	0		0.683	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	4		0.718	0.000	0.632	
SUPERVISORY PERSONNEL	2	0	2		0.226	0.000	3.239	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	18	34	6	58	5.945	14.330	3.871	24.146
REFUELING								
MAINTENANCE PERSONNEL	0	2	0		0.000	0.267	0.000	
OPERATING PERSONNEL	40	0	0		9.866	0.000	0.382	
HEALTH PHYSICS PERSONNEL	0	0	2		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	2	0	0		0.824	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	42	2	2	46	10.690	0.267	0.382	11.339
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	123	948	446	1517	94.200	1236.764	382.375	1713.339
OPERATING PERSONNEL	138	0	1	139	87.681	0.000	0.737	88.418
HEALTH PHYSICS PERSONNEL	29	0	129	158	13.335	0.000	97.029	110.364
SUPERVISORY PERSONNEL	44	35	352	431	12.449	14.638	400.374	427.461
ENGINEERING PERSONNEL	0	0	4	4	0.000	0.000	0.496	0.496
GRAND TOTAL	334	983	932	2249	207.665	1251.402	881.011	2340.078

*Workers may be counted in more than one category.

[a]Special maintenance includes maintenance in primary containment, recirc. pipe replacement, reactor water clean up heat exchanger mods., and condenser retube.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

*† PLANT: NINE MILE POINT (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	392	10	160		65.475	0.787	8.583	
OPERATING PERSONNEL	293	51	148		30.154	3.204	10.209	
HEALTH PHYSICS PERSONNEL	119	4	18		14.889	0.092	4.842	
SUPERVISORY PERSONNEL	47	3	13		9.773	0.012	0.558	
ENGINEERING PERSONNEL	40	24	73		5.573	0.825	5.487	
TOTAL	891	92	412	1395	125.864	4.920	29.679	160.463
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	485	8	314		46.041	0.258	98.822	
OPERATING PERSONNEL	345	33	166		18.586	0.827	13.578	
HEALTH PHYSICS PERSONNEL	85	4	15		3.769	0.021	0.942	
SUPERVISORY PERSONNEL	44	0	17		2.383	0.000	4.434	
ENGINEERING PERSONNEL	59	10	81		1.665	0.080	8.854	
TOTAL	1018	55	593	1666	72.444	1.186	126.630	200.260
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	134	1	117		7.485	0.003	52.919	
OPERATING PERSONNEL	120	3	59		3.804	0.076	23.631	
HEALTH PHYSICS PERSONNEL	7	0	9		0.048	0.000	0.329	
SUPERVISORY PERSONNEL	10	0	6		0.586	0.000	3.481	
ENGINEERING PERSONNEL	14	4	33		1.109	0.211	9.265	
TOTAL	285	8	224	517	13.032	0.290	89.625	102.947
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	1382	5	656		145.128	0.363	57.891	
OPERATING PERSONNEL	468	24	294		39.507	0.397	22.709	
HEALTH PHYSICS PERSONNEL	161	0	54		24.169	0.000	4.939	
SUPERVISORY PERSONNEL	85	0	17		5.885	0.000	1.295	
ENGINEERING PERSONNEL	120	21	167		3.786	0.647	14.004	
TOTAL	2216	50	1188	3454	218.475	1.407	100.838	320.720
WASTE PROCESSING								
MAINTENANCE PERSONNEL	95	2	28		6.372	0.017	1.743	
OPERATING PERSONNEL	71	4	30		38.426	0.050	5.242	
HEALTH PHYSICS PERSONNEL	45	0	11		3.205	0.000	4.021	
SUPERVISORY PERSONNEL	6	0	1		0.594	0.000	0.001	
ENGINEERING PERSONNEL	10	1	10		0.153	0.018	2.994	
TOTAL	227	7	80	314	48.750	0.085	14.001	62.836
REFUELING								
MAINTENANCE PERSONNEL	81	0	24		13.972	0.000	4.692	
OPERATING PERSONNEL	55	1	12		7.280	0.015	0.239	
HEALTH PHYSICS PERSONNEL	15	0	2		0.247	0.000	0.045	
SUPERVISORY PERSONNEL	16	0	1		1.352	0.000	0.020	
ENGINEERING PERSONNEL	10	0	9		0.283	0.000	0.111	
TOTAL	177	1	48	226	23.134	0.015	5.107	28.256
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	2569	26	1299	3894	284.473	1.428	224.650	510.551
OPERATING PERSONNEL	1352	116	709	2177	137.757	4.569	75.608	217.934
HEALTH PHYSICS PERSONNEL	432	8	109	549	46.327	0.113	15.118	61.558
SUPERVISORY PERSONNEL	208	3	55	266	20.573	0.012	9.789	30.374
ENGINEERING PERSONNEL	253	60	373	686	12.569	1.781	40.715	55.065
GRAND TOTAL	4814	213	2545	7572	501.699	7.903	365.880	875.482

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: *NORTH ANNA 1,2 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	168	47	653		16.965	1.159	31.846	
OPERATING PERSONNEL	228	1	18		41.839	0.005	0.515	
HEALTH PHYSICS PERSONNEL	54	8	183		33.457	0.100	22.128	
SUPERVISORY PERSONNEL	46	1	9		1.568	0.002	0.092	
ENGINEERING PERSONNEL	47	22	74		1.358	0.234	1.225	
TOTAL	543	79	937	1559	95.187	1.500	55.806	152.493
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	158	71	737		164.002	18.365	237.755	
OPERATING PERSONNEL	134	0	23		63.347	0.000	1.300	
HEALTH PHYSICS PERSONNEL	46	6	189		33.585	1.196	93.678	
SUPERVISORY PERSONNEL	37	5	7		4.464	0.300	0.440	
ENGINEERING PERSONNEL	40	22	79		3.965	0.297	6.700	
TOTAL	415	104	1035	1554	269.363	20.158	339.873	629.394
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	12	8	53		0.990	0.260	4.094	
OPERATING PERSONNEL	13	0	1		2.478	0.000	0.010	
HEALTH PHYSICS PERSONNEL	5	1	34		0.243	0.025	1.524	
SUPERVISORY PERSONNEL	1	0	0		0.015	0.000	0.000	
ENGINEERING PERSONNEL	3	1	4		0.015	0.010	0.064	
TOTAL	34	10	92	136	3.741	0.295	5.692	9.728
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	73	19	1139		11.445	1.944	786.286	
OPERATING PERSONNEL	35	0	22		5.566	0.000	6.674	
HEALTH PHYSICS PERSONNEL	36	2	149		6.124	0.115	81.222	
SUPERVISORY PERSONNEL	11	1	16		0.616	0.008	10.684	
ENGINEERING PERSONNEL	12	12	68		2.453	1.354	32.024	
TOTAL	167	34	1394	1595	26.204	3.421	916.890	946.515
WASTE PROCESSING								
MAINTENANCE PERSONNEL	54	9	122		4.425	0.246	14.316	
OPERATING PERSONNEL	34	0	5		13.085	0.000	5.916	
HEALTH PHYSICS PERSONNEL	45	0	115		18.885	0.000	14.942	
SUPERVISORY PERSONNEL	7	0	0		1.369	0.000	0.000	
ENGINEERING PERSONNEL	1	0	7		0.002	0.000	0.485	
TOTAL	141	9	249	399	37.766	0.246	35.659	73.671
REFUELING								
MAINTENANCE PERSONNEL	84	28	156		31.451	13.214	26.905	
OPERATING PERSONNEL	75	3	18		14.849	0.166	1.780	
HEALTH PHYSICS PERSONNEL	14	2	112		0.452	0.014	11.497	
SUPERVISORY PERSONNEL	11	3	4		1.021	0.461	0.270	
ENGINEERING PERSONNEL	6	12	26		0.200	1.541	3.110	
TOTAL	190	48	316	554	47.973	15.396	43.562	106.931
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	549	182	2860	3591	229.278	35.188	1101.202	1365.668
OPERATING PERSONNEL	519	4	87	610	141.164	0.171	16.195	157.530
HEALTH PHYSICS PERSONNEL	200	19	782	1001	92.746	1.450	224.991	319.187
SUPERVISORY PERSONNEL	113	10	36	159	9.053	0.771	11.486	21.310
ENGINEERING PERSONNEL	109	69	258	436	7.993	3.436	43.608	55.037
GRAND TOTAL	1490	284	4023	5797	480.234	41.016	1397.482	1918.732

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: OCONEE 1,2,3 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	202	417	126		3.050	3.650	0.915	
OPERATING PERSONNEL	154	1	23		45.480	0.645	1.235	
HEALTH PHYSICS PERSONNEL	62	2	44		2.300	0.070	0.840	
SUPERVISORY PERSONNEL	35	0	0		1.135	0.000	0.000	
ENGINEERING PERSONNEL	82	27	4		11.566	0.435	0.000	
TOTAL	535	447	197	1179	63.531	4.800	2.990	71.321
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	221	474	93		118.055	96.107	41.540	
OPERATING PERSONNEL	137	1	55		19.060	0.235	55.340	
HEALTH PHYSICS PERSONNEL	75	2	92		35.645	0.370	37.929	
SUPERVISORY PERSONNEL	31	0	0		4.246	0.000	0.000	
ENGINEERING PERSONNEL	79	16	3		11.455	1.500	0.960	
TOTAL	543	493	243	1279	188.461	98.212	135.769	422.442
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	86	206	70		7.305	45.435	33.775	
OPERATING PERSONNEL	11	0	16		0.150	0.000	0.400	
HEALTH PHYSICS PERSONNEL	42	1	65		2.935	0.000	8.235	
SUPERVISORY PERSONNEL	3	0	0		0.015	0.000	0.000	
ENGINEERING PERSONNEL	55	4	3		11.020	0.330	1.425	
TOTAL	197	211	154	562	21.425	45.765	43.835	111.025
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	195	553	134		55.480	327.620	59.905	
OPERATING PERSONNEL	68	1	36		2.125	0.015	2.150	
HEALTH PHYSICS PERSONNEL	54	1	88		12.685	0.015	22.280	
SUPERVISORY PERSONNEL	16	0	0		0.940	0.000	0.000	
ENGINEERING PERSONNEL	79	24	4		19.845	8.680	0.685	
TOTAL	412	579	262	1253	91.075	336.330	85.020	512.425
WASTE PROCESSING								
MAINTENANCE PERSONNEL	79	62	0		2.420	3.185	0.000	
OPERATING PERSONNEL	60	0	50		15.045	0.000	8.400	
HEALTH PHYSICS PERSONNEL	60	1	22		8.675	0.015	0.800	
SUPERVISORY PERSONNEL	15	0	0		1.535	0.000	0.000	
ENGINEERING PERSONNEL	25	3	0		0.830	0.440	0.000	
TOTAL	239	66	72	377	28.505	3.640	9.200	41.345
REFUELING								
MAINTENANCE PERSONNEL	125	113	38		31.450	12.135	7.675	
OPERATING PERSONNEL	123	1	13		20.985	0.245	1.565	
HEALTH PHYSICS PERSONNEL	28	1	61		1.435	0.005	6.805	
SUPERVISORY PERSONNEL	9	0	0		1.490	0.000	0.000	
ENGINEERING PERSONNEL	34	3	1		1.940	0.195	0.120	
TOTAL	319	118	113	550	57.300	12.580	16.165	86.045
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	908 (223)	1825 (574)	461 (167)	3194 (964)	217.760	488.132	143.810	849.702
OPERATING PERSONNEL	553 (155)	4 (1)	193 (62)	750 (218)	102.845	1.140	69.090	173.075
HEALTH PHYSICS PERSONNEL	321 (75)	8 (2)	372 (92)	701 (169)	63.675	0.475	76.889	141.039
SUPERVISORY PERSONNEL	109 (35)	0 (0)	0 (00)	109 (35)	9.361	0.000	0.000	9.361
ENGINEERING PERSONNEL	354 (92)	77 (29)	15 (5)	446 (126)	56.656	11.580	3.190	71.426
GRAND TOTAL	2245 (580)	1914 (606)	1041 (326)	5200 (1512)	450.297	501.327	292.979	1244.603

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

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT:* OYSTER CREEK (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	144	31	475		18.621	5.978	30.081	
OPERATING PERSONNEL	156	1	10		35.844	0.015	0.990	
HEALTH PHYSICS PERSONNEL	54	0	114		6.850	0.000	18.041	
SUPERVISORY PERSONNEL	41	2	0		2.278	0.055	0.000	
ENGINEERING PERSONNEL	46	0	11		2.461	0.000	0.487	
TOTAL	441	34	610	1085	66.054	6.048	49.599	121.701
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	209	43	1013		84.437	11.574	313.269	
OPERATING PERSONNEL	218	1	37		18.122	0.045	1.706	
HEALTH PHYSICS PERSONNEL	61	0	103		7.440	0.000	15.075	
SUPERVISORY PERSONNEL	94	1	1		8.070	0.125	0.005	
ENGINEERING PERSONNEL	55	0	15		2.077	0.000	0.937	
TOTAL	637	45	1169	1851	120.146	11.744	330.992	462.882
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	3	1	23		0.160	0.000	2.885	
OPERATING PERSONNEL	3	0	1		0.350	0.000	0.015	
HEALTH PHYSICS PERSONNEL	1	0	5		0.028	0.000	0.090	
SUPERVISORY PERSONNEL	1	0	0		0.090	0.000	0.000	
ENGINEERING PERSONNEL	0	0	1		0.000	0.000	0.055	
TOTAL	8	1	30	39	0.628	0.000	3.045	3.673
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	194	43	1244		99.222	25.405	790.082	
OPERATING PERSONNEL	154	1	16		39.793	0.918	6.777	
HEALTH PHYSICS PERSONNEL	34	0	119		22.971	0.000	42.168	
SUPERVISORY PERSONNEL	55	2	1		10.199	1.778	0.073	
ENGINEERING PERSONNEL	56	0	15		10.362	0.000	2.545	
TOTAL	493	46	1395	1934	182.547	28.101	841.645	1052.293
WASTE PROCESSING								
MAINTENANCE PERSONNEL	97	0	336		4.267	0.000	127.119	
OPERATING PERSONNEL	29	0	5		0.737	0.000	0.083	
HEALTH PHYSICS PERSONNEL	22	0	67		1.584	0.000	7.178	
SUPERVISORY PERSONNEL	9	0	0		0.368	0.000	0.000	
ENGINEERING PERSONNEL	2	0	0		0.126	0.000	0.000	
TOTAL	159	0	408	567	7.082	0.000	134.380	141.462
REFUELING								
MAINTENANCE PERSONNEL	96	6	175		29.080	0.220	36.225	
OPERATING PERSONNEL	61	0	5		15.748	0.000	0.949	
HEALTH PHYSICS PERSONNEL	15	0	21		0.478	0.000	1.281	
SUPERVISORY PERSONNEL	13	0	0		2.637	0.000	0.000	
ENGINEERING PERSONNEL	3	0	1		0.020	0.000	0.010	
TOTAL	188	6	202	396	47.963	0.220	38.465	86.648
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	743 (224)	124 (44)	3266 (1461)	4133 (1729)	235.787	43.177	1299.661	1578.625
OPERATING PERSONNEL	621 (242)	3 (1)	74 (48)	698 (291)	110.594	0.978	10.520	122.092
HEALTH PHYSICS PERSONNEL	187 (67)	0 (0)	429 (142)	616 (209)	39.351	0.000	83.833	123.184
SUPERVISORY PERSONNEL	213 (97)	5 (2)	2 (1)	220 (100)	23.642	1.958	0.078	25.678
ENGINEERING PERSONNEL	162 (79)	0 (0)	43 (23)	205 (102)	15.046	0.000	4.034	19.080
GRAND TOTAL	1926 (709)	132 (47)	3814 (1675)	5872 (2431)	424.420	46.113	1398.126	1868.659

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

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT:* PALISADES (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	1	1	4		0.698	1.036	1.932	
OPERATING PERSONNEL	26	0	0		15.950	0.000	0.008	
HEALTH PHYSICS PERSONNEL	35	11	51		17.101	4.049	30.572	
SUPERVISORY PERSONNEL	0	0	0		0.299	0.014	0.000	
ENGINEERING PERSONNEL	1	2	0		0.551	1.280	0.000	
TOTAL	63	14	55	132	34.599	6.379	32.512	73.490
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	50	38	27		30.407	31.146	12.872	
OPERATING PERSONNEL	7	0	0		4.190	0.000	0.000	
HEALTH PHYSICS PERSONNEL	5	1	7		2.228	0.528	3.985	
SUPERVISORY PERSONNEL	0	0	0		0.053	0.121	0.000	
ENGINEERING PERSONNEL	1	4	0		0.507	3.332	0.000	
TOTAL	63	43	34	140	37.385	35.127	16.857	89.369
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	1	13		0.257	0.618	6.249	
OPERATING PERSONNEL	11	0	0		6.707	0.000	0.003	
HEALTH PHYSICS PERSONNEL	0	0	0		0.165	0.039	0.296	
SUPERVISORY PERSONNEL	1	0	0		0.496	0.103	0.021	
ENGINEERING PERSONNEL	7	40	0		4.305	32.593	0.163	
TOTAL	19	41	13	73	11.930	33.353	6.732	52.015
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	38	13	310		23.024	11.069	146.515	
OPERATING PERSONNEL	17	0	0		10.261	0.000	0.004	
HEALTH PHYSICS PERSONNEL	12	4	18		6.002	1.421	10.729	
SUPERVISORY PERSONNEL	0	1	0		0.087	0.572	0.000	
ENGINEERING PERSONNEL	6	29	0		3.585	23.545	0.000	
TOTAL	73	47	328	448	42.959	36.607	157.248	236.814
WASTE PROCESSING								
MAINTENANCE PERSONNEL	23	0	4		13.977	0.000	2.007	
OPERATING PERSONNEL	8	0	0		4.860	0.000	0.000	
HEALTH PHYSICS PERSONNEL	5	2	8		2.711	0.642	4.847	
SUPERVISORY PERSONNEL	0	0	0		0.089	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.032	0.211	0.000	
TOTAL	36	2	12	50	21.669	0.853	6.854	29.376
REFUELING								
MAINTENANCE PERSONNEL	29	20	0		17.694	16.778	0.000	
OPERATING PERSONNEL	6	0	0		3.819	0.000	0.002	
HEALTH PHYSICS PERSONNEL	1	0	1		0.254	0.060	0.453	
SUPERVISORY PERSONNEL	1	0	0		0.715	0.035	0.000	
ENGINEERING PERSONNEL	3	9	0		1.582	7.335	0.000	
TOTAL	40	29	1	70	24.064	24.208	0.455	48.727
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	141	73	358	572	86.057	60.647	169.575	316.279
OPERATING PERSONNEL	75	0	0	75	45.787	0.000	0.017	45.804
HEALTH PHYSICS PERSONNEL	58	18	85	161	28.461	6.739	50.882	86.082
SUPERVISORY PERSONNEL	2	1	0	3	1.739	0.845	0.021	2.605
ENGINEERING PERSONNEL	18	84	0	102	10.562	68.296	0.163	79.021
GRAND TOTAL	294	176	443	913	172.606	136.527	220.658	529.791

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT:* PEACH BOTTOM 2,3 (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	2	163	472		0.371	16.765	33.010	
OPERATING PERSONNEL	71	26	129		39.540	2.337	19.304	
HEALTH PHYSICS PERSONNEL	66	25	87		37.021	1.934	29.884	
SUPERVISORY PERSONNEL	1	4	5		0.095	0.104	0.203	
ENGINEERING PERSONNEL	64	14	23		30.514	2.061	4.537	
TOTAL	204	232	716	1152	107.541	23.201	86.938	217.680
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	9	611	1728		0.812	228.742	1510.163	
OPERATING PERSONNEL	45	24	159		3.063	1.437	41.723	
HEALTH PHYSICS PERSONNEL	48	8	122		9.188	0.423	114.560	
SUPERVISORY PERSONNEL	0	4	5		0.000	0.106	0.089	
ENGINEERING PERSONNEL	27	40	30		2.307	5.033	10.148	
TOTAL	129	687	2044	2860	15.370	235.741	1676.683	1927.794
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	7	123		0.000	0.261	21.802	
OPERATING PERSONNEL	1	0	0		0.017	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	5		0.000	0.000	0.309	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	1	2		0.000	0.048	0.385	
TOTAL	1	8	130	139	0.017	0.309	22.496	22.822
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	0	8	329		0.000	0.162	124.872	
OPERATING PERSONNEL	1	0	25		0.056	0.000	6.245	
HEALTH PHYSICS PERSONNEL	1	0	5		0.018	0.000	0.119	
SUPERVISORY PERSONNEL	0	2	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	4	0	3		0.092	0.060	2.497	
TOTAL	6	10	362	378	0.166	0.222	133.733	134.121
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	26	210		0.000	1.024	18.418	
OPERATING PERSONNEL	4	1	13		2.325	0.004	0.677	
HEALTH PHYSICS PERSONNEL	5	3	21		0.777	0.080	1.614	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	1	4	4		0.010	0.110	0.323	
TOTAL	10	34	248	292	3.112	1.218	21.032	25.362
REFUELING								
MAINTENANCE PERSONNEL	0	44	209		0.000	3.576	33.563	
OPERATING PERSONNEL	6	1	7		0.522	0.020	0.310	
HEALTH PHYSICS PERSONNEL	10	1	21		0.642	0.042	3.212	
SUPERVISORY PERSONNEL	0	1	0		0.000	0.031	0.000	
ENGINEERING PERSONNEL	0	3	2		0.000	0.057	0.131	
TOTAL	16	50	239	305	1.164	3.726	37.216	42.106
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	11 (9)	859 (639)	3071 (1901)	3941 (2549)	1.183	250.530	1741.828	1993.541
OPERATING PERSONNEL	128 (83)	52 (42)	333 (230)	513 (355)	45.523	3.798	68.259	117.580
HEALTH PHYSICS PERSONNEL	130 (70)	37 (28)	261 (138)	428 (236)	47.646	2.479	149.698	199.823
SUPERVISORY PERSONNEL	1 (1)	11 (8)	10 (8)	22 (17)	0.095	0.241	0.292	0.628
ENGINEERING PERSONNEL	96 (67)	62 (45)	64 (42)	222 (154)	32.923	7.369	18.021	58.313
GRAND TOTAL	366 (230)	1021 (762)	3739 (2319)	5126 (3311)	127.370	264.417	1978.098	2369.885

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

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: PILGRIM* (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	131	11	2570		25.700	1.275	438.885	
OPERATING PERSONNEL	70	0	46		21.890	0.000	4.435	
HEALTH PHYSICS PERSONNEL	59	0	203		10.005	0.000	77.665	
SUPERVISORY PERSONNEL	75	59	87		8.135	3.045	13.230	
ENGINEERING PERSONNEL	42	24	243		2.815	1.190	20.790	
TOTAL	377	94	3149	3620	68.545	5.510	555.005	629.060
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	98	7	2030		74.060	4.190	727.765	
OPERATING PERSONNEL	50	0	20		37.215	0.000	2.760	
HEALTH PHYSICS PERSONNEL	35	0	172		8.960	0.000	122.705	
SUPERVISORY PERSONNEL	42	20	52		10.810	2.010	12.060	
ENGINEERING PERSONNEL	27	15	163		3.825	3.445	46.005	
TOTAL	252	42	2437	2731	134.870	9.645	911.295	1055.810
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	35	0	531		1.465	0.000	67.280	
OPERATING PERSONNEL	33	0	11		2.850	0.000	2.140	
HEALTH PHYSICS PERSONNEL	4	0	81		0.420	0.000	9.520	
SUPERVISORY PERSONNEL	1	0	19		0.240	0.000	4.010	
ENGINEERING PERSONNEL	24	0	70		3.025	0.000	11.315	
TOTAL	97	0	712	809	8.000	0.000	94.265	102.265
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	62	1	1769		11.650	0.155	1915.945	
OPERATING PERSONNEL	40	0	15		4.485	0.000	9.435	
HEALTH PHYSICS PERSONNEL	20	0	122		2.265	0.000	16.015	
SUPERVISORY PERSONNEL	27	12	57		5.190	1.330	40.035	
ENGINEERING PERSONNEL	26	9	152		2.450	2.410	51.470	
TOTAL	175	22	2115	2312	26.040	3.895	2032.900	2062.835
WASTE PROCESSING								
MAINTENANCE PERSONNEL	40	0	274		5.380	0.000	32.895	
OPERATING PERSONNEL	8	0	2		5.995	0.000	0.700	
HEALTH PHYSICS PERSONNEL	21	0	78		2.405	0.000	16.525	
SUPERVISORY PERSONNEL	5	0	6		0.675	0.000	3.055	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	74	0	360	434	14.455	0.000	53.175	67.630
REFUELING								
MAINTENANCE PERSONNEL	44	0	187		27.900	0.000	8.965	
OPERATING PERSONNEL	28	0	0		2.245	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	47		0.000	0.000	4.495	
SUPERVISORY PERSONNEL	14	0	0		4.795	0.000	0.000	
ENGINEERING PERSONNEL	3	0	1		0.290	0.000	0.100	
TOTAL	89	0	235	324	35.230	0.000	13.560	48.790
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	410 (126)	19 (11)	7361 (2542)	7790 (2679)	146.155	5.620	3191.735	3343.510
OPERATING PERSONNEL	229 (66)	0 (0)	94 (48)	323 (114)	74.680	0.000	19.470	94.150
HEALTH PHYSICS PERSONNEL	139 (57)	0 (0)	703 (191)	842 (248)	24.055	0.000	246.925	270.980
SUPERVISORY PERSONNEL	164 (73)	91 (62)	221 (94)	476 (229)	29.845	6.385	72.390	108.620
ENGINEERING PERSONNEL	122 (45)	48 (24)	629 (253)	799 (322)	12.405	7.045	129.680	149.130
GRAND TOTAL	1064 (367)	158 (97)	9008 (3128)	10230 (3592)	287.140	19.050	3660.200	3966.390

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

[a]NRC mandated work, including torus mods., TMI mods., scram discharge volume, IGSCC ISI, pipe hangers and bolts, and equipment qualifications, contributed 501.5 man-rems

Appendix D (cont.)

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

Plant: †Point Beach 1,2 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 mrem)				TOTAL MAN-REMS			
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REM
Reactor Operations & Surv.								
Maintenance Personnel					0.000			
Operating Personnel					53.560			
Health Physics Personnel					55.430			
Supervisory Personnel					2.900			
Engineering Personnel					0.000			
TOTAL					111.890		1.250	113.140
Routine Maintenance								
Maintenance-Personnel					44.070			
Operating Personnel					0.000			
Health Physics Personnel					0.000			
Supervisory Personnel					0.000			
Engineering Personnel					0.000			
TOTAL					44.070		0.000	44.070
In-Service Inspection								
Maintenance Personnel					6.080			
Operating Personnel					13.940			
Health Physics Personnel					0.000			
Supervisory Personnel					4.560			
Engineering Personnel					1.220			
TOTAL					25.800		42.330	68.130
Special Maintenance								
Maintenance Personnel					60.865			
Operating Personnel					0.000			
Health Physics Personnel					0.000			
Supervisory Personnel					0.000			
Engineering Personnel					0.000			
TOTAL					60.865		*352.590	413.455
Waste Processing								
Maintenance Personnel					0.000			
Operating Personnel					17.830			
Health Physics Personnel					3.400			
Supervisory Personnel					0.000			
Engineering Personnel					0.000			
TOTAL					21.230		30.300	51.530
Refueling								
Maintenance Personnel					36.520			
Operating Personnel					6.880			
Health Physics Personnel					0.830			
Supervisory Personnel					0.320			
Engineering Personnel					1.490			
TOTAL					46.040		0.790	46.830
Total By Job Function								
Maintenance Personnel	116				147.535			
Operating Personnel	75				92.210			
Health Physics Personnel	29				59.660			
Supervisory Personnel	20				7.780			
Engineering Personnel	4				2.710			
GRAND TOTAL	244		540	784	309.895		*427.260	737.155

*Includes 246 rems from the steam generator replacement in Unit 1.

*+ NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: PRAIRIE ISLAND 1,2 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	14	1	0		4.478	0.482	0.166	
OPERATING PERSONNEL	29	0	0		6.416	0.000	0.000	
HEALTH PHYSICS PERSONNEL	12	0	2		3.048	0.000	0.660	
SUPERVISORY PERSONNEL	0	0	0		0.464	0.030	0.013	
ENGINEERING PERSONNEL	2	0	1		0.591	0.114	0.402	
TOTAL	57	1	3	61	14.997	0.626	1.241	16.864
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	12	6	0		4.221	2.665	0.143	
OPERATING PERSONNEL	0	0	0		0.036	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.189	0.000	0.117	
SUPERVISORY PERSONNEL	5	0	0		1.373	0.009	0.068	
ENGINEERING PERSONNEL	3	0	3		1.153	0.064	0.576	
TOTAL	20	6	3	29	6.972	2.738	0.904	10.614
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	16	9	51		5.211	2.191	28.879	
OPERATING PERSONNEL	0	0	0		0.010	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	10		0.379	0.000	2.470	
SUPERVISORY PERSONNEL	0	0	0		0.066	0.000	0.000	
ENGINEERING PERSONNEL	4	0	8		3.094	0.086	4.460	
TOTAL	21	9	69	99	8.760	2.277	35.809	46.846
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	19	59	11		7.129	24.774	5.372	
OPERATING PERSONNEL	0	0	0		0.011	0.000	0.000	
HEALTH PHYSICS PERSONNEL	5	0	11		1.538	0.000	3.332	
SUPERVISORY PERSONNEL	1	0	0		0.402	0.075	0.008	
ENGINEERING PERSONNEL	3	2	3		1.137	1.405	0.980	
TOTAL	28	61	25	114	10.217	26.254	9.692	46.163
WASTE PROCESSING								
MAINTENANCE PERSONNEL	6	0	0		1.970	0.518	0.159	
OPERATING PERSONNEL	0	0	0		0.134	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	0		1.261	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.023	0.000	0.000	
TOTAL	10	0	0	10	3.388	0.518	0.159	4.065
REFUELING								
MAINTENANCE PERSONNEL	24	14	0		5.656	4.385	0.100	
OPERATING PERSONNEL	0	0	0		0.304	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.055	0.000	0.070	
SUPERVISORY PERSONNEL	0	0	0		0.027	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.316	0.096	0.014	
TOTAL	24	14	0	38	6.358	4.481	0.184	11.023
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	91	89	62	242	28.665	35.015	34.819	98.499
OPERATING PERSONNEL	29	0	0	29	6.911	0.000	0.000	6.911
HEALTH PHYSICS PERSONNEL	22	0	23	45	6.470	0.000	6.649	13.119
SUPERVISORY PERSONNEL	6	0	0	6	2.332	0.114	0.089	2.535
ENGINEERING PERSONNEL	12	2	15	29	6.314	1.765	6.432	14.511
GRAND TOTAL	160	91	100	351	50.692	36.894	47.989	135.575

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: †* QUAD CITIES 1,2 (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	21	1	25		29.725	0.037	17.544	
OPERATING PERSONNEL	42	0	1		36.968	0.000	0.003	
HEALTH PHYSICS PERSONNEL	9	0	7		9.279	0.000	3.603	
SUPERVISORY PERSONNEL	27	0	0		13.121	0.000	0.000	
ENGINEERING PERSONNEL	9	76	7		3.567	1.522	2.192	
TOTAL	108	77	40	225	92.660	1.559	23.342	117.561
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	94	27	223		131.010	7.011	155.127	
OPERATING PERSONNEL	49	0	7		43.041	0.000	0.132	
HEALTH PHYSICS PERSONNEL	16	0	2		17.071	0.000	0.832	
SUPERVISORY PERSONNEL	69	0	0		33.630	0.000	0.000	
ENGINEERING PERSONNEL	23	58	15		9.215	1.162	4.465	
TOTAL	251	85	247	583	233.967	8.173	160.556	402.696
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	5	1	533		6.055	0.260	372.121	
OPERATING PERSONNEL	4	0	2		3.238	0.000	0.027	
HEALTH PHYSICS PERSONNEL	6	0	0		5.998	0.000	0.000	
SUPERVISORY PERSONNEL	3	0	0		1.465	0.000	0.000	
ENGINEERING PERSONNEL	20	75	177		7.966	1.497	54.235	
TOTAL	38	76	712	826	24.722	1.757	426.383	452.862
[a] SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	3	42	540		3.854	11.289	375.815	
OPERATING PERSONNEL	4	0	38		3.508	0.000	0.664	
HEALTH PHYSICS PERSONNEL	8	0	55		8.356	0.000	26.365	
SUPERVISORY PERSONNEL	4	0	0		1.720	0.000	0.000	
ENGINEERING PERSONNEL	22	3	66		8.948	0.059	20.298	
TOTAL	41	45	699	785	26.386	11.348	423.142	460.876
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	3		0.000	0.000	1.847	
OPERATING PERSONNEL	44	0	1		39.262	0.000	0.014	
HEALTH PHYSICS PERSONNEL	6	0	0		6.152	0.000	0.000	
SUPERVISORY PERSONNEL	17	0	0		8.153	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	67	0	4	71	53.567	0.000	1.861	55.428
REFUELING								
MAINTENANCE PERSONNEL	9	0	2		12.844	0.000	0.923	
OPERATING PERSONNEL	10	0	0		8.905	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	0		4.409	0.000	0.000	
SUPERVISORY PERSONNEL	11	0	0		5.605	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.029	0.000	0.000	
TOTAL	35	0	2	37	31.792	0.000	0.923	32.715
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	132	71	1326	1529	183.488	18.597	923.377	1125.462
OPERATING PERSONNEL	153	0	49	202	134.922	0.000	0.840	135.762
HEALTH PHYSICS PERSONNEL	49	0	64	113	51.265	0.000	30.800	82.065
SUPERVISORY PERSONNEL	131	0	0	131	63.694	0.000	0.000	63.694
ENGINEERING PERSONNEL	75	212	265	552	29.725	4.240	81.190	115.155
GRAND TOTAL	540	283	1704	2527	463.094	22.837	1036.207	1522.138

[a] NRC mandated special maintenance contributed 461 man-rems.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: *RANCHO SECO (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	66	0	140		10.240	0.000	2.910	
OPERATING PERSONNEL	105	0	144		21.855	0.000	0.260	
HEALTH PHYSICS PERSONNEL	34	0	49		4.745	0.000	17.365	
SUPERVISORY PERSONNEL	30	5	43		0.260	0.005	1.190	
ENGINEERING PERSONNEL	106	4	188		4.555	0.060	2.675	
TOTAL	341	9	564	914	41.655	0.065	24.400	66.120
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	35	0	63		13.010	0.000	8.680	
OPERATING PERSONNEL	1	0	1		0.720	0.000	0.095	
HEALTH PHYSICS PERSONNEL	1	0	1		0.700	0.000	0.740	
SUPERVISORY PERSONNEL	1	0	2		0.145	0.000	0.110	
ENGINEERING PERSONNEL	9	0	10		1.540	0.000	0.530	
TOTAL	47	0	77	124	16.115	0.000	10.155	26.270
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	11	0	47		6.340	0.000	22.090	
OPERATING PERSONNEL	0	0	1		0.060	0.000	0.410	
HEALTH PHYSICS PERSONNEL	0	0	0		0.275	0.000	0.310	
SUPERVISORY PERSONNEL	0	0	4		0.000	0.000	0.120	
ENGINEERING PERSONNEL	11	0	17		4.965	0.000	4.370	
TOTAL	22	0	69	91	11.640	0.000	27.300	38.940
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	23	0	54		9.640	0.000	19.995	
OPERATING PERSONNEL	2	0	0		1.135	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	1		0.595	0.000	2.470	
SUPERVISORY PERSONNEL	1	0	6		0.035	0.000	4.100	
ENGINEERING PERSONNEL	6	0	7		1.345	0.000	1.265	
TOTAL	32	0	68	100	12.750	0.000	27.830	40.580
WASTE PROCESSING								
MAINTENANCE PERSONNEL	14	0	34		5.175	0.000	10.070	
OPERATING PERSONNEL	0	0	0		0.345	0.000	0.000	
HEALTH PHYSICS PERSONNEL	12	0	8		8.865	0.000	4.550	
SUPERVISORY PERSONNEL	1	0	0		0.070	0.000	0.105	
ENGINEERING PERSONNEL	1	0	0		0.160	0.000	0.240	
TOTAL	28	0	42	70	14.615	0.000	14.965	29.580
REFUELING								
MAINTENANCE PERSONNEL	1	0	0		0.065	0.000	0.000	
OPERATING PERSONNEL	1	0	0		0.410	0.000	0.010	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.005	
ENGINEERING PERSONNEL	2	0	0		0.095	0.000	0.000	
TOTAL	4	0	0	4	0.570	0.000	0.015	0.585
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	150	0	338	488	44.470	0.000	63.745	108.215
OPERATING PERSONNEL	109	0	146	255	24.525	0.000	0.775	25.300
HEALTH PHYSICS PERSONNEL	47	0	59	106	15.180	0.000	25.435	40.615
SUPERVISORY PERSONNEL	33	5	55	93	0.510	0.005	5.630	6.145
ENGINEERING PERSONNEL	135	4	222	361	12.660	0.060	9.080	21.800
GRAND TOTAL	474	9	820	1303	97.345	0.065	104.665	202.075

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT:* ROBINSON 2 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	16	4	70		6.373	1.340	36.801	
OPERATING PERSONNEL	19	1	0		9.582	0.245	0.000	
HEALTH PHYSICS PERSONNEL	20	0	59		14.678	0.000	66.125	
SUPERVISORY PERSONNEL	1	0	0		0.995	0.000	0.000	
ENGINEERING PERSONNEL	25	15	158		7.515	6.990	81.387	
TOTAL	81	20	287	388	39.143	8.575	184.313	232.031
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	22	21	17		17.056	11.680	28.567	
OPERATING PERSONNEL	2	0	0		0.670	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	6		2.565	0.000	4.640	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	5	1	14		1.628	0.200	7.710	
TOTAL	32	22	37	91	21.919	11.880	40.917	74.716
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	4	0	67		1.150	0.000	75.641	
OPERATING PERSONNEL	0	0	0		0.025	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	14		1.025	0.000	15.850	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	18	0	38		5.696	0.025	37.840	
TOTAL	23	0	119	142	7.896	0.025	129.331	137.252
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	129	38	1463		96.285	39.630	1870.446	
OPERATING PERSONNEL	15	0	0		7.515	0.000	0.000	
HEALTH PHYSICS PERSONNEL	45	1	148		34.246	0.250	172.920	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	51	11	309		15.782	4.860	554.678	
TOTAL	240	50	1920	2210	153.828	44.740	2598.044	2796.612
WASTE PROCESSING								
MAINTENANCE PERSONNEL	6	6	2		5.785	2.575	0.575	
OPERATING PERSONNEL	27	0	0		14.373	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	2		2.775	0.000	1.185	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.025	0.000	0.000	
TOTAL	37	6	4	47	22.958	2.575	1.760	27.293
REFUELING								
MAINTENANCE PERSONNEL	41	29	52		39.500	30.675	45.526	
OPERATING PERSONNEL	7	0	0		3.600	0.080	0.000	
HEALTH PHYSICS PERSONNEL	2	0	5		1.835	0.000	3.775	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	9	2	21		2.600	0.450	12.225	
TOTAL	59	31	78	168	47.535	31.205	61.526	140.266
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	218	98	1671	1987	166.149	85.900	2057.556	2309.605
OPERATING PERSONNEL	70	1	0	71	35.765	0.325	0.000	36.090
HEALTH PHYSICS PERSONNEL	75	1	234	310	57.124	0.250	264.495	321.869
SUPERVISORY PERSONNEL	1	0	0	1	0.995	0.000	0.000	0.995
ENGINEERING PERSONNEL	108	29	540	677	33.246	12.525	693.840	739.611
GRAND TOTAL	472	129	2445	3046	293.279	99.000	3015.891	3408.170

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

*+ a
PLANT: SALEM 0 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	0	0	0.000	0.000	0.000	0.000
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	1	0	6		1.950	0.025	2.604	
OPERATING PERSONNEL	2	0	0		1.965	0.050	0.010	
HEALTH PHYSICS PERSONNEL	6	0	2		2.870	0.000	1.525	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.010	0.000	
ENGINEERING PERSONNEL	1	0	0		0.215	0.065	0.000	
TOTAL	10	0	8	18	7.000	0.150	4.139	11.289
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	2		0.000	0.000	0.510	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.045	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	2	2	0.000	0.000	0.555	0.555
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	2	0	0		1.130	0.000	0.505	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.150	0.040	0.150	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.010	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.010	0.000	
TOTAL	2	0	0	2	1.280	0.060	0.655	1.995
WASTE PROCESSING								
MAINTENANCE PERSONNEL	12	0	5		4.245	0.055	2.009	
OPERATING PERSONNEL	1	0	0		0.450	0.020	0.010	
HEALTH PHYSICS PERSONNEL	5	0	50		1.605	0.000	24.326	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.010	
ENGINEERING PERSONNEL	0	1	0		0.010	0.300	0.000	
TOTAL	18	1	55	74	6.310	0.375	26.355	33.040
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.115	0.000	0.125	
OPERATING PERSONNEL	0	0	0		0.010	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.010	0.000	0.010	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	0	0	0.135	0.000	0.135	0.270
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	15	0	13	28	7.440	0.080	5.753	13.273
OPERATING PERSONNEL	3	0	0	3	2.425	0.070	0.020	2.515
HEALTH PHYSICS PERSONNEL	11	0	52	63	4.635	0.040	26.056	30.731
SUPERVISORY PERSONNEL	0	0	0	0	0.000	0.020	0.010	0.030
ENGINEERING PERSONNEL	1	1	0	2	0.225	0.375	0.000	0.600
GRAND TOTAL	30	1	65	96	14.725	0.585	31.839	47.149

*Workers may be counted in more than one category.

[a]Salem 0 is for work common to both Salem 1 and 2.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: *+SALEM 1[a] (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	2	0	0		1.712	0.020	0.375	
OPERATING PERSONNEL	0	0	0		1.820	0.041	0.000	
HEALTH PHYSICS PERSONNEL	0	0	5		0.284	0.000	1.984	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.090	0.115	0.080	
TOTAL	2	0	5	7	3.906	0.176	2.439	6.521
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	7	0	4		4.370	0.000	4.874	
OPERATING PERSONNEL	0	0	0		0.180	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	2		0.315	0.000	1.880	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.130	
ENGINEERING PERSONNEL	0	0	0		0.000	0.138	0.000	
TOTAL	7	0	6	13	4.865	0.138	6.884	11.887
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	8		0.253	0.035	2.295	
OPERATING PERSONNEL	0	1	0		0.078	0.290	0.000	
HEALTH PHYSICS PERSONNEL	0	0	1		0.023	0.000	0.265	
SUPERVISORY PERSONNEL	0	1	0		0.000	0.165	0.045	
ENGINEERING PERSONNEL	0	1	0		0.000	0.280	0.020	
TOTAL	0	3	9	12	0.354	0.770	2.625	3.749
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	142	10	174		59.500	4.795	69.336	
OPERATING PERSONNEL	2	1	0		0.635	0.520	0.000	
HEALTH PHYSICS PERSONNEL	0	0	44		0.432	0.010	14.175	
SUPERVISORY PERSONNEL	0	0	4		0.000	0.030	1.205	
ENGINEERING PERSONNEL	0	5	0		0.075	0.920	0.000	
TOTAL	144	16	222	382	60.642	6.275	84.716	151.633
WASTE PROCESSING								
MAINTENANCE PERSONNEL	4	0	7		1.025	0.000	2.860	
OPERATING PERSONNEL	0	0	0		0.000	0.015	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.040	0.000	0.510	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.055	
ENGINEERING PERSONNEL	0	0	0		0.012	0.015	0.000	
TOTAL	4	0	7	11	1.077	0.030	3.425	4.532
REFUELING								
MAINTENANCE PERSONNEL	409	11	749		120.284	3.430	300.399	
OPERATING PERSONNEL	62	2	0		22.521	0.844	0.035	
HEALTH PHYSICS PERSONNEL	11	0	317		5.087	0.130	115.380	
SUPERVISORY PERSONNEL	0	1	19		0.000	0.275	8.861	
ENGINEERING PERSONNEL	0	18	4		0.100	7.066	1.093	
TOTAL	482	32	1089	1603	147.992	11.745	425.768	585.505
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	564	21	942	1527	187.144	8.280	380.139	575.563
OPERATING PERSONNEL	64	4	0	68	25.234	1.710	0.035	26.979
HEALTH PHYSICS PERSONNEL	11	0	369	380	6.181	0.140	134.194	140.515
SUPERVISORY PERSONNEL	0	2	23	25	0.000	0.470	10.296	10.766
ENGINEERING PERSONNEL	0	24	4	28	0.277	8.534	1.193	10.004
GRAND TOTAL	639	51	1338	2028	218.836	19.134	525.857	763.827

*Workers may be counted in more than one category.
[a]Excludes work common to both units, Salem 1 and 2.
*Dose incruued during various maintenance and special maintenance activities while Salem 1 was refueling was attributed to the refueling work function.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: SALEM 2 [a] (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	2	0	0		2.431	0.030	0.514	
OPERATING PERSONNEL	0	0	0		1.354	0.030	0.000	
HEALTH PHYSICS PERSONNEL	2	0	0		1.469	0.000	1.082	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.010	0.025	
ENGINEERING PERSONNEL	0	0	0		0.025	0.141	0.105	
TOTAL	4	0	0	4	5.279	0.211	1.726	7.216
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	29	1	60		11.898	0.495	23.648	
OPERATING PERSONNEL	1	0	0		0.595	0.165	0.050	
HEALTH PHYSICS PERSONNEL	5	0	4		3.120	0.000	3.240	
SUPERVISORY PERSONNEL	0	0	5		0.015	0.010	2.102	
ENGINEERING PERSONNEL	0	1	0		0.125	0.482	0.050	
TOTAL	35	2	69	106	15.753	1.152	29.090	45.995
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	11		0.025	0.015	2.799	
OPERATING PERSONNEL	0	0	0		0.029	0.045	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.216	0.000	0.045	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.055	0.304	
ENGINEERING PERSONNEL	0	0	0		0.000	0.090	0.040	
TOTAL	0	0	12	12	0.270	0.205	3.188	3.663
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	11	0	124		5.964	0.320	44.272	
OPERATING PERSONNEL	1	2	0		1.917	0.150	0.050	
HEALTH PHYSICS PERSONNEL	14	0	21		5.035	0.000	7.602	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.065	1.026	
ENGINEERING PERSONNEL	3	0	3		1.010	0.302	0.040	
TOTAL	29	2	148	179	13.926	0.837	52.990	67.753
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	0		0.010	0.000	0.125	
OPERATING PERSONNEL	0	0	0		0.060	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	2		0.000	0.000	1.880	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.010	0.000	
TOTAL	0	0	2	2	0.070	0.010	2.005	2.085
REFUELING								
MAINTENANCE PERSONNEL	9	0	18		4.555	0.025	6.939	
OPERATING PERSONNEL	0	0	0		0.140	0.020	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.609	0.000	1.085	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.295	
ENGINEERING PERSONNEL	0	0	0		0.000	0.065	0.000	
TOTAL	9	0	18	27	5.304	0.110	8.319	13.733
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	51	1	213	265	24.883	0.885	78.297	104.065
OPERATING PERSONNEL	2	2	0	4	4.095	0.410	0.100	4.605
HEALTH PHYSICS PERSONNEL	21	0	27	48	10.449	0.000	14.934	25.383
SUPERVISORY PERSONNEL	0	0	6	6	0.015	0.140	3.752	3.907
ENGINEERING PERSONNEL	3	1	3	7	1.160	1.090	0.235	2.485
GRAND TOTAL	77	4	249	330	40.602	2.525	97.318	140.445

*Workers may be counted in more than one category.

[a]Excludes work common to both units, Salem 1 and 2.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: *SAN ONOFRE 1 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	2	1	43		0.148	0.012	2.551	
OPERATING PERSONNEL	22	1	0		13.283	0.153	0.000	
HEALTH PHYSICS PERSONNEL	20	1	38		12.546	0.553	16.718	
SUPERVISORY PERSONNEL	0	0	4		0.000	0.000	0.352	
ENGINEERING PERSONNEL	12	9	117		1.644	0.492	8.451	
TOTAL	56	12	202	270	27.621	1.210	28.072	56.903
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	27	4	466		13.787	0.704	65.853	
OPERATING PERSONNEL	4	0	1		0.118	0.000	0.101	
HEALTH PHYSICS PERSONNEL	21	2	116		2.746	1.233	29.135	
SUPERVISORY PERSONNEL	0	0	10		0.000	0.000	1.138	
ENGINEERING PERSONNEL	20	11	216		7.386	2.679	30.474	
TOTAL	72	17	809	898	24.037	4.616	126.701	155.354
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	7	0	11		0.268	0.000	0.050	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	1		0.000	0.000	0.060	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.000	0.000	
ENGINEERING PERSONNEL	2	2	51		0.008	0.011	0.228	
TOTAL	9	2	64	75	0.276	0.011	0.338	0.625
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	21	3	482		7.434	0.392	185.745	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	37		0.025	0.000	2.381	
SUPERVISORY PERSONNEL	0	0	7		0.000	0.000	1.373	
ENGINEERING PERSONNEL	12	5	117		0.602	0.829	17.027	
TOTAL	36	8	643	687	8.061	1.221	206.526	215.808
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	8		0.000	0.000	0.464	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	1	47		0.000	0.149	3.971	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	1	0		0.000	0.109	0.000	
TOTAL	0	2	55	57	0.000	0.258	4.435	4.693
REFUELING								
MAINTENANCE PERSONNEL	0	0	1		0.000	0.000	0.012	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	3		0.000	0.000	0.005	
TOTAL	0	0	4	4	0.000	0.000	0.017	0.017
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	57 (28)	8 (4)	1011 (545)	1076 (577)	21.637	1.108	254.675	277.420
OPERATING PERSONNEL	26 (22)	1 (1)	1 (1)	28 (24)	13.401	0.153	0.101	13.655
HEALTH PHYSICS PERSONNEL	44 (22)	4 (1)	239 (118)	287 (141)	15.317	1.935	52.265	69.517
SUPERVISORY PERSONNEL	0 (0)	0 (0)	22 (11)	22 (11)	0.000	0.000	2.863	2.863
ENGINEERING PERSONNEL	46 (26)	28 (13)	504 (236)	578 (375)	9.640	4.120	56.185	69.945
GRAND TOTAL	173 (98)	41 (20)	1777 (911)	1991 (1029)	59.995	7.316	366.089	433.400

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

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: *SAN ONOFRE 2 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	11	5	8		0.164	0.069	0.038	
OPERATING PERSONNEL	34	0	1		4.819	0.000	0.081	
HEALTH PHYSICS PERSONNEL	33	5	65		8.362	0.912	15.761	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.000	0.009	
ENGINEERING PERSONNEL	14	5	52		0.936	0.072	1.374	
TOTAL	92	15	127	234	14.281	1.053	17.263	32.597
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	58	29	319		20.056	7.578	52.605	
OPERATING PERSONNEL	33	0	1		2.350	0.000	0.055	
HEALTH PHYSICS PERSONNEL	32	5	171		6.624	0.623	50.180	
SUPERVISORY PERSONNEL	0	1	1		0.000	0.307	0.047	
ENGINEERING PERSONNEL	24	13	147		3.795	2.051	17.181	
TOTAL	147	48	639	834	32.825	10.559	120.068	163.452
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	18	5	40		0.101	0.084	1.224	
OPERATING PERSONNEL	1	0	0		0.005	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	5		0.024	0.000	0.160	
SUPERVISORY PERSONNEL	0	0	2		0.000	0.000	0.005	
ENGINEERING PERSONNEL	15	10	63		1.119	0.255	1.713	
TOTAL	36	15	110	161	1.249	0.339	3.102	4.690
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	41	14	369		2.026	0.496	151.338	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	2	84		0.276	0.045	7.714	
SUPERVISORY PERSONNEL	0	0	3		0.000	0.000	0.353	
ENGINEERING PERSONNEL	11	9	140		0.364	0.240	27.926	
TOTAL	55	25	596	676	2.666	0.781	187.331	190.778
WASTE PROCESSING								
MAINTENANCE PERSONNEL	1	1	6		0.016	0.003	0.129	
OPERATING PERSONNEL	1	0	0		0.004	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	37		0.000	0.000	2.439	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	2	1	43	46	0.020	0.003	2.568	2.591
REFUELING								
MAINTENANCE PERSONNEL	0	2	63		0.000	0.335	6.121	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	5		0.043	0.000	0.055	
SUPERVISORY PERSONNEL	0	1	1		0.000	0.019	0.089	
ENGINEERING PERSONNEL	5	6	63		0.152	0.046	4.904	
TOTAL	6	9	132	147	0.195	0.400	11.169	11.764
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	129 (58)	56 (29)	805 (436)	990 (523)	22.363	8.565	211.455	242.383
OPERATING PERSONNEL	69 (34)	0 (0)	2 (1)	71 (35)	7.178	0.000	0.136	7.314
HEALTH PHYSICS PERSONNEL	71 (34)	12 (6)	367 (188)	450 (228)	15.329	1.580	76.309	93.218
SUPERVISORY PERSONNEL	0 (0)	2 (1)	8 (3)	10 (4)	0.000	0.326	0.503	0.829
ENGINEERING PERSONNEL	69 (27)	43 (13)	465 (186)	577 (226)	6.366	2.664	53.098	62.128
GRAND TOTAL	338 (153)	113 (49)	1647 (814)	2098 (1016)	51.236	13.135	341.501	405.872

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

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: *SEQUOYAH 1,2 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	503	562	9		25.907	21.450	0.548	
OPERATING PERSONNEL	95	0	0		16.703	0.000	0.000	
HEALTH PHYSICS PERSONNEL	60	2	58		19.472	0.000	21.220	
SUPERVISORY PERSONNEL	74	22	2		10.738	2.388	0.226	
ENGINEERING PERSONNEL	62	106	27		12.357	15.559	1.218	
TOTAL	794	692	96	1582	85.177	39.397	23.212	147.786
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	540	587	3		120.746	72.022	0.030	
OPERATING PERSONNEL	82	0	0		1.737	0.000	0.000	
HEALTH PHYSICS PERSONNEL	59	1	51		4.741	0.000	1.288	
SUPERVISORY PERSONNEL	63	23	2		6.177	2.743	0.103	
ENGINEERING PERSONNEL	62	95	39		10.448	8.477	30.117	
TOTAL	806	706	95	1607	143.849	83.242	31.538	258.629
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	226	236	9		34.218	37.399	7.001	
OPERATING PERSONNEL	26	0	0		0.400	0.000	0.000	
HEALTH PHYSICS PERSONNEL	30	0	35		2.024	0.000	6.798	
SUPERVISORY PERSONNEL	19	6	2		0.938	2.191	0.053	
ENGINEERING PERSONNEL	55	54	47		5.960	13.607	31.173	
TOTAL	356	296	93	745	43.540	53.197	45.025	141.762
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	415	622	6		37.351	229.127	1.955	
OPERATING PERSONNEL	75	0	0		0.990	0.000	0.000	
HEALTH PHYSICS PERSONNEL	57	0	37		5.936	0.000	0.618	
SUPERVISORY PERSONNEL	60	18	1		8.158	2.120	0.032	
ENGINEERING PERSONNEL	58	83	11		12.280	10.183	1.670	
TOTAL	665	723	55	1443	64.715	241.430	4.275	310.420
WASTE PROCESSING								
MAINTENANCE PERSONNEL	368	271	3		19.822	8.197	0.840	
OPERATING PERSONNEL	91	0	0		11.831	0.000	0.000	
HEALTH PHYSICS PERSONNEL	60	0	47		5.849	0.000	0.721	
SUPERVISORY PERSONNEL	40	9	1		0.992	0.105	0.007	
ENGINEERING PERSONNEL	45	40	2		0.193	1.024	0.005	
TOTAL	604	320	53	977	38.687	9.326	1.573	49.586
REFUELING								
MAINTENANCE PERSONNEL	352	347	4		69.132	64.188	0.025	
OPERATING PERSONNEL	66	0	0		10.394	0.000	0.000	
HEALTH PHYSICS PERSONNEL	47	0	30		1.698	0.000	1.106	
SUPERVISORY PERSONNEL	35	3	1		12.428	0.997	0.137	
ENGINEERING PERSONNEL	55	36	5		8.856	5.648	0.798	
TOTAL	555	386	40	981	102.508	70.833	2.066	175.407
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	2404	2625	34	5063	307.176	432.383	10.399	749.958
OPERATING PERSONNEL	435	0	0	435	42.055	0.000	0.000	42.055
HEALTH PHYSICS PERSONNEL	313	3	258	574	39.720	0.000	31.751	71.471
SUPERVISORY PERSONNEL	291	81	9	381	39.431	10.544	0.558	50.533
ENGINEERING PERSONNEL	337	414	131	882	50.094	54.498	64.981	169.573
GRAND TOTAL	3780	3123	432	7335	478.476	497.425	107.689	1083.590

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: ST LUCIE 1,2 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	75	0	15		12.020	0.020	1.310	
OPERATING PERSONNEL	40	0	0		15.390	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	13		0.930	0.000	5.020	
SUPERVISORY PERSONNEL	8	0	0		1.220	0.000	0.010	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	126	0	28	154	29.560	0.020	6.340	35.920
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	54	21	94		42.280	7.790	27.940	
OPERATING PERSONNEL	10	0	0		3.430	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	17		2.790	0.000	8.520	
SUPERVISORY PERSONNEL	5	0	4		2.470	0.000	1.340	
ENGINEERING PERSONNEL	4	0	10		0.870	0.020	3.370	
TOTAL	77	21	125	223	51.840	7.810	41.170	100.820
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	4	0	65		16.610	0.030	83.760	
OPERATING PERSONNEL	1	0	0		5.760	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	8		4.970	0.000	9.400	
SUPERVISORY PERSONNEL	1	4	6		1.760	7.120	2.240	
ENGINEERING PERSONNEL	0	17	6		0.010	35.130	7.430	
TOTAL	8	21	85	114	29.110	42.280	102.830	174.220
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	18	1	504		67.420	0.620	404.980	
OPERATING PERSONNEL	7	0	0		4.210	0.000	0.000	
HEALTH PHYSICS PERSONNEL	13	0	43		17.700	0.000	33.460	
SUPERVISORY PERSONNEL	10	1	29		7.270	0.270	32.950	
ENGINEERING PERSONNEL	3	2	65		0.410	1.350	49.580	
TOTAL	51	4	641	696	97.010	2.240	520.970	620.220
WASTE PROCESSING								
MAINTENANCE PERSONNEL	22	0	48		18.250	0.150	19.400	
OPERATING PERSONNEL	1	0	0		0.220	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	5		1.320	0.000	2.500	
SUPERVISORY PERSONNEL	3	0	2		1.470	0.000	1.420	
ENGINEERING PERSONNEL	0	0	4		0.000	0.000	1.950	
TOTAL	28	0	59	87	21.260	0.150	25.270	46.680
REFUELING								
MAINTENANCE PERSONNEL	37	34	11		79.720	20.480	10.580	
OPERATING PERSONNEL	33	0	0		14.390	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	8		4.100	0.000	7.750	
SUPERVISORY PERSONNEL	6	0	2		4.720	0.030	1.410	
ENGINEERING PERSONNEL	0	0	1		0.020	0.120	0.290	
TOTAL	78	34	22	134	102.950	20.630	20.030	143.610
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	210	56	737	1003	236.300	29.090	547.970	813.360
OPERATING PERSONNEL	92	0	0	92	43.400	0.000	0.000	43.400
HEALTH PHYSICS PERSONNEL	26	0	94	120	31.810	0.000	66.650	98.460
SUPERVISORY PERSONNEL	33	5	43	81	18.910	7.420	39.370	65.700
ENGINEERING PERSONNEL	7	19	86	112	1.310	36.620	62.620	100.550
GRAND TOTAL	368	80	960	1408	331.730	73.130	716.610	1121.470

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: *SUMMER 1 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	1	0	0		0.255	0.000	0.000	
OPERATING PERSONNEL	36	0	2		10.418	0.000	0.220	
HEALTH PHYSICS PERSONNEL	5	0	73		0.965	0.000	17.674	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.110	0.000	0.000	
TOTAL	43	0	75	118	11.748	0.000	17.894	29.642
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	27	0	45		4.107	0.000	10.808	
OPERATING PERSONNEL	1	0	0		0.130	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	6		0.000	0.000	0.797	
SUPERVISORY PERSONNEL	1	0	0		0.140	0.000	0.000	
ENGINEERING PERSONNEL	5	1	3		0.681	0.125	0.515	
TOTAL	34	1	54	89	5.058	0.125	12.120	17.303
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	26	0	27		8.210	0.000	10.828	
OPERATING PERSONNEL	3	0	0		0.440	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	15		0.000	0.000	2.640	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	5	7	11		2.055	2.515	9.267	
TOTAL	34	7	53	94	10.705	2.515	22.735	35.955
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	95	0	190		52.053	0.000	82.397	
OPERATING PERSONNEL	3	0	1		0.470	0.000	0.275	
HEALTH PHYSICS PERSONNEL	1	0	69		0.230	0.000	24.671	
SUPERVISORY PERSONNEL	1	0	0		0.220	0.000	0.000	
ENGINEERING PERSONNEL	6	14	40		2.325	4.142	23.636	
TOTAL	106	14	300	420	55.298	4.142	130.979	190.419
WASTE PROCESSING								
MAINTENANCE PERSONNEL	1	0	16		0.175	0.000	4.392	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	4		0.000	0.000	0.750	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	1	0	20	21	0.175	0.000	5.142	5.317
REFUELING								
MAINTENANCE PERSONNEL	13	0	49		3.542	0.000	15.969	
OPERATING PERSONNEL	0	0	1		0.000	0.000	0.660	
HEALTH PHYSICS PERSONNEL	0	0	3		0.000	0.000	0.860	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	1	3	0		0.140	0.940	0.000	
TOTAL	14	3	53	70	3.682	0.940	17.489	22.111
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	163	0	327	490	68.342	0.000	124.394	192.736
OPERATING PERSONNEL	43	0	4	47	11.458	0.000	1.155	12.613
HEALTH PHYSICS PERSONNEL	6	0	170	176	1.195	0.000	47.392	48.587
SUPERVISORY PERSONNEL	2	0	0	2	0.360	0.000	0.000	0.360
ENGINEERING PERSONNEL	18	25	54	97	5.311	7.722	33.418	46.451
GRAND TOTAL	232	25	555	812	86.666	7.722	206.359	300.747

*Workers may be counted in more than one category.

Appendix D (cont.)

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: *SURRY 1,2 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS[a] STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	84	3	132		4.902	0.004	6.894	
OPERATING PERSONNEL	233	19	32		158.822	0.614	0.662	
HEALTH PHYSICS PERSONNEL	51	1	242		40.520	0.009	237.458	
SUPERVISORY PERSONNEL	59	3	5		14.378	0.039	0.880	
ENGINEERING PERSONNEL	40	18	96		8.534	0.441	10.300	
TOTAL	467	44	507	1018	227.156	1.107	256.194	484.457
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	210	49	896		260.484	12.583	683.454	
OPERATING PERSONNEL	79	17	57		11.647	1.022	9.458	
HEALTH PHYSICS PERSONNEL	23	1	163		12.681	0.501	90.139	
SUPERVISORY PERSONNEL	34	0	3		14.102	0.000	0.618	
ENGINEERING PERSONNEL	21	3	194		5.013	0.080	67.232	
TOTAL	367	70	1313	1750	303.927	14.186	850.901	1169.014
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	29	0	102		1.994	0.000	11.376	
OPERATING PERSONNEL	122	1	11		14.800	0.003	1.447	
HEALTH PHYSICS PERSONNEL	0	0	3		0.000	0.000	0.019	
SUPERVISORY PERSONNEL	12	0	0		0.268	0.000	0.000	
ENGINEERING PERSONNEL	14	1	14		3.023	0.012	4.360	
TOTAL	177	2	130	309	20.085	0.015	17.202	37.302
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	48	2	536		2.788	0.007	212.864	
OPERATING PERSONNEL	19	0	29		4.393	0.227	7.363	
HEALTH PHYSICS PERSONNEL	1	0	17		0.240	0.000	1.324	
SUPERVISORY PERSONNEL	3	0	0		0.242	0.000	0.000	
ENGINEERING PERSONNEL	2	1	93		0.027	0.015	28.980	
TOTAL	73	3	675	751	7.690	0.249	250.531	258.470
WASTE PROCESSING								
MAINTENANCE PERSONNEL	8	0	84		0.090	0.000	3.474	
OPERATING PERSONNEL	28	0	0		11.303	0.000	0.000	
HEALTH PHYSICS PERSONNEL	5	0	77		1.126	0.000	17.588	
SUPERVISORY PERSONNEL	6	0	3		2.436	0.000	0.121	
ENGINEERING PERSONNEL	0	0	11		0.000	0.000	0.055	
TOTAL	47	0	175	222	14.955	0.000	21.238	36.193
REFUELING								
MAINTENANCE PERSONNEL	46	0	55		12.345	0.000	19.321	
OPERATING PERSONNEL	23	13	6		3.619	0.000	0.678	
HEALTH PHYSICS PERSONNEL	1	0	2		0.005	0.573	0.029	
SUPERVISORY PERSONNEL	8	0	0		1.122	0.000	0.000	
ENGINEERING PERSONNEL	0	0	34		0.000	0.000	5.972	
TOTAL	78	13	97	188	17.091	0.573	26.000	43.664
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	425	54	1805	2284	282.603	12.594	937.383	1232.580
OPERATING PERSONNEL	504	50	135	689	204.584	1.866	19.608	226.058
HEALTH PHYSICS PERSONNEL	81	2	504	587	54.572	1.083	346.557	402.212
SUPERVISORY PERSONNEL	122	3	11	136	32.548	0.039	1.619	34.206
ENGINEERING PERSONNEL	77	23	442	542	16.597	0.548	116.899	134.044
GRAND TOTAL	1209	132	2897	4238	590.904	16.130	1422.066	2029.100

*Workers may be counted in more than one category.

[a]Uncorrected pocket dosimeter totals for everyone whose dose 1 mrem.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: SUSQUEHANANA 1 (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	10	1	3		3.055	0.307	0.611	
OPERATING PERSONNEL	57	1	5		19.234	0.120	0.639	
HEALTH PHYSICS PERSONNEL	7	0	14		2.708	0.000	5.617	
SUPERVISORY PERSONNEL	4	0	0		0.979	0.000	0.000	
ENGINEERING PERSONNEL	0	2	0		0.000	1.403	0.000	
TOTAL	78	4	22	104	25.976	1.830	6.867	34.673
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	61	67	73		19.133	26.958	21.189	
OPERATING PERSONNEL	5	0	5		0.914	0.000	1.011	
HEALTH PHYSICS PERSONNEL	8	0	26		2.483	0.000	7.899	
SUPERVISORY PERSONNEL	5	0	0		1.199	0.000	0.000	
ENGINEERING PERSONNEL	0	0	8		0.000	0.000	2.191	
TOTAL	79	67	112	258	23.729	26.958	32.290	82.977
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	1	1		0.000	0.157	0.202	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	1	1	2	0.000	0.157	0.202	0.359
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	0	19	47		0.000	4.792	8.438	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	2		0.000	0.000	0.242	
SUPERVISORY PERSONNEL	1	0	0		0.117	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	1	19	49	69	0.117	4.792	8.680	13.589
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	5	18		0.000	1.375	6.436	
OPERATING PERSONNEL	1	0	9		0.199	0.000	8.290	
HEALTH PHYSICS PERSONNEL	6	0	2		2.660	0.000	0.390	
SUPERVISORY PERSONNEL	1	0	0		0.388	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	8	5	29	42	3.247	1.375	15.116	19.738
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	0	0	0.000	0.000	0.000	0.000
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	71	93	142	306	22.188	33.589	36.876	92.653
OPERATING PERSONNEL	63	1	19	83	20.347	0.120	9.940	30.407
HEALTH PHYSICS PERSONNEL	21	0	44	65	7.851	0.000	14.148	21.999
SUPERVISORY PERSONNEL	11	0	0	11	2.683	0.000	0.000	2.683
ENGINEERING PERSONNEL	0	2	8	10	0.000	1.403	2.191	3.594
GRAND TOTAL	166	96	213	475	53.069	35.112	63.155	151.336

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: *† THREE MILE ISLAND 1 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	133	1	47		0.796	0.010	0.049	
OPERATING PERSONNEL	94	0	10		6.192	0.000	0.016	
HEALTH PHYSICS PERSONNEL	115	6	39		7.866	0.002	0.013	
SUPERVISORY PERSONNEL	220	76	51		3.769	0.047	0.119	
ENGINEERING PERSONNEL	75	43	79		1.973	0.033	0.304	
TOTAL	637	126	226	989	20.596	0.092	0.501	21.189
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	174	0	18		14.424	0.000	0.332	
OPERATING PERSONNEL	60	0	8		0.135	0.000	0.688	
HEALTH PHYSICS PERSONNEL	60	0	2		0.915	0.000	0.000	
SUPERVISORY PERSONNEL	86	3	10		2.295	0.004	0.361	
ENGINEERING PERSONNEL	28	7	21		0.335	0.018	0.148	
TOTAL	408	10	59	477	18.104	0.022	1.529	19.655
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	29	0	20		0.973	0.000	1.133	
OPERATING PERSONNEL	10	0	4		0.003	0.000	0.293	
HEALTH PHYSICS PERSONNEL	26	0	0		0.090	0.000	0.000	
SUPERVISORY PERSONNEL	32	11	11		0.291	0.002	0.149	
ENGINEERING PERSONNEL	29	3	43		0.195	0.002	2.956	
TOTAL	126	14	78	218	1.552	0.004	4.531	6.087
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	139	1	153		52.301	0.000	5.746	
OPERATING PERSONNEL	60	0	7		29.603	0.000	0.900	
HEALTH PHYSICS PERSONNEL	32	0	1		5.694	0.000	0.003	
SUPERVISORY PERSONNEL	98	9	25		7.620	0.001	1.776	
ENGINEERING PERSONNEL	46	13	46		4.259	0.145	0.957	
TOTAL	375	23	232	630	99.477	0.146	9.382	109.005
WASTE PROCESSING								
MAINTENANCE PERSONNEL	96	0	11		2.313	0.000	0.008	
OPERATING PERSONNEL	58	0	9		3.705	0.000	0.630	
HEALTH PHYSICS PERSONNEL	34	0	4		0.527	0.000	0.145	
SUPERVISORY PERSONNEL	37	0	4		1.118	0.000	0.248	
ENGINEERING PERSONNEL	15	2	5		0.884	0.003	0.043	
TOTAL	240	2	33	275	8.547	0.003	1.074	9.624
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	0	0	0.000	0.000	0.000	0.000
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	571	2	249	822	70.807	0.010	7.268	78.085
OPERATING PERSONNEL	282	0	38	320	39.638	0.000	2.527	42.165
HEALTH PHYSICS PERSONNEL	267	6	46	319	15.092	0.002	0.161	15.255
SUPERVISORY PERSONNEL	473	99	101	673	15.093	0.054	2.653	17.800
ENGINEERING PERSONNEL	193	68	194	455	7.646	0.201	4.408	12.255
GRAND TOTAL	1786	175	628	2589	148.276	0.267	17.017	165.560

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: *† THREE MILE ISLAND 2 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	73	0	72		1.414	0.000	0.449	
OPERATING PERSONNEL	59	0	3		11.113	0.000	0.006	
HEALTH PHYSICS PERSONNEL	98	2	67		12.112	0.000	6.601	
SUPERVISORY PERSONNEL	98	9	32		0.971	0.000	1.587	
ENGINEERING PERSONNEL	30	0	51		0.529	0.072	1.373	
TOTAL	358	11	225	594	26.139	0.072	10.016	36.227
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	91	2	166		42.735	0.002	4.503	
OPERATING PERSONNEL	52	0	3		4.478	0.000	0.149	
HEALTH PHYSICS PERSONNEL	75	0	36		5.773	0.000	2.461	
SUPERVISORY PERSONNEL	61	0	21		3.002	0.000	2.023	
ENGINEERING PERSONNEL	24	2	61		0.619	0.002	2.528	
TOTAL	303	4	287	594	56.607	0.004	11.664	68.275
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	14	0	7		1.089	0.000	0.183	
OPERATING PERSONNEL	37	0	1		0.021	0.000	0.027	
HEALTH PHYSICS PERSONNEL	7	0	5		0.019	0.000	0.023	
SUPERVISORY PERSONNEL	11	0	4		0.324	0.000	0.168	
ENGINEERING PERSONNEL	3	0	10		0.016	0.000	1.276	
TOTAL	72	0	27	99	1.469	0.000	1.677	3.146
SPECIAL MAINTENANCE[a]								
MAINTENANCE PERSONNEL	91	0	241		80.762	0.000	280.918	
OPERATING PERSONNEL	57	0	5		18.973	0.000	0.512	
HEALTH PHYSICS PERSONNEL	84	0	50		30.980	0.000	14.842	
SUPERVISORY PERSONNEL	81	4	41		17.841	0.234	13.552	
ENGINEERING PERSONNEL	30	0	67		6.545	0.000	25.235	
TOTAL	343	4	404	751	155.101	0.234	335.059	490.394
WASTE PROCESSING								
MAINTENANCE PERSONNEL	100	1	190		9.636	0.000	5.836	
OPERATING PERSONNEL	78	0	6		8.424	0.000	0.650	
HEALTH PHYSICS PERSONNEL	80	0	58		6.397	0.000	1.538	
SUPERVISORY PERSONNEL	83	4	29		1.766	0.000	0.395	
ENGINEERING PERSONNEL	28	2	68		1.550	0.009	0.450	
TOTAL	369	7	351	727	27.773	0.009	8.869	36.651
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	0	0	0.000	0.000	0.000	0.000
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	369	3	676	1048	135.636	0.002	291.889	427.527
OPERATING PERSONNEL	283	0	18	301	43.009	0.000	1.344	44.353
HEALTH PHYSICS PERSONNEL	344	2	216	562	55.281	0.000	25.465	80.746
SUPERVISORY PERSONNEL	334	17	127	478	23.904	0.234	17.725	41.863
ENGINEERING PERSONNEL	115	4	257	376	9.259	0.083	30.862	40.204
GRAND TOTAL	1445	26	1294	2765	267.089	0.319	367.285	634.693

*Workers may be counted in more than one category.

[a]Includes reactor building decon and dose reduction, reactor defueling, reactor systems disassembly, primary coolant decon.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: *† TROJAN (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	6	2	6		2.160	0.720	1.920	
OPERATING PERSONNEL	30	0	0		14.330	0.000	0.000	
HEALTH PHYSICS PERSONNEL	28	0	38		9.370	0.070	11.530	
SUPERVISORY PERSONNEL	5	0	13		1.500	0.170	4.490	
ENGINEERING PERSONNEL	1	3	1		0.660	1.260	0.240	
TOTAL	70	5	58	133	28.020	2.220	18.180	48.420
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	64	44	156		27.470	17.820	138.410	
OPERATING PERSONNEL	1	0	0		0.710	0.000	0.000	
HEALTH PHYSICS PERSONNEL	32	2	59		18.560	0.840	30.980	
SUPERVISORY PERSONNEL	14	4	0		5.830	1.100	0.020	
ENGINEERING PERSONNEL	2	0	0		0.870	0.240	0.020	
TOTAL	113	50	215	378	53.440	20.000	169.430	242.870
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	0	0	0.000	0.000	0.000	0.000
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	60	26	125		36.210	14.100	49.420	
OPERATING PERSONNEL	8	0	0		3.220	0.000	0.000	
HEALTH PHYSICS PERSONNEL	30	6	26		13.880	2.900	10.760	
SUPERVISORY PERSONNEL	11	1	1		3.450	0.830	0.560	
ENGINEERING PERSONNEL	6	3	0		3.210	0.830	0.030	
TOTAL	115	36	152	303	59.970	18.660	60.770	139.400
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	1	15		0.280	0.300	4.140	
OPERATING PERSONNEL	2	0	0		0.780	0.000	0.000	
HEALTH PHYSICS PERSONNEL	30	11	33		15.300	2.650	13.070	
SUPERVISORY PERSONNEL	1	0	0		0.100	0.010	0.040	
ENGINEERING PERSONNEL	0	0	0		0.050	0.010	0.000	
TOTAL	33	12	48	93	16.510	2.970	17.250	36.730
REFUELING								
MAINTENANCE PERSONNEL	21	9	10		18.600	5.270	3.940	
OPERATING PERSONNEL	12	0	0		9.160	0.000	0.000	
HEALTH PHYSICS PERSONNEL	14	2	13		4.690	0.560	4.310	
SUPERVISORY PERSONNEL	2	2	0		0.840	0.310	0.010	
ENGINEERING PERSONNEL	0	0	0		0.180	0.160	0.000	
TOTAL	49	13	23	85	33.470	6.300	8.260	48.030
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	151	82	312	545	84.720	38.210	197.830	320.760
OPERATING PERSONNEL	53	0	0	53	28.200	0.000	0.000	28.200
HEALTH PHYSICS PERSONNEL	134	21	169	324	61.800	7.020	70.650	139.470
SUPERVISORY PERSONNEL	33	7	14	54	11.720	2.420	5.120	19.260
ENGINEERING PERSONNEL	9	6	1	16	4.970	2.500	0.290	7.760
GRAND TOTAL	380	116	496	992	191.410	50.150	273.890	515.450

*Workers may be counted in more than one category.

PLANT: *TURKEY POINT 3,4 (PWR)

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	133	4	88		38.835	2.170	42.830	
OPERATING PERSONNEL	37	0	0		30.785	0.025	0.000	
HEALTH PHYSICS PERSONNEL	24	0	111		18.540	0.005	86.765	
SUPERVISORY PERSONNEL	26	2	23		8.755	0.610	5.715	
ENGINEERING PERSONNEL	31	3	38		9.235	1.050	12.700	
TOTAL	251	9	260	520	106.150	3.860	148.010	258.020
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	166	32	189		148.420	17.865	80.390	
OPERATING PERSONNEL	24	0	0		14.420	0.000	0.000	
HEALTH PHYSICS PERSONNEL	10	0	14		3.320	0.000	4.795	
SUPERVISORY PERSONNEL	9	0	7		4.885	0.035	2.300	
ENGINEERING PERSONNEL	8	0	6		5.560	0.135	3.445	
TOTAL	217	32	216	465	176.605	18.035	90.930	285.570
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	29	5	93		8.400	1.555	54.455	
OPERATING PERSONNEL	4	0	0		1.700	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	6		1.440	0.000	2.020	
SUPERVISORY PERSONNEL	4	1	2		1.600	0.120	0.895	
ENGINEERING PERSONNEL	6	1	1		2.065	0.535	0.640	
TOTAL	47	7	102	156	15.205	2.210	58.010	75.425
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	46	9	612		15.170	2.205	683.950	
OPERATING PERSONNEL	5	0	0		2.040	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	7		0.640	0.000	2.885	
SUPERVISORY PERSONNEL	3	2	46		1.140	2.455	24.905	
ENGINEERING PERSONNEL	4	1	20		1.370	0.275	12.505	
TOTAL	60	12	685	757	20.360	4.935	724.245	749.540
WASTE PROCESSING								
MAINTENANCE PERSONNEL	14	4	6		7.205	1.725	2.730	
OPERATING PERSONNEL	0	0	0		0.130	0.000	0.000	
HEALTH PHYSICS PERSONNEL	10	0	15		14.690	0.000	3.580	
SUPERVISORY PERSONNEL	1	0	0		0.255	0.000	0.000	
ENGINEERING PERSONNEL	2	0	0		0.690	0.000	0.075	
TOTAL	27	4	21	52	22.970	1.725	6.385	31.080
REFUELING								
MAINTENANCE PERSONNEL	0	22	19		44.680	17.110	5.185	
OPERATING PERSONNEL	35	0	0		12.010	0.140	0.000	
HEALTH PHYSICS PERSONNEL	0	0	4		0.325	0.000	0.975	
SUPERVISORY PERSONNEL	9	0	12		2.240	0.015	5.175	
ENGINEERING PERSONNEL	7	0	2		1.835	0.060	0.650	
TOTAL	51	22	37	110	61.090	17.325	11.985	90.400
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	388(195)	76 (39)	1007 (733)	1471 (967)	262.710	42.630	869.540	1174.880
OPERATING PERSONNEL	105 (61)	0 (0)	0 (0)	105 (61)	61.085	0.165	0.000	61.250
HEALTH PHYSICS PERSONNEL	50 (25)	0 (0)	157 (118)	207 (143)	38.955	0.005	101.020	139.980
SUPERVISORY PERSONNEL	52 (30)	5 (4)	90 (56)	147 (80)	18.875	3.235	38.990	61.100
ENGINEERING PERSONNEL	58 (44)	5 (3)	67 (57)	130 (105)	20.755	2.055	30.015	52.825
GRAND TOTAL	653(355)	87 (47)	1321 (964)	2060(1366)	402.380	48.090	1039.565	1490.035

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

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: †VERMONT YANKEE (BWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	2	0	0		4.262	0.000	0.286	
OPERATING PERSONNEL	30	0	20		27.882	0.000	3.954	
HEALTH PHYSICS PERSONNEL	8	0	16		15.640	0.010	20.707	
SUPERVISORY PERSONNEL	1	0	0		0.163	0.000	0.000	
ENGINEERING PERSONNEL	5	0	3		6.113	0.025	1.254	
TOTAL	46	0	39	85	54.060	0.035	26.201	80.296
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	13	27	37		37.076	135.328	211.449	
OPERATING PERSONNEL	11	0	0		4.890	0.000	0.034	
HEALTH PHYSICS PERSONNEL	3	0	10		1.336	0.025	4.370	
SUPERVISORY PERSONNEL	0	0	0		0.536	0.052	0.029	
ENGINEERING PERSONNEL	2	0	1		1.390	0.000	0.201	
TOTAL	29	27	48	104	45.228	135.405	216.083	396.716
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	21	70		9.071	34.536	56.937	
OPERATING PERSONNEL	0	0	0		1.170	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.398	0.000	1.073	
SUPERVISORY PERSONNEL	0	0	0		0.126	0.010	0.000	
ENGINEERING PERSONNEL	0	0	0		0.392	0.000	0.049	
TOTAL	1	21	70	92	11.157	34.546	58.059	103.762
[a] SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	1	20	22		0.745	9.908	5.137	
OPERATING PERSONNEL	0	0	0		0.050	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.013	0.000	0.046	
SUPERVISORY PERSONNEL	0	0	0		0.011	0.253	0.000	
ENGINEERING PERSONNEL	1	0	0		0.898	0.000	0.002	
TOTAL	2	20	22	44	1.717	10.161	5.185	17.063
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	6	0	0		3.108	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.319	0.000	0.423	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	6	0	0	6	3.427	0.000	0.423	3.850
REFUELING								
MAINTENANCE PERSONNEL	0	0	2		0.140	0.086	0.490	
OPERATING PERSONNEL	0	0	0		0.119	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.074	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.155	0.000	0.000	
TOTAL	1	0	2	3	0.414	0.086	0.564	1.064
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	17	68	131	216	51.294	179.858	274.299	505.451
OPERATING PERSONNEL	47	0	20	67	37.219	0.000	3.988	41.207
HEALTH PHYSICS PERSONNEL	11	0	26	37	17.706	0.035	26.693	44.434
SUPERVISORY PERSONNEL	1	0	0	1	0.836	0.315	0.029	1.180
ENGINEERING PERSONNEL	9	0	4	13	8.948	0.025	1.506	10.479
GRAND TOTAL	85	68	181	334	116.003	180.233	306.515	602.751

[a]NRC mandated work on environmental qualifications contributed 13 man-rems.

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT:*YANKEE ROWE (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	1	2	0		0.700	0.830	0.000	
OPERATING PERSONNEL	25	0	0		8.732	0.000	0.000	
HEALTH PHYSICS PERSONNEL	13	0	2		4.363	0.000	0.760	
SUPERVISORY PERSONNEL	0	0	0		0.145	0.000	0.080	
ENGINEERING PERSONNEL	0	0	0		0.205	0.265	0.010	
TOTAL	39	2	2	43	14.145	1.095	0.850	16.090
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	23	39	5		10.227	11.930	1.577	
OPERATING PERSONNEL	2	0	0		0.623	0.000	0.000	
HEALTH PHYSICS PERSONNEL	6	0	11		3.605	0.000	10.205	
SUPERVISORY PERSONNEL	0	0	0		0.010	0.000	0.080	
ENGINEERING PERSONNEL	0	0	0		0.018	0.160	0.000	
TOTAL	31	39	16	86	14.483	12.090	11.862	38.435
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	11	43	58		5.390	21.637	61.629	
OPERATING PERSONNEL	0	0	0		0.735	0.000	0.030	
HEALTH PHYSICS PERSONNEL	11	0	30		9.525	0.000	15.385	
SUPERVISORY PERSONNEL	6	0	0		7.250	0.000	0.040	
ENGINEERING PERSONNEL	6	4	8		7.980	2.035	6.560	
TOTAL	34	47	96	177	30.880	23.672	83.644	138.196
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	22	80	29		12.890	33.370	12.295	
OPERATING PERSONNEL	17	0	0		5.202	0.000	0.000	
HEALTH PHYSICS PERSONNEL	9	0	18		2.460	0.000	4.860	
SUPERVISORY PERSONNEL	1	0	0		1.295	0.000	0.010	
ENGINEERING PERSONNEL	1	9	0		0.695	2.335	0.235	
TOTAL	50	89	47	186	22.542	35.705	17.400	75.647
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	0		0.305	0.935	0.155	
OPERATING PERSONNEL	7	0	0		2.620	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	26		6.465	0.000	15.820	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.095	
ENGINEERING PERSONNEL	0	0	0		0.010	0.040	0.000	
TOTAL	11	0	26	37	9.400	0.975	16.070	26.445
REFUELING								
MAINTENANCE PERSONNEL	25	72	22		10.975	26.035	6.100	
OPERATING PERSONNEL	32	0	0		14.025	0.000	0.000	
HEALTH PHYSICS PERSONNEL	10	0	33		3.850	0.000	15.695	
SUPERVISORY PERSONNEL	2	0	0		0.740	0.000	0.085	
ENGINEERING PERSONNEL	4	10	0		0.760	2.461	0.665	
TOTAL	73	82	55	210	30.350	28.496	22.545	81.391
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	82	236	114	432	40.487	94.737	81.756	216.980
OPERATING PERSONNEL	83	0	0	83	31.937	0.000	0.030	31.967
HEALTH PHYSICS PERSONNEL	53	0	120	173	30.268	0.000	62.725	92.993
SUPERVISORY PERSONNEL	9	0	0	9	9.440	0.000	0.390	9.830
ENGINEERING PERSONNEL	11	23	8	42	9.668	7.296	7.470	24.434
GRAND TOTAL	238	259	242	739	121.800	102.033	152.371	376.204

*Workers may be counted in more than one category.

Appendix D (cont.)

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PLANT: *† ZION 1,2 (PWR) 1984

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	TOTAL MAN-REMS STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	40	0	0		0.010	0.000	0.000	
OPERATING PERSONNEL	45	0	11		4.000	0.000	1.570	
HEALTH PHYSICS PERSONNEL	9	0	12		3.750	0.000	2.300	
SUPERVISORY PERSONNEL	93	0	0		2.600	0.000	0.000	
ENGINEERING PERSONNEL	30	0	0		7.454	0.000	0.000	
TOTAL	217	0	23	240	17.814	0.000	3.870	21.684
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	52	0	411		74.041	0.000	227.073	
OPERATING PERSONNEL	23	0	0		16.650	0.000	0.000	
HEALTH PHYSICS PERSONNEL	15	0	72		13.026	0.000	52.790	
SUPERVISORY PERSONNEL	71	0	0		9.260	0.000	0.000	
ENGINEERING PERSONNEL	19	139	84		5.264	1.230	5.305	
TOTAL	180	139	567	886	118.241	1.230	285.168	404.639
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	28		0.000	0.000	22.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	9		0.000	0.000	4.650	
SUPERVISORY PERSONNEL	18	0	0		2.350	0.000	0.000	
ENGINEERING PERSONNEL	4	0	40		3.450	0.000	8.040	
TOTAL	22	0	77	99	5.800	0.000	34.690	40.490
[a] SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	31	83	372		16.000	1.237	172.000	
OPERATING PERSONNEL	17	0	0		3.650	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	43		1.450	0.000	18.650	
SUPERVISORY PERSONNEL	24	0	0		4.500	0.000	0.000	
ENGINEERING PERSONNEL	4	83	42		2.340	0.460	9.320	
TOTAL	80	166	457	703	27.940	1.697	199.970	229.607
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	17		0.000	0.000	2.400	
OPERATING PERSONNEL	18	0	0		2.150	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	3		1.050	0.000	1.420	
SUPERVISORY PERSONNEL	9	0	0		0.650	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	31	0	20	51	3.850	0.000	3.820	7.670
REFUELING								
MAINTENANCE PERSONNEL	31	0	0		32.000	0.000	0.000	
OPERATING PERSONNEL	17	0	0		0.695	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	0		3.850	0.000	0.000	
SUPERVISORY PERSONNEL	11	0	0		3.700	0.000	0.000	
ENGINEERING PERSONNEL	3	0	0		1.260	0.000	0.000	
TOTAL	65	0	0	65	41.505	0.000	0.000	41.505
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	154	83	828	1065	122.051	1.237	423.473	546.761
OPERATING PERSONNEL	120	0	11	131	27.145	0.000	1.570	28.715
HEALTH PHYSICS PERSONNEL	35	0	139	174	23.126	0.000	79.810	102.936
SUPERVISORY PERSONNEL	226	0	0	226	23.060	0.000	0.000	23.060
ENGINEERING PERSONNEL	60	222	166	448	19.768	1.690	22.665	44.123
GRAND TOTAL	595	305	1144	2044	215.150	2.927	527.518	745.595

*Workers may be counted in more than one category.

[a]NRC mandated special maintenance contributed 230 man-rems.

APPENDIX E

Summary of Annual Whole Body Dose Distributions by Year and Reactor Type 1980 - 1984

*Appendix E

SUMMARY OF ANNUAL WHOLE BODY DOSE DISTRIBUTIONS BY YEAR AND REACTOR TYPE
1980 - 1984

Year and Reactor Type	Number of Individuals with Whole Body Doses in the Following Range (rems or cSv)																	Total Number Monitored	Number with Measurable Doses	Collective Dose (person-rems or person-cSv)
	No Measurable Exposure	Measurable <0.10	0.10 - 0.25	0.25 - 0.50	0.50 - 0.75	0.75 - 1.0	1.0 - 2.0	2.0 - 3.0	3.0 - 4.0	4.0 - 5.0	5.0 - 6.0	6.0 - 7.0	7.0 - 8.0	8.0 - 9.0	9.0 - 10.0	10.0 - 12.0	> 12.0			
1984 - BWRs	21741	14997	6165	4907	3033	2398	5679	2714	994	218								62846	41105	27074
1984 - PWRs	37875	24887	8599	6585	4133	2998	6774	2253	681	77								94862	56987	28140
1984 - LWRs	59616	39884	14764	11492	7166	5396	12453	4967	1675	295								157708	98092	55214
1983 - BWRs	17721	10475	4317	4036	2607	1925	5659	2890	1252	299	63	16	4					51194	33473	27455
1983 - PWRs	33350	21425	7894	6260	3863	2783	6512	2421	698	315	2							85523	52173	29016
1983 - LWRs	51071	31900	12211	10296	6470	4708	12171	5311	1950	544	65	16	4					136717	85646	56471
1982 - BWRs	15661	9944	4431	4403	2839	2046	4794	2358	1183	230	7							47896	32235	24437
1982 - PWRs	29232	21536	8262	6411	3900	2749	6061	2328	631	202	49	13	4	0	1			81378	52146	27753
1982 - LWRs	44893	31480	12693	10814	6739	4795	10855	4686	1814	432	56	13	4	0	1			129275	84381	52190
1981 - BWRs	15345	11130	4869	4536	2939	2326	5373	2485	911	224	32	4	2	0	0	0	1	50177	34832	25471
1981 - PWRs	26978	18202	7348	5790	3686	2577	6393	2061	882	262	61	77	9	2	1			74329	47351	28671
1981 - LWRs	42323	29332	12217	10326	6625	4903	11766	4546	1793	486	93	81	11	2	1		1	124506	82183	54142
1980 - BWRs	13971	9765	4671	4283	2803	2090	5884	2831	1073	503	129	60	2					48065	34094	29530
1980 - PWRs	33406	19873	7079	5537	3279	2428	5590	1684	464	183	63	38	16	3				79643	46237	24266
1980 - LWRs	47377	29638	11750	9820	6082	4518	11474	4515	1537	686	192	98	18	3				127708	80331	53796

*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 years1969 through 1984. 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 1984 annual reports submitted by about 500 licensees indicated that approximately 195,000 individuals were monitoried, 171,000 of whom were monitored by nuclear power facilities. They incurred an average individual dose of 0.30 rem (cSv) and an average measureable dose of 0.55 rem (cSv). Termination radiation exposure reports were analyzed to reveal that about 67,500 individuals completed their employment with one or more of the 500 covered licensees during 1984*. Some 66,100 of these individuals terminated from power reactor facilties, and about 5,500 of them were considered to be transient workers who received an average dose of 0.91 rem (cSv).

*These figures may be incomplete because data for about 15% of the individuals terminating during 1984 has not been entered into REIRS.

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