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Occupational Radiation Exposure at Commercial Nuclear Power Reactors and Other Facilities 1987

Twentieth Annual Report

U.S. Nuclear Regulatory Commission

Office of Nuclear Regulatory Research

B. G. Brooks, D. Hagemeyer

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

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

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

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

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

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

NUREG-0713 Occupational Radiation Exposure At Commercial Nuclear Power Reactors and Other Facilities 1985, Vol. 7, U.S. Nuclear Regulatory Commission, April 1988.

NUREG-0713 Occupational Radiation Exposure At Commercial Nuclear Power Reactors and Other Facilities 1986, Vol. 8, U.S. Nuclear Regulatory Commission, August 1989.

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

WASH-1350-R1 through WASH-1350-R6 First through Sixth Annual Reports of the Operation of the U.S. AEC's Centralized Ionizing Radiation Exposure Records and Reporting System, U.S. Atomic Energy Commission.

NUREG-75/108 Seventh Annual Occupational Radiation Exposure Report for Certain NRC Licensees - 1974, U.S. Nuclear Regulatory Commission, October 1975.

NUREG-0119 Eighth Annual Occupational Radiation Exposure Report for 1975, U.S. Nuclear Regulatory Commission, October 1976.

NUREG-0322 Ninth Annual Occupational Radiation Exposure Report for 1976, U.S. Nuclear Regulatory Commission, October 1977.

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

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

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

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

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

ABSTRACT

This report summarizes the occupational exposure data that are maintained in the U.S. Nuclear Regulatory Commission's Radiation Exposure Information and Reporting System (REIRS). The bulk of the information contained in the report was extracted from the 1987 annual statistical reports submitted by six of the seven categories* of NRC licensees subject to the reporting requirements of 10 CFR § 20.407. Since there are no geologic repositories for high level waste currently licensed, only six categories will be considered in this report. These six categories of licensees also submit personal identification and exposure information for terminating employees pursuant to 10 CFR § 20.408, and some analysis of this "termination" data is also presented in this report.

Annual reports for 1987 were received from a total of 456 NRC licensees, 106 of which were operators of nuclear power reactors. Compilations of the 456 reports indicated that some 232,779 individuals were monitored, 112,097 of whom received a measurable dose (Table 3.1). The collective dose incurred by these individuals was calculated to be 44,079 person-rems (person-cSv)** which represents a decrease of 5% from the 1986 value. The number of workers receiving a measurable dose increased while the collective dose decreased, causing the average measurable dose to decrease from 0.42 rem (cSv) in 1986, to 0.39 rem (cSv) in 1987. About 14% of the monitored individuals were found to have received doses greater than 0.50 rem (cSv), which is about the same as the value for 1986.

Some 118,000 termination reports (Table 5.1) were submitted to the NRC which contained personel identification and exposure information for about 86,300 individuals who had completed their work assignment or employment with a covered category of NRC licensees during 1987. The total number of monitored individuals for whom personal identification and exposure information has been incorporated into REIRS during the 19 years that it has been operating is now about 564,000, 500,000 of whom terminated from nuclear power facilities. Analyses of these termination data indicate that about 8,700 individuals completed work assignments at two or more nuclear reactor facilities during calendar year 1987 and received an average dose of 0.69 rems (cSv). Approximately 3,100 of these individuals worked at two or more reactor facilities during one calendar quarter and received an average quarterly dose of 0.28 rem (cSv).

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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.

EDITOR'S NOTE

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

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PREFACE

A number of NRC Licensees have inquired as to how the occupational radiation exposure data that are extracted from 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 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. These facts are used by the NRC staff as indicated below:

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

2. The external dose data assist in the evaluation of the radiological risk associated with certain categories of NRC-licensed activities and are used for comparative analyses of radiation protection performance: US/foreign, BWRs/PWRs, civilian/military, plant/plant, nuclear industry/other industries, etc.

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

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

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

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

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

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

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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 that was maintained at the Oak Ridge National Laboratory Computer Technology Center in Oak Ridge, Tennessee, until May 1990. At that time the data were transferred to a database management system at Science Applications International Corporation (SAIC) at Oak Ridge, Tennessee. The computerization of these data ensure that they are kept indefinitely and

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

facilitate their retrieval and analysis. The data maintained in REIRS have been summarized and published in a report every year since 1969. Annual reports for each of the years 1969 through 1973 presented the data reported by both AEC licensees and contractors and were published in six documents designated as WASH-1350-R1 through WASH-1350-R6.

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

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

This report and each of the predecessors summarizes information reported during previous years. However, more licensee-specific data, such as the annual reports submitted by each commercial power reactor pursuant to 10 CFR § 20.407 and their technical specifications, may be found in those documents listed on the inside of the front cover of this report. Additional operating data and statistics for each power reactor for the years 1973 through 1982 may be found in a series of reports, "Nuclear Power Plant Operating Experience" [Refs. 1-9]. These documents are available for viewing at all NRC public document rooms, or they may be purchased from the National Technical Information 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 (for example, see Table 3.1).

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 (dose ranges are shown in Table 3.2). This allows the collective dose to be calculated without knowing each person's actual annual dose. Past experience has shown that the actual mean dose of the individuals reported in each range is usually less than the midpoint. Thus, the collective doses presented for categories of licenses shown in this report may be 10% higher

than the sum of the actual individual doses. However, nearly 75% of the nuclear power reactors reported the actual collective dose in 1987 so the figure shown for this category is more accurate.

The average dose per individual, as well as the dose distributions shown for groups of licensees, also could have been affected by the multiple reporting of individuals who were monitored by two or more licensees during the year. Since individuals are not identified in the annual reports, an individual who was monitored by five different licensees would have been counted once on each report. Therefore, when the data were summed to determine the total number of individuals monitored by a group of licensees, this person would be counted as five individuals rather than as one. This could also affect the distribution of doses because the individual has been counted five times in the lower dose ranges rather than one time in the higher range in which his actual accumulated dose (the sum of his doses incurred at each facility) would have placed him. This source of error has the greatest potential impact on the data reported by power reactor facilities since they employ many short-term workers. Further discussion of this point is provided in Section 5.

Another fact that should be kept in mind when examining the annual statistical data is that all of the personnel included in the report may not have been monitored throughout the entire year. Many licensees such as radiography firms and nuclear power facilities may monitor numerous individuals for periods much less than a year. The average doses calculated from these data, therefore, are less than the average dose that an individual would receive if he were involved in that activity for the full year.

Considerable attention should also be given when referencing the collective totals presented in this report. The differences between the totals presented for all licensees that reported versus only those licensees that are required to report should be noted. Likewise, one should pay close attention to the differences between all power reactors (including the high temperature gas reactor, HTGR), all pressurized water reactors (PWRs), all boiling water reactors (BWRs), and all light water reactors (LWRs). The totals may be inclusive or exclusive of those licensees that were in commercial operation for less than one full year. These parameters vary

throughout the tables and appendices of this report in order to provide the most comprehensive analysis of all the data available. The apparent discrepancies among the various tables are a necessary side-effect of this endeavor.

Also, it should be again pointed out that this report contains information reported by NRC licensees only. Since the NRC licenses all commercial nuclear power reactors, fuel processors, fabricators and reprocessors, and independent spent fuel storage facilities, information shown for these categories reflects the U.S. experience. This is not the case, however, for the remaining categories of industrial radiography, manufacturing and distribution of specified quantities of by-product material, and low-level waste disposal. Companies that conduct these types of activities in Agreement States* are licensed by the state and are not required to submit occupational exposure reports to the NRC. Therefore, information shown for these categories does not reflect the total U.S. experience.

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

3 ANNUAL PERSONNEL MONITORING REPORTS - 10 CFR § 20.407

3.1 Definition of Terms and Sources of Data

3.1.1 Statistical Summary Reports

On February 4, 1974, 10 CFR § 20.407 was amended to require certain categories* of licensees to submit an annual statistical report indicating the distribution of the whole body doses incurred by individuals whom they monitored for exposure to radiation. Table 3.2 shows the dose ranges specified by 10 CFR § 20.407(b) among which the doses are distributed. Since the regulations do not require these licensees to report the collective dose incurred by the individuals shown on the statistical reports, the dose distributions are used as the basis for the staff's calculation of the collective dose (see Section 3.1.4).

3.1.2 Number of Monitored Individuals

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

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

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 the average measurable dose per worker because it deletes those individuals who received exposures too small to be detected by personnel monitoring devices, many of whom probably did not routinely work in radiation areas (and were monitored for convenience or for identification purposes).

3.1.4 Collective Dose

The concept of collective dose is used in this report to denote the summation of the whole body external doses received by all monitored individuals 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 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 3.2) by the midpoint of the corresponding range. This assumes that the midpoint of the range is equal to the arithmetic mean of the individual doses in the range. Past experience has shown that the actual mean dose of individuals reported in each dose range is less than the midpoint of the range, and the collective doses shown in this report for these may be about 10% too high. In 1981, a few power reactor licensees began reporting the actual collective dose (as determined from official personnel dosimetry results) on the § 20.407 annual reports, and, when provided, the NRC staff used these doses instead of the above-described calculations. The staff would prefer to use the actual collective dose and encourages more licensees to make it available.

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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-rem becomes person-cSv.

3.1.5 Average Individual Dose

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

3.1.6 Average Measurable Dose

The average measurable dose is obtained by dividing the collective dose by the number of workers that received a measurable dose. This is the average most commonly used in this and other reports when examining trends and comparing doses received by workers in various segments of the nuclear industry because it reflects the deletion of those individuals receiving zero or minimal doses, many of whom were monitored 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

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* The collective dose of workers with doses exceeding 1.5 rems (cSv) was calculated by assuming that half of the collective dose incurred by workers with doses between one and two rems (cSv) was due to doses greater than 1.5 rems (cSv). This value was then added to the collective dose incurred by workers in the higher ranges.

TABLE 3.1
ANNUAL EXPOSURE DATA FOR CERTAIN CATEGORIES OF LICENSEES
1978-1987

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	1987	312	7,236	4,454	1,835	0.25	0.41	0.36
Radiography	1986	335	7,952	5,130	2,108	0.26	0.41	0.39
	1985	340	8,476	5,550	2,374	0.28	0.43	0.45
	1984	361	8,458	5,446	2,490	0.30	0.46	0.46
	1983	340	8,624	5,131	2,384	0.28	0.46	0.45
	1982	353	9,235	6,160	2,998	0.32	0.49	0.46
	1981	266	9,938	5,486	2,652	0.27	0.48	0.48
	1980	292	11,102	6,556	2,979	0.27	0.45	0.45
	1979	341	11,969	6,904	3,461	0.29	0.50	0.47
	1978	337	13,093	6,685	2,950	0.23	0.44	0.43
Manufacturing	1987	24	3,589	2,317	716	0.20	0.31	0.54
and	1986	33	4,042	2,065	745	0.18	0.36	0.49
Distribution	1985	33	3,958	2,250	755	0.19	0.34	0.50
	1984	40	5,076	1,977	671	0.13	0.34	0.46
	1983	33	5,051	2,003	824	0.16	0.41	0.54
	1982	34	5,453	2,199	890	0.16	0.40	0.51
	1981	29	4,846	2,395	904	0.19	0.38	0.52
	1980	29	5,119	2,460	1,033	0.20	0.42	0.61
	1979	28	3,937	2,219	888	0.23	0.40	0.55
	1978	27	3,973	1,886	851	0.21	0.45	0.61
Low-Level	1987	2	778	173	24	0.03	0.14	0.00
Waste	1986	2	996	175	31	0.03	0.18	0.05
Disposal	1985	2	1,240	252	70	0.06	0.28	0.24
	1984	2	925	297	72	0.08	0.24	0.16
	1983	1	612	358	71	0.12	0.20	0.14
	1982	1	680	251	53	0.08	0.21	0.20
Independent	1987	3	129	64	41	0.32	0.64	0.60
Spent Fuel	1986	1	32	32	34	1.06	1.06	0.46
Storage	1985	1	32	32	34	1.06	1.06	0.51
	1984	1	32	32	13	0.41	0.41	0.06
	1983	1	33	27	8	0.24	0.30	0.00
	1982	1	35	32	9	0.26	0.28	0.00
Fuel	1987	10	10,370	3,994	514	0.05	0.13	0.01
Fabrication	1986	10	8,017	3,790	466	0.06	0.12	0.01
and	1985	11	8,596	5,032	643	0.07	0.13	0.05
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
Commercial	1987	106	210,677**	101,095**	40,947	0.19	0.41	0.37
Light Water	1986	101	194,048**	99,502**	42,982	0.22	0.43	0.44
Reactors***	1985	93	180,254**	94,873**	43,624	0.24	0.46	0.47
	1984	88	165,803**	95,224**	55,353	0.33	0.58	0.57
	1983	80	139,885**	83,546**	56,758	0.41	0.68	0.60
	1982	79	127,904**	80,871**	52,227	0.41	0.65	0.57
	1981	73	123,978**	80,664**	54,271	0.44	0.67	0.58
	1980	70	124,250**	77,903**	53,810	0.43	0.69	0.59
	1979	69	99,463**	62,316**	39,759	0.40	0.64	0.57
	1978	68	72,448**	45,474**	31,910	0.44	0.70	0.61
Grand Totals	1987	457	232,779**	112,097**	44,079	0.19	0.39	0.37
and Averages	1986	482	215,087**	110,694**	46,366	0.22	0.42	0.43
	1985	480	202,556**	107,989**	47,474	0.23	0.44	0.46
	1984	506	189,782**	108,748**	59,421	0.31	0.55	0.56
	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

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

*CR is the ratio of the annual collective dose delivered at annual doses exceeding 1.5 rems to the total annual collective dose. (see Section 3.1.8)

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

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

annual collective dose. One UNSCEAR report [Ref. 10] states that normal values of CR should be between 0.05 and 0.50. This means that, usually, no more than 50% of the collective dose should be due to individual doses that exceed 1.5 rems. The last column in Table 3.1 shows the values of CR for the different types of licensees; one can see that most categories now have a CR that is less than 0.50 and that 1987 is the third year in a row the CR for commercial LWRs and the grand total for all licensees has dropped below 0.50.

3.2 Annual Whole Body Dose Distributions

Table 3.2 is a compilation of the statistical summary reports currently being submitted by six categories of licensees. In nearly every category a large number of the doses are less than measurable, and very few doses exceed 4 or 5 rems (cSv). About 90% of the reported individuals continue to be monitored by nuclear power facilities where they receive about 90% of the total collective dose.

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

A summary of the annual whole body exposures reported to the Commission by certain categories of NRC licensees required to submit reports pursuant to 10 CFR § 20.407 is presented in Table 3.3, which shows that about 95% of the exposures have consistently remained less than two rems (cSv) since 1968. The number of individuals receiving an annual exposure in excess of

TABLE 3.2
DISTRIBUTION OF ANNUAL WHOLE BODY DOSES BY LICENSE CATEGORY
1987

LICENSE CATEGORY	*Number of Individuals with Whole Body Doses in the Ranges (rems or cSv)															TOTAL NUMBER MONI-TORED	NUMBER WITH MEAS. EXPOSURE	TOTAL COLLECTIVE DOSE (PERSON-cSv)
	No Meas-urable	Meas. <0.10	0.10-0.25	0.25-0.50	0.50-0.75	0.75-1.00	1.00-2.00	2.00-3.00	3.00-4.00	4.00-5.00	5.00-6.00	6.00-7.00	7.00-8.00	8.00-9.00	9.00-12.00	>12.0			
INDUSTRIAL RADIOGRAPHY																		
Single Location	903	301	66	33	12	3											1,318	415	44
Multiple Locations	1,879	1,693	715	609	290	216	346	129	28	9	3	1					5,918	4,039	1,791
Total	2,782	1,994	781	642	302	219	346	129	28	9	3	1					7,236	4,454	1,835
MANUFACTURING AND DISTRIBUTION																		
Broad	1,117	1,390	317	114	55	29	88	61	35	6							3,212	2,095	661
Limited	155	145	37	14	6	6	10	3	0	1							377	222	55
Total	1,272	1,535	354	128	61	35	98	64	35	7							3,589	2,317	716
LOW-LEVEL WASTE DISPOSAL																		
Total	605	122	28	13	6	4											778	173	24
INDEPENDENT SPENT FUEL STORAGE																		
Total	65	29	8	2	3	8	6	8									129	64	41
FUEL FABRICATION																		
Total	6,376	2,711	753	374	135	15	6										10,370	3,994	514
**COMMERCIAL POWER REACTORS																		
+Boiling Water	56,600	19,063	7,254	5,857	3,483	2,403	4,607	725	117	12							100,121	43,521	17,111
+Pressurized Water	60,384	28,419	10,960	8,857	5,155	3,443	6,189	987	124	10							124,528	64,144	23,836
+High Tempurature Gas	155	52	2														209	54	1
Total																			
+GRAND TOTALS	128,363	53,923	20,140	15,871	9,145	6,127	11,252	1,913	304	38	3	1					246,953	118,716	44,080

*Dose values exactly equal to the values separating ranges are reported in the next higher range.
**Includes all reactors that reported although all of them may not have been in commercial operation for a full year.
+These values have not been adjusted for the multiple counting of transient reactor workers.

TABLE 3.3
SUMMARY OF ANNUAL DOSE DISTRIBUTIONS FOR CERTAIN NRC LICENSEES

1968-1987

Year	Total Number of Monitored Persons: Reported Number	Total Number of Monitored Persons: Corrected Number*	Percent of Individuals With Doses <2 rems*	Percent of Individuals With Doses >5 rems*	Number of Individuals With Doses >12 rems*
1968	36,836		97.2%	0.5%	3
1969	31,176		96.5%	0.5%	7
1970	36,164		96.1%	0.6%	0
1971	36,311		96.3%	0.7%	1
1972	44,690		95.7%	0.5%	8
1973	67,862		95.0%	0.5%	1
1974	85,097		96.4%	0.3%	1
1975	78,713		94.8%	0.5%	1
1976	92,773		95.0%	0.4%	3
1977	98,212	93,438	93.8%	0.4%	1
1978	105,893	100,818	94.6%	0.2%	3
1979	131,027	125,316	95.2%	0.2%	1
1980	159,177	150,675	94.6%	0.3%	0
1981	157,874	149,314	94.6%	0.2%	1
1982	162,456	154,117	94.9%	0.1%	0
1983	172,927	164,239	94.6%	0.1%	0
1984	204,136	191,401	95.9%	0.1%	0
1985	215,197	204,319	97.0%	<0.01%	2
1986	227,943	215,378	97.7%	<0.01%	0
1987	246,953	232,981	98.6%	<0.01%	0

*Data for 1977-1987 are based on the distribution of individual doses after adjusting for the multiple counting of transient reactor workers (see Section 5).

five rems (cSv) has been gradually declining since 1971 and has been less than 0.01% since 1985.

3.3 Summary of Occupational Exposure Data by License Category

3.3.1 Industrial Radiography Licenses, Single and Multiple Locations

These licenses are issued to allow the use of sealed radioactive materials, usually in exposure devices or "cameras," that primarily emit gamma rays for

nondestructive testing of pipeline weld joints, steel structures, boilers, air craft and ship parts, and other high-stress alloy parts. Some firms are licensed to conduct such activities in one location, usually in a permanent facility which was designed and shielded for radiography, and others perform radiography at multiple, temporary sites in the field. The radioisotopes most commonly used are cobalt-60 and iridium-192. As shown in Table. 3.1, annual reports were received for 312 radiography licensees in 1987, which is about 20 (7%) less than that reporting in 1986.

Table 3.4 summarizes the reported data for the two types of radiography licenses for 1987 and for the previous two years for comparison purposes. For single location facilities, the table shows that in 1987, the number of workers receiving measurable doses (415) increased by 12% over last year's value, while the collective dose remained at 44 person-rems (cSv). This resulted in the average measurable dose decreasing slightly from 0.12 to 0.11 rem (cSv) in 1987. The sharp reduction in the collective dose reported for the single-location facilities from 1985 to 1986 was primarily due to change in the status of three licensees. One licensee ceased operations, and two other licensees became licensed for radiography in multiple locations.

At firms having multiple-location licenses in 1987, the number of monitored workers decreased by 15%, and the collective dose decreased by 13% from the 1986 values. This resulted in the average measurable dose increasing slightly to 0.44 rem (cSv). Overall, while the number of radiography firms has remained about the same, the values of the other parameters shown in Table 3.4 continue to decline, the average measurable dose in 1987 being about 0.4 rem (cSv). However, the average dose for workers performing radiography at a single location was one-fourth that amount. This was 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 1987 is presented in alphabetical order in Appendix A.

TABLE 3.4
ANNUAL EXPOSURE INFORMATION FOR INDUSTRIAL RADIOGRAPHERS

1985-1987

Year	Type of License	Number of Licenses	Number of Monitored Individuals	Workers with Measurable Doses	Collective Dose (person-rems or person-cSv)	Average Measurable Dose (rems or cSv)
1987	Single location	83	1,318	415	44	0.11
	Multiple locations	229	5,918	4,039	1,791	0.44
	Total	312	7,236	4,454	1,835	0.41
1986	Single location	95	1,345	371	44	0.12
	Multiple locations	240	6,607	4,759	2,064	0.43
	Total	335	7,952	5,130	2,108	0.41
1985	Single location	111	1,703	635	124	0.20
	Multiple locations	229	6,773	4,915	2,250	0.46
	Total	340	8,476	5,550	2,374	0.43

Since personnel monitoring data has frequently been found to have log-normal distributions [Ref. 11], trends in the data reported by radiography licensees may be observed from log probability plots* of data (see for example Fig. 3.1). There are a few characteristics of these distributions readers should keep in mind. First, each single plotted point represents the total cumulative percent of all workers with measurable doses up to the plotted value. All measurable doses up to 0.1 rem are included in the value plotted at 0.1 rem, and the values shown on the "Annual Dose" axis are derived from the dose ranges specified in 10 CFR § 20.407(b). Second,

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

because it is not possible to plot 100% on these figures, the data for the highest dose group are plotted at 99.99%, and can be said to account for all of the workers.

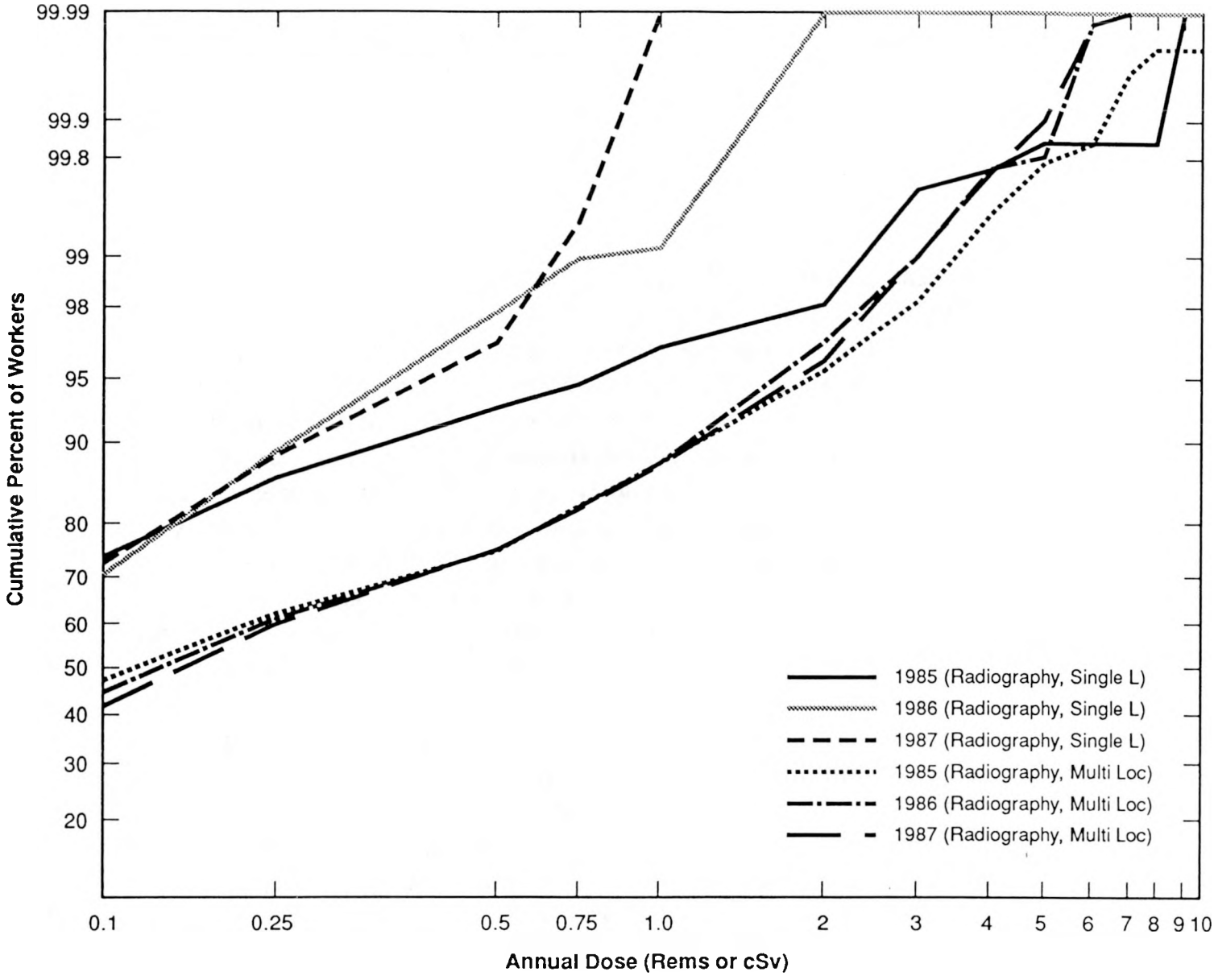
Figure 3.1 displays such plots of the doses incurred by workers monitored by the two types of radiography licensees for each of the years 1985 through 1987. The plots of the dose distributions of workers at single-location radiography facilities, where the workers receive doses that are lower than those usually received by workers at multiple-location facilities, lie above those of the multiple-location facilities.

Another feature of these types of graphs is that several comparisons of various dose distributions can be quickly made. For example, one can easily see in Figure 3.1 that in 1987, about 70% of the workers monitored by firms licensed for radiography at multiple locations received doses that were less than 0.50 rem (cSv), while some 97% of the workers monitored at single location radiography facilities received such doses. One should also note that the doses at which the 50 percentile line crosses the plot corresponds to the median dose, i.e. the dose below which half of the dose fell and above which half fell. For multiple location radiography, the median dose is near 0.10 rem (cSv) while for single locations, the median measurable dose is considerably less.

The relative positions and curvature of the graphs are indicative of certain characteristics of the dose distributions. The positions of the 1987 plots of the dose distribution of workers at single-location facilities above that of the other plots indicate smaller values of the average doses and CR (as shown in the chart at the bottom of the graph). This is due to the continuing decrease in the number of workers with doses that exceeded 1.5 rems (cSv) in 1987 as compared to previous years. The plots of the multiple-location licensees are also moving upwards, and one finds that the average doses and values of CR exhibit a decreasing trend, overall.

The tendency of the plots to curve upward for doses greater than one rem (cSv) is typical of distributions having several workers with doses in the higher dose ranges [Refs. 10, 11], and indicates that the entire distribution is not a log-normal one. Another theoretical analysis of occupational dose distributions [Ref. 12] has found that these data may be

Figure 3.1
Annual Dose Distribution of Workers at Industrial Radiography Facilities
1985 - 1987



	Average Meas. Dose (Rem or cSv)		CR*	
	Single Location	Multiple Location	Single Location	Multiple Location
1985	0.20	0.46	0.34	0.45
1986	0.12	0.43	0.02	0.38
1987	0.11	0.42	0.00	0.47

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

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 Limited

Manufacturer and distributor licenses are issued to allow the manufacture and distribution of radionuclides in various forms for a number of diverse purposes. The products are usually distributed to persons specifically licensed by the NRC or an Agreement State. Broad licenses are issued to larger organizations who may use many different radionuclides in many different ways and who have a comprehensive radiation protection program. The Limited 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. Limited 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 25) 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 1987 and the previous two years. The total number of workers receiving measurable doses as reported by these types of licensees increased by about 12% to 2,317 workers in 1987 as compared to 2,065 in 1986. The collective dose decreased slightly, causing the average dose to decrease to 0.31 rem (cSv). Looking at the information shown separately for the Broad and Limited 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 Limited licenses. However, when attempting to examine trends in the

TABLE 3.5
ANNUAL EXPOSURE INFORMATION FOR MANUFACTURERS AND DISTRIBUTORS

1985-1987

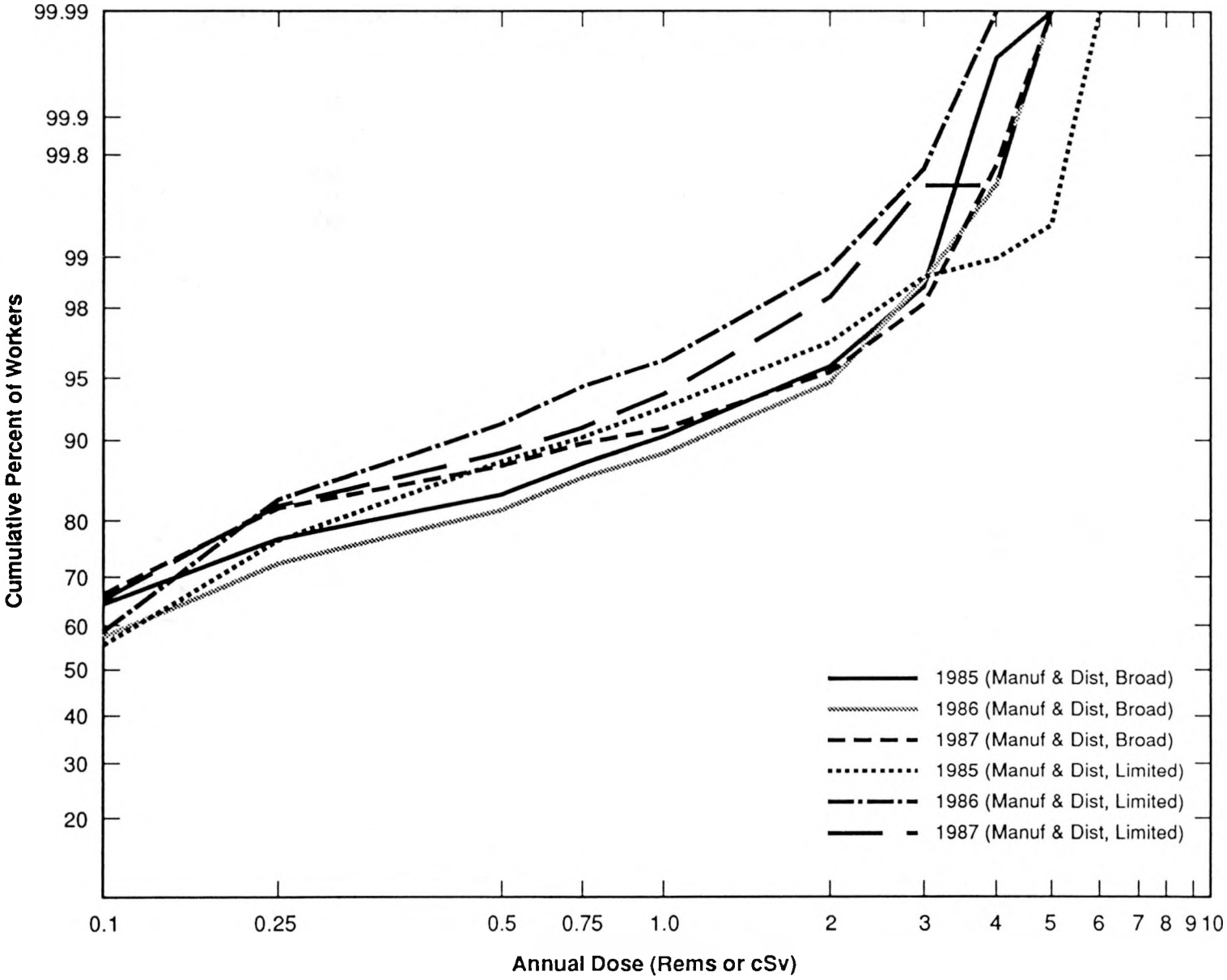
Year	Type of License	Number of Licenses	Number of Monitored Individuals	Workers with Measurable Doses	Collective Dose (person-rems or person-cSv)	Average Measurable Dose (rems or cSv)
1987	M & D-Broad	11	3,212	2,095	661	0.32
	M & D-Limited	13	377	222	55	0.25
	Total	24	3,589	2,317	716	0.31
1986	M & D-Broad	11	3,488	1,749	678	0.39
	M & D-Limited	22	554	316	67	0.21
	Total	33	4,042	2,065	745	0.36
1985	M & D-Broad	12	3,460	1,967	668	0.34
	M & D-Limited	21	498	283	87	0.31
	Total	33	3,958	2,250	755	0.34

data presented for this category of licensees, one should note that the types and quantities of radionuclides may fluctuate from year to year, and even during the year, so that some licensees may report dose data one year and not the next and may be included as a Broad licensee one year and an Limited licensee at other times. Since the number of reporting licensees is quite small, these fluctuations may have a significant impact on the values of the parameters.

In order to see the contribution that each of these licensees made toward the total values of the number of persons monitored, number of workers, and collective dose, Appendix A lists the values of these parameters for each licensee in alphabetical order by licensee name for 1987.

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 1985 through 1987. The position of the curves plotted for the Limited licenses above those plotted for the Broad licenses indicates that a larger portion of the workers reported by the Limited licensees have lower doses

Figure 3.2
Annual Dose Distribution of Workers at Manufacturing and Distribution Facilities 1985 - 1987



	Average Meas. Dose (Rem or cSv)		CR*	
	Broad	Limited	Broad	Limited
1985	0.34	0.31	0.50	0.49
1986	0.39	0.21	0.52	0.27
1987	0.32	0.25	0.57	0.38

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

than those reported by the Broad licensees. For example, the graphs show that about 90% of workers monitored by the broad licensees received doses that were less than one rem (cSv), while about 94% of the workers monitored by the Limited licensees received such doses in 1987. The value of CR reported for both categories of licensees increased somewhat in 1987 to values of 0.57 and 0.38 for Broad and Limited licensees, respectively.

3.3.3 Low-Level Waste Disposal Licenses

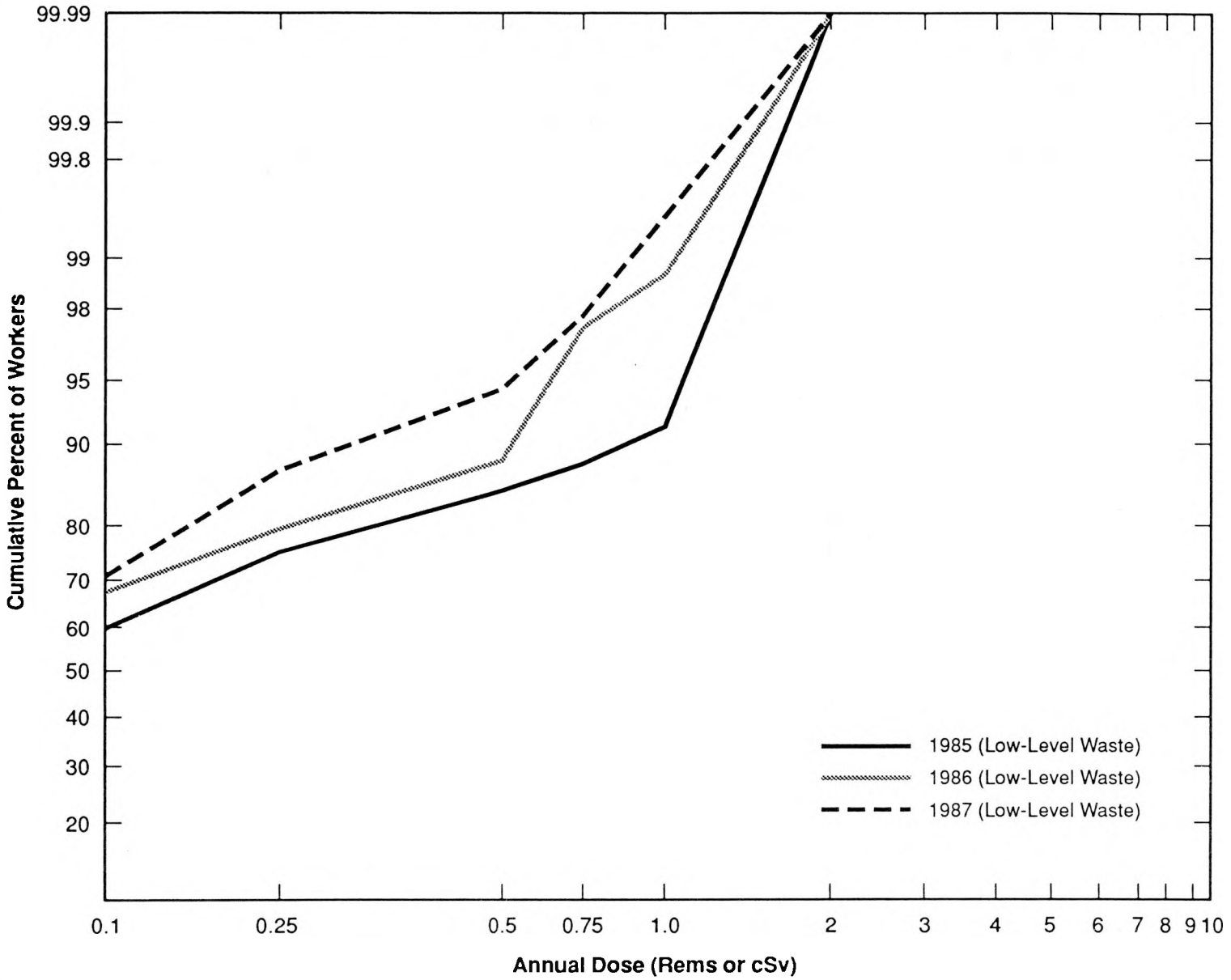
These licenses are issued to allow the receipt, possession, and disposal of low-level radioactive wastes at a land disposal facility. The licensee has the appropriate facilities to receive wastes from such places as hospitals and laboratories, store them for a short time and dispose of them in a properly prepared burial ground. The licensees in this category are located in and licensed by Agreement States that have primary regulatory authority over their activity. However, they also have an NRC license that covers certain special nuclear material they might receive. The annual dose reports submitted by these licensees include all doses received during the year regardless of whether they were due to NRC or Agreement State licensed material.

The requirement for this category of NRC licensee to file annual reports became effective in January 1983. While in 1982 and 1983 there was only one licensee in this category, there have been two licensees in this category since 1984. Table 3.1 summarizes the data reported for 1982 through 1987.

In 1987, the number of workers receiving measurable doses (173) remained about the same as last year (175), while the collective dose dropped from 31 to 24 person-rem (-cSv), a 22% decrease. The average measurable dose, therefore, decreased from 0.18 person-rem (-cSv) to 0.14 person-rem (-cSv).

Figure 3.3 displays log probability plots of the doses incurred by workers at the low-level waste disposal facilities from 1985 through 1987. One can quickly see that the distributions are quite similar, with all of the doses being two rems (cSv) or less, and at least 90% of the doses being less than one rem (cSv) for the years shown. The position of the plot for 1987 above that of the others is indicative of the decreases in the average dose and

Figure 3.3
Annual Dose Distribution of Workers at Low-Level Waste Disposal Facilities
1985 - 1987



	Average Meas. Dose (Rem or cSv)	CR*
1985	0.28	0.24
1986	0.18	0.05
1987	0.14	0.00

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

CR. Appendix A summarizes the exposure information reported by these two licensees in 1987.

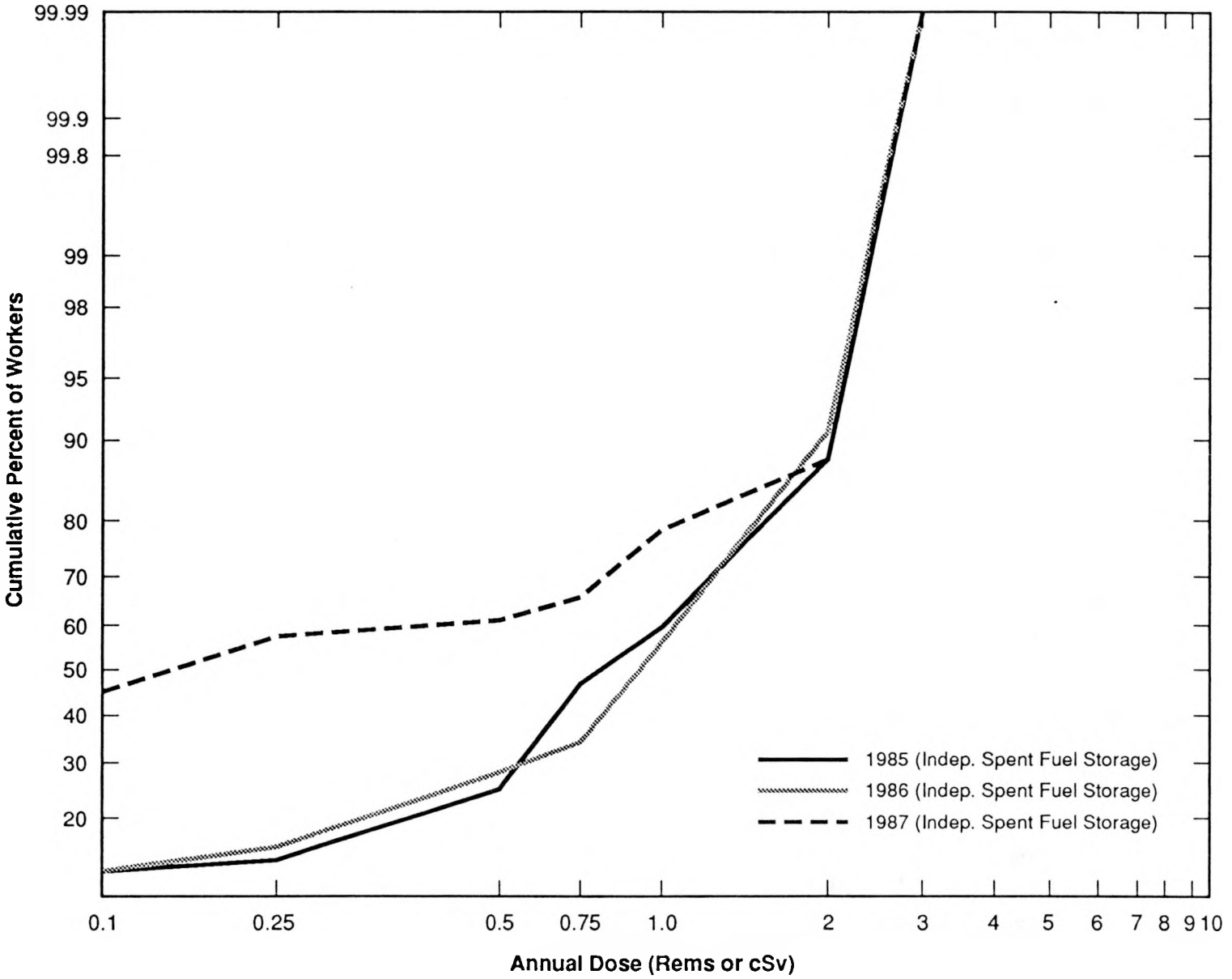
3.3.4 Independent Spent Fuel Storage Installation Licenses

These licenses are issued to allow the possession of power reactor spent fuel and other associated radioactive materials for the purpose of storage of such fuel in an independent spent fuel storage installation (ISFSI). Here, the spent fuel, which has undergone at least one year of decay since being used as a source of energy in a power reactor, is provided interim storage, protection, and safeguarding for a limited time pending its ultimate disposal. Presently, there is only one license for a facility that is not located at a nuclear power plant. Two other licenses have been issued to nuclear power utilities and any doses due to the storage of spent fuel have previously been included in the annual dose report submitted for the utilities' nuclear power plants. However, in 1987, one of the utilities separately reported the doses received by personnel working with the spent fuel, and these doses are now shown in this category along with the other facility that was presented in previous years.

Table 3.1 summarizes the data submitted for 1982 through 1986 by the one ISFSI that is separate from a nuclear power plant and shows the sum of this facility with the one located at a power plant in 1987. For comparison purposes, if one examines the information reported by this separate facility (see Appendix A), one finds that 40 workers received a collective dose of 40 person-rems (-cSv). These values are about the same as previous years, as is the average measurable dose of 1.01 rems. A contributing factor to this relatively high average dose is that the licensee reports the doses of only those workers <u>required</u> to be monitored for exposure to radiation, unlike most other licensees which report the doses of all individuals for whom monitoring was <u>provided</u>. This has a tendency to result in the calculation of a higher average dose.

Figure 3.4 displays log probability plots of the doses incurred by workers at the ISFSI's for the years 1985 through 1987. The position of the plot of the 1987 data considerably above that of the previous two years indicates fewer doses in the higher ranges. This is also reflected in the significant decrease in the average dose since 1985. The figure also shows that all

Figure 3.4
Annual Dose Distribution of Workers at Independent Spent Fuel Storage Facility
1985 - 1987



	Average Meas. Dose (Rem or cSv)	CR*
1985	1.06	0.51
1986	1.06	0.46
1987	0.64	0.62

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

doses remained less than 3 rems (cSv). Appendix A summarizes the exposure information reported by the two installations in 1987.

3.3.5 Fuel Fabrication and Reprocessing Licenses

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

The number of facilities licensed by the NRC to fabricate fuel, especially plutonium fuel, has been decreasing for the last several years (Table 3.1). A number of licensees began decontamination and decommissioning of their plutonium facilities, and for several years, the data for these licensees was shown in the "Decommissioning" category in Table 3.6. Since these facilities have ceased to fabricate plutonium fuel, they are not required to file annual reports and are no longer shown in the tables.

Table 3.6 shows that while the number of licensees involved in uranium fuel fabrication has remained at 10 since 1985, the collective dose increased by about 10% in 1987, from 466 to 514 person-rems (cSv). The number of workers with measurable external doses also increased slightly so that the average dose has remained at about 0.13 rem (cSv) since 1985. Appendix A lists alphabetically each of the ten licensees reporting in 1987, with the number of persons monitored, the number of workers receiving measurable external doses, and the collective dose for each licensee.

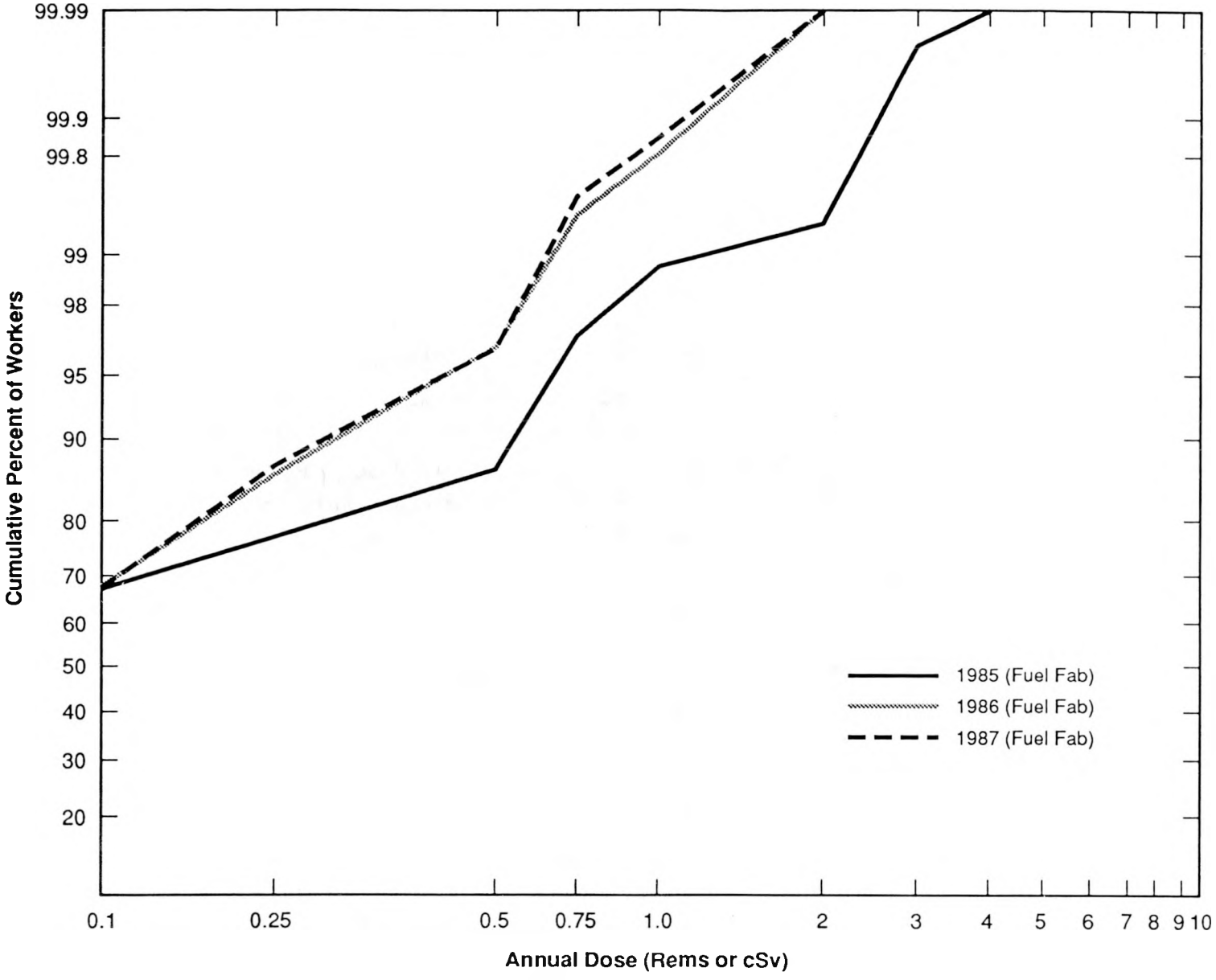
TABLE 3.6
ANNUAL EXPOSURE INFORMATION FOR FUEL FABRICATORS
1985-1987

Year	Type of License	Number of Licenses	Number of Monitored Individuals	Workers with Measurable Doses	Collective Dose (person-rems or person-cSv)	Average Measurable Dose (rems or cSv)
1987	Uranium Fuel Fab	10	10,370	3,994	514	0.13
1986	Uranium Fuel Fab	10	8,077	3,790	466	0.12
1985	Uranium Fuel Fab	10	7,777	4,732	575	0.12
	Pu Decommissioning	1	819	300	68	0.23
	Total	11	8,596	5,032	643	0.13

Figure 3.5 consists of the log-normal plots of the external dose distributions of workers at fuel fabrication facilities for the years 1985 through 1987. The plots are quite similar, with all doses for 1986 and 1987 being less than two rems (cSv) and about 99% of the doses being less than 0.75 rem (cSv). This is evident from the small average measurable doses to external radiation and the extremely small values for CR. It should be noted that exposure to internally deposited radioactive material is likely for workers at fuel fabrication facilities. However, internal doses are not included in the licensee's annual report to the NRC and are not presented in this document.

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.

Figure 3.5
Annual Dose Distribution of Workers at Fuel Fabricators and Processors
1985 - 1987



	Average Meas. Dose (Rem or cSv)	CR*
1985	0.13	0.05
1986	0.12	0.01
1987	0.13	0.01

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

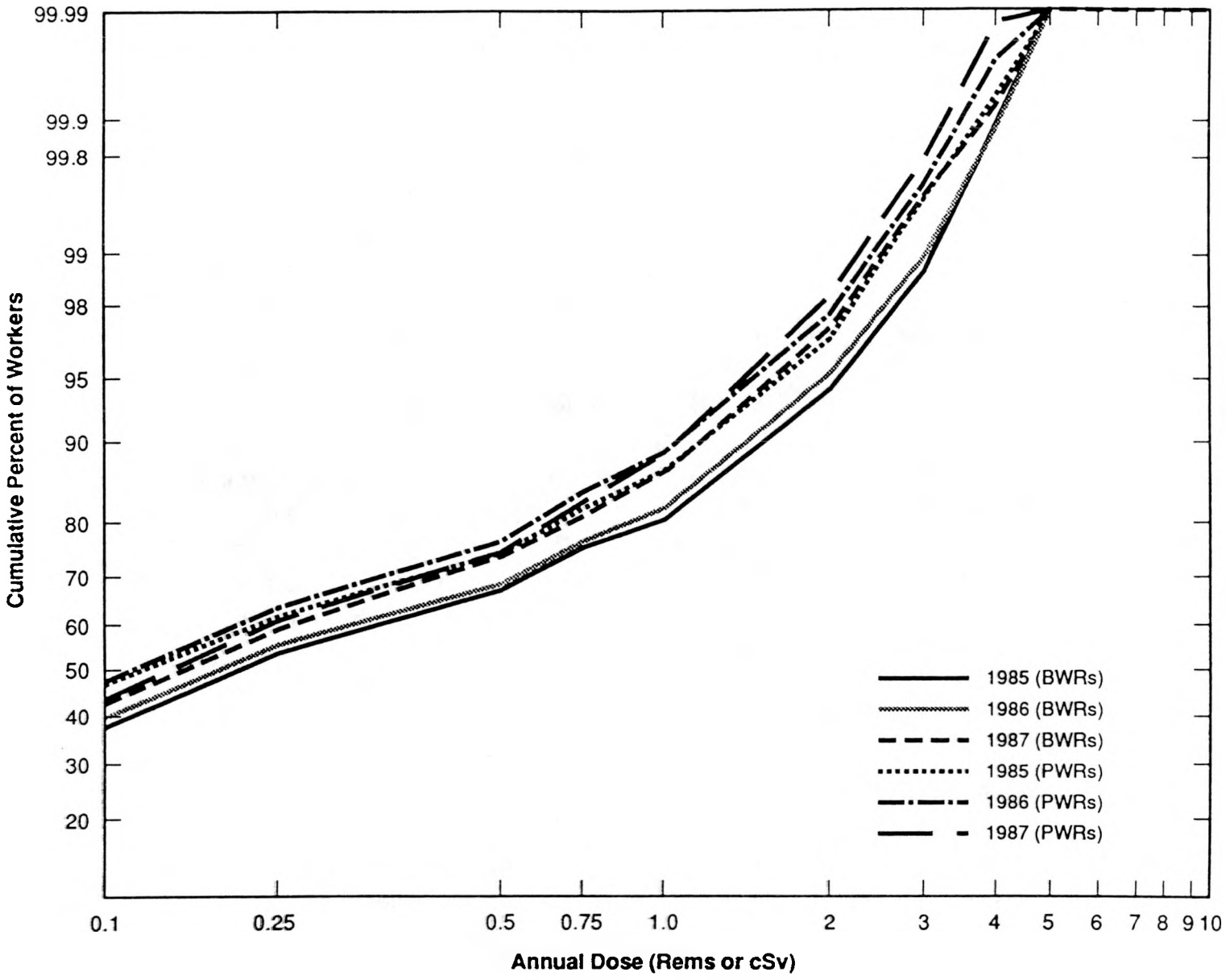
3.3.6 Light Water-Cooled Power Reactor (LWR) Licenses

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

As shown in Table 3.1, annual reports were received from nuclear power facilities for 106 licensed LWRs where 224,649 individuals were monitored for exposure to radiation in 1987. Of this number, 107,665 workers received a measurable dose and incurred a collective dose of 40,947 person-rems (person-cSv). This is about 5% less than the collective dose reported for 1986. However, the number of workers with measurable doses has continued to increase somewhat which has resulted in the average measurable dose continuing to decrease to reach an all-time low of 0.38 rem (cSv) in 1987. The dose distribution of workers monitored at each plant site is presented in alphabetical order by site name in Appendix B.

Figure 3.6 presents the log-normal plot of the distribution of the whole body doses received by radiation workers at nuclear power facilities for the years 1985 through 1987. The slightly higher position of the plots of the 1987 data indicates that a smaller portion of doses were distributed in the higher ranges. For example, in 1986 about 82% of the workers receiving measurable doses at BWRs received doses that were less than one rem (cSv), but in 1987 about 87% of such workers at BWRs received doses of less than one rem (cSv). The plots for the PWRs showed a similar shift. The graph also shows that the median dose has been decreasing and is now near 0.15 rem (cSv) for both PWRs and BWRs. 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].

Figure 3.6
Annual Dose Distribution of Workers at Light Water Reactor Facilities
1985 - 1987



	Average Meas. Dose (Rem or cSv)		CR*	
	BWRs	PWRs	BWRs	PWRs
1985	0.53	0.30	0.47	0.40
1986	0.49	0.36	0.45	0.36
1987	0.39	0.37	0.33	0.32

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

Listed at the bottom of the figure are the values of the average measurable dose and of CR for the last three years. These data show a decreasing overall trend at both types of facilities. While the parameters remain slightly higher for BWRs compared to PWRs, the BWR data show sharper decreases in the average measurable dose, down from 0.49 rem (cSv) in 1986 to 0.39 rem (cSv) in 1987, and in CR, down from 0.45 in 1986 to 0.33 in 1987. At PWRs, the average measurable dose rose slightly from 0.36 rem (cSv) in 1986 to 0.37 rem (cSv) in 1987, while the CR dropped from 0.36 in 1986 to 0.32 in 1987 indicating fewer doses in the higher ranges. More detailed presentations and analyses of the annual exposure information reported by nuclear power facilities can be found in Section 4.

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

A license to operate a power reactor is issued to utilities to allow them to use special nuclear material in a reactor to produce heat to generate electricity to be sold to consumers. In the HTGR, a gas, usually helium, is used as the primary coolant. Fort St. Vrain near Greeley, Colorado, was the only such reactor in operation in the U.S. in 1987. As shown in Table 3.7, annual whole body doses incurred by workers at the plant have been minimal. No one exceeded an annual dose of 0.25 rem (cSv) until 1985 when the highest annual dose was between 1 and 2 rems (cSv). In 1986 the average dose per worker dropped back down to 0.03 rem (cSv) along with a large decrease in the number of workers at the site. This trend continued in 1987 with the number of workers with measurable doses falling to 54 with an average measurable dose of 0.02 rem. The reactor has not operated near full power for significant periods of time since July, 1984, with most of the collective dose in 1985 resulting from maintenance activities. Although these activities resulted in the largest collective and average annual doses in the history of the plant, these doses remain much smaller than those for PWRs and BWRs.

TABLE 3.7
ANNUAL EXPOSURE INFORMATION FOR FORT ST. VRAIN

1974-1987

Year	No. of Individuals with Annual Doses in Ranges (rems or cSv)				Total No. of Individuals Monitored	Annual Collective Dose (person-rems or person-cSv)	Gross Electricity Generated (MW-yr)	Average Measurable Dose per Worker (rem or cSv)
	No Meas'ble Dose	Meas'ble Dose <0.10	0.10-0.25	0.25-2.00				
1974	1,597	63	1	0	1,661	3.3	0.0	0.05
1975	1,263	0	0	0	1,263	0.0	0.0	0.00
1976	1,362	25	0	0	1,387	1.3	2.8	0.05
1977	946	55	1	0	1,002	2.9	29.8	0.05
1978	896	34	0	0	930	1.7	75.7	0.05
1979	1,149	120	2	0	1,271	6.4	28.6	0.05
1980	902	57	1	0	960	3.0	83.2	0.05
1981	1,096	31	0	0	1,127	1.0	93.6	0.03
1982	978	22	0	0	1,000	0.4	72.6	0.02
1983	965	48	0	0	1,013	1.0	94.4	0.02
1984	1,616	62	8	0	1,686	3.0	10.9	0.04
1985	1,929	370	40	33	2,372	35.0	3.8	0.08
1986	221	66	4	0	291	1.8	9.7	0.03
1987	155	52	2	0	209	1.2	23.8	0.02

4 COMMERCIAL LIGHT WATER REACTORS - FURTHER ANALYSIS

4.1 Introduction

General trends in occupational radiation exposures at nuclear power reactors are best evaluated within the context of other pertinent information. In this chapter, some of the tables and appendices that summarize exposure data also show the type, capacity, and age of the reactor; the amount of electricity generated; the type of workers being exposed; and the sort of tasks being performed. Exposure data is then presented as a function of these data.

4.2 Definitions of Terms and Sources of Data

4.2.1 Number of Reactors

The number of reactors shown in Tables 4.1, 4.2, and 4.3 is the number of BWRs, PWRs, and LWRs, respectively, that had been in commercial operation for at least one full year as of December 31 of each of the indicated years. This is the number of reactors on which the average number of workers and average collective dose per reactor is based. Excluded are those reactors that may have been in commercial operation for only a few months during the first year and reactors that have been defueled and declared that they will not be commercially operated again. This yields conservative values for many of the averages shown in the tables. The date that each reactor was declared to be in commercial operation was found in Reference 14.

4.2.2 Electric Energy Generated

The electric energy generated in gross megawatt-years (MW-yr) each year by each facility is shown in Appendix C and graphically represented in Appendix E. This number was obtained by dividing the gross megawatt-hours of electricity annually produced by each facility by 8,760, the number of hours in the year, except for leap years when the number is 8,784 hours. The gross megawatt-years of generated electricity that are presented in Tables 4.1, 4.2, and 4.3 are the sums of that produced by the number of reactors included in each year. These sums are divided by the number of those reactors included in each year to yield the average amount of electric

TABLE 4.1

SUMMARY OF ANNUAL INFORMATION REPORTED BY COMMERCIAL BOILING WATER REACTORS†

1973-1987

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 Maximum Dependable Capacity Net (MWe)
1973	12	4,564	5,340	3,394	0.85	380	445	1.3	283	459
1974	14	7,095	8,769	4,059	0.81	507	626	1.7	290	513
1975	18	12,611	14,607	5,786	0.86	701	812	2.2	321	611
1976	23	12,626	17,859	8,586	0.71	549	776	1.5	373	647
1977	23	19,042	21,388	9,098	0.89	828	930	2.1	396	645
1978	25	15,096	20,278	11,774	0.74	604	811	1.3	471	668
1979	25	18,322	25,245	11,671	0.73	733	1,010	1.6	467	669
1980	26	29,530	34,094	10,868	0.87	1,136	1,311	2.7	418	664
1981	26	25,471	34,832	10,899	0.73	980	1,340	2.3	419	674
1982	26	24,437	32,235	10,665	0.76	940	1,240	2.3	410	674
1983	26	27,455	33,473	9,730	0.82	1,056	1,287	2.8	374	675
1984	27*	27,074	41,105	9,963	0.66	1,003	1,522	2.7	369	722
1985	28**	20,572	38,237	11,461	0.54	735	1,366	1.8	409	766
1986	30	19,515	37,928	11,055	0.51	651	1,264	1.8	369	786
1987	32***	16,871	41,737	15,109	0.40	527	1,304	1.1	472	832

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

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

**In 1985 it was decided that Dresden 1, a plant that has been shut down since 10/78, would not be put in commercial operation again, and it is no longer included in the count of reactors.

***In 1987 it was decided that LaCrosse, a plant that has been shut down since 4/30/87, would not be put in commercial operation again, and it is no longer included in the count of reactors.

TABLE 4.2

SUMMARY OF ANNUAL INFORMATION REPORTED BY COMMERCIAL PRESSURIZED WATER REACTORS†

1973-1987

Year	Number of Reactors Included	Annual Collective Doses (person-rems or person-cSv)	No. of Workers With Measurable Doses	Gross Electricity Generated (MW-yr)	Average Dose Per Worker (rems or cSv)	Average Collective Dose Per Reactor (person-rems or person-cSv)	Average No. Personnel With Measurable Doses Per Reactor	Average Collective Doses per MW-yr	Average Electricity Generated Per Reactor (MW-yr)	Average Maximum Dependable Capacity Net (MWe)
1973	12	9,399	9,440	3,770	1.00	783	787	2.5	314	533
1974	20	6,627	9,697	6,824	0.68	331	485	1.0	341	619
1975	26	8,268	10,884	11,983	0.76	318	419	0.7	461	643
1976	30	13,807	17,588	13,325	0.79	460	586	1.0	444	675
1977	34	13,469	20,878	17,346	0.65	396	614	0.8	510	699
1978	39	16,713	25,720	19,840	0.65	429	659	0.8	509	723
1979	42	21,659	38,877	18,249	0.56	516	924	1.2	434	729
1980	42	24,266	46,237	18,287	0.52	578	1,101	1.3	435	721
1981	44	28,671	47,351	20,552	0.61	652	1,076	1.4	467	745
1982	48	27,753	52,147	22,141	0.53	578	1,086	1.3	461	773
1983	49	29,016	52,173	23,196	0.56	592	1,065	1.3	473	778
1984	51	28,140	56,987	26,478	0.49	552	1,117	1.1	519	805
1985	54*	22,470	54,634	30,140	0.41	416	1,012	0.7	558	826
1986	59	23,008	62,994	32,743	0.37	390	1,068	0.7	555	835
1987	64	23,722	62,593	37,007	0.38	371	978	0.6	578	862

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

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

TABLE 4.3

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

1973-1987

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 Maximum Dependable Capacity Net (MWe)
1973	24	13,963	14,780	7,164	0.94	582	616	1.9	299	496
1974	34	13,722	18,466	10,883	0.74	404	543	1.3	320	575
1975	44	20,879	25,489	17,769	0.82	475	579	1.2	404	630
1976	53	26,433	35,447	21,911	0.75	499	669	1.2	413	663
1977	57	32,511	42,266	26,444	0.77	570	742	1.2	462	677
1978	64	31,809	45,998	31,614	0.69	497	719	1.0	494	702
1979	67	39,981	64,122	29,920	0.62	597	956	1.3	447	705
1980	68	53,796	80,331	29,155	0.67	791	1,181	1.8	429	699
1981	70	54,142	82,183	31,451	0.66	773	1,174	1.7	449	719
1982	74	52,190	84,382	32,795	0.62	705	1,139	1.6	443	738
1983	75	56,471	85,646	32,926	0.66	753	1,142	1.7	439	742
1984	78*	55,214	98,092	36,441	0.56	708	1,258	1.5	467	776
1985	82**	43,042	92,871	41,601	0.46	525	1,132	1.0	507	806
1986	89	42,523	100,922	43,798	0.42	478	1,134	1.0	492	818
1987	96***	40,593	104,330	52,116	0.39	423	1,087	0.8	543	852

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

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

**In 1985 it was decided that Dresden 1, a plant that has been shut down since 10/78, would not be put in commercial operation again, and it is no longer included in this count of reactors.

***In 1987 it was decided that LaCrosse, a plant that has been shut down since 4/30/87, would not be put in commercial operation again, and it is no longer included in this count of reactors.

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 Maximum Dependable Capacity

Average maximum dependable capacity, shown in Tables 4.1, 4.2, and 4.3 was found by dividing the sum of the net maximum dependable capacities (net MWe) of the reactors by the number of reactors included each year. The net maximum dependable capacity is defined to be the gross electrical output as measured at the output terminals of the turbine generator during the most restrictive seasonal conditions, less the normal station service loads. This "capacity" of each plant was found in Reference 14, and it is shown for each site in Appendix C.

4.3 Annual Whole Body Dose Distributions

Table 4.4 summarizes the distribution of the annual whole body doses received by workers at all commercial LWRs during each of the years 1973 through 1987. 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 1987 is shown in Appendix B. Table 4.4 shows that the number of monitored individuals continues to increase while the collective dose, after leveling off through the years 1980-1984, declined sharply in 1985 and has continued this decline through 1987. The values of CR show that the fraction of the collective dose due to individual doses greater than 1.5 rems (cSv) has also decreased, falling to

TABLE 4.4

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

1973 - 1987*

		Number of Individuals with Whole Body Doses in the Ranges (rems or cSv)																		
Year	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	Total Number Monitored	Number with Measurable Exposure	**Collective Dose (person-rems or cSv)	CR***
1973	19,043	5,494	1,698	1,214	740	652	2,468	1,584	422	251	125	71	38	16	7			33,823	14,780	13,963	0.72
1974	20,472	6,735	2,887	2,056	1,182	906	2,503	1,378	471	226	86	30	6					38,938	18,466	13,722	0.63
1975	18,854	8,841	3,674	2,750	1,685	1,339	3,948	1,872	691	423	169	60	24	12	0	1		44,343	25,489	20,879	0.65
1976	25,704	12,821	5,130	4,135	2,520	2,030	4,880	2,354	789	487	188	70	26	11	5	1		61,151	35,447	26,433	0.62
1977	23,502	12,395	6,030	4,518	2,890	2,220	5,649	2,856	1,288	661	186	89	47	23	6			62,360	38,858	32,511	0.64
1978	28,372	15,101	6,342	4,998	3,088	2,247	5,995	3,034	1,197	514	109	37	9	0	1	0	2	71,046	42,674	31,804	0.61
1979	39,434	22,711	9,020	7,400	4,755	3,206	7,536	3,403	1,404	545	117	42	17	3	0	1		99,594	60,160	39,981	0.57
1980	44,703	26,903	10,676	8,904	5,570	4,134	10,671	4,607	1,816	831	235	119	29	7	1			119,206	74,503	53,796	0.59
1981	38,149	26,805	11,226	9,330	6,042	4,497	11,170	4,811	1,999	585	122	96	11	3	1	0	1	114,848	76,699	54,142	0.58
1982	41,713	29,226	11,713	9,903	6,229	4,420	10,220	4,716	2,066	596	97	31	5	0	1	1		120,937	79,224	52,190	0.57
1983	48,545	29,774	11,413	9,522	5,998	4,366	11,553	5,390	2,276	716	121	38	8	2				129,722	81,177	57,212	0.60
1984	54,670	36,296	13,427	10,275	6,336	4,804	11,276	5,206	2,122	487	52	22						144,973	90,303	55,214	0.57
1985	59,634	36,831	13,008	11,041	6,627	4,547	10,040	3,575	1,001	157	1							146,462	86,828	43,042	0.48
1986	68,050	41,463	14,573	11,833	7,016	4,692	10,241	3,062	868	146								161,954	93,904	42,523	0.45
1987	86,766	41,542	16,013	12,984	7,686	5,400	10,652	2,146	442	63								183,694	96,928	40,593	0.37

*Summary of reports submitted in accordance with 10 CFR 20.407 by plants that had been in commercial operation for at least one full year as of December 31 of each of the indicated years. Figures shown for the years 1977-1987 have been adjusted for the muliple reporting of transient individuals (see Section 5).

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

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

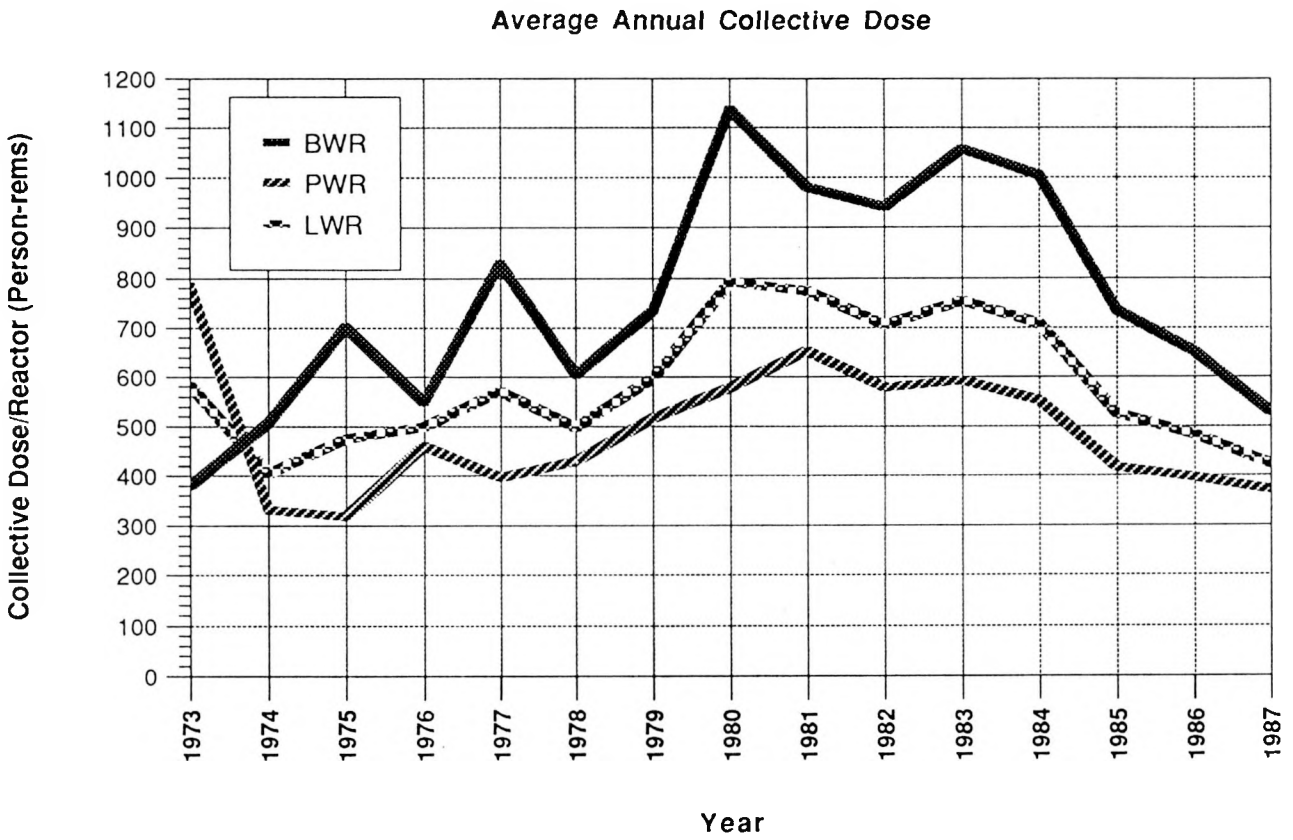
a value of 0.37, less than 0.50 for the third year in a row and the lowest ever reported. The distributions shown in Table 4.4 for 1987 have been corrected for the number of individuals that may have been reported by more than one site (see Section 5). Appendix F provides uncorrected dose distributions for BWRs and PWRs separately for the years 1981 through 1987.

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 1983. At that time, the average collective dose per reactor appeared to begin leveling off or decreasing slightly. After a sharp decrease in 1985, the collective dose has continued the more moderate decreasing trend in 1987 with collective doses per reactor of 527 person-rem (-cSv) and 371 person-rem (-cSv) at BWRs and PWRs, respectively. However, the number of workers per reactor has remained at about 1300 for BWRs and 1000 for PWRs since 1985.

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

Figure 4.1
Average Collective Dose and Number of Workers per Reactor
1973 – 1987



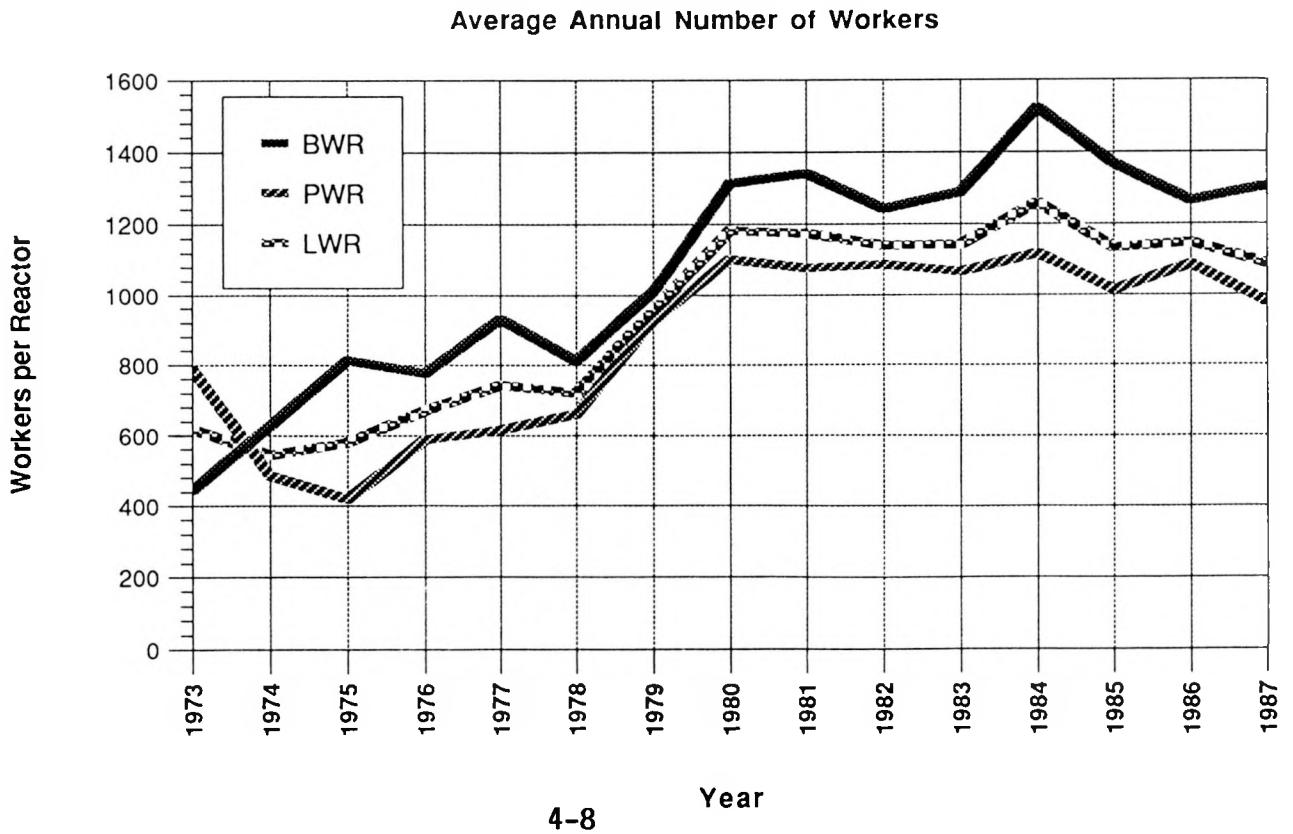


Figure 4.2
Annual Values at BWRs and PWRs
1973 - 1987

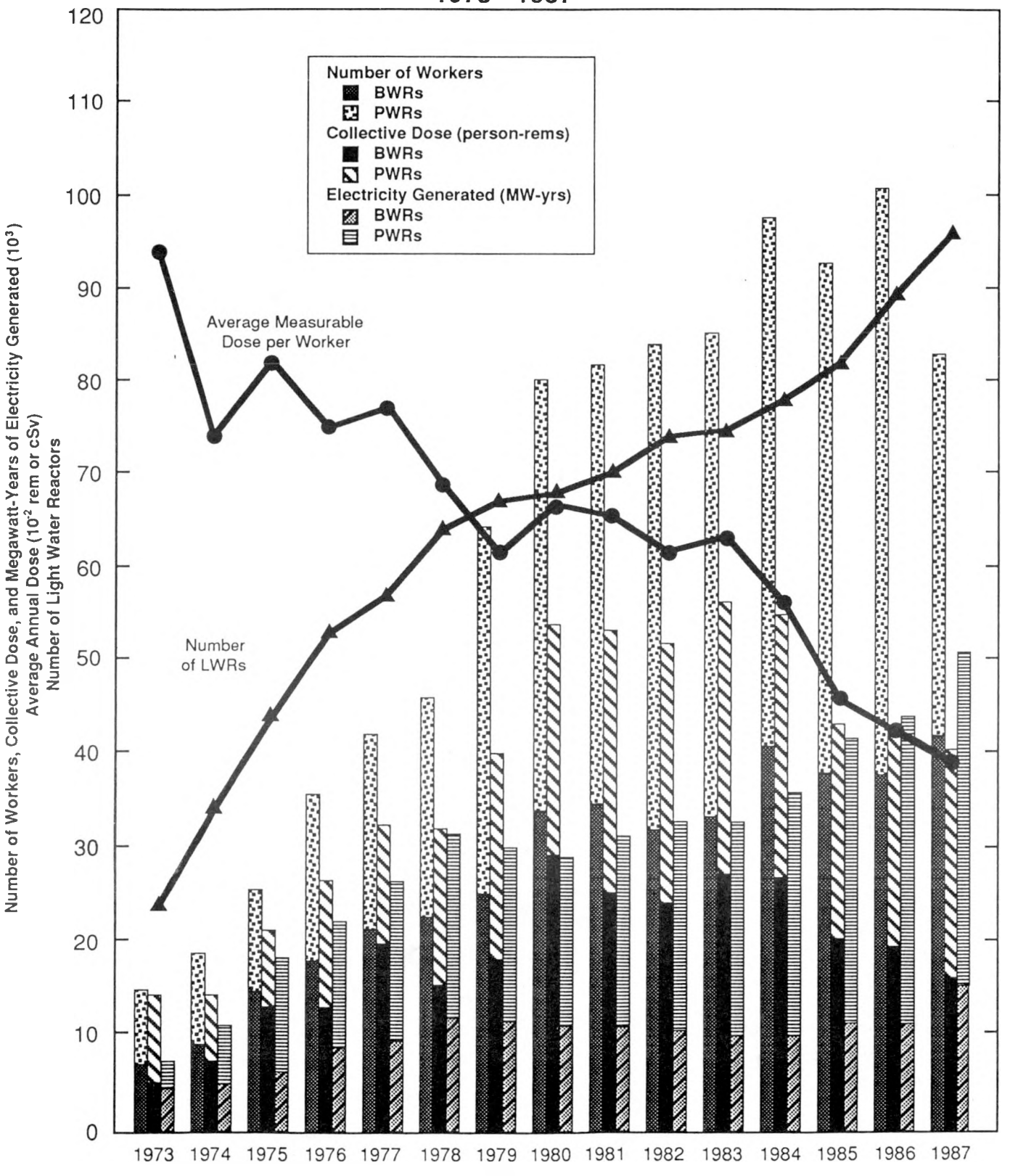
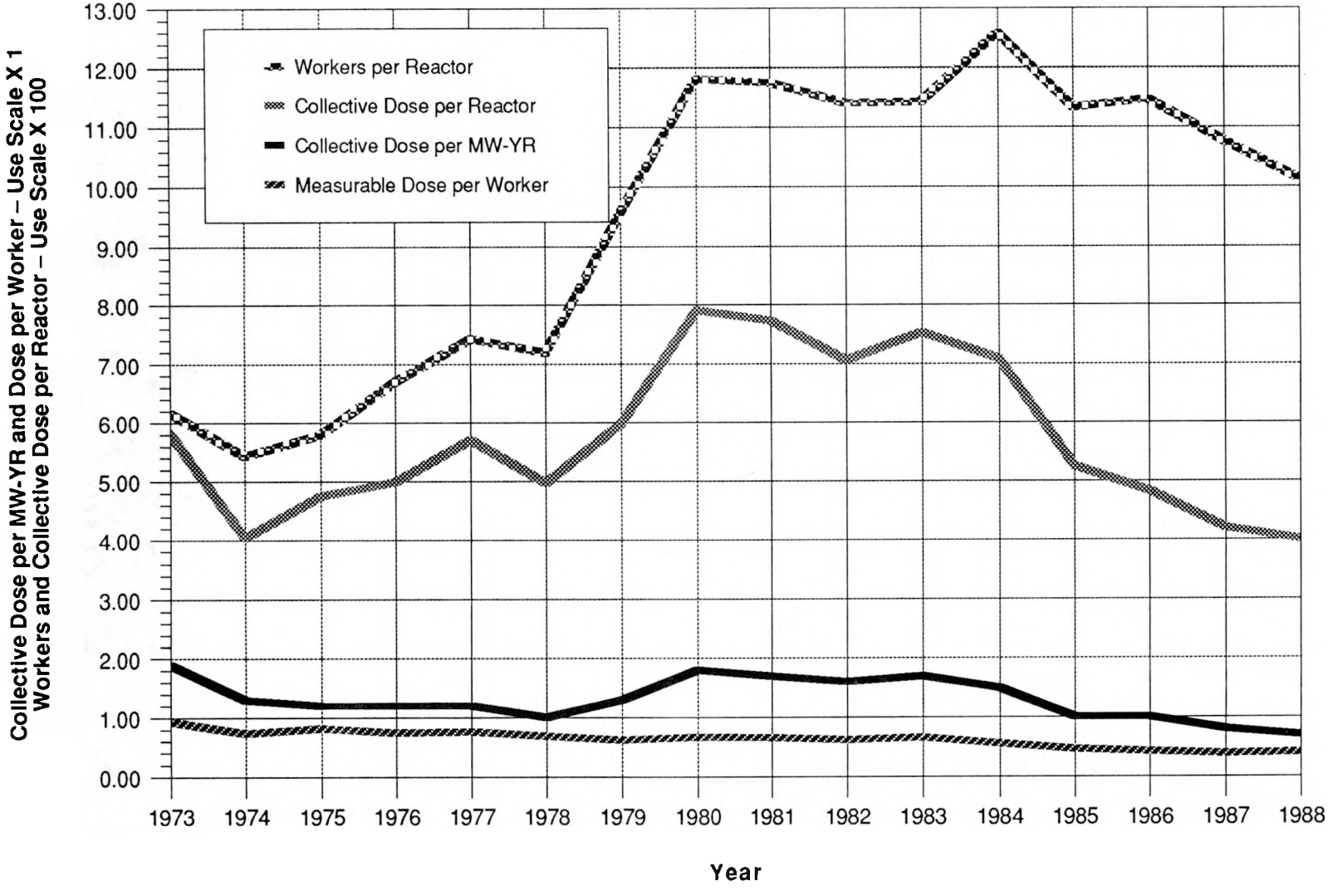


Figure 4.3
Average Annual Values at LWRs 1973 – 1987



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 1987. 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. After remaining between 400 and 500 person-rem (person-cSv) for the years 1978-1985, the median collective dose for PWRs fell to a value of 300 person-rem (person-cSv) in 1986 and rose slightly to 333 in 1987. At BWRs the median fluctuates more from year to year, and in 1987 the median collective dose continued on a downward trend, falling to 408 person-rems (person-cSv). Figure 4.4 also shows that in 1987 fifty percent of the PWRs reported collective doses between 225 and 456 person-rems (person-cSv) while fifty percent of the BWRs reported collective doses between 311 and 684 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 collective dose per reactor for each of the five years from 1983 through 1987. Two other parameters, dose per worker and collective dose per megawatt-year, are also given for each plant and could have been used in ranking the plants as well. Also shown is a parameter "CR" which is defined

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

Figure 4.4
Average, Median and Extreme Values of the Collective Dose per Reactor 1973-1987

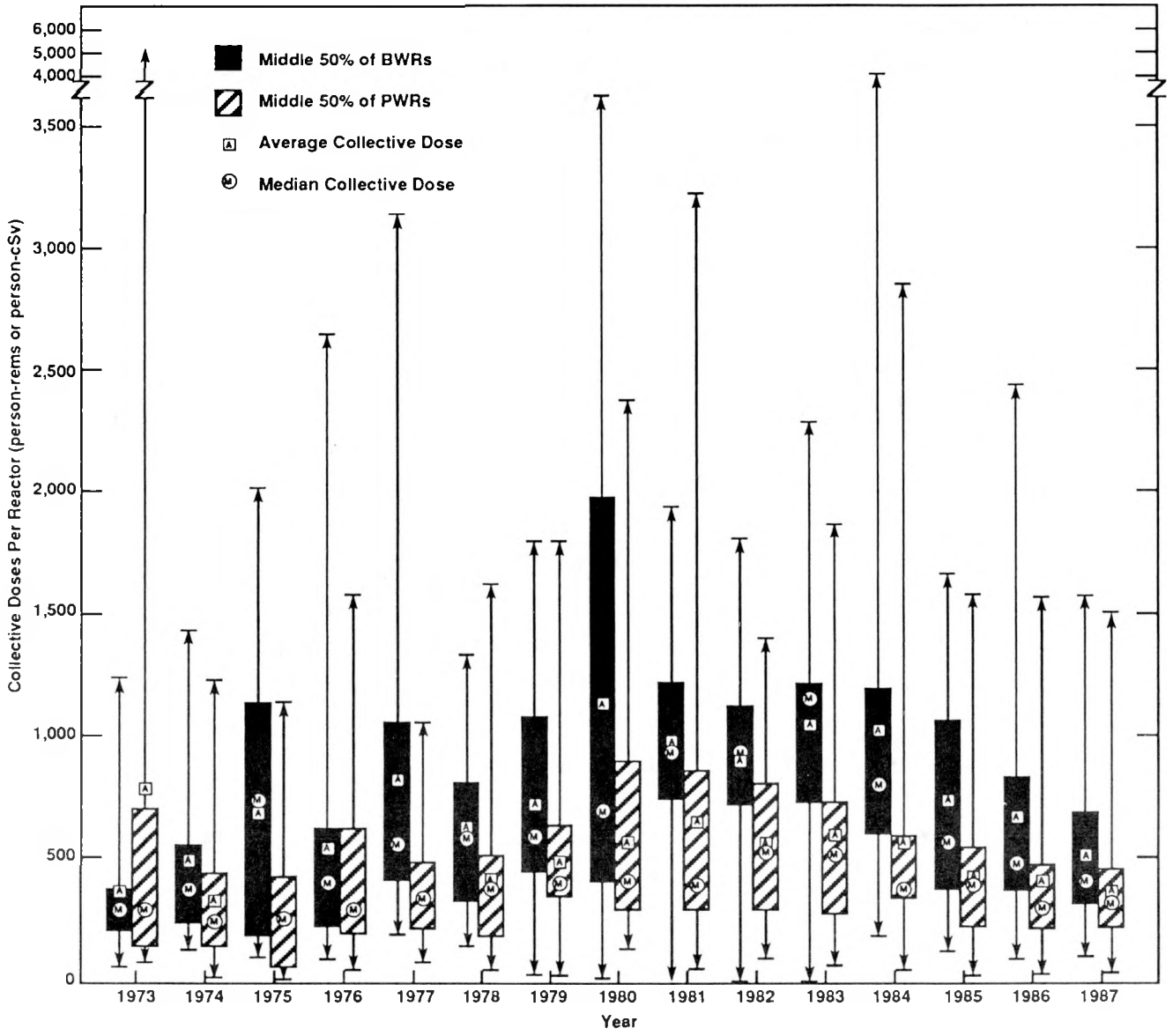


TABLE 4.5

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

1983 - 1987

1983

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

1984

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

1985

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

1986

Site Name	Coll. Dose per Site*	Dose per Worker (rems or cSv)	Coll. Dose per MW-Yr	CR**
Big Rock Point	84	0.42	1.4	0.33
Millstone Point 1	150	0.39	0.2	0.31
Duane Arnold	187	0.39	0.5	0.22
Washington Nuclear 2	222	0.22	0.4	0.14
Lacrosse	290	1.12	14.8	0.89
Cooper Station	320	0.36	0.7	0.34
Browns Ferry 1,2,3	1,050	0.35	---	0.30
Fitzpatrick	411	0.35	0.6	0.32
Susquehanna 1,2	828	0.28	0.6	0.16
Grand Gulf 1	436	0.29	0.9	0.23
Lasalle 1,2	949	0.59	3.0	0.37
Quad Cities 1,2	992	0.68	0.9	0.44
Peach Bottom 2,3	1,080	0.44	0.8	0.36
Monticello	596	0.67	1.5	0.40
Hatch 1,2	1,497	0.43	3.4	0.32
Pilgrim 1	874	0.33	7.2	0.31
Brunswick 1,2	1,909	0.57	1.8	0.52
Vermont Yankee 1	1,188	0.86	4.8	0.56
Nine Mile Point 1	1,220	0.65	3.3	0.60
Dresden 2,3	2,796	0.90	3.8	0.59
Oyster Creek	2,436	0.65	15.5	0.58

1987

Site Name	Coll. Dose per Site*	Dose per Worker (rems) or cSv)	Coll. Dose per MW-Yr	CR**
Cooper Station	103	0.19	0.2	0.17
Hope Creek	117	0.20	0.1	0.31
Nine Mile Point 1	141	0.12	0.3	0.04
Limerick 1	175	0.08	0.3	0.00
Big Rock Point	222	0.89	4.9	0.57
Vermont Yankee	303	0.37	0.7	0.17
Susquehanna 1,2	621	0.24	0.4	0.07
River Bend	378	0.30	0.6	0.17
Quad Cities 1,2	775	0.54	0.7	0.31
Browns Ferry 1,2,3	1,181	0.38	---	0.31
Washington Nuclear 2	406	0.34	0.6	0.25
Hatch 1,2	816	0.37	0.6	0.30
Grand Gulf	420	0.31	0.5	0.14
Oyster Creek	522	0.27	1.4	0.31
Monticello	568	0.60	7.1	0.32
Dresden 2,3	1,245	0.61	1.3	0.35
Duane Arnold	667	0.61	2.2	0.37
Millstone Point 1	684	0.43	1.3	0.28
La Salle 1,2	1,394	0.80	1.4	0.54
Brunswick 1,2	1,419	0.46	1.2	0.43
Fitzpatrick	940	0.60	1.9	0.50
Peach Bottom 2,3	2,195	0.50	6.0	0.35
Pilgrim	1,579	0.34	---	0.34

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

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

TABLE 4.6

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

1983 - 1987

1983

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

1984

Site Name	Coll. Dose per Site*	Dose per Worker (rems or cSv)	Coll. Dose per MW-Yr	CR**
Crystal River	49	0.09	0.1	0.00
Prairie Island 1, 2	147	0.27	0.2	0.16
Millstone Point 2	120	0.42	0.2	0.33
Kewaunee	139	0.29	0.3	0.15
Davis Besse	177	0.16	0.3	0.07
Rancho Seco	222	0.28	0.5	0.22
Indian Point 3	230	0.35	0.3	0.61
Calvert Cliffs 1, 2	479	0.35	0.3	0.33
Summer	295	0.26	0.6	0.11
Salem 1, 2	681	0.49	1.0	0.39
Three Mile Island 1, 2	688	0.64	-	0.45
Yankee Rowe	348	0.53	2.8	0.44
Oconee 1, 2, 3	1,106	0.53	0.5	0.39
Cook 1, 2	762	0.49	0.5	0.32
Zion 1, 2	786	0.71	0.6	0.47
Ginna	394	0.55	1.0	0.39
Point Beach 1, 2	789	0.58	1.0	0.50
Arkansas 1, 2	806	0.46	0.6	0.37
Trojan	433	0.42	0.8	0.34
Farley 1, 2	902	0.44	0.6	0.41
San Onofre 1, 2	946	0.15	0.7	0.14
Beaver Valley	504	0.36	0.9	0.32
McGuire 1	507	0.30	0.7	0.26
Sequoyah 1, 2	1,117	0.47	0.8	0.36
Fort Calhoun	563	0.62	2.0	0.47
Palisades	573	0.43	5.8	0.41
Turkey Point 3, 4	1,255	0.62	1.3	0.53
St. Lucie 1, 2	1,263	0.60	1.1	0.49
Maine Yankee	884	0.70	1.5	0.47
North Anna 1, 2	1,945	0.64	1.9	0.59
Surry 1, 2	2,247	0.70	2.2	0.61
Haddam Neck	1,216	0.85	3.0	0.66
Indian Point 2	2,644	0.91	6.3	0.61
Robinson 2	2,880	0.70	-	0.69

1985

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

1986

Site Name	Coll. Dose per Site*	Dose per Worker (rems or cSv)	Coll. Dose per MW-Yr	CR**
Summer 1	23	0.06	0.0	0.00
Yankee-Rowe 1	45	0.12	0.3	0.05
Fort Calhoun	74	0.10	0.2	0.17
Maine Yankee	100	0.20	0.1	0.17
Byron 1	104	0.10	0.1	0.04
Davis-Besse	124	0.13	37.8	0.03
Prairie Island 1,2	255	0.31	0.3	0.27
Wolf Creek 1	142	0.21	0.2	0.03
Kewaunee	169	0.34	0.4	0.21
Calvert Cliffs 1,2	347	0.27	0.2	0.19
Point Beach 1,2	402	0.61	0.5	0.33
Indian Point 3	202	0.34	0.3	0.20
Three Mile Island 1	213	0.16	0.4	0.10
Waterford 3	223	0.18	0.3	0.17
Callaway	225	0.21	0.3	0.04
St. Lucie 1,2	491	0.38	0.3	0.23
Zion 1,2	498	0.51	0.3	0.27
Sequoyah 1,2	526	0.30	---	0.24
San Onofre 1,2,3	824	0.23	0.5	0.15
Catawba 1	286	0.17	0.4	0.04
Salem 1,2	599	0.17	0.4	0.21
Diablo Canyon 1	304	0.24	0.5	0.16
Oconee 1,2,3	949	0.38	0.5	0.30
Ginna	357	0.40	0.8	0.27
North Anna 1,2	722	0.26	0.5	0.40
Cook 1,2	745	0.42	0.6	0.27
Trojan	381	0.29	0.4	0.15
Rancho Seco	402	0.27	---	0.22
Farley 1,2	858	0.37	0.6	0.35
Crystal River 3	472	0.45	1.5	0.38
Turkey Point 3,4	946	0.52	1.3	0.36
McGuire 1,2	1,015	0.44	0.7	0.37
Robinson 2	539	0.34	0.9	0.26
Arkansas 1,2	1,141	0.53	1.1	0.47
Beaver Valley	627	0.40	1.1	0.35
Palisades	672	0.47	6.6	0.44
Three Mile Island 2	915	0.61	---	0.59
Millstone Point 2	918	0.38	1.5	0.32
Surry 1,2	2,356	0.63	2.2	0.64
Indian Point 2	1,250	0.65	2.7	0.45
Haddam Neck	1,567	0.81	5.3	0.53

1987

Site Name	Coll. Dose per Site*	Dose per Worker (rems or cSv)	Coll. Dose per MW-Yr	CR**
Davis-Besse	47	0.08	0.1	0.00
Prairie Island 1,2	135	0.23	0.1	0.09
Wolf Creek	134	0.20	1.0	0.05
Three Mile Island 1	149	0.12	0.2	0.05
Waterford 3	156	0.16	0.2	0.05
Diablo Canyon 1,2	336	0.29	0.2	0.15
Oconee 1,2,3	1,142	0.43	0.6	0.29
Arkansas 1,2	382	0.34	0.3	0.23
Calvert Cliffs 1,2	412	0.30	0.3	0.22
Beaver Valley	210	0.16	0.3	0.04
Sequoyah 1,2	420	0.20	---	0.12
Yankee Rowe 1	217	0.37	1.6	0.22
Catawba 1,2	449	0.24	0.3	0.10
Kewaunee	226	0.30	0.5	0.17
San Onofre 1,2,3	696	0.33	0.4	0.21
Millstone Point 2,3	505	0.35	0.3	0.34
Point Beach 1,2	554	0.77	0.6	0.46
Farley 1,2	598	0.32	0.4	0.23
Rancho Seco	300	0.20	---	0.10
Salem 1,2	600	0.24	0.4	0.25
Cook 1,2	666	0.39	0.6	0.21
Palo Verde 1,2	669	0.37	0.4	0.41
Ginna	344	0.45	0.7	0.29
Zion 1,2	693	0.66	0.5	0.37
Surry 1,2	712	0.27	0.6	0.38
Trojan	363	0.30	0.7	0.13
Fort Calhoun	388	0.31	1.1	0.35
Callaway	393	0.36	0.5	0.22
Palisades	456	0.41	1.4	0.24
St. Lucie 1,2	951	0.47	0.7	0.35
Crystal River 3	488	0.35	1.1	0.21
Robinson 2	499	0.36	1.0	0.29
Indian Point 3	500	0.38	0.9	0.20
McGuire 1,2	1,043	0.36	0.6	0.31
Summer	560	0.52	0.9	0.42
Turkey Point 3,4	1,371	0.69	3.2	0.42
Maine Yankee	722	0.66	1.5	0.39
Haddam Neck	750	0.43	2.5	0.38
North Anna 1,2	1,521	0.58	1.4	0.54
Byron 1	769	0.42	1.2	0.33
Three Mile Island 2	977	0.71	---	0.59
Indian Point 2	1,217	0.61	2.0	0.37

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

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

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 1987 the value of CR continued to decline for most plants so that 95% (up from 84% in 1986) of the U.S. LWRs fell between 0.05 to 0.50, the range recommended by the UNSCEAR [Ref. 10]. Of the reactors having values of CR greater than 0.50, three were BWRs and two were PWRs, the highest value being 0.59, down from last year's high of 0.89.

In 1987, the five BWR sites with the highest collective doses all exceeded 700 person-rems (person-cSv) per reactor (Table 4.5). Although these five sites represented only 15% of the 32 BWRs, they contributed nearly 45% of the total collective dose incurred at BWRs in 1987. Most of the collective dose accumulated at the BWR site with the highest collective dose per reactor (1,579 person-rems (person-cSv)) was attributed to inservice inspection, cable replacement, valve maintenance and modifications for fire protection.

At PWRs, the five sites with the highest collective doses all equalled or exceeded 750 person-rems (person-cSv) per reactor (Table 4.6). Although representing 9% of the 64 PWRs included in 1987, they contributed 22% of the total collective dose at PWRs. The plant with the highest collective dose per reactor (1,217 person-rems (person-cSv)) in 1987 attributed most of the collective dose to steam generator servicing and repair, valve packing and repair, and refueling operations.

Table 4.7 lists the sites that had been in commercial operation for at least five years as of December 31, 1987, 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 105 reactor-years of operation accumulated by the 21 BWRs listed, the average annual collective dose per reactor was found to be 867 person-rems (person-cSv), the average measurable dose was 0.61 rem (cSv), and the average collective dose per megawatt-year was 2.3.

Based on the 210 reactor-years of operation at the 42 PWRs listed, the average annual collective dose per reactor, average measurable dose, and average collective dose per megawatt-year were found to be 469 person-rems (person-cSv), 0.47 rem (cSv) and 0.89 person-rem/megawatt-year, respectively.

TABLE 4.7a

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

1983-1987

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
Big Rock Point	1,015	1,678	0.60	242.7	4.2
Millstone Point 1	2,522	5,010	0.50	2854.9	0.9
Browns Ferry 1,2,3	8,693	15,137	0.57	3441.1	2.5
Duane Arnold	3,290	5,063	0.65	1522.5	2.2
Hatch 1,2	6,648	16,067	0.41	4536.4	1.5
Quad Cities 1,2	6,827	7,544	0.90	5570.9	1.2
Nine Mile Point 1	3,431	7,010	0.49	2251.1	1.5
Cooper Station	3,848	6,405	0.60	2068.1	1.9
Monticello	4,075	4,710	0.87	1863.3	2.2
Fitzpatrick	4,463	7,933	0.56	2822.1	1.6
Vermont Yankee	4,672	5,878	0.79	1777.3	2.6
Peach Bottom 2,3	12,042	17,446	0.69	4433.9	2.7
Brunswick 1,2	12,867	21,127	0.61	4423.9	2.9
Oyster Creek	8,017	12,686	0.63	1039.4	7.7
Pilgrim	8,590	16,422	0.52	1270.1	6.8
Grand Totals and Averages	91,000	150,116	0.61	40,117.7	2.3
Averages per Reactor-year	867	1,430		382.1	

*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 12/31/87 are not included.

TABLE 4.7b

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

1983-1987

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	499	4,130	0.12	1,970.2	0.3
Prairie Island 1,2	1,186	3,686	0.32	4,676.3	0.3
Kewaunee	875	2,703	0.32	2,284.2	0.4
Yankee Rowe 1	890	2,679	0.33	741.0	1.2
Calvert Cliffs 1,2	2,600	7,562	0.34	6,713.7	0.4
Salem 1,2	2,665	10,987	0.24	6,012.3	0.4
Sequoyah 1,2	3,625	9,814	0.37	4,296.9	0.8
Point Beach 1,2	3,630	5,129	0.71	3,984.8	0.9
Fort Calhoun	1,832	4,758	0.39	1,774.4	1.0
Trojan	1,847	5,393	0.34	3,268.1	0.6
Oconee 1,2,3	5,708	11,887	0.48	10,348.9	0.6
Arkansas 1,2	4,012	8,371	0.48	5,776.0	0.7
Farley 1,2	4,178	10,720	0.39	6,950.8	0.6
Indian Point 3	2,109	4,588	0.46	2,518.6	0.8
Beaver Valley	2,173	6,354	0.34	3,121.0	0.7
Zion 1,2	4,454	5,906	0.75	6,599.1	0.7
Crystal River 3	2,250	6,686	0.34	2,326.0	1.0
Ginna	2,377	4,201	0.57	2,072.1	1.1
Rancho Seco	2,467	6,950	0.35	1,046.6	2.4
Main Yankee	2,571	4,458	0.58	3,108.8	0.8
North Anna 1,2	5,691	13,181	0.43	6,435.8	0.9
Indian Point 2	5,789	8,590	0.67	2,979.6	1.9
Palisades	3,185	7,426	0.43	1,613.8	2.0
Turkey Point 3,4	7,506	10,633	0.71	4,045.4	1.9
Cook 1,2	3,776	8,431	0.45	6,414.5	0.6
Haddam Neck	5,018	7,167	0.70	2,013.2	2.5
Robinson 2	5,152	10,699	0.48	2,154.5	2.4
Surry 1,2	10,350	15,596	0.66	5,322.5	1.9
Grand Totals and Averages	98,415	208,685	0.47	110,569.1	0.89
Averages per Reactor-year	469	994		526.5	

*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 12/31/87 are not included.

Almost all of these values, at both types of facilities, are lower than those found for the five year period ending in 1986. The only exception was the average measurable dose, 0.47 rem, for PWRs which remained about the same.

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

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 1987 included replacement of recirculation system piping, reactor vessel component in-service inspection, and plant decontamination activities. At PWR facilities, the major contributors to the collective dose have been extensive tube inspection, sleeving, and plugging related to the repair of steam generators. Even with the use of better techniques and robots, these tasks continue to be responsible for a major precentage of the collective dose. It should be noted that the differences in nuclear plant designs and the ages of the plants [Ref. 15], even between plants of a given type, affect the nature of these parameters. Therefore care should be exercised when attempting to draw conclusions from these data.

4.6 Collective Dose by Work Function and Employee Type

A second type of annual statistical report that is required by each plant's technical specifications provides the collective dose of workers monitored at each plant site by employee type (plant, utility, or contractor) and by work and job functions. A copy of the report submitted for each reactor site is provided in Appendix D, and much of the data are graphically represented for each site in Appendix E. Tables 4.8 and 4.10 summarize the

1987 data for BWRs, PWRs and LWRs. Table 4.8 shows that at both BWR's and PWR's about 70% of the collective dose is incurred during routine and special maintenance activities. Also, the portion of the collective dose incured during most of the other activities is similar at the two types of plants. One should note that the collective doses obtained from these reports are not used in any other tables in this document for the following reasons: the technical specifications of each plant requires only 80% of the plant's collective dose be accounted for and some utilities may use the results of self-reading pocket dosimeters instead of the results of the official dosimeter (usually thermoluminescent dosimeters) in compiling the data. Also, when examining the number of personnel shown on these reports, it should be kept in mind that individuals who perform tasks in more than one category may be counted more than once.

Table 4.9 shows that workers performing special maintenance usually incurred the largest portion (35%-45%) of the collective dose and that workers performing routine maintenance activities usually incurred between 30% and 35% of the total each year since 1977. The figures have been fairly stable over the years with these two categories always accounting for the majority of the collective dose. Some of the fluctuations shown in the percentage of the dose incurred during refueling activities at PWRs (particularly in 1987 when it increased to 8.1%) is due to the fact that two or three PWR's include doses other than those directly associated with fuel movement in this category.

Figure 4.5 graphically shows the trends in the collective dose by work function and type of personnel for the years 1982 through 1987 for BWRs and PWRs separately. Contractor personnel still incur most of the collective dose during special maintenance, but, at least in recent years, the collective dose is nearly equally divided between contractor and plant and utility personnel during routine maintenance, waste processing, and refueling activities. The general decrease in collective dose is also apparent among most of these activities.

Table 4.10 presents the distribution of the collective dose for 1987 at all LWRs among five occupations. As expected, maintenance personnel incurred the majority (67%) of the collective dose with contractor maintenance

TABLE 4.8

ANNUAL COLLECTIVE DOSE
BY WORK FUNCTION AND PERSONNEL TYPE
1987

WORK AND JOB FUNCTION	STATION EMPLOYEES PERSON-REM	% OF TOTAL	UTILITY EMPLOYEES PERSON-REM	% OF TOTAL	CONTRACT WORKERS PERSON-REM	% OF TOTAL	TOTAL PER FUNCTION PERSON-REM	% OF TOTAL
BOILING WATER REACTORS								
REACTOR OPS & SURV	1,438	8.9%	116	0.7%	882	5.5%	2,436	15.1%
ROUTINE MAINTENANCE	2,290	14.2%	473	2.9%	3,419	21.2%	6,182	38.4%
IN-SERVICE INSPECTION	113	0.7%	65	0.4%	1,097	6.8%	1,275	7.9%
SPECIAL MAINTENANCE	982	6.1%	368	2.3%	3,892	24.2%	5,242	32.6%
WASTE PROCESSING	269	1.7%	9	0.1%	256	1.6%	534	3.3%
REFUELING	166	1.0%	16	0.1%	256	1.6%	438	2.7%
TOTALS	5,258	32.6%	1,047	6.5%	9,802	60.9%	1,6107	100.0%
PRESSURIZED WATER REACTORS								
REACTOR OPS & SURV	1,389	5.8%	69	0.3%	876	3.6%	2,335	9.7%
ROUTINE MAINTENANCE	2,460	10.2%	891	3.7%	4,536	18.8%	7,887	32.7%
IN-SERVICE INSPECTION	260	1.1%	168	0.7%	1,494	6.2%	1,922	8.0%
SPECIAL MAINTENANCE	1,494	6.2%	882	3.7%	5,761	23.9%	8,137	33.7%
WASTE PROCESSING	379	1.6%	13	0.1%	649	2.7%	1,042	4.3%
REFUELING	879	3.6%	308	1.3%	1,622	6.7%	2,809	11.6%
TOTALS	6,862	28.4%	2,331	9.7%	14,938	61.9%	24,131	100.0%
ALL LIGHT WATER REACTORS								
REACTOR OPS & SURV	2,827	7.0%	186	0.5%	1,758	4.4%	4,771	11.9%
ROUTINE MAINTENANCE	4,751	11.8%	1,364	3.4%	7,955	19.8%	14,070	35.0%
IN-SERVICE INSPECTION	373	0.9%	233	0.6%	2,591	6.4%	3,197	8.0%
SPECIAL MAINTENANCE	2,477	6.2%	1,249	3.1%	9,652	24.0%	13,378	33.2%
WASTE PROCESSING	648	1.6%	23	0.1%	905	2.2%	1,576	3.9%
REFUELING	1,045	2.6%	324	0.8%	1,878	4.7%	3,247	8.1%
TOTALS	12,120	30.1%	3,379	8.4%	24,740	61.5%	40,238	100.0%

*Table does not inlcude results from the PWRs at Point Beach 1, 2 (554 person-rems) because the data for these units were not submitted in the suggested format.

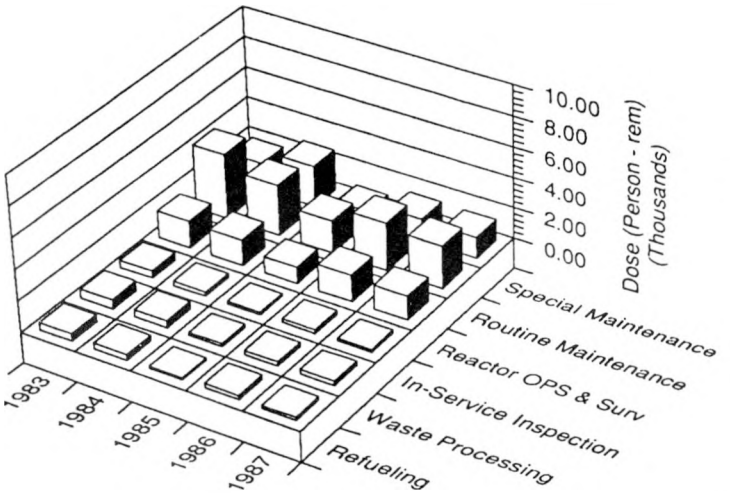
TABLE 4.9

PERCENTAGES OF ANNUAL COLLECTIVE
DOSE AT LWRs BY WORK FUNCTION
1978 - 1987

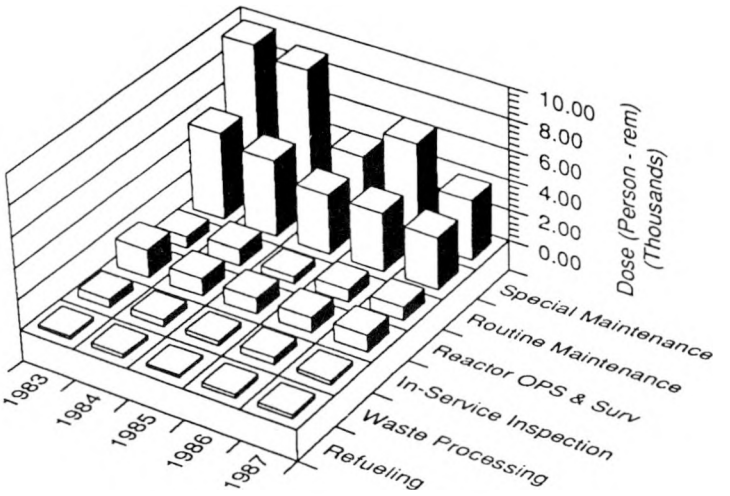
WORK FUNCTION	PERCENTAGE OF COLLECTIVE DOSE EACH YEAR									
	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
REACTOR OPERATIONS AND SURVEILLANCE	13.3%	12.2%	9.5%	8.9%	9.4%	10.1%	11.4%	12.8%	12.8%	11.9%
ROUTINE MAINTENANCE	31.5%	29.2%	35.5%	36.1%	27.9%	29.7%	26.9%	34.6%	33.2%	35.0%
INSERVICE INSPECTION	7.7%	9.0%	5.5%	5.3%	6.5%	7.6%	6.3%	8.6%	8.3%	8.0%
SPECIAL MAINTENANCE	35.9%	39.4%	40.6%	40.5%	46.8%	43.9%	45.4%	32.5%	35.5%	33.2%
WASTE PROCESSING	5.0%	3.6%	3.0%	4.2%	5.0%	4.6%	3.6%	5.1%	4.0%	3.9%
REFUELING	6.6%	6.6%	6.1%	5.0%	4.4%	4.1%	6.4%	6.5%	6.2%	8.1%

Figure 4.5
Collective Dose by Work Function and Personnel Type
1983 – 1987

Boiling Water Reactors

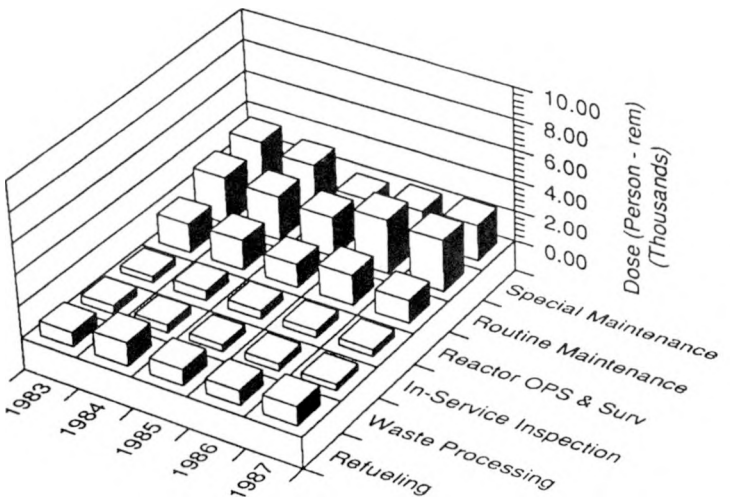


Plant



Contract

Pressurized Water Reactors



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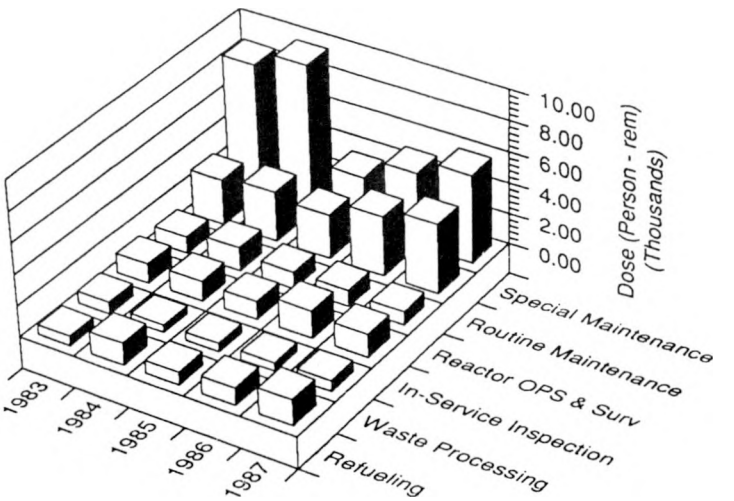

Contract

TABLE 4.10

ANNUAL COLLECTIVE DOSE
BY OCCUPATION AND PERSONNEL TYPE
1987

OCCUPATION	STATION EMPLOYEES PERSON-REM	% OF TOTAL	UTILITY EMPLOYEES PERSON-REM	% OF TOTAL	CONTRACT WORKERS PERSON-REM	% OF TOTAL	TOTAL PER FUNCTION PERSON-REM	% OF TOTAL
BOILING WATER REACTORS								
MAINTENANCE	2,823	17.5%	908	5.6%	7,712	47.9%	11,443	71.0%
OPERATIONS	996	6.2%	42	0.3%	410	2.5%	1,448	9.0%
HEALTH PHYSICS	872	5.4%	6	0.0%	989	6.1%	1,867	11.6%
SUPERVISORY	272	1.7%	19	0.1%	153	1.0%	443	2.8%
ENGINEERING	294	1.8%	73	0.5%	538	3.3%	905	5.6%
TOTALS	5,258	32.6%	1,048	6.5%	9,802	60.9%	16,107	100.0%
PRESSURIZED WATER REACTORS*								
MAINTENANCE	3,507	14.4%	2,126	8.8%	9,978	40.8%	15,610	64.0%
OPERATIONS	1,380	5.7%	27	0.1%	636	2.6%	2,043	8.5%
HEALTH PHYSICS	1,182	4.9%	17	0.1%	2,546	10.5%	3,745	15.4%
SUPERVISORY	308	1.3%	26	0.1%	325	1.3%	659	2.7%
ENGINEERING	486	2.0%	136	0.6%	1,453	6.0%	2,074	8.6%
TOTALS	6,862	28.2%	2,331	9.7%	14,938	61.3%	24,131	100.0%
ALL LIGHT WATER REACTORS								
MAINTENANCE	6,330	15.6%	3,034	7.5%	17,689	43.6%	27,053	66.8%
OPERATIONS	2,376	5.8%	69	0.2%	1,045	2.6%	3,491	8.7%
HEALTH PHYSICS	2,054	5.1%	23	0.1%	3,535	8.8%	5,612	13.9%
SUPERVISORY	580	1.4%	44	0.1%	478	1.2%	1,103	2.7%
ENGINEEING	780	1.9%	209	0.5%	1,991	4.9%	2,980	7.4%
TOTALS	12,120	30.0%	3,379	8.4%	24,740	61.1%	40,238	100.0%

*Table does not include results from the PWRs at Point Beach 1, 2 (554 person-rems) because the data for these plants were not submitted in the suggested format.

personnel receiving about twice as much as the station and utility maintenance employees combined. This is about the same as that reported for 1985 and 1986. Supervisory personnel received 2.75% of the dose, compared to 3.6% in 1986, while workers in the remaining three occupations--operations, health physics, and engineering--received 8.71%, 13.97%, and 7.41% respectively, of the collective dose. None of these values changed very much from those found for 1985 and 1986. 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 annual reports required to be submitted pursuant to 10 CFR Part 20.407.

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 calculated 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 calculated 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 Number of Personnel by Work Function and Employee Type

Half of the information presented in the statistical annual reports shown in Appendix D concerns the number of various types of personnel that performed certain work functions. Tables 4.11 and 4.12 sum this information to show the percentage of personnel by work function and occupation. The major problem in interpreting the figures shown in these tables is the fact that the same person may perform several work functions during the year so that the total number of personnel obtained by summing those shown in the various work functions would be inflated. However, Table 4.11 is still useful in showing the percentage of personnel associated with each of the six work functions shown. As one would expect, about 60% of the personnel perform routine or special maintenance functions, about 20% are involved with reactor operations and surveillance, and the remaining 20% are about equally divided among the other three work functions.

Table 4.12 shows the percentage of personnel in each of five "occupations" at BWRs, PWRs, and LWRs. The workers are similarly distributed at BWRs and PWRs, the largest difference occurring in the maintenance and health physics categories with 64% and 11% at BWRs and 59% and 15% at PWRs, respectively. A large part of these two categories are contractor personnel whereas station and utility personnel form the majority of the "operations" category. Overall, some 58% of the personnel are contractors, 33% are station employees, and 8% are utility employees.

Table 4.13 presents the average annual dose incurred by workers in the five "occupations" in 1987. These averages were calculated by dividing the collective dose reported for these groups (see Table 4.10) by the number of individuals shown in Table 4.12. It shows that in nearly every instance, the maintenance and health physics personnel incur the highest average doses and that supervisory and engineering personnel usually have the lowest. When examining the values of the averages that are given in Table 4.13, one should bear in mind the several sources of error to which they are subject: (1) the number of individuals may be inflated because the same plant contractor employee may work at several plants so that the employee

TABLE 4.11
NUMBER OF PERSONNEL*
BY WORK FUNCTION AND PERSONNEL TYPE
1987

WORK FUNCTION	STATION EMPLOYEES NUMBER	% OF TOTAL	UTILITY EMPLOYEES NUMBER	% OF TOTAL	CONTRACT WORKERS NUMBER	% OF TOTAL	TOTAL PER FUNCTION NUMBER	% OF TOTAL
BOILING WATER REACTORS								
REACTOR OPS & SURV	7,364	14.5%	489	1.0%	2,807	5.5%	10,660	20.9%
ROUTINE MAINTENANCE	8,308	16.3%	2,016	4.0%	9,047	17.8%	19,371	38.0%
IN-SERVICE INSPECTION	846	1.7%	190	0.4%	2,386	4.7%	3,422	6.7%
SPECIAL MAINTENANCE	3,110	6.1%	717	1.4%	8,456	16.6%	12,283	24.1%
WASTE PROCESSING	2,671	5.2%	132	0.3%	906	1.8%	3,709	7.3%
REFUELING	674	1.3%	90	0.2%	714	1.4%	1,478	2.9%
TOTALS*	22,973	45.1%	3,634	7.1%	24,316	47.8%	50,923	100.0%
PRESSURIZED WATER REACTORS**								
REACTOR OPS & SURV	7,629	9.4%	2,261	2.8%	6,233	7.7%	16,123	19.8%
ROUTINE MAINTENANCE	8,271	10.2%	2,949	3.6%	12,958	15.9%	24,178	29.7%
IN-SERVICE INSPECTION	1,802	2.2%	840	1.0%	4,302	5.3%	6,944	8.5%
SPECIAL MAINTENANCE	5,474	6.7%	2,537	3.1%	12,861	15.8%	20,872	25.6%
WASTE PROCESSING	2,191	2.7%	379	0.5%	2,488	3.1%	5,058	6.2%
REFUELING	2,746	3.4%	1,397	1.7%	4,141	5.1%	8,284	10.2%
TOTALS*	28,113	34.5%	10,363	12.7%	42,983	52.7%	81,459	100.0%
ALL LIGHT WATER REACTORS**								
REACTOR OPS & SURV	14,993	11.3%	2,750	2.1%	9,040	6.8%	26,873	20.3%
ROUTINE MAINTENANCE	16,579	12.5%	4,965	3.8%	22,005	16.6%	43,580	32.9%
IN-SERVICE INSPECTION	2,648	2.0%	1,031	0.8%	6,688	5.1%	10,374	7.8%
SPECIAL MAINTENANCE	8,584	6.5%	3,254	2.5%	21,317	16.1%	33,198	25.0%
WASTE PROCESSING	4,862	3.7%	511	0.4%	3,394	2.6%	8,767	6.6%
REFUELING	3,420	2.6%	1,487	1.1%	4,855	3.7%	9,762	7.4%
TOTALS*	51,086	38.6%	13,997	10.6%	67,299	50.8%	132,554	100.0%

* Workers may be counted in more then one catagory. The number of personnel in Table 4.12 is considered to be more accurate than Table 4.11, because the actual total number of individuals in each profession was provided by some plants in an attempt to correct for multiple counting of individuals.

**Table does not include results from the PWRs at Point Beach 1, 2 (554) because the data for these plants were not submitted in the suggested format.

TABLE 4.12
NUMBER OF PERSONNEL*
BY OCCUPATION AND PERSONNEL TYPE
1987

OCCUPATION	STATION EMPLOYEES NUMBER	% OF TOTAL	UTILITY EMPLOYEES NUMBER	% OF TOTAL	CONTRACT WORKERS NUMBER	% OF TOTAL	TOTAL PER FUNCTION NUMBER	% OF TOTAL
BOILING WATER REACTORS								
MAINTENANCE	6,441	16.7%	2,686	7.0%	15,454	40.2%	24,581	63.9%
OPERATIONS	2,598	6.7%	254	0.7%	1,432	3.7%	4,284	11.1%
HEALTH PHYSICS	1,857	4.8%	51	0.1%	2,250	5.8%	4,158	10.8%
SUPERVISORY	839	2.2%	92	0.2%	1,066	2.8%	1,997	5.2%
ENGINEERING	1,305	3.4%	366	1.0%	1,801	4.7%	3,472	9.0%
TOTALS	13,040	33.9%	3,449	9.0%	22,003	57.2%	38,492	100.0%
PRESSURIZED WATER REACTORS**								
MAINTENANCE	7,574	14.0%	3,327	6.2%	20,734	38.4%	31,679	58.6%
OPERATIONS	4,367	8.1%	110	0.2%	1,366	2.5%	5,847	10.8%
HEALTH PHYSICS	2,627	4.8%	58	0.1%	5,540	10.3%	8,266	15.3%
SUPERVISORY	1,485	2.7%	208	0.4%	758	1.4%	2,451	4.5%
ENGINEERING	1,739	3.2%	611	1.1%	3,506	6.5%	5,860	10.8%
TOTALS	17,792	32.9%	4,314	8.0%	31,904	59.2%	54,103	100.0%
ALL LIGHT WATER REACTORS**								
MAINTENANCE	14,015	15.1%	6,013	6.5%	36,188	39.2%	56,186	60.8%
OPERATIONS	6,965	7.5%	364	0.4%	2,798	3.0%	10,105	10.9%
HEALTH PHYSICS	4,484	4.8%	109	0.1%	7,790	8.4%	12,369	13.4%
SUPERVISORY	2,324	2.5%	300	0.3%	1,824	2.0%	4,448	4.8%
ENGINEERING	3,044	3.3%	977	1.1%	5,307	5.7%	9,318	10.1%
TOTALS	30,832	33.3%	7,763	8.4%	53,907	58.3%	92,426	100.0%

*Workers may be counted in more then one category. The number of personnel shown in this table is considered to be more accurate than Table 4.11, because the actual total number of individuals in each profession was provided by some plants in an attempt to correct for multiple counting of individuals.

**Table does not include results from the PWRs at Point Beach 1, 2 (554) because the data for these plants were not submitted in the suggested format.

TABLE 4.13
AVERAGE DOSES BY OCCUPATION AND PERSONNEL TYPE
1987

OCCUPATION	STATION & UTILITY EMPLOYEES	COLLECTIVE DOSE	AVERAGE DOSE	CONTRACT EMPLOYEES	COLLECTIVE DOSE	AVERAGE DOSE
BOILING WATER REACTORS						
MAINTENANCE	9,127	3,732	0.41	15,454	7,712	0.50
OPERATIONS	2,852	1,038	0.36	1,432	410	0.29
HEALTH PHYSICS	1,908	878	0.46	2,250	989	0.44
SUPERVISORY	931	290	0.31	1,066	153	0.30
ENGINEERING	1,671	367	0.22	1,801	538	0.14
TOTALS	16,489	6305	0.38	22,003	9,802	0.44
PRESSURIZED WATER REACTORS						
MAINTENANCE	10,901	5,595	0.51	20,778	9,840	0.47
OPERATIONS	4,477	1,402	0.31	1,370	639	0.47
HEALTH PHYSICS	2,685	1,194	0.45	5,581	2,532	0.45
SUPERVISORY	1,693	334	0.20	758	324	0.43
ENGINEERING	2,350	624	0.27	3,510	1,446	0.41
TOTALS	22,106	9,149	0.44	31,997	14,781	0.46
ALL LIGHT WATER REACTORS						
MAINTENANCE	20,028	9,327	0.47	36,232	17,511	0.48
OPERATIONS	7,329	2,440	0.33	2,802	1,049	0.37
HEALTH PHYSICS	4,993	2,072	0.41	7,831	3,521	0.45
SUPERVISORY	2,624	624	0.24	1,824	477	0.26
ENGINEERING	4,021	991	0.25	5,311	1,985	0.37
TOTALS	38,995	15,454	0.40	53,993	24,543	0.45

would be counted more than once in a summary such as Table 4.13, (2) the occupations are not clearly defined so that workers performing certain tasks in one plant may be classified as being in one occupation and be included in a different one at another plant, (3) some plants count only those workers whose doses exceed 0.10 rem (cSv) while other plants count all workers regardless of the dose received. It is because of these reasons that the usefulness of the numbers of individuals obtained from the reports provided in Appendix D is rather limited, and they are not used to develop any other statistics in this document.

4.8 Graphical Representation of Dose Trends in Appendix E

Appendix E is a new addition to this report. Each page of Appendix E presents two types of graphs for one site. One graph plots certain dose-performance indicators from 1973 through 1987, and the other indicates the collective dose by job function for 1978 through 1987. The dose and performance indicators shown in the top graph illustrate the history of the collective dose for the site, the rolling three-year average dose per reactor, and the gross electricity generated at the site. These data are plotted, beginning with the plant's first full year of commercial operation, and continuing through 1987. However, any data reported prior to 1973 are not included. The three-year average dose per reactor data is included because it appears to provide a better overall indication of the plant's general trend in collective dose. This average is determined by summing the collective dose for the current year and the previous two years and then dividing this sum by the number of reactors in operation during those years. This reduces the sporadic effects of refueling operations and occasional high-dose maintenance activities, and it gives a better idea of collective dose trends over the life of the plant. (One may note that for sites with more than one reactor, the plot of the three-year rolling average will lie below that of the plot of the annual collective dose for the site because the rolling average is calculated on a per-reactor basis.)

The second type of graph at the bottom of each page in Appendix E displays the breakdown of collective dose by job function and employee type for the years 1978 through 1987. The horizontal axis lists the six job functions of reactor operations, routine maintenance, in-service inspection, special maintenance, waste management and refueling operations and the vertical axis

indicates collective dose at each site. This representation quickly shows the job functions where most of the dose was accumulated as well as the division of the collective dose among plant and contract workers. The data are taken from the submittals presented in Appendix D and therefore represent at least 80% of the collective dose at each site. Only those reactors that have completed at least one full year of commercial operation are presented in Appendix E.

4.9 Health Implications of Average Annual Doses

Of interest to individuals exposed to radiation in the workplace, are the potential health risks associated with occupational exposure. If any damage to health is caused by exposure to radiation in the workplace, it would likely manifest itself as certain types of cancer in the exposed worker or, less likely, as inherited genetic damage in the first few generations of the workers' offspring. 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 considerably higher doses and dose rates 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 1990 [Ref. 16]. Based on this report, which is still under review by NRC and others, a large working population receiving 1,000,000 person-rems (person-cSv) might suffer an estimated 300 to 800 additional cancer deaths over the remaining years of their lives. Assuming about 400 latent cancer deaths per million person-rems to this population of radiation workers, the potential risk associated with the 44,100 person-rems (person-cSv) (Table 3.1) among 119,000 workers who received measurable exposures in 1987 can be estimated. The result is

that for these workers the expected number of additional cancer deaths that might result from the collective radiation dose received that year would be about 18. These deaths would normally 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 119,000 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 0.37 rem (cSv) or the maximum accidental dose of 7.5 rems (cSv) to the whole body during 1987 (see page 6-4). The estimated increased cancer death risk is about two chances in 10,000 for the average dose and about four chances in 1000 for the maximum dose. Should a worker receive 0.37 rem (cSv) per year continuously during his entire working career (working from age 18 until age 65) his lifetime risk of dying from cancer could increase by less than 3% over the normal risk of dying of cancer. Since the American Cancer Society estimates that an individual's risk of dying of cancer is about 20% (one in five) the risk to an individual receiving 0.37 rem (cSv) would be approximately 20.6% instead of 20%.

The potential genetic effects from a worker population receiving about 44,100 person-rems (person-cSv) is 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 119,000 exposed workers would, according to the report NUREG/CR-4214 [Ref. 17], be an increase of about two or less cases (less than 0.02%) compared to the expected 10,000 cases that occur normally*. No significant increase in the number of genetic defects has been observed in the children of individuals exposed to much higher levels of ionizing radiation at Hiroshima and Nagasaki, Japan.

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* Assuming that, on the average, each exposed person will have one live born child in the future, i.e., 119,000 children born to this worker population.

5 TERMINATION DATA SUBMITTED PURSUANT TO 10 CFR § 20.408

5.1 Termination Reports, 1969-1987

In 1969, the Atomic Energy Commission (predecessor of the NRC) began requiring certain categories of licensees* to submit personal identification and exposure information upon the termination of each monitored person's employment or work assignment at their facility. The appropriate information on each report has been manually coded and entered into the Commission's computerized Radiation Exposure Information Reporting System (REIRS) for permanent retention. The data are retrievable by several criteria - social security number, name, facility, etc. - which allows statistical analysis of the data as well as the tracing of individual dose histories. During the years that this information has been collected, more than 1.2 million reports have been received for approximately 564,000 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 thousands of individuals have worked at more than one facility over the years and a termination report was submitted to the NRC each time they left a facility. Table 5.1 provides a breakdown of this information for individuals terminating during each of these 19 years and, since the majority of termination reports are submitted by nuclear power facilities, the number of individuals terminating from power reactors is displayed separately. Primarily because of the need for workers at an increasing number of nuclear power plants, the number of individuals terminating employment or work assignment has increased nearly every year, and in 1987, about 81,600 individuals terminated employment or work assignments at nuclear power plants.

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* Commercial nuclear power reactors; industrial radiographers; fuel processors, fabricators, and reprocessors; and manufacturers and distributors of specified quantities of by-product 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 - 1987

YEAR	All Covered Categories*			Power Reactor Licensees		
	Number of Termination Records	Number of Submittals+	Number of Terminating Individuals	Number of Termination Records	Number of Submittals+	Number of Terminating Individuals
1969	5,009		3,992	790		727
1970	8,606		6,069	2,126		1,908
1971	12,955		8,874	2,246		2,197
1972	15,685		10,353	4,997		3,888
1973	19,985		15,588	11,525		9,071
1974	30,389		21,499	16,946		11,603
1975	44,676		27,415	38,376		22,627
1976	70,230		40,079	63,593		35,294
1977	88,295		42,183	81,074		36,864
1978	96,010		44,541	85,308		37,359
1979	133,470		58,913	118,218		48,305
1980	175,408		73,662	162,515		65,092
1981	205,103		73,004	196,104		67,908
1982	200,191		67,589	192,314		63,848
1983	243,229		76,202	234,803		72,869
1984	305,302	124,963	80,608	294,386	121,215	77,380
1985	235,300	116,462	80,809	231,200	112,140	77,065
1986		111,957	81,985		107,857	78,379
1987		117,523	86,302		111,822	81,624

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

+Because of a recent change in the computer system (both hardware and software), a count of "termination records" will no longer be provided. A count of records that is more closely related to the number of reports or submittals that is received for terminating individuals will be shown instead.

5.2 Limitations of Termination Data

When examining or using the statistics that are based on the termination data, one should keep in mind that these data have various limitations: (1) some licensees submit a termination report for each monitoring period rather than waiting until the individual actually completes his work assignment at the facility, (2) the reports contain no indication of the tasks the worker may have performed nor of the type of employee (contractor, plant, part-time, etc.) he was while monitored by the licensee, (3) 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, (4) some licensees report cumulative periods of exposure and doses rather than the actual periods and dose incurred during each period, and (5) 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.

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 a large number 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 that move rapidly between 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 has about doubled during the past ten years from some

TABLE 5.2

TRANSIENT WORKERS PER CALENDAR QUARTER

1978 - 1987

All Covered Licensees				Power Reactor Facilities			
Year	No. of Persons Terminated by Two or more Licensees Within One Quarter	Collective Dose (person-rems person-cSv)	Average Individual Dose (rem or cSv)	Year	No. of Persons Terminated by Two or more Licensees Within One Quarter	Collective Dose (person-rems person-cSv)	Average Individual Dose (rem or cSv)
1978	1,570	720	0.46	1978	1,500	680	0.45
1979	1,809	836	0.46	1979	1,754	802	0.46
1980	2,355	1,063	0.45	1980	2,218	1,033	0.47
1981	2,344	955	0.41	1981	2,335	952	0.41
1982	2,428	935	0.39	1982	2,396	914	0.38
1983	2,774	913	0.33	1983	2,728	886	0.32
1984	3,414	1,123	0.33	1984	3,356	1,083	0.32
1985	2,791	700	0.25	1985	2,746	674	0.25
1986	3,069	921	0.30	1986	3,033	910	0.30
1987	3,093	882	0.29	1987	3,067	866	0.28

Power Reactor Facilities

Year	No. of Persons Terminated by Two Licensees	Collective Dose	Average Dose	No. of Persons Terminated by Three Licensees	Collective Dose	Average Dose	No. of Persons Terminated by >Three Licensees	Collective Dose	Average Dose
1978	1,303	590	0.45	165	75	0.45	32	15	0.47
1979	1,527	647	0.43	178	130	0.73	49	25	0.51
1980	1,896	856	0.45	259	140	0.54	63	36	0.57
1981	1,967	780	0.40	308	145	0.47	60	27	0.45
1982	2,047	789	0.39	288	113	0.39	61	12	0.20
1983	2,276	767	0.34	362	101	0.28	90	18	0.20
1984	2,782	901	0.32	431	147	0.34	143	35	0.24
1985	2,340	597	0.26	335	67	0.20	71	10	0.14
1986	2,612	785	0.30	362	115	0.32	59	10	0.17
1987	2,635	756	0.29	360	98	0.27	72	12	0.17

1,570 in 1978 to about 3,100 in 1986, and where it remained in 1987. The average individual dose (which is approximately equal to a quarterly dose for these workers) has decreased over these years and is remaining at about 0.3 rem (cSv).

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 and that their average quarterly dose has remained at about 0.3 rem (cSv) for the past several years, as has the average dose of individuals employed by three facilities. The average dose incurred by persons terminated by three or more plants has remained at about 0.2 rem (cSv) for the past several years. All of these average doses are considerably less than those incurred 10 years ago. This is believed to be a reflection of the industry's continuing efforts to reduce the exposure of all individuals working at their facilities and their efforts to control the workers' annual doses so that no one exceeds an annual dose of five rems regardless of the number of facilities at which they work during the year.

Examination of these records also revealed that some individuals have worked for as many as six different NRC licensees during one calendar quarter, and examination of their doses revealed no instances during the last six years 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 most of the cases that were found in previous years, the doses that the workers had received while employed by the first utility were re-evaluated and revised upward later in the year. These late revisions resulted in a few workers receiving quarterly doses that slightly exceeded three rems (cSv). However, because some facilities do not report the workers' doses in quarterly increments in the termination reports that are submitted to the NRC, it is not always possible to determine, from the data in REIRS, the portion of the dose received during each quarter. This inability could have allowed any of these doses that exceeded three rems to go undetected by the analyses presented in this document. Regulations require, however, that each licensee take measures to ensure that such exposures do not occur.

5.4 Transient Workers per Calendar Year at Nuclear Power Facilities

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 examine the data reported for workers who began and terminated two or more periods of employment with two or more different reactor facilities within one calendar year. 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 ten years from 1978 through 1987. The number of these individuals increased from about 3,200 in 1978 to about 8,700 in 1987. The average dose remained at about 1 rem (cSv) until 1985 when the average dose decreased by about 30% to 0.77 rem (cSv). The average dose remained about the same in 1986, but in 1987, it fell to 0.70 rem.

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. The average dose of workers terminating from two plants has decreased to about 0.5 rem (cSv) while the average dose of individuals terminating from three or more facilities remains at about 1 rem (cSv). However, the average doses calculated for all these workers are now significantly lower than those reported for 1984 and prior years.

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 licensees' 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 correct distribution of transient worker doses as determined from the above-mentioned termination reports and compares it with the distribution of the doses of these workers as they would have appeared in a summation of the annual statistical reports submitted by each of the nuclear power facilities. During each of the years shown, each of the transient workers was counted an average of 2.6 times so that in 1987, the 8,700 transients

TABLE 5.3

TRANSIENT WORKERS PER CALENDAR YEAR AT NUCLEAR POWER FACILITIES

1978 - 1987

Year	No. of Commercial Reactors	No. of Persons Terminated by Two or More Licensees	Collective Dose (person-rems person-cSv)	Average Dose (rems or cSv)
1978	65	3,202	3,231	1.01
1979	68	3,938	3,891	0.99
1980	69	5,463	6,028	1.10
1981	71	5,425	5,381	0.99
1982	75	5,303	5,610	1.06
1983	76	6,340	6,675	1.05
1984	79	7,760	8,045	1.04
1985	83	6,871	5,319	0.77
1986	90	7,816	5,954	0.76
1987	97	8,667	6,024	0.70

Year	No. of Persons Terminated by Two Licensees	Collective Dose	Average Dose	No. of Persons Terminated by Three Licensees	Collective Dose	Average Dose	No. of Persons Terminated by >Three Licensees	Collective Dose	Average Dose
1978	2,119	1,490	0.70	621	792	1.28	462	949	2.05
1979	2,761	2,097	0.76	688	805	1.17	489	989	2.02
1980	3,772	3,444	0.91	959	1,245	1.30	732	1,339	1.83
1981	3,745	3,033	0.81	924	1,172	1.27	756	1,176	1.56
1982	3,645	3,349	0.92	913	1,131	1.24	745	1,130	1.52
1983	4,203	3,624	0.86	1,256	1,694	1.39	881	1,357	1.53
1984	5,118	4,224	0.83	1,461	1,945	1.33	1,181	1,875	1.59
1985	4,584	3,000	0.65	1,357	1,400	1.03	930	920	0.99
1986	5,079	2,907	0.57	1,490	1,508	1.01	1,247	1,539	1.23
1987	5,620	2,978	0.53	1,730	1,592	0.92	1,317	1,455	1.10

TABLE 5.4a
REPORTED AND CORRECT DOSE OF TRANSIENT WORKERS FOR CALENDAR YEAR AT POWER REACTORS[a]

Type of Distribution and Year	Number of Individuals with Whole Body Doses in the Ranges (rems or cSv)																Total Individuals	[b]Collective Dose (Person-rem or -cSv)	Avg. Dose (rem or cSv)	Avg. Measurable Dose (rem or cSv)
	Less than Measurable	Meas'ble <0.10	0.10-0.25	0.25-0.50	0.50-0.75	0.75-1.00	1.00-2.00	2.00-3.00	3.00-4.00	4.00-5.00	5.0-6.0	6.0-7.0	7.0-8.0	8.0-9.0	9.0-10.0	>10				
Correct Distribution of Transients - 1981	562	1,271	482	422	380	310	954	614	275	107	30	17	0	1			5,425	5,381	0.99	1.08
Reported Distribution of Transients - 1981	3,640	3,767	1,473	1,418	963	716	1,550	349	69	8	1	1					13,955	5,381	0.39	0.52
Correct Distribution of Transients - 1982	623	1,226	452	397	332	286	867	536	339	184	42	18	1	0	0	1	5,303	5,610	1.06	1.20
Reported Distribution of Transients - 1982	3,803	3,480	1,432	1,308	842	661	1,502	506	87	20	1						13,642	5,610	0.41	0.57
Correct Distribution of Transients - 1983	881	1,480	513	445	367	320	975	663	420	185	61	24	4	2			6,340	6,675	1.05	1.22
Reported Distribution of Transients - 1983	4,904	4,273	1,529	1,397	986	752	1,801	642	101	13	5	2					16,405	6,675	0.41	0.58
Correct Distribution of Transients - 1984	1,108	1,852	557	540	425	387	1,193	878	544	202	52	22					7,760	8,045	1.04	1.21
Reported Distribution of Transients - 1984	6,054	5,440	1,894	1,757	1,255	979	2,370	639	97	10							20,495	8,045	0.39	0.56
Correct Distribution of Transients - 1985	1,201	1,854	518	521	455	314	967	629	336	74	1						6,871	5,319	0.77	0.94
Reported Distribution of Transients - 1985	6,037	5,014	1,625	1,459	1,042	664	1,484	371	51	1							17,748	5,319	0.30	0.45
Correct Distribution of Transients - 1986	1,319	2,006	648	656	472	369	1,248	691	325	72							7,816	5,954	0.76	0.92
Reported Distribution of Transients - 1986	6,866	5,372	2,071	1,935	1,236	856	1,685	299	50	1							20,371	5,954	0.29	0.44
Correct Distribution of Transients - 1987	1,850	1,557	738	838	713	582	1,519	600	229	41							8,667	6,024	0.70	0.88
Reported Distribution of Transients - 1987	8,420	4,796	2,547	2,420	1,626	1,006	1,632	164	28								22,639	6,024	0.27	0.42

[a]Includes data from Fort St. Vrain.
[b]Collective dose found by summing the actual doses reported for those workers in their termination reports.

would have been counted as 22,600 individuals. 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 individuals had on the staff's summation of the annual statistical reports for the years 1981 through 1987. 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 1987, Table 5.4b shows that the summation of annual reports indicated that 104,384 workers received a measurable dose, 1,973 of whom received doses greater than two rems (cSv). After accounting for those individuals that were reported more than once, the corrected distribution indicated that there were really only 96,982 workers that received a measurable dose and that 2,651 of them received doses greater than two rems (cSv). Thus, some 2.7% of the workers received an annual dose greater than two rems rather than 1.8% that would have been computed from the "Reported Statistical Distribution" shown in the first row of Table 5.4b.

Since the number of transient workers receiving measurable doses and the collective dose they receive are only about 6% and 14% of the total number of workers and of the total collective dose, respectively, each year, their impact on <u>most</u> of the statistics derived from compilations of the annual summary reports is not very great. However, when examining the number of annual doses in the higher dose ranges (Table 5.4b), one finds that the correct statistical distribution indicates that the number of workers who received doses greater than four rems (cSv) is usually about twice the number found in the reported statistical distribution. But there is still a clear trend for the number of higher doses to decrease; in 1987, there were only 505 annual doses that exceeded three rems, which is half of the number (1,014) found in 1986. And Table 5.5 shows that no doses greater than five

TABLE 5.4b
EFFECTS OF TRANSIENT WORKERS ON ANNUAL STATISTICAL COMPILATIONS[a]

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	5.0-6.0	6.0-7.0	7.0-8.0	8.0-9.0	9.0-10.0	>10				
Reported Statistical Distribution - 1981	42,323	29,332	12,217	10,326	6,625	4,903	11,766	4,546	1,763	486	93	81	11	2	1	1	124,506	54,152	0.43	0.66
[b]Correct 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
Reported Statistical Distribution - 1982	45,871	31,502	12,693	10,814	6,739	4,795	10,855	4,686	1,814	432	56	13	4	0	1		130,275	52,191	0.40	0.62
[b]Correct 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
Reported 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				137,703	56,472	0.41	0.66
[b]Correct Statistical Distribution - 1983	48,013	29,155	11,195	9,344	5,851	4,276	11,345	5,332	2,269	716	121	38	8	2			127,665	56,472	0.44	0.71
Reported Statistical Distribution - 1984	61,232	39,946	14,772	11,492	7,166	5,396	12,453	4,967	1,675	295							159,394	55,217	0.35	0.56
[b]Correct Statistical Distribution - 1984	56,286	36,358	13,435	10,275	6,336	4,804	11,276	5,206	2,122	487	52	22					146,659	55,217	0.38	0.61
Reported Statistical Distribution - 1985	66,399	40,361	14,155	12,012	7,214	4,897	10,557	3,317	716	84							159,712	43,077	0.27	0.46
[b]Correct Statistical Distribution - 1985	61,563	37,201	13,048	11,074	6,627	4,547	10,040	3,575	1001	157	1						148,834	43,077	0.29	0.49
Reported Statistical Distribution - 1986	73,818	44,895	16,000	13,112	7,780	5,179	10,678	2,670	593	75							174,810	42,525	0.24	0.42
[b]Correct Statistical Distribution - 1986	68,271	41,529	14,577	11,833	7,016	4,692	10,241	3,062	868	146							162,245	42,525	0.26	0.45
Reported Statistical Distribution - 1987	93,491	44,833	17,824	14,566	8,599	5,824	10,765	1,710	241	22							197,875	40,594	0.21	0.39
[b]Correct Statistical Distribution - 1987	86,921	41,594	16,015	12,984	7,686	5,400	10,652	2,146	442	63							183,903	40,594	0.22	0.42

[a]Includes data from Fort St. Vrain.
[b]Distribution found by subtracting the correct from the reported distribution shown in Table 5.4a and then subtracting this difference from the reported statistical distribution shown in Table 5.4b.

rems have been found since 1985. This reflects the industry's continuing concerted efforts to keep the total annual doses of all workers under five rems and shows that such reductions can be accomplished without increasing the collective dose.

TABLE 5.5

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

Year	Reported Number >5 Rems (cSv)	Corrected Number >5 Rems (cSv)	Percent of Workers
1977	270	351	0.9
1978	103	158	0.4
1979	130	180	0.3
1980	311	391	0.5
1981	189	235	0.3
1982	74	135	0.2
1983	85	168	0.2
1984	0	71	0.1
1985	0	1	0.0
1986	0	0	0.0
1987	0	0	0.0

5.5 Temporary Workers per Calendar Year at Nuclear Power Facilities

To complete the examination of the doses received by the short-term workers employed at nuclear power facilities, Table 5.6 summarizes the data compiled on "temporary workers." For purposes of this report, temporary workers were defined to be those individuals who began and ended a period of employment or work assignment at only one nuclear power facility during the calendar year. Table 5.6 shows that the number of these temporary individuals increased by about 65% between 1978 and 1987 while the number of reactors

TABLE 5.6

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

Year	No. of Reactors	Number of Temps. Monitored	Number with Measurable Doses	Collective Dose (person-rems person-cSv)	Average Dose (rem or cSv)	Average Measurable Dose (rem or cSv)
1978	64	28,864	17,110	9,821	0.34	0.57
1979	68	38,347	21,491	9,488	0.25	0.44
1980	69	48,383	28,305	16,168	0.33	0.57
1981	71	48,265	28,675	16,755	0.35	0.58
1982	75	44,503	25,646	14,266	0.32	0.56
1983	76	50,903	26,682	16,007	0.31	0.60
1984	79	53,438	29,988	15,856	0.30	0.52
1985	83	48,678	24,991	10,418	0.21	0.42
1986	90	47,108	22,911	8,014	0.17	0.35
1987	97	48,069	21,211	7,867	0.16	0.37

increased by 50% during this time. The number of temporary workers receiving a measurable dose, however, increased by only 24%. The collective dose reached a high of nearly 17,000 person-rems (person-cSv) in the early eighties, but declined to about 7,900 person-rems (person-cSv) in 1987. The average measurable dose remained at about 0.6 rem during the early eighties, but in 1985, all of the parameters listed in Table 5.6, except for the number of reactors, decreased significantly and have remained at about the same level since then. This resulted in the average measurable dose of these workers falling to about 0.4 rem (cSv) where it has remained.

One apparent discrepancy in the above analysis of termination data is that not all of the individuals that terminated during each of the calendar year

are included. When one compares the total number of persons terminating during a year (Table 5.1) to the sum of workers terminating from one facility (temporary workers, Table 5.6) and the number of individuals terminating from two or more facilities (transient workers, Table 5.3), one finds a considerable difference in these figures. This is because of the criteria that is used to determine which individuals should be included in the "temporary" and "transient" worker groups. To be included in either of these groups in this analysis, the individuals' periods of employment must begin and end during the same calendar year. Any individual whose beginning or ending dates of employment overlap the beginning and ending dates of the calendar year are not included in these analyses. In 1987, for example, one finds that the number of individuals not included in these analyses is roughly 25,000. However, there is no indication that the exclusion of these individuals significantly impacts most of the statistics presented.

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

6.1 Control Levels

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

(1) Category A

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

(2) Category B

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

(3) Category C

10 CFR § 20.405 - Exposure of any individual to radiation or concentrations of radioactive material that exceeds any applicable quarterly limit in Part 20 [§ 20.101 or § 20.104(b)] or in the licensee's license but is less than the values given above. This includes reports of whole body exposures that exceed 1.25 rems (cSv), or that exceed 3 rems (cSv), as discussed in Section 3.2.

Reports of skin exposures that exceed 7.5 rems (cSv) and extremity exposures that exceed 18.75 rems (cSv) are included, and reports of exposures of individuals to concentrations in excess of the levels given in 10 CFR § 20.103 and Appendix B usually fall into this category as well. These reports must be submitted to the Commission within 30 days of the occurrence.

6.2 Summary of Overexposures

Table 6.1 summarizes all the occupational overexposures to external sources of radiation as reported by Commission licensees pursuant to § 20.403 and § 20.405 during the years 1979 through 1987. For 1985, 1986, and 1987, it shows the number of individuals that exceeded various limits while employed by one of several types of licensees. For the years 1979 through 1983, only the overexposures reported by licensed industrial radiography firms are shown separately. Most of the occurrences included in the "Others" category come from research facilities, universities and measuring and well-logging activities. In 1980, the total number of individuals reported as being overexposed was 96, a considerable increase over the numbers reported for other years. This increase was due to the overexposure of some 67 individuals at one nuclear power facility during steam generator repair work. They received doses between three and five rems. In 1987, the number of individuals receiving external doses that exceeded applicable quarterly limits increased to 13 from the 1986 low of 8. The highest external whole body dose was 7.5 rem (cSv). In each of the years from 1979 through 1987, the highest external whole body doses were 17.0, 7.7, 21.0, 9.4, 25.0, 8.2, 27.0, 4.2, and 7.5 rems (cSv), respectively.

In 1987, as in 1986, there were three incidents in which external exposures of the magnitude described in Category A or B were received by three individuals. Two were extremity overexposures and the other one was a whole body overexposure from a teletherapy source. Summaries of the three incidents are presented below.

On January 8, 1987, a radiographer repositioned the guide tube of his radiography source without retracting the source, resulting in an overexposure to the left thumb of 180 rems. Although the radiographer had

TABLE 6.1
PERSONNEL OVEREXPOSURES TO EXTERNAL RADIATION
1979-1987

YEAR	LICENSE CATEGORY	PERSONS AND DOSES (REM)	TYPES OF OVEREXPOSURES AND DOSES								
			WHOLE BODY (REM)			SKIN (REMS)			EXTREMITY (REMS)		
			(<5)	(>5<25)	(>25)	(>7.5<30)	(>30<150)	(>150)	(>18.75<75)	(>75<375)	(>375)
1987	INDUSTRIAL RADIOGRAPHY	NO. OF PERSONS	1							1	
		SUM OF DOSES	3.1							180	
	POWER REACTORS	NO. OF PERSONS	1			2			1		
		SUM OF DOSES	1.3			34.8			30.3		
	MEDICAL FACILITIES	NO. OF PERSONS		1							
		SUM OF DOSES		7.5							
	MARKETING & MANUFACT.	NO. OF PERSONS							2		1
		SUM OF DOSES							41.7		650
	OTHER	NO. OF PERSONS	1			3					
		SUM OF DOSES	1.5			93.6					
1986	INDUSTRIAL RADIOGRAPHY	NO. OF PERSONS	2								
		SUM OF DOSES	4.4								
	POWER REACTORS	NO. OF PERSONS	1								2
		SUM OF DOSES	3.3								930
	MEDICAL FACILITIES	NO. OF PERSONS	1								
		SUM OF DOSES	4.2								
	MARKETING & MANUFACT.	NO. OF PERSONS									
		SUM OF DOSES									
	OTHER	NO. OF PERSONS							1	1	
		SUM OF DOSES							41.2	115	
1985	INDUSTRIAL RADIOGRAPHY	NO. OF PERSONS	6	3	1					1	
		SUM OF DOSES	16.7	32.6	27.0					288	
	POWER REACTORS	NO. OF PERSONS	3			1					
		SUM OF DOSES	3.3			10.8					
	MEDICAL FACILITIES	NO. OF PERSONS	3								
		SUM OF DOSES	6.7								
	MARKETING & MANUFACT.	NO. OF PERSONS							2	1	
		SUM OF DOSES							38.7	93	
	OTHER	NO. OF PERSONS	1				1		1		
		SUM OF DOSES	1.8				38.0		21.5		
1984	INDUSTRIAL RADIOGRAPHY	NO. OF PERSONS	3	1					3		
		SUM OF DOSES	12.5	8.2					127.9		
	POWER REACTORS	NO. OF PERSONS	3								
		SUM OF DOSES	7.6								
	MEDICAL FACILITIES	NO. OF PERSONS	2	1					1		
		SUM OF DOSES	5.7	5.2					18.8		
	MARKETING & MANUFACT.	NO. OF PERSONS							1		
		SUM OF DOSES							21.8		
	OTHER	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
	ALL OTHER	NO. OF PERSONS	11	1[a]					27	2	
		SUM OF DOSES	20.1	25					887	228	
1982	INDUSTRIAL RADIOGRAPHY	NO. OF PERSONS	6	3							
		SUM OF DOSES	16.1	20.7							
	ALL OTHER	NO. OF PERSONS	5[b]	1					15	2	
		SUM OF DOSES	12.5	9.4					569	206	
1981	INDUSTRIAL RADIOGRAPHY	NO. OF PERSONS	7	1							
		SUM OF DOSES	12.2	7.1							
	ALL OTHER	NO. OF PERSONS	10	2[c]		1			4		
		SUM OF DOSES	24.1	30.9		8.1			102.9		
1980	INDUSTRIAL RADIOGRAPHY	NO. OF PERSONS	4	1					1		
		SUM OF DOSES	23.6	7.7					56		
	ALL OTHER	NO. OF PERSONS	86						3		3
		SUM OF DOSES	291.8						73.5		33,000
1979	INDUSTRIAL RADIOGRAPHY	NO. OF PERSONS	8[d]	3							
		SUM OF DOSES	25.9	34.6							
	ALL OTHER	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	

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

locked the exposure device, he had not performed a survey to ascertain whether the source had been fully retracted as required by procedures.

On April 8, 1987, a laboratory technician handling a vial of molybdenum-99 tore a glove and contaminated approximately one square centimeter of skin on the left thumb. The contamination resulted in a skin dose of about 650 rems. The overexposure was attributed to several procedural violations prior to and during the opening of the vial.

On October 27, 1987, a medical physicist performing a survey on a cobalt-60 teletherapy source while the door interlock was bypassed received a whole body dose of 7.5 rems. The overexposure was attributed to failure to properly assess the radiation hazards (8990-curie source in the exposed position) before entering the teletherapy room.

It has now been determined that there was another event in 1986 (total of three) in which the estimated intake of radioactive materials exceeded the quarterly limit, equivalent to exposure to 520 hours at the maximum permissible concentration (MPC-hrs). This event occurred on or about November 11, 1986, when a hospital technician was exposed to greater than 520 MPC-hrs of iodine-125, resulting in a thyroid uptake of between 1.07 and 2.06 microcuries (approximately twice the regulatory limit). The overexposure was the result of inadequately defined roles, relationships, and responsibilities of the groups and individuals responsible for worker radiation protection at the hospital.

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APPENDIX A
Alphabetical Listing of Annual Exposure Data Compiled for Certain NRC Licensees
1987

APPENDIX A*

INDUSTRIAL RADIOGRAPHERS Single Location - 1987

Licensee Name	Program Code	License Number	Total Individuals Monitored	Workers with Measurable Exposure	Collective Dose (person-rem)	Average Meas'ble Dose (rems or cSv)
ABEX CORP (WAUKESHA FOUNDRY DIV)	03310	48-13776-01	8	0	0	0.00
ABEX CORPORATION	03310	29-01208-02	9	0	0	0.00
ABEX CORP.	03310	34-24346-01	15	8	1	0.08
AIR FORCE, ENGINEERING SERVICE CTR.	03310	09-15149-1AFP	8	3	0	0.05
AIR PRODUCTS AND CHEMICALS, INCORPORATED	03310	37-05105-05	20	10	1	0.08
ALONSO & CARUS IRON WORKS	03310	52-21350-01	7	5	1	0.15
ARMY, DEPARTMENT OF THE	03310	13-18235-01	16	2	0	0.00
ARMY, DEPARTMENT OF THE	03310	29-00047-06	192	26	1	0.04
ARROW TANK & ENGINEERING COMPANY	03310	22-13253-01	5	2	0	0.11
ATLANTIC RESEARCH CORPORATION	03310	45-02808-04	24	10	1	0.10
BABCOCK & WILCOX COMPANY	03310	34-02160-03	36	21	1	0.05
BRIGHTON CORP.	03310	34-21480-01	5	5	2	0.37
BUCKEYE INTERNATIONAL	03310	34-06627-01	3	2	0	0.05
CBI SERVICES	03310	12-05639-01	8	5	0	0.05
CONNECTICUT, STATE OF	03310	06-06472-03	33	1	0	0.05
CONNEX PIPE SYSTEMS	03310	34-00850-02	9	7	2	0.25
CONSOLIDATED FOUNDRIES & MFG.	03310	34-04657-02	0	0	0	0.00
COPES-VULCAN	03310	37-19530-01	1	1	0	0.05
DAY AND ZIMMERMANN INC.	03310	42-15051-02	3	0	0	0.00
DEPT OF THE NAVY	03310	28-00102-A1NP	42	42	4	0.10
DEPT OF THE NAVY, NAVAL UNDERSEA WARFARE	03310	46-00253-A1NP	2	0	0	0.00
DEPT OF THE NAVY, PHILADELPHIA NAVAL SHIPYARD	03310	37-00151-A1NP	80	18	4	0.21
DEPT OF THE NAVY, SHORE INTERMED MTN	03310	45-32732-A1NP	11	2	0	0.11
DEPT OF THE NAVY, SURFACE WARFARE CTR	03310	45-60921-A1NP	0	0	0	0.00
DEPT OF THE NAVY, USS FRANK CABLE (AS-40)	03310	59-45255-A1NP	13	9	1	0.12
DEPT OF THE NAVY USS HUNLEY (AS-31)	03310	59-45249-A1NP	11	10	1	0.12
DEPT. OF ARMY, MCALESTER ARMY AMMUNITION PLAN	03310	35-19189-02	33	2	0	0.05
DEPT. OF THE NAVY, LONG BEACH NAVAL SHIPYARD	03310	04-60258-A1NP	31	5	0	0.05
DRESSER IND.,WORTHINGTON PUMP DIV	03310	29-02210-02	4	1	0	0.05
DURALOY COMPANY (THE)	03310	37-02279-02	6	6	2	0.34
DURIRON COMPANY INCORPORATED	03310	34-06398-01	4	4	1	0.24
EMPIRE STEEL CASTINGS, INC.	03310	37-02448-01	4	4	1	0.23
EXXON COMPANY U. S. A.	03310	25-03375-02	0	0	0	0.00
E. I. DU PONT DE NEMOURS & COMPANY INC.	03310	07-00455-30	0	0	0	0.00
GENERAL ELECTRIC COMPANY	03310	34-00499-10	3	0	0	0.00
GENERAL ELECTRIC CO.	03310	45-24957-01	26	0	0	0.00
GENERAL MOTORS CORPORATION	03310	34-15315-02	53	1	0	0.05
GREDE FOUNDRIES INCORPORATED	03310	48-02844-01	3	2	0	0.11
HARRISON STEEL CASTINGS COMPANY	03310	13-02141-01	5	2	0	0.21
HESS OIL VIRGIN ISLAND CORPORATION	03310	55-15533-02	0	0	0	0.00
HIGH STEEL STRUCTURES INC.	03310	37-17534-01	15	7	0	0.07

* The collective dose shown in Appendix A has been rounded to the nearest rem, whereas the average measurable dose has been calculated using the non-rounded dose reported by the licensee.

INDUSTRIAL RADIOGRAPHERS Single Location - 1987

Licensee Name	Program Code	License Number	Total Individuals Monitored	Workers with Measurable Exposure	Collective Dose (person-rem)	Average Meas'ble Dose (rems or cSv)
INDUSTRIAL NDT	03310	39-24888-01	11	11	5	0.45
INGERSOLL-RAND COMPANY	03310	29-02015-02	2	2	0	0.11
INTERIOR, DEPARTMENT OF THE	03310	24-02619-02	9	4	0	0.05
JOHN DEERE FOUNDRY	03310	12-09111-01	3	0	0	0.00
LUCIUS PITKIN	03310	29-27816-01	12	10	2	0.24
LUKENS STEEL COMPANY	03310	37-02827-01	9	0	0	0.00
LYNCHBURG FOUNDRY COMPANY	03310	45-17464-01	9	2	0	0.05
MARATHON PETROLEUM CO.	03310	12-24435-01	0	0	0	0.00
MASON & HANGER-SILAS MASON COMPANY INC.	03310	16-17692-01	142	36	2	0.06
MAYNARD ELECTRIC STEEL CASTING COMPANY	03310	48-07080-01	4	4	1	0.23
MINNESOTA VALLEY ENGINEERING	03310	22-24393-01	5	4	1	0.21
MISSOURI STEEL CASTINGS CO.	03310	25-15152-01	5	3	0	0.09
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	03310	34-00507-04	35	4	0	0.05
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	03310	45-08886-02	0	0	0	0.00
NATIONAL CASTING CO.	03310	34-01115-03	5	2	0	0.00
NATIONAL FEEDSCREW & MACHINING	03310	34-24500-01	0	0	0	0.00
NAVY DEPT.,NAVAL SHIP REPAIR	03310	56-62586-A1NP	10	2	0	0.05
NILES STEEL TANK COMPANY	03310	21-04741-01	4	1	0	0.05
NORTHWEST AIRLINES INC.	03310	22-12080-01	57	6	0	0.00
OZARK AIR LINES, INC.	03310	24-13591-01	39	0	0	0.00
PELTON CASTEEL INC	03310	48-02669-02	4	4	0	0.11
PENNSYLVANIA SHIPBUILDING CO.	03310	37-21067-01	8	6	0	0.07
PRYOR FOUNDRY INC.	03310	35-18099-01	2	0	0	0.00
P. X. ENGINEERING COMPANY INC.	03310	20-15102-01	8	2	0	0.05
QUAKER ALLOY CASTING COMPANY	03310	37-03671-01	20	16	4	0.23
REFINERY PRODUCTS CORPORATION	03310	48-03665-02	3	1	0	0.38
SAWYER RESEARCH PRODUCT INC	03310	34-02044-01	6	2	0	0.05
SHAFER VALVE CO.	03310	34-21198-01	4	2	0	0.05
SOUTHWESTERN ENGINEERING CO.	03310	24-19500-01	3	3	1	0.27
STRUTHERS WELLS CORPORATION	03310	37-11152-01	17	7	1	0.10
ST. LOUIS STEEL CASTING, INC.	03310	24-01587-01	3	0	0	0.00
TAYLOR AND FENN COMPANY	03310	06-02024-01	3	3	0	0.05
THIOKOL CHEMICAL CORPORATION	03310	01-00856-02	26	9	0	0.05
THIOKOL CORPORATION (AEROSPACE GROUP)	03310	17-16380-01	43	30	2	0.08
TRANS WORLD AIRLINES INC	03310	24-05151-05	36	6	0	0.05
VOLLRATH COMPANY (THE)	03310	48-05395-01	4	0	0	0.00
WEHR STEEL COMPANY	03310	48-02005-02	0	0	0	0.00
WESTINGHOUSE ELECTRIC CORPORATION	03310	37-05809-02	6	2	0	0.05
WILLIAM POWELL COMPANY (THE)	03310	34-02963-01	6	2	0	0.05
WISCONSIN CENTRIFUGAL INCORPORATED	03310	48-11641-01	5	4	1	0.25
WORD INDUSTRIES PIPE FABRICATING INC.	03310	35-15458-01	0	0	0	0.00
YUBA HEAT TRANSFER CORPORATION	03310	35-13735-01	3	3	2	0.60

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ABC TESTING	03320	20-19778-01	9	9	2	0.22
ADVANCED RADIATION SERVICE INC.	03320	29-14171-01	6	3	3	1.00
ADVEX CORPORATION	03320	45-16452-01	12	10	8	0.77
AKRON INDUSTRIAL SERVICE	03320	34-24673-01	4	3	2	0.58
ALASKA INDUSTRIAL X-RAY	03320	50-16084-01	6	6	2	0.34
ALLEGHENY LABS.	03320	37-20734-01	8	7	6	0.89
ALLIED INSPECTION SERVICES INC.	03320	21-18428-01	4	4	5	1.14
ALLOY CRAFTS COMPANY	03320	13-17511-01	5	3	0	0.09
AMERICAN AIRLINES INC	03320	35-13964-01	111	19	1	0.07
AMERICAN OIL COMPANY (THE)	03320	13-00155-10	30	21	1	0.06
AMERICON	03320	34-02160-04	96	28	6	0.23
ANCHOR/DARLING VALVE COMPANY	03320	37-15476-01	9	7	2	0.23
ANP PIPELINE CO, LAB. SERVICES	03320	21-24502-01	5	2	0	0.11
ANVIL CORP	03320	46-23236-01	0	0	0	0.00
ARMY, DEPARTMENT OF THE	03320	30-02405-05	3	2	0	0.05
ARNOLD GREENE TESTING LAB. INC.	03320	20-01074-02	37	23	4	0.16
ARROW NDE CO	03320	35-23198-01	2	2	3	1.44
ASTROTECH INC	03320	37-09928-01	19	10	2	0.23
BAKER TESTING SERVICES INC.	03320	20-19067-01	5	5	1	0.30
BASIN INDUSTRIAL X-RAY, INC.	03320	42-19906-01	0	0	0	0.00
BATH IRON WORKS CORPORATION	03320	18-00828-04	20	12	1	0.07
BENJAMIN SHAW CO.	03320	01-24890-01	2	2	0	0.11
BILL MILLER INC.	03320	35-19048-01	36	32	21	0.66
BMY, DIV. OF HARSCO	03320	37-20684-02	6	0	0	0.00
BOOTHE-TWINING,INC	03320	04-19522-01	35	33	24	0.73
BRANCH RADIOGRAPHIC LAB. INC.	03320	29-03405-02	34	34	19	0.55
BRAUN ENGINEERING TESTING, INC.	03320	22-16537-02	15	15	5	0.31
BRIGGS ENGINEERING & TESTING CO.	03320	20-16401-01	10	3	0	0.16
BRISTOL STEEL AND IRON WORKS INC.	03320	45-16947-01	4	3	0	0.09
C & R LABORATORIES	03320	53-19179-01	5	5	0	0.05
CALUMET TESTING SERVICES INC.	03320	13-16347-01	30	24	13	0.53
CAPITAL X-RAY SERVICE	03320	35-11114-01	17	17	41	2.41
CARROLL ENGINEERS	03320	20-13042-02	3	1	0	0.18
CBI INDUSTRIES	03320	42-13553-02	125	83	9	0.10
CERTIFIED TESTING LABORATORIES INC	03320	29-14150-01	39	20	5	0.24
CHERNE CONTRACTING CORPORATION	03320	22-18342-01	0	0	0	0.00
CLEVELAND X-RAY INSPECTION INC.	03320	35-15205-01	43	41	39	0.94
COLBY AND THIELMEIER TESTING CO.	03320	24-13737-01	5	5	3	0.69
COLUMBIA GAS TRANSMISSION CORP.	03320	47-16060-01	6	4	1	0.19
COMBUSTION ENGINEERING INC	03320	06-04154-01	28	20	4	0.21
CONSOLIDATED NDE	03320	29-21452-01	100	98	91	0.92
CONSOLIDATED X-RAY SERVICE CORP.	03320	42-08456-02	73	73	92	1.26

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Licensee Name	Program Code	License Number	Total Individuals Monitored	Workers with Measurable Exposure	Collective Dose (person-rem)	Average Meas'ble Dose (rems or cSv)
CONSTRUCTION ENGINEERING	03320	37-18456-01	52	24	2	0.09
CONSUMERS POWER COMPANY	03320	21-08606-03	20	13	2	0.13
CORROSION MONITORING SERVICE	03320	12-24827-01	0	0	0	0.00
COTTON HOUSTON, INC.	03320	42-26823-01	56	54	51	0.94
CRAMER & LINDELL ENGINEERS	03320	06-20794-01	35	23	3	0.12
CRANE COMPANY	03320	24-00563-02	6	6	2	0.34
CTI INC.	03320	50-19202-01	56	47	33	0.70
CTL ENGINEERING INC.	03320	34-08331-01	2	2	2	1.19
D & S TESTING, INC.	03320	34-21458-01	14	13	10	0.74
DANIEL INTERNATIONAL CORP.	03320	39-01261-02	0	0	0	0.00
DAYTON X-RAY COMPANY	03320	34-06943-01	15	12	4	0.37
DELTAK CORP.	03320	22-21447-01	0	0	0	0.00
DEPT OF THE NAVY	03320	04-0581A-A1NP	118	0	0	0.00
DEPT OF THE NAVY	03320	06-68316-A1NP	14	14	1	0.08
DEPT OF THE NAVY	03320	38-68829-A1NP	13	0	0	0.00
DEPT OF THE NAVY	03320	39-00191-A1NP	65	59	9	0.16
DEPT OF THE NAVY	03320	39-52903-A1NP	13	0	0	0.00
DEPT OF THE NAVY	03320	45-00181-A1NP	72	64	6	0.09
DEPT OF THE NAVY	03320	45-32770-A1NP	23	0	0	0.00
DEPT OF THE NAVY	03320	46-00251-A1NP	60	55	6	0.12
DEPT OF THE NAVY	03320	46-68438-A1NP	29	25	1	0.05
DEPT OF THE NAVY	03320	53-00311-A1NP	29	27	1	0.05
DEPT OF THE NAVY	03320	53-00314-A1NP	19	0	0	0.00
DEPT OF THE NAVY	03320	53-68251-A1NP	11	0	0	0.00
DEPT OF THE NAVY	03320	59-04620-A1NP	14	0	0	0.00
DEPT OF THE NAVY	03320	59-04628-A1NP	14	13	1	0.05
DEPT OF THE NAVY	03320	59-04629-A1NP	19	18	1	0.05
DEPT OF THE NAVY	03320	59-04638-A1NP	15	1	0	0.05
DEPT OF THE NAVY	03320	59-04639-A1NP	15	0	0	0.00
DEPT OF THE NAVY	03320	59-04648-A1NP	21	7	0	0.05
DEPT OF THE NAVY	03320	59-04696-A1NP	18	16	1	0.05
DEPT OF THE NAVY	03320	59-04697-A1NP	15	11	1	0.05
DEPT OF THE NAVY	03320	59-04720-A1NP	15	15	2	0.11
DEPT OF THE NAVY	03320	59-05837-A1NP	15	5	0	0.05
DEPT OF THE NAVY	03320	59-05851-A1NP	15	14	1	0.09
DEPT OF THE NAVY	03320	59-08808-A1NP	14	0	0	0.00
DEPT OF THE NAVY	03320	59-08810-A1NP	33	11	1	0.05
DEPT OF THE NAVY	03320	59-20132-A1NP	17	17	1	0.07
DEPT OF THE NAVY	03320	59-20635-A1NP	19	19	2	0.09
DEPT OF THE NAVY	03320	59-21046-A1NP	14	9	0	0.05
DEPT OF THE NAVY	03320	59-21047-A1NP	20	20	1	0.05
DEPT OF THE NAVY	03320	59-21063-A1NP	18	0	0	0.00

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DEPT OF THE NAVY	03320	59-21098-A1NP	31	1	0	0.05
DEPT OF THE NAVY	03320	59-45247-A1NP	10	10	1	0.05
DEPT OF THE NAVY	03320	59-68780-A1NP	12	12	1	0.05
DEPT OF THE NAVY	03320	82-62770-A1NP	23	0	0	0.00
DEPT OF THE NAVY, NAVAL EXPL. ORD.	03320	19-0464A-A1NP	37	6	0	0.05
DEPT OF THE NAVY, NONDEST. TESTING	03320	04-68828-A1NP	6	0	0	0.00
DEPT OF THE NAVY, SHORE INTERM MTN	03320	04-65918-A1NP	23	0	0	0.00
DEPT OF THE NAVY, WEAPONS STATION	03320	04-60036-A1NP	22	0	0	0.00
DEPT OT THE NAVY, MARE ISLAND	03320	04-00221-A1NP	47	41	5	0.12
DETROIT TESTING LABORATORY INC.	03320	21-18302-01	16	12	3	0.24
DUQUESNE LIGHT COMPANY	03320	37-17507-01	8	5	1	0.21
EAGLE INSPECTION AND TESTING	03320	17-26831-01	0	0	0	0.00
EASTERN AIRLINES, AIRCRAFT INSPEC.	03320	20-27917-01	12	2	0	0.05
EASTERN TESTING AND INSPECTION INC	03320	29-09814-01	33	28	9	0.32
EBASCO SERVICES INC.	03320	29-07056-03	74	48	19	0.40
EDWARDS PIPELINE TESTING	03320	35-23193-01	51	50	45	0.90
EG & G FLORIDA, INC.	03320	09-21233-01	34	15	1	0.08
ELPASO NATURAL GAS COMPANY	03320	42-03201-02	5	5	2	0.36
EQUITABLE GAS COMPANY	03320	37-17491-01	7	2	0	0.05
E. L. CONWELL & COMPANY	03320	37-17637-01	0	0	0	0.00
FACTORY MUTUAL RESEARCH CORPORATION	03320	20-04007-02	8	5	0	0.00
FINLAY TESTING LABORATORIES	03320	53-17854-01	9	9	14	1.59
FOSTER WHEELER ENERGY CORP.	03320	31-01776-05	15	11	3	0.28
FROEHLING & ROBERTSON INC.	03320	45-08890-01	14	11	5	0.44
GENERAL DYNAMICS CORPORATION	03320	06-01781-08	88	88	18	0.20
GLITSCH FIELD SERVICE	03320	34-14071-01	45	33	8	0.23
GLOBE X-RAY SERVICES INC	03320	35-15194-01	20	20	20	1.00
H & G INSPECTION	03320	42-26838-01	22	22	32	1.44
HERRON TESTING LABORATORY INC.	03320	34-00681-03	11	7	1	0.13
HIGH MOUNTAIN INSPECTION SERV.	03320	49-26808-01	56	51	57	1.12
HOUSTON INSPECTION SERVICE, INC.	03320	42-23150-01	5	5	1	0.10
HUNTINGTON TESTING LAB	03320	47-23076-01	15	15	11	0.73
HUTCHINSON AREA VO-TECH INSTITUTE	03320	22-15554-01	240	93	6	0.06
H&H X-RAY SERVICES INC.	03320	17-19236-01	8	8	13	1.67
H. C. NUTTING CO.	03320	34-14924-01	8	3	1	0.31
H. R. INSPECTION SERVICE INC.	03320	15-06209-01	8	7	6	0.82
INDEPENDENT INSPECTION	03320	35-26824-01	3	3	2	0.56
INDUSTRIAL GAMMA INSPECTION	03320	24-19850-01	1	0	0	0.00
INDUSTRIAL LABORATORIES INC	03320	41-04226-02	7	7	9	1.29
INDUSTRIAL NDT COMPANY	03320	45-19494-01	18	18	9	0.50
INDUSTRIAL TESTING LAB. CORP.	03320	37-16406-01	11	0	0	0.00

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Licensee Name	Program Code	License Number	Total Individuals Monitored	Workers with Measurable Exposure	Collective Dose (person-rem)	Average Meas'ble Dose (rems or cSv)
INSPECTION SERVICE, INC.	03320	41-21154-01	39	27	24	0.90
INSPECTION SERVICE CORP OF PENN.	03320	37-11636-01	3	2	4	2.00
INSPECTION SERVICE & ENGR.	03320	50-23257-01	13	11	1	0.09
INTERMOUNTAIN TESTING COMPANY	03320	05-07872-01	40	20	2	0.10
INTERNATIONAL TESTING LABS. INC.	03320	29-14027-01	8	0	0	0.00
JACKSONVILLE SHIPYARDS INC.	03320	09-15611-01	9	6	1	0.15
JAN X-RAY SERVICES INC.	03320	21-16560-01	18	17	18	1.06
KELLOG RUST CONSTRUCTORS	03320	42-16573-01	0	0	0	0.00
LABARGE PIPE & STEEL	03320	35-26736-01	2	2	0	0.11
LAW ENGINEERING TESTING COMPANY	03320	10-00346-03	15	15	1	0.06
LEHIGH TESTING LABORATORIES INC.	03320	07-01173-03	10	5	2	0.32
LOCKHEED SHIPBUILDING & CONST.	03320	46-06926-02	4	0	0	0.00
MAGNA CHEK, INC.	03320	21-19111-02	30	22	2	0.11
MASSACHUSETTS MATERIALS RESEARCH INC	03320	20-19130-01	7	3	0	0.09
MATERIALS TESTING LAB. OF VA.	03320	45-17151-01	29	20	3	0.15
METALOGIC, INC.	03320	02-19728-01	28	22	5	0.21
MIDWEST INSPECTION SERVICE LTD	03320	48-16296-01	7	6	1	0.18
MK-FERGUSON CO	03320	34-24757-01	0	0	0	0.00
MONROE X-RAY CO.	03320	17-12201-02	8	8	13	1.67
MONTANA X-RAY INC.	03320	25-21134-01	1	1	2	1.50
MQS INSPECTION	03320	12-00622-07	582	395	211	0.54
NATIONAL INSPECTION & CONSUL	03320	09-21289-01	0	0	0	0.00
NATIONWIDE TESTING SERVICE	03320	12-24461-01	8	7	8	1.14
NDE SERVICES, INC.	03320	05-19821-01	10	10	3	0.30
NEW YORK TESTING LABORATORIES INC.	03320	31-02933-01	5	4	2	0.41
NEWPORT NEWS SHIPBUILDING	03320	45-09428-02	79	75	16	0.21
NONDESTRUCTIVE INSP. INC	03320	47-11883-01	7	7	3	0.48
NONDESTRUCTIVE TESTING CORP	03320	29-19742-01	13	11	2	0.17
NOOTER CORPORATION	03320	24-03783-01	19	11	2	0.16
NORFOLK SHIPBUILDING	03320	45-12042-01	20	16	1	0.07
NORTH AMERICAN INSPECTION, INC.	03320	37-23370-01	35	30	0	0.00
NORTH AMERICAN TESTING	03320	24-24635-01	1	1	1	0.88
NORTHEASTERN RESEARCH & TESTING	03320	29-18006-01	0	0	0	0.00
NOVA DATA TESTING LABS	03320	45-24872-01	10	8	7	0.83
NUCLEAR ENERGY SERVICE INC	03320	42-16559-01	57	52	16	0.31
OKLAHOMA TESTING LABORATORIES	03320	35-10577-01	13	5	1	0.12
OLD DOMINION IRON & STEEL CORP.	03320	45-15581-01	5	4	1	0.29
PANHANDLE EASTERN PIPE LINE	03320	24-08074-03	7	7	2	0.24
PARKER INDUSTRIAL X-RAY LABORATORY	03320	06-01337-03	16	10	3	0.26
PENN INSPECTION CO.	03320	35-21144-01	20	20	9	0.44
PHOTON FIELD INSPECTION, INC.	03320	21-21010-01	5	1	0	0.05

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PIPING SPECIALISTS	03320	24-24826-01	10	7	2	0.29
PITTSBURGH DES MOINES STEEL CO.	03320	14-01837-05	6	3	0	0.13
PITTSBURGH DES MOINES STEEL CO.	03320	37-02607-02	17	7	1	0.20
PITTSBURGH TESTING LABORATORY	03320	37-00276-25	295	212	111	0.52
PITT-DES MOINES	03320	37-27878-01	6	5	1	0.15
PLANT INSPECTION CO	03320	04-21032-01	0	0	0	0.00
POGUE INDUSTRIES	03320	24-24541-01	12	8	4	0.53
PORTABLE ATOMIC X-RAY COMPANY	03320	35-07488-03	2	1	1	0.63
POWER INSPECTION, INC.	03320	37-21428-01	0	0	0	0.00
POWER PIPING COMPANY	03320	37-09945-01	14	8	1	0.10
PRECISION COMPONENTS	03320	37-16280-01	81	62	5	0.08
PROFESSIONAL WELDING ASSOC.	03320	48-25806-01	3	2	1	0.28
PROGRESS SERVICES,INC.	03320	34-19592-01	17	11	2	0.15
PUBLIC SERVICE OF INDIANA	03320	13-15544-06	5	4	1	0.16
PULLMAN POWER PRODUCTS	03320	37-08042-01	21	13	3	0.24
QUAD CITY TESTING LABORATORY, INC.	03320	14-17989-01	12	11	7	0.63
QUALITY ASSURANCE LABORATORIES INC.	03320	18-19078-01	9	7	4	0.52
QUALITY ENGINEERING SERV.& TEST.	03320	35-26815-01	6	5	4	0.80
QUALITY TESTING INC.	03320	34-17799-01	2	0	0	0.00
Q.C. LABORATORIES INC.	03320	09-11579-03	30	29	18	0.63
RADIOGRAPHY INSPECTION	03320	35-26812-01	12	12	7	0.61
RELIANCE TESTING LABORATORIES INC.	03320	19-17176-01	28	24	9	0.36
RICHARD KRUEGEL	03320	34-09037-01	5	5	1	0.10
ROCKWELL INTERNATIONAL	03320	04-17624-03	0	0	0	0.00
ROCKY MOUNTAIN SURVEYORS	03320	25-26835-01	0	0	0	0.00
S & S INSPECTION COMPANY	03320	12-19780-01	7	7	3	0.50
SCIENTIFIC TECHNICAL	03320	45-24882-01	3	3	1	0.24
SMITH-EMERY COMPANY	03320	04-19467-01	4	4	2	0.40
SOUTHWEST X-RAY CORP.	03320	03-21354-01	13	13	15	1.16
SPACE SCIENCE SERVICES INC	03320	09-07550-01	63	49	35	0.72
SPEC CONSULTANTS	03320	37-27891-01	6	6	4	0.60
SPECTRUM LABORATORIES INC.	03320	29-07266-01	5	1	0	0.05
STANDARD TESTING & ENGINEERING	03320	35-17054-02	2	2	0	0.18
STONE & WEBSTER ENGINEERING CORP.	03320	20-05600-02	30	13	1	0.06
ST. LOUIS TESTING LABORATORIES INC.	03320	24-00188-02	13	13	10	0.79
SUPERIOR INDUSTRIAL X-RAY COMPANY	03320	12-02370-01	0	0	0	0.00
TECHNICAL WELDING & INSPECTION SERV.	03320	16-24812-01	12	9	8	0.84
TENNECO INC	03320	42-09073-02	23	20	1	0.05
TENNESSEE VALLEY AUTHORITY	03320	41-06832-06	35	15	2	0.13
TEREX CORPORATION	03320	34-19607-01	2	0	0	0.00
TESTING INSTITUTE OF ALASKA	03320	50-17446-01	9	9	10	1.11
TESTING LAB OF UTAH	03320	43-26821-01	34	32	16	0.49

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TESTMASTER INSPECTION CO.	03320	34-24872-01	16	14	7	0.52
TRANS-EASTERN INSPECTION SERV.	03320	37-14855-01	59	51	32	0.62
TRUTOM LTD.	03320	06-20755-01	32	26	9	0.36
TULSA GAMMA RAY INC.	03320	35-17178-01	23	20	17	0.87
TUMBLEWEED X-RAY	03320	03-23185-01	44	26	20	0.75
TWIN CITY TESTING AND ENGRNG. LAB.	03320	22-01376-02	27	24	12	0.51
TWIN PORTS TESTING, INC.	03320	48-23476-01	29	13	10	0.77
ULTRA TECHNOLOGY, INC.	03320	50-23363-01	29	9	4	0.47
ULTRASONIC SPECIALISTS	03320	47-24878-01	6	6	3	0.44
UNITED STATES TESTING	03320	04-23240-01	355	179	46	0.26
UNIVERSAL TECHNICAL TESTING LAB.	03320	37-00453-03	21	17	11	0.66
UNIVERSAL TESTING	03320	43-11213-02	15	15	7	0.48
UNIVERSAL TESTING LABORATORIES INC.	03320	29-16397-01	15	14	5	0.36
VENEGAS INDUSTRIAL TESTING LAB.	03320	28-14847-02	4	3	1	0.31
VOITH HYDRO INC	03320	37-16280-03	16	5	0	0.05
WALASHEK ENTERPRISES	03320	53-23225-01	11	6	1	0.19
WESTERN X-RAY COMPANY	03320	35-19993-01	16	13	11	0.87
WISCONSIN INDUSTRIAL TESTING INC.	03320	48-17480-01	55	54	36	0.67
X-RAY, INC.	03320	46-03414-03	30	30	17	0.58
X-R-I TESTING OF MICHIGAN	03320	21-05472-01	80	43	9	0.20
X-SCAN INSPECTION COMPANY	03320	35-19507-01	15	14	11	0.78

MANUFACTURERS AND DISTRIBUTORS - 1987

Licensee Name	Program Type	Program Code	License Number	Total Individuals Monitored	Workers with Measurable Exposure	Collective Dose (person-rem)	Average Meas'ble Dose (rems or cSv)
ACCURAY CORPORATION	BROAD	03211	34-00255-03	410	156	12	0.08
AMERSHAM CORP	BROAD	03211	20-12836-01	54	29	7	0.25
AMERSHAM CORPORATION	BROAD	03211	12-12836-01	296	63	19	0.31
E. I. DUPONT (NEN)	BROAD	03211	20-00320-21	0	0	0	0.00
E. R. SQUIBB AND SONS INC.	BROAD	03211	29-00139-02	457	99	41	0.42
HALLIBURTON COMPANY	BROAD	03211	35-00502-03	15	15	1	0.06
MALLINCKRODT/NUCLEAR	BROAD	03211	24-04206-01	292	283	185	0.65
NEW ENGLAND NUCLEAR CORP.	BROAD	03211	20-00320-19	925	800	340	0.42
NUCLEAR RESEARCH CORPORATION	BROAD	03211	29-04236-01	29	22	1	0.05
RAMSEY ENGRNG CO., (TEXAS DIV.)	BROAD	03211	42-01485-04	98	51	22	0.42
UPJOHN COMPANY	BROAD	03211	21-00182-03	633	574	33	0.06
ADVANCED MAGNETICS	LIMITED	03214	20-20526-01	23	4	0	0.05
ADVANCED MEDICAL SYSTEMS INC.	LIMITED	03214	34-19089-01	21	17	21	1.24
ATOMIC ENERGY OF CANADA LIMITED	LIMITED	03212	54-00300-04	60	60	7	0.12
CAMBRIDGE NUCLEAR CORPORATION	LIMITED	03214	20-06799-02	18	2	0	0.11
CANBERRA INDUSTRIES	LIMITED	03214	06-15099-01	27	10	1	0.08
FRONTIER TECHNOLOGY CORP	LIMITED	03214	SNM-1957	19	7	1	0.10
NUCLEAR RESEARCH CORPORATION	LIMITED	03214	37-02401-01	40	10	1	0.05
OHMART CORPORATION (THE)	LIMITED	03212	34-00639-01	83	56	5	0.10
SEAMAN NUCLEAR CORPORATION	LIMITED	03212	48-12016-01	16	15	11	0.73
SYNCOR CORP.	LIMITED*	02500	24-19360-01	17	11	1	0.06
SYNCOR CORP.	LIMITED*	02500	34-16654-01	27	17	6	0.35
SYNCOR CORP.	LIMITED*	02500	35-19583-01	9	2	0	0.11
VARIAN ASSOCIATES	LIMITED	03212	20-02237-04	17	11	1	0.05

FUEL FABRICATORS AND PROCESSORS - 1987

Licensee Name	Program Code	License Number	Total Individuals Monitored	Workers with Measurable Exposure	Collective Dose (person-rem)	Average Meas'ble Dose (rems or cSv)
BABCOCK AND WILCOX	21210	SNM-1168	155	145	12	0.08
BABCOCK AND WILCOX INC NAVAL DIV.	21210	SNM-0042	2608	1519	123	0.08
COMBUSTION ENGINEERING, INC. (POWER SYS.)	21210	SNM-0033	81	72	9	0.13
COMBUSTION ENGINEERING, INC.	21210	SNM-1067	449	134	11	0.09
EXXON NUCLEAR COMPANY INC	21210	SNM-1227	859	400	38	0.10
GENERAL ATOMIC COMPANY	21210	SNM-0696	753	96	16	0.16
GENERAL ELECTRIC CO.	21210	SNM-1097	943	494	64	0.13
NUCLEAR FUEL SERVICES INC,	21210	SNM-0124	3559	367	20	0.05
UNITED NUCLEAR CORPORATION (NAVAL DIV.)	21210	SNM-0368	136	58	4	0.07
WESTINGHOUSE ELECTRIC CORP	21210	SNM-1107	827	709	217	0.31

INDEPENDENT SPENT FUEL STORAGE INSTALLATION - 1987

Licensee Name	Program Code	License Number	Total Individuals Monitored	Workers with Measurable Exposure	Collective Dose (person-rem)	Average Meas'ble Dose (rems or cSv)
GENERAL ELECTRIC COMPANY	23200	SNM-2500	41	40	40	1.01
CAROLINA POWER AND LIGHT	23200	SNM-2502	88	24	1	0.05
VIRGINIA ELECTRIC POWER	23200	SNM-2501*				

*Reported with Surry 1,2 DPR-32,37

LOW LEVEL WASTE DISPOSAL FACILITIES - 1987

Licensee Name	Program Code	License Number	Total Individuals Monitored	Workers with Measurable Exposure	Collective Dose (person-rem)	Average Meas'ble Dose (rems or cSv)
CHEM-NUCLEAR SYSTEMS	03231	12-13536-01	554	145	18	0.12
U.S. ECOLOGY INC.	03231	16-19204-01	223	28	6	0.20

APPENDIX B
Annual Whole Body Doses at Licensed Nuclear Power Facilities
1987

APPENDIX B
ANNUAL WHOLE BODY DOSES AT LICENSED NUCLEAR POWER FACILITIES
CY 1987

PLANT NAME	TYPE	Number of Individuals with Whole Body Doses in the Ranges (rems or cSv)													TOTAL NUMBER MONITORED	NUMBER WITH MEAS. EXPOSURE	TOTAL COLLECTIVE DOSE (Person-rem,cSv)
		No Measurable	Meas. <0.10	0.10-0.25	0.25-0.50	0.50-0.75	0.75-1.00	1.00-2.00	2.00-3.00	3.00-4.00	4.00-5.00	5.00-6.00	6.00-7.00	7.00-12.00	>12.0			
ARKANSAS 1,2	PWR	1,297	529	193	160	78	61	97	4		1					2,420	1,123	382
BEAVER VALLEY	PWR	2,466	708	310	168	52	33	11								3,748	1,282	210 **
BIG ROCK POINT	BWR	171	62	24	29	23	22	58	32	1						422	251	222
BROWNS FERRY 1,2,3	BWR	6,038	1,210	685	469	224	148	329	50							9,153	3,115	1,181 **
BRUNSWICK 1,2	BWR	1,958	1,333	417	345	239	161	450	99	8						5,010	3,052	1,419 **
BYRON 1	PWR	1,719	678	335	252	170	118	244	29							3,545	1,826	769 **
CALLAWAY 1	PWR	912	344	246	229	98	66	92	7							1,994	1,082	393 **
CALVERT CLIFFS 1,2	PWR	568	728	181	165	112	75	123								1,952	1,384	412 **
CATAWBA 1,2*	PWR	1,130	794	431	357	161	64	58								2,995	1,865	449 **
COOK 1,2	PWR	829	699	299	264	156	113	156	8	1						2,525	1,696	666 **
COOPER STATION	BWR	1,589	373	62	51	29	10	24								2,138	549	103 **
CRYSTAL RIVER 3	PWR	1,029	488	308	243	127	91	122	5							2,413	1,384	488 **
DAVIS-BESSE	PWR	2,629	462	130	30	3										3,254	625	47 **
DIABLO CANYON 1,2*	PWR	1,693	447	280	221	114	42	66								2,863	1,170	336 **
DRESDEN 2,3	BWR	1,161	541	351	323	173	156	480	27	1						3,213	2,052	1,245
DUANE ARNOLD	BWR	2,211	248	164	177	132	112	233	28							3,305	1,094	667 **
FARLEY 1,2	PWR	223	820	340	275	194	71	165	6							2,094	1,871	598 **
FITZPATRICK	BWR	765	567	226	165	113	125	288	77	17						2,343	1,578	940 **
FORT CALHOUN	PWR	89	706	158	116	75	69	99	21	3						1,336	1,247	388 **
GINNA	PWR	496	258	153	132	90	39	88	13							1,269	773	344
GRAND GULF	BWR	1,677	523	327	242	144	48	71	3							3,035	1,358	420
HADDAM NECK	PWR	633	771	246	226	156	105	208	46	5						2,396	1,763	750 **
HATCH 1,2	BWR	1,274	924	361	320	224	151	186	25	8	3					3,476	2,202	816 **
HOPE CREEK 1*	BWR	633	337	101	71	29	17	28	6							1,222	589	117 **
INDIAN POINT 2	PWR	586	541	286	240	229	180	465	37	2						2,566	1,980	1,217 **
INDIAN POINT 3	PWR	856	437	313	225	129	89	107	8							2,164	1,308	500
KEWAUNEE	PWR	160	329	141	124	87	31	40	2	1						915	755	226 **
LASALLE 1,2	BWR	1,067	403	217	220	184	149	416	111	36	8					2,811	1,744	1,394 **
LIMERICK 1*	BWR	6,281	1,646	339	135	33	3									8,437	2,156	175 **
MAINE YANKEE	PWR	420	353	99	135	121	95	266	30	1						1,520	1,100	722
MCGUIRE 1,2	PWR	1,147	1,187	498	456	260	161	252	42	9						4,012	2,865	1,043 **
MILLSTONE POINT 1	BWR	1,033	583	304	267	141	113	151	26	3						2,621	1,588	684 **
MILLSTONE POINT 2,3*	PWR	939	529	276	242	128	103	137	23	3						2,380	1,441	505 **
MONTICELLO	BWR	1,148	237	140	151	123	88	186	14	2						2,089	941	568
NINE MILE POINT 1	BWR	2,128	847	152	119	50	14	8								3,318	1,190	141 **

* Indicates plants counted for the first time in 1987 after completing their first full year of operation.
** Indicates actual collective dose reported by facility, otherwise calculated by staff.

APPENDIX B (Continued)
ANNUAL WHOLE BODY DOSES AT LICENSED NUCLEAR POWER FACILITIES
CY 1987

PLANT NAME	TYPE	Number of Individuals with Whole Body Doses in the Ranges (rems or cSv)													TOTAL NUMBER MONI-TORED	NUMBER WITH MEAS. EXPOSURE	TOTAL COLLECTIVE DOSE (Person-rem,cSv)
		No Meas-urable	Meas. <0.10	0.10-0.25	0.25-0.50	0.50-0.75	0.75-1.00	1.00-2.00	2.00-3.00	3.00-4.00	4.00-5.00	5.00-6.00	6.00-7.00	7.00-12.00	>12.0			
NORTH ANNA 1,2	PWR	1,729	1,058	316	295	211	173	387	118	57	9					4,353	2,624	1,521 **
OCONEE 1,2,3	PWR	1,111	910	464	437	309	211	297	44							3,783	2,672	1,142 **
OYSTER CREEK	BWR	362	1,194	200	165	126	89	134	22	2						2,294	1,932	522 **
PALISADES	PWR	544	501	142	148	115	84	125	7							1,666	1,122	456
PALO VERDE 1,2*	PWR	2,587	794	363	227	140	72	133	48	15						4,379	1,792	669 **
PEACH BOTTOM 2,3	BWR	4,255	1,402	789	760	434	288	561	114	15						8,618	4,363	2,195
PILGRIM	BWR	3,249	2,382	761	522	322	230	408	65	20						7,959	4,710	1,579 **
POINT BEACH 1,2	PWR	321	175	74	97	82	69	175	46	2						1,041	720	554
PRAIRIE ISLAND 1,2	PWR	468	264	149	101	46	22	9	2							1,061	593	135 **
QUAD CITIES 1,2	BWR	1,280	456	220	208	141	128	257	16	3						2,709	1,429	775
RANCHO SECO	PWR	1,794	840	303	222	89	43	35	1							3,327	1,533	300 **
RIVER BEND 1*	BWR	1,648	518	254	222	125	67	81	1							2,916	1,268	378 **
ROBINSON 2	PWR	1,656	609	252	171	94	81	164	8							3,035	1,379	499 **
SALEM 1,2	PWR	2,739	1,458	437	305	123	75	120	25							5,282	2,543	600 **
SAN ONOFRE 1,2,3	PWR	3,980	921	347	380	181	140	159	10							6,118	2,138	696 **
SEQUOYAH 1,2	PWR	2,698	1,060	500	307	100	50	60	3							4,778	2,080	420 **
ST. LUCIE 1,2	PWR	1,309	697	392	320	201	106	236	55	5						3,321	2,012	951
SUMMER 1	PWR	820	338	197	165	95	70	167	41	2						1,895	1,075	560 **
SURRY 1,2	PWR	894	1,738	264	192	142	98	195	39	7						3,569	2,675	712 **
SUSQUEHANNA 1,2	BWR	1,501	1,161	505	451	243	127	61								4,049	2,548	621 **
THREE MILE ISLAND 1	PWR	137	937	167	97	31	20	6	1							1,396	1,259	149 **
THREE MILE ISLAND 2	PWR	188	539	117	103	81	71	341	116	10						1,566	1,378	977 **
TROJAN	PWR	871	508	215	204	112	107	63								2,080	1,209	363 **
TURKEY POINT 3,4	PWR	1,633	469	296	302	213	169	426	105							3,613	1,980	1,371
VERMONT YANKEE	BWR	811	220	232	166	88	57	62	2							1,638	827	303 **
WASHINGTON NUCLEAR 2	BWR	1,448	544	196	161	107	80	106	5	1	1					2,649	1,201	406 **
WATERFORD 3	PWR	1,166	570	216	125	23	14	11								2,125	959	156
WOLF CREEK 1	PWR	1,414	334	159	128	32	9	9								2,085	671	134
YANKEE-ROWE	PWR	492	286	76	72	57	46	53	3							1,085	593	218
ZION 1,2	PWR	1,276	256	126	169	135	105	220	34	1						2,322	1,046	693
TOTALS: 64 PWRs		49,648	27,070	10,795	8,827	5,152	3,441	6,187	987	124	10					112,241	62,593	23,721
TOTALS: 32 BWRs		43,688	17,711	7,027	5,739	3,447	2,383	4,578	723	117	12					85,425	41,737	16,871
TOTALS: 96 LWRs		93,336	44,781	17,822	14,566	8,599	5,824	10,765	1,710	241	22					197,666	104,330	40,592

* Indicates plants counted for the first time in 1987 after completing their first full year of operation.

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

APPENDIX B (Continued)
ANNUAL WHOLE BODY DOSES AT LICENSED NUCLEAR POWER FACILITIES
FACILITIES NOT IN OPERATION OR IN OPERATION LESS THAN ONE YEAR
CY 1987

PLANT NAME	TYPE	Number of Individuals with Whole Body Doses in the Ranges (rems or cSv)													TOTAL NUMBER MONI-TORED	NUMBER WITH MEAS. EXPOSURE	TOTAL COLLECTIVE DOSE (Person-rem,cSv)
		No Meas-urable	Meas. <0.10	0.10-0.25	0.25-0.50	0.50-0.75	0.75-1.00	1.00-2.00	2.00-3.00	3.00-4.00	4.00-5.00	5.00-6.00	6.00-7.00	7.00-12.00	>12.0			
BRAIDWOOD 1,2	PWR	5,171	160													5,331	160	8
BYRON 2	Reported with BYRON 1																	
CLINTON	BWR	1,986	414	80	64	21	6	2								2,573	587	80
FERMI 2	BWR	3,726	287	43	11											4,067	341	26
HARRIS	PWR	2,150	312	74	16	1	2	2								2,557	407	40
LACROSSE *	BWR	738	55	16	10	5	12	27	2							865	127	68
NINE MILE POINT 2	Reported with NINE MILE POINT 1																	
PERRY	BWR	2,475	565	88	33	10	2									3,173	698	64
SEABROOK	PWR	853	1													854	1	0
SHOREHAM	BWR	3,987	31													4,018	31	2
VOGTLE	PWR	2,562	876	91	14	2										3,545	983	66
TOTALS: 10		23,648	2,701	392	148	39	22	31	2							26,983	3,335	354
FORT ST. VRAIN	HTGR	155	52	2												209	54	1

* Indicates plants that are no longer in commercial operation.
** Indicates actual collective dose reported by facility, otherwise calculated by staff.

APPENDIX C
Personnel, Dose, and Power Generation Summary
1969-1987

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	1978	627.2	77.5	722	189	32	157	109	80	0.26	0.3
Capacity - 836, 858 MWe	1979	397.0	55.3	1,321	369	54	315	252	117	0.28	0.9
	1980	452.8	63.7	1,233	342	81	261	213	129	0.28	0.8
	1981	1,104.7	68.3	2,225	1,102	130	972	843	259	0.50	1.0
	1982	905.4	58.6	1,608	803	97	706	505	298	0.50	0.9
	1983	915.0	54.6	2,109	1,397	97	1,300	1,145	252	0.66	1.5
	1984	1,289.1	77.4	1,742	806	89	717	533	273	0.46	0.6
	1985	1,192.3	73.6	1,262	286	61	225	148	138	0.23	0.2
	1986	1,070.3	66.9	2,135	1,141	194	947	881	260	0.53	1.1
	1987	1,366.1	87.9	1,123	382	92	290	205	177	0.34	0.3
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	1,817	553	76	477	477	76	0.30	13.9
Capacity - 810 MWe	1981	573.4	73.6	1,237	229	38	191	142	87	0.19	0.4
	1982	326.7	41.6	1,755	599	126	473	481	118	0.34	1.8
	1983	561.2	68.2	1,485	772	158	614	615	157	0.52	1.4
	1984	576.7	71.8	1,393	504	125	379	302	202	0.36	0.9
	1985	717.7	91.9	619	60	17	43	12	48	0.10	0.1
	1986	581.3	70.7	1,575	627	82	545	456	171	0.40	1.1
	1987	684.1	83.6	1,282	210	43	167	137	73	0.16	0.3
BIG ROCK POINT	1969	48.1		165	136					0.82	2.8
Docket 50-155; DPR-6	1970	43.5		290	194					0.67	4.5
1st commercial operation 3/63	1971	44.4		260	184					0.71	4.1
Type - BWR	1972	43.5		195	181					0.93	4.2
Capacity - 69 MWe	1973	50.9		241	285			119	166	1.18	5.6
	1974	40.7	70.3	281	276	54	222	42	234	0.98	6.8
	1975	35.1	59.8	300	180	58	122	20	160	0.60	5.1
	1976	29.5	50.1	488	289	82	207	105	184	0.59	9.8
	1977	43.6	73.4	465	334	94	240	60	274	0.72	7.7
	1978	48.5	77.9	285	175	93	82	9	166	0.61	3.6

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)	1979	13.0	23.5	623	455	89	366	102	353	0.73	35.0
	1980	48.9	79.0	599	354	16	338	91	263	0.59	7.2
	1981	56.9	90.6	479	160	58	102	38	122	0.33	2.8
	1982	43.6	70.8	521	328	129	199	68	260	0.63	7.5
	1983	42.3	71.0	493	263	32	231	55	208	0.53	6.2
	1984	50.3	78.6	297	155	37	118	20	135	0.52	3.1
	1985	43.8	73.5	435	291	54	237	60	231	0.67	6.6
	1986	61.0	95.5	202	84	34	50	17	67	0.42	1.4
	1987	45.3	70.0	251	222	45	177	35	187	0.89	4.9
BROWNS FERRY 1,2,3	1975	161.7	17.8	2,380	325					0.14	2.0
Docket 50-259, 50-260, 50-296	1976	337.6	26.9	2,207	234					0.11	0.7
DPR - 33, - 52, - 68	1977	1,327.5	73.0	1,858	863	60	803	249	614	0.46	0.7
1st commercial operation 8/74, 3/75, 3/77	1978	1,992.1	73.5	2,376	1,792	4	1,788	259	1,533	0.75	0.9
	1979	2,393.0	79.1	2,689	1,667	0	1,667	289	1,378	0.62	0.7
Type - BWRs	1980	2,182.1	73.6	2,712	1,825	4	1,821	49	1,776	0.67	0.8
Capacity - 1065,1065,1065 MWe	1981	2,132.9	69.5	3,379	2,380	100	2,280	404	1,976	0.70	1.1
	1982	2,025.4	67.6	3,277	2,220	181	2,039	317	1,903	0.68	1.1
	1983	1,641.0	54.3	3,302	3,363	276	3,087	908	2,454	1.02	2.0
	1984	1,431.9	54.2	2,962	1,940	229	1,711	541	1,399	0.65	1.4
	1985	368.2	11.9	2,755	1,159	201	958	306	853	0.42	3.1
	1986	0.0	0.0	3,003	1,050	13	1,037	343	707	0.35	---
	1987	0.0	0.0	3,115	1,181	187	994	222	959	0.38	---
BRUNSWICK 1,2	1976	297.2	56.0	1,265	326	15	311	222	104	0.26	1.1
Docket 50-324, 50-325; DPR-62, -71	1977	291.1	55.7	1,512	1,119	48	1,071	782	337	0.74	3.8
1st commercial operation 3/77, 11/75	1978	1,173.1	83.7	1,458	1,004	99	905	695	309	0.69	0.9
Type - BWRs	1979	810.0	60.1	2,891	2,602	97	2,505	2,074	528	0.90	3.2
Capacity - 790, 790 MWe	1980	687.2	52.2	3,788	3,870	111	3,759	3,098	772	1.02	5.6
	1981	925.2	56.9	3,854	2,638	159	2,479	1,890	748	0.68	2.9
	1982	540.3	50.3	4,957	3,792	162	3,630	2,841	951	0.76	7.0
	1983	636.7	40.6	5,602	3,475	152	3,323	2,428	1,047	0.62	5.5
	1984	761.3	51.5	5,046	3,260	143	3,117	2,363	897	0.65	4.3
	1985	822.2	58.4	4,057	2,804	121	2,683	2,078	726	0.69	3.4
	1986	1,051.3	69.1	3,370	1,909	232	1,677	761	1,148	0.57	1.8
	1987	1,152.4	79.1	3,052	1,419	144	1,275	861	558	0.46	1.2

APPENDIX C (Continued)
PERSONNEL, DOSE AND POWER GENERATION SUMMARY

Reporting Organization	Year	Mega-watt-Years (MW-Yr)	Unit Availa-bility Factor	Total Personnel With Measur-able Doses	Collective Dose (person-rems or cSv)	Person-rems (-cSv) per Work Function		Person-rems (-cSv) per Personnel Type		Average Meas'ble Dose (rems or cSv)	Person rems (-cSv)/ MW-Yr
						Opera-tions	Maint. & Others	Contrac-tor	Station & Utility		
BYRON 1	1986	894.5	88.6	1,081	104	16	88	65	39	0.10	0.1
Docket 50-454; NPF-37	1987	650.9	68.6	1,826	769	11	758	667	102	0.42	1.2
1st commercial operation 9/85											
Type - PWR											
Capacity - 1129 MWe											
CALLAWAY 1	1985	967.4	90.0	964	36	16	20	7	29	0.04	0.0
Docket 50-483; NPF-30	1986	865.2	81.3	1,052	225	53	172	129	96	0.21	0.3
1st commercial operation 12/84	1987	759.0	70.1	1,082	393	89	304	249	144	0.36	0.5
Type - PWR											
Capacity - 1120											
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	2,265	547	36	511	224	323	0.24	0.9
1st commercial operation 5/75, 4/77	1978	1,188.5	75.8	1,391	500	13	487	143	357	0.36	0.4
Type - PWRs	1979	1,161.0	74.0	1,428	805	33	772	423	382	0.56	0.7
Capacity - 825, 825 MWe	1980	1,309.9	84.1	1,496	677	15	662	402	275	0.45	0.5
	1981	1,379.7	83.1	1,555	607	29	578	378	229	0.39	0.4
	1982	1,238.3	73.7	1,805	1,057	84	973	402	655	0.59	0.9
	1983	1,397.2	81.6	1,915	668	5	663	143	525	0.35	0.5
	1984	1,389.4	79.2	1,369	479	61	418	78	401	0.35	0.3
	1985	1,189.8	68.4	1,598	694	69	625	144	550	0.43	0.6
	1986	1,530.1	87.2	1,296	347	2	345	101	246	0.27	0.2
	1987	1,207.3	69.1	1,384	412	29	383	110	302	0.30	0.3
CATAWBA 1,2	1986	638.9	58.8	1,724	286	27	259	68	218	0.17	0.4
Docket 50-413, 50-414; NPF-35, NPF-52	1987	1,651.2	73.9	1,865	449	32	417	161	288	0.24	0.3
1st commercial operation 6/85, 8/86											
Type - PWR											
Capacity - 1129, 1129 MWe											

APPENDIX C (Continued)
PERSONNEL, DOSE AND POWER GENERATION SUMMARY

Reporting Organization	Year	Mega-watt-Years (MW-Yr)	Unit Availa-bility Factor	Total Personnel With Measur-able Doses	Collective Dose (person-rems or cSv)	Person-rems (-cSv) per Work Function		Person-rems (-cSv) per Personnel Type		Average Meas'ble Dose (rems or cSv)	Person rems (-cSv)/ MW-Yr
						Opera-tions	Maint. & Others	Contrac-tor	Station & Utility		
COOK 1,2	1976	807.4	83.1	395	116	13	103	71	45	0.29	0.1
Docket 5-315; 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	0.5
Type - PWRs	1979	1,373.0	65.3	1,445	718	45	673	454	264	0.50	0.5
Capacity - 1020, 1060 MWe	1980	1,552.4	74.1	1,345	493	46	447	323	170	0.37	0.3
	1981	1,557.3	73.4	1,341	655	48	607	442	213	0.49	0.4
	1982	1,461.6	69.8	1,527	699	67	632	472	227	0.46	0.5
	1983	1,456.5	71.2	1,418	658	50	608	467	191	0.46	0.5
	1984	1,526.0	75.3	1,559	762	42	720	597	165	0.49	0.5
	1985	925.4	47.6	1,984	945	93	852	758	187	0.48	1.0
	1986	1,307.1	73.4	1,774	745	22	723	585	160	0.42	0.6
	1987	1,199.5	69.5	1,696	666	79	587	525	141	0.39	0.6
COOPER STATION	1975	456.4	83.6	579	117	30	87	19	98	0.20	0.3
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	1,383	1,293	57	1,236	1,081	212	0.93	3.3
	1984	411.9	67.2	1,598	799	46	753	635	164	0.50	1.9
	1985	127.3	21.5	1,980	1,333	49	1,284	1,104	229	0.67	10.5
	1986	480.0	74.7	895	320	49	271	115	205	0.36	0.7
	1987	652.3	94.7	549	103	26	77	11	92	0.19	0.2
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	1,150	495	29	466	346	149	0.43	1.1
1st commercial operation 3/77	1980	404.1	53.2	1,053	625	24	601	382	243	0.59	1.5
Type - PWR	1981	490.4	62.2	1,120	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	1,720	552	71	481	353	199	0.32	1.2
	1984	774.2	94.5	549	49	10	39	22	27	0.09	0.1
	1985	344.2	47.6	1,976	689	43	646	424	265	0.35	2.0
	1986	319.5	41.8	1,057	472	25	447	298	174	0.45	1.5
	1987	436.0	60.1	1,384	488	49	439	302	186	0.35	1.1

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		
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	1,283	154	4	150	121	33	0.12	0.6
Type - PWR	1981	531.4	67.4	578	58	1	57	32	26	0.10	0.1
Capacity - 860 MWe	1982	390.8	51.5	1,350	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	1,088	177	10	167	122	55	0.16	0.3
	1985	238.3	31.2	718	71	3	68	46	25	0.10	0.3
	1986	3.3	1.3	981	124	22	102	103	21	0.13	37.6
	1987	618.0	83.5	625	47	11	36	27	20	0.08	0.1
DIABLO CANYON 1,2	1986	641.5	80.6	1,260	304	4	300	206	98	0.24	0.5
Docket 50-275, 50-323; DPR-80, DPR-82	1987	1,688.6	80.5	1,170	336	5	331	226	110	0.29	0.2
1st commercial operation 5/85, 3/86											
Type - PWRs											
Capacity - 1073, 1087 MWe											
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, 7/70,	1972	1,243.7			728						0.6
11/71	1973	1,112.2		1,341	939	143	796	344	595	0.70	0.8
Type - BWRs	1974	842.5	54.9	1,594	1,662			57	1,605	1.04	2.0
Capacity - 197, 772, 773 MWe	1975	708.1	54.6	2,310	3,423	271	3,152	2,252	1,171	1.48	4.8
	1976	1,127.2	80.8	1,746	1,680	228	1,452	749	931	0.96	1.5
	1977	1,132.9	77.0	1,862	1,693	316	1,377	693	1,000	0.91	1.5
	1978	1,242.2	79.5	1,946	1,529	204	1,325	619	910	0.79	1.2
	1979	1,013.0	74.7	2,407	1,800	191	1,609	641	1,159	0.75	1.8
	1980	1,074.4	55.0	2,717	2,105	236	1,869	1,093	1,012	0.77	2.0
	1981	1,035.7	51.5	2,408	2,802	120	2,682	1,850	952	1.16	2.7
	1982	1,085.3	77.9	2,572	2,923	136	2,787	1,731	1,192	1.14	2.7
	1983	913.6	65.6	2,854	3,582	176	3,406	2,127	1,455	1.26	3.9
	1984	789.8	55.3	2,261	1,774	153	1,621	814	960	0.78	2.2

*Dresden 1 has been shut down since 1978, and in 1985 it was decided that it would not be put in commercial operation again. Therefore, it is no longer included in the count of commercial reactors.

APPENDIX C (Continued)
PERSONNEL, DOSE AND POWER GENERATION SUMMARY

Reporting Organization	Year	Mega-watt-Years (MW-Yr)	Unit Availa-bility Factor	Total Personnel With Measur-able Doses	Collective Dose (person-rems or cSv)	Person-rems (-cSv) per Work Function		Person-rems (-cSv) per Personnel Type		Average Meas'ble Dose (rems or cSv)	Person rems (-cSv)/ MW-Yr
						Opera-tions	Maint. & Others	Contrac-tor	Station & Utility		
DRESDEN 1*,2,3 (Continued)	1985	903.0	64.5	2,817	1,685	473	1,212	878	807	0.60	1.9
	1986	740.5	52.6	3,111	2,796	272	2,524	2,113	683	0.90	3.8
	1987	933.9	68.2	2,052	1,245	262	983	645	600	0.61	1.3
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	1,112	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	1,108	671	32	639	570	101	0.61	2.0
	1981	277.7	69.8	1,286	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	1,468	1,135	42	1,093	1,016	119	0.77	4.0
	1984	329.4	72.9	611	189	27	162	117	72	0.31	0.6
	1985	236.2	53.8	1,414	1,112	49	1,063	954	158	0.79	4.7
	1986	365.5	82.0	476	187	49	138	94	93	0.39	0.5
	1987	308.4	63.0	1,094	667	241	426	478	189	0.61	2.2
FARLEY 1,2	1978	713.8	86.5	527	108	39	69	34	74	0.20	0.2
Docket 50-348, 50-364; NPF-2, -8	1979	211.0	28.6	1,227	643	108	535	460	183	0.52	3.0
1st commercial operation 12/77, 7/81	1980	557.3	69.3	1,330	435	106	329	185	250	0.33	0.8
Type - PWR	1981	310.2	41.4	1,331	511	96	415	270	241	0.38	1.6
Capacity - 816, 807 MWe	1982	1,271.5	79.2	1,453	484	155	329	196	288	0.33	0.4
	1983	1,356.5	82.9	1,938	1,021	241	780	479	542	0.53	0.8
	1984	1,447.0	86.6	2,046	902	177	725	504	398	0.44	0.6
	1985	1,368.2	81.1	2,551	799	157	642	443	356	0.31	0.6
	1986	1,409.3	82.4	2,314	858	148	710	464	394	0.37	0.6
	1987	1,369.7	83.3	1,871	598	105	493	347	251	0.32	0.4
FITZPATRICK	1976	489.0	71.6	600	202					0.34	0.4
Docket 50-333; DPR-59	1977	460.5	68.4	1,380	1,080	14	1,066	937	143	0.78	2.3
1st commercial operation 7/75	1978	497.0	72.1	904	909	166	743	597	312	1.01	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	2,056	2,040	118	1,922	1,808	232	0.99	4.0
	1981	562.9	74.7	2,490	1,425	187	1,238	1,072	353	0.57	2.5
	1982	583.6	75.0	2,322	1,190	136	1,054	862	328	0.51	2.0

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		
FITZPATRICK (Continued)	1983	546.2	70.6	1,715	1,090	158	932	667	423	0.64	2.0
	1984	576.2	76.8	1,610	971	82	889	467	504	0.60	1.7
	1985	492.3	63.7	1,845	1,051	110	941	718	333	0.57	2.1
	1986	711.2	90.6	1,185	411	81	330	168	243	0.35	0.6
	1987	496.2	67.3	1,578	940	164	776	616	324	0.60	1.9
FORT CALHOUN	1975	252.3	67.4	469	294			92	202	0.63	1.2
Docket 50-285; DPR-40	1976	265.9	69.5	516	313	28	285	38	275	0.61	1.2
1st commercial operation 9/73	1977	351.8	79.4	535	297	33	264	72	225	0.56	0.8
Type - PWR	1978	342.3	75.1	596	410	59	351	151	259	0.69	1.2
Capacity - 478 MWe	1979	440.0	95.7	451	126	19	107	47	79	0.28	0.3
	1980	242.3	60.4	891	668	38	630	426	242	0.75	2.8
	1981	260.9	72.3	822	458	61	397	254	204	0.56	1.8
	1982	418.0	89.7	604	217	44	173	99	118	0.36	0.5
	1983	330.4	73.1	860	433	66	367	205	228	0.50	1.3
	1984	279.2	59.9	913	563	91	472	313	250	0.62	2.0
	1985	367.0	73.7	984	373	54	319	231	142	0.38	1.0
	1986	431.8	94.3	756	74	26	48	30	44	0.10	0.2
	1987	366.0	74.6	1,247	388	79	310	227	162	0.31	1.1
GINNA	1971	327.8		340	430	69	361	108	322	1.26	1.3
Docket 50-244; DPR-18	1972	293.6		677	1,032	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	1,225					1.39	4.8
Capacity - 470 MWe	1975	365.2	76.7	685	538					0.79	1.5
	1976	248.8	58.2	758	636	29	607	210	426	0.84	2.6
	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	1,073	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	1,117	1,140	80	1,060	546	594	1.02	3.9
	1983	365.0	74.6	969	855	42	813	378	477	0.88	2.3
	1984	378.1	77.2	713	394	57	337	195	199	0.55	1.0
	1985	436.7	87.9	845	426	91	335	178	248	0.50	1.0
	1986	433.3	87.4	901	357	45	312	107	250	0.40	0.8
	1987	459.0	91.3	773	344	35	309	151	193	0.45	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		
GRAND GULF	1986	494.7	60.9	1,486	436	68	368	329	107	0.29	0.9
Docket 50-416; NPF-29	1987	920.7	81.1	1,358	420	106	314	303	117	0.31	0.5
1st commercial operation 7/85											
Type - BWR											
Capacity - 1108 MWe											
HADDAM NECK	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	1971	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					0.37	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	1,226	1,161	73	1,088	783	378	0.95	2.4
	1980	426.8	75.0	1,860	1,353	175	1,178	1,076	277	0.73	3.2
	1981	487.5	84.3	1,554	1,036	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	1,645	1,384	106	1,278	1,017	367	0.84	3.1
	1984	404.0	71.7	1,430	1,216	154	1,062	803	413	0.85	3.0
	1985	556.1	98.4	384	101	21	80	22	79	0.26	0.2
	1986	294.8	53.6	1,945	1,567	179	1,388	1,274	293	0.81	5.3
	1987	920.7	81.1	1,358	420	106	314	303	117	0.31	0.5
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	1,303	465	96	369	220	245	0.36	1.0
NPF-05	1978	513.0	72.8	1,304	248	88	160	52	196	0.19	0.5
1st commercial operation 12/75, 9/79	1979	401.0	54.6	2,131	582	85	497	382	200	0.27	1.5
Type - BWRs	1980	1,008.7	70.9	1,930	449	143	306	163	286	0.23	0.4
Capacity - 752, 748 MWe	1981	870.9	64.3	2,899	1,337	200	1,137	792	545	0.46	1.5
	1982	768.0	56.6	3,418	1,460	218	1,242	1,064	396	0.43	1.9
	1983	934.7	68.6	3,428	1,299	253	1,046	851	448	0.38	1.4
	1984	658.6	117.3	4,110	2,218	311	1,907	1,861	357	0.54	3.4
	1985	1,211.0	79.1	2,841	818	182	636	507	311	0.29	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		
HATCH 1,2 (Continued)	1986	872.1	59.0	3,486	1,497	347	1,150	862	635	0.43	1.7
	1987	1,295.4	88.1	2,202	816	207	609	435	381	0.37	0.6
HOPE CREEK 1 Docket 50-354; NPF-57 1st commercial operation 12/86 Type - BWR Capacity - 1031 MWe	1987	869.2	85.1	589	117	21	96	40	77	0.20	0.1
HUMBOLDT BAY*	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	0.0	1,063	1,904	24	1,880	973	931	1.79	---
	1978	0.0	0.0	320	335	13	322	145	190	1.05	---
	1979	0.0	0.0	135	31	11	20	2	29	0.23	---
	1980	0.0	0.0	142	22	10	12	3	19	0.15	---
	1981	0.0	0.0	75	9					0.12	---
	1982	0.0	0.0	71	19	5	14	0	19	0.27	---
	1983	0.0	0.0	84	17	4	13	0	17	0.20	---

* Humboldt Bay has been shutdown since 1976 and in 1984, it was decided that it would not be placed in operation again. Therefore, it it no longer included in the count of commecial reactors.

APPENDIX C (Continued)
PERSONNEL, DOSE AND POWER GENERATION SUMMARY

Reporting Organization	Year	Mega-watt-Years (MW-Yr)	Unit Availa-bility Factor	Total Personnel With Measur-able Doses	Collective Dose (person-rems or cSv)	Person-rems (-cSv) per Work Function		Person-rems (-cSv) per Personnel Type		Average Meas'ble Dose (rems or cSv)	Person rems (-cSv)/ MW-Yr
						Opera-tions	Maint. & Others	Contrac-tor	Station & Utility		
INDIAN POINT 1**,2,3***	1969	206.2			298						1.4
Docket 50-3, 50-247, 50-286;	1970	43.3			1,639						37.8
DPR-5, -26, -64	1971	154.0			768						5.0
1st commercial operation 10/62, 8/73,	1972	142.3			967						6.8
8/76	1973	0.0		2,998	5,262	709	4,553	2,847	2,415	1.75	---
Type - PWR	1974	556.1	59.4	1,019	910					0.89	1.6
Capacity - 0, 864, 965	1975	584.4	74.8	891	705	166	539	47	658	0.79	1.2
	1976	273.9	34.8	1,590	1,950	154	1,796	172	1,778	1.23	7.1
	1977	1,278.3	75.3	1,391	1,070	189	881	383	687	0.77	0.8
	1978	1,172.3	67.8	1,909	2,006	260	1,746	759	1,247	1.05	1.7
INDIAN POINT 1**,2	1979	574.0	71.4	1,349	1,279	209	1,070	612	667	0.95	2.2
	1980	510.8	64.8	1,577	971	181	790	398	573	0.62	1.9
	1981	367.5	46.0	2,595	2,731	237	2,494	1,595	1,137	1.05	7.4
	1982	532.4	65.4	2,144	1,635	343	1,292	883	752	0.76	3.1
	1983	702.6	84.0	1,057	486	200	286	217	269	0.46	0.7
	1984	416.7	51.9	2,919	2,644	650	1,994	1,863	781	0.91	6.3
	1985	791.4	95.7	708	192	123	69	95	97	0.27	0.2
INDIAN POINT 2	1986	457.5	56.2	1,926	1,250	350	900	349	901	0.65	2.7
Docket 50-247; DPR-26	1987	611.4	72.3	1,980	1,217	128	1,089	805	412	0.61	2.0
1st commercial operation 8/73											
Type - PWR											
Capacity - 864 MWe											
INDIAN POINT 3***	1979	574.0	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	367.5	59.8	677	364	46	318	255	109	0.54	1.0
Type - PWR	1982	171.5	22.5	1,477	1,226	42	1,184	1,094	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

** 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		
INDIAN POINT 3 (continued)	1985	566.5	66.0	1,093	570	35	535	455	115	0.52	1.0
	1986	655.3	73.4	588	202	34	168	123	79	0.34	0.3
	1987	574.6	61.6	1,308	500	84	416	365	135	0.38	0.9
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	0.45	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	19	0.29	0.3
	1985	443.1	82.4	519	176	4	172	118	58	0.34	0.4
	1986	461.7	85.8	502	169	8	161	111	58	0.34	0.4
	1987	480.0	89.2	755	226	8	218	173	53	0.30	0.5
LACROSSE	1970	15.3			111			40	71		7.2
Docket 50-409; DPR-45	1971	323.1		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	7.8
	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	0.88	6.5
	1985	39.2	86.7	373	173	76	97	22	151	0.46	4.4
	1986	19.6	46.1	260	290					1.12	14.8
	1987	0.0	0.0	127	68	42	26	2	66	0.54	---

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		
LASALLE 1,2	1984	677.8	68.9	1,245	252	30	222	86	166	0.20	0.4
Docket 50-373, -374; NPF-11, -18	1985	987.9	52.5	1,635	685	88	597	420	265	0.42	0.7
1st commercial operation 1/84, 10/84	1986	929.5	26.6	1,614	949	151	798	557	392	0.59	1.0
Type - BWR	1987	1,030.0	58.0	1,744	1,394	216	1,178	988	406	0.80	1.4
Capacity - 1036, 1036 MWe											
LIMERICK 1	1987	636.1	67.7	2,156	175	7	168	114	61	0.08	0.3
Docket 50-352; NPF-39											
1st commercial operation 2/86											
Type - BWR											
Capacity - 1055 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	0.73	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	0.7
	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	868	424	11	413	308	116	0.49	0.7
	1982	542.5	69.1	1,295	619	33	586	462	157	0.48	1.1
	1983	677.1	83.6	592	164	40	124	72	92	0.28	0.2
	1984	605.7	74.4	1,262	884	9	875	702	182	0.70	1.5
	1985	635.4	79.2	1,009	700	54	646	529	171	0.69	1.1
	1986	737.6	87.8	495	100	21	79	14	86	0.20	0.1
	1987	478.1	61.8	1,100	722	39	683	531	191	0.66	1.5
MCGUIRE 1,2	1982	524.9	80.4	1,560	169	26	143	29	140	0.11	0.3
Docket 50-369, -370; NPF-9, -17	1983	558.3	55.4	1,751	521	35	486	123	398	0.30	0.9
1st commercial operation 12/81, 3/84	1984	764.1	68.5	1,663	507	40	467	110	397	0.30	0.7
Type - PWR	1985	1,477.6	68.1	2,217	771	92	679	277	494	0.35	0.5
Capacity - 1180, 1180 MWe	1986	1,360.0	56.1	2,326	1,015	46	969	399	616	0.44	0.7
	1987	1,774.7	78.1	2,865	1,043	38	1,005	510	533	0.36	0.6

APPENDIX C (Continued)
PERSONNEL, DOSE AND POWER GENERATION SUMMARY

Reporting Organization	Year	Mega-watt-Years (MW-Yr)	Unit Availa-bility Factor	Total Personnel With Measur-able Doses	Collective Dose (person-rems or cSv)	Person-rems (-cSv) per Work Function		Person-rems (-cSv) per Personnel Type		Average Meas'ble Dose (rems or cSv)	Person rems (-cSv)/ MW-Yr
						Opera-tions	Maint. & Others	Contrac-tor	Station & Utility		
MILLSTONE POINT 1	1972	377.6		612	596	50	546	340	256	0.97	1.6
Docket 50-245; DPR-21	1973	225.1		1,184	663	125	538	422	241	0.56	2.9
1st commercial operation 3/71	1974	430.3	79.1	2,477	1,430					0.58	3.3
Type - BWR	1975	465.4	75.6	2,587	2,022					0.78	4.3
Capacity - 654 MWe	1976	449.8	76.1	1,377	1,194	54	1,140	955	239	0.87	2.7
	1977	575.7	89.6	1,075	392	118	274	159	233	0.36	0.7
	1978	556.6	87.6	1,391	1,239	140	1,099	907	332	0.89	2.2
	1979	505.0	77.3	1,769	1,793	198	1,595	1,326	467	1.01	3.6
	1980	405.8	69.0	3,024	2,158	100	2,058	1,864	294	0.71	5.3
	1981	304.3	51.6	2,506	1,496	96	1,400	1,201	295	0.60	4.9
	1982	490.2	79.9	1,370	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	1,992	836	80	756	532	304	0.42	1.6
	1985	548.5	83.6	732	608	65	543	369	239	0.83	1.1
	1986	626.8	95.4	389	150	46	104	52	98	0.39	0.2
	1987	523.4	77.9	1,588	684	56	628	523	161	0.43	1.3
MILLSTONE POINT 2,3	1976	545.7	78.7	620	168	26	142	73	95	0.27	0.3
Docket 50-336, 50-423; DPR-65, NPF-49	1977	518.7	65.7	667	242	38	204	153	89	0.36	0.5
1st commercial operation 12/75, 4/86	1978	536.6	67.3	1,420	1,621	72	1,549	1,534	87	1.14	3.0
Type - PWR	1979	520.0	62.8	757	472	81	391	305	167	0.62	0.9
Capacity - 857, 1197 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	2,083	1,413	27	1,386	1,219	194	0.68	2.4
	1983	294.0	34.2	2,383	1,881	170	1,711	1,548	333	0.79	6.4
	1984	782.7	93.5	285	120	11	109	63	57	0.42	0.2
	1985	417.8	49.4	1,905	1,581	60	1,521	1,255	326	0.83	3.8
	1986	613.7	72.5	2,393	918	125	793	737	181	0.38	1.5
	1987	1,624.5	82.3	1,441	505	19	486	370	135	0.35	0.3
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	0.5
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	1,353	1,353					1.00	3.9
Capacity - 536 MWe	1976	476.4	91.5	325	263	59	204	51	212	0.81	0.6

APPENDIX C (Continued)
PERSONNEL, DOSE AND POWER GENERATION SUMMARY

Reporting Organization	Year	Mega-watt-Years (MW-Yr)	Unit Availa-bility Factor	Total Personnel With Measur-able Doses	Collective Dose (person-rems or cSv)	Person-rems (-cSv) per Work Function		Person-rems (-cSv) per Personnel Type		Average Meas'ble Dose (rems or cSv)	Person rems (-cSv)/ MW-Yr
						Opera-tions	Maint. & Others	Contrac-tor	Station & Utility		
MONTICELLO (Continued)	1977	425.6	79.9	860	1,000	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	1,114	531	82	449	248	283	0.48	1.3
	1981	389.3	72.6	1,446	1,004	101	903	756	248	0.69	2.6
	1982	291.1	63.3	1,307	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	1,872	2,462	208	2,254	927	1,535	1.32	73.1
	1985	509.8	91.7	586	327	87	240	47	280	0.56	0.6
	1986	402.7	79.1	895	596	94	502	115	481	0.67	1.5
	1987	422.5	80.5	941	568	102	466	115	453	0.60	1.3
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		1,006	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	1,093	1,383	41	1,342	883	500	1.27	4.0
	1978	527.7	95.1	561	314	59	255	26	288	0.56	0.6
	1979	354.0	66.1	1,326	1,497	106	1,391	940	557	1.13	4.2
	1980	533.9	92.3	1,174	591	75	516	251	340	0.50	1.1
	1981	385.2	66.0	2,029	1,592	144	1,448	1,064	528	0.78	4.1
	1982	133.5	21.4	1,352	1,264	63	1,201	944	320	0.93	9.5
	1983	329.8	56.2	1,405	860	50	810	576	284	0.61	2.6
	1984	426.8	71.9	1,530	890	163	727	372	518	0.58	2.1
	1985	580.9	96.4	1,007	265	60	205	43	222	0.26	0.5
	1986	371.0	65.3	1,878	1,220	36	1,184	698	522	0.65	3.3
	1987	542.6	92.8	1,190	141	35	106	39	102	0.12	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		
NORTH ANNA 1,2	1979	507.0	61.7	2,025	449	78	371	190	259	0.22	0.9
Docket 50-338; NPF-04, -09	1980	681.8	86.5	2,086	218	128	90	85	133	0.10	0.3
1st commercial operation 6/78, 12/80	1981	1,241.9	71.5	2,416	680	188	492	343	337	0.28	0.5
Type - PWRs	1982	777.7	45.8	2,872	1,915	78	1,837	1,207	708	0.67	2.5
Capacity - 893, 893 MWe	1983	1,338.4	76.1	2,228	665	129	536	296	369	0.30	0.5
	1984	1,021.3	58.8	3,062	1,945	154	1,791	1,416	529	0.64	1.9
	1985	1,516.9	86.1	2,436	839	141	698	502	337	0.34	0.6
	1986	1,484.5	83.7	2,831	722	111	611	343	379	0.26	0.5
	1987	1,112.6	64.6	2,624	1,521	60	1,461	1,075	446	0.58	1.4
OCONEE 1,2,3	1974	650.6	60.1	844	517	18	499	144	373	0.61	0.8
Docket 50-269, 50-270, 50-287;	1975	1,838.3	75.5	829	497	72	425	90	407	0.60	0.3
DPR-38, -47, -55	1976	1,561.4	63.0	1,215	1,026	65	961	219	807	0.84	0.7
1st commercial operation 7/73, 9/74,	1977	1,566.4	65.9	1,595	1,328	244	1,084	294	1,034	0.83	0.8
12/74	1978	1,909.0	75.8	1,636	1,393	179	1,214	340	1,053	0.85	0.7
Type - PWRs	1979	1,708.0	67.7	2,100	1,001	123	878	181	820	0.48	0.6
Capacity - 860, 860, 860 MWe	1980	1,703.7	70.1	2,124	1,055	117	938	162	893	0.50	0.6
	1981	1,661.5	66.8	2,445	1,211	113	1,098	275	936	0.50	0.7
	1982	1,293.1	52.5	2,445	1,792	97	1,695	364	1,428	0.73	1.4
	1983	2,141.5	82.2	1,902	1,207	88	1,119	316	891	0.63	0.6
	1984	2,242.9	85.7	2,085	1,106	63	1,043	260	846	0.53	0.5
	1985	2,036.3	80.5	2,729	1,304	143	1,161	378	926	0.48	0.6
	1986	1,995.5	79.0	2,499	949	37	912	261	688	0.38	0.5
	1987	1,962.6	81.2	2,672	1,142	51	1,091	376	766	0.43	0.6
OYSTER CREEK	1970	413.6		95	63	21	42	11	52	0.66	0.1
Docket 50-219; DPR-16	1971	448.9		249	240	50	190	92	148	0.96	0.5
1st commercial operation 12/69	1972	515.0		339	582	150	432	167	415	1.72	1.1
Type - BWR	1973	424.6		782	1,236	195	1,041	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	1,210	1,140	169	971	271	869	0.94	3.1
	1976	456.5	79.3	1,582	1,078	70	1,008	587	491	0.68	2.4
	1977	385.7	70.1	1,673	1,614	76	1,538	1,048	566	0.96	4.2
	1978	431.8	74.3	1,411	1,279	134	1,145	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	1,966	1,733	97	1,636	1,182	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	1,689	917	48	869	479	438	0.54	2.9
	1982	242.7	62.5	1,270	865	33	832	491	374	0.68	3.6
	1983	27.9	11.5	2,303	2,257	65	2,192	1,863	394	0.98	80.9
	1984	37.1	9.6	2,369	2,054	134	1,920	1,538	516	0.87	55.4
	1985	446.1	89.4	2,342	748	116	632	318	430	0.32	1.7
	1986	157.3	31.5	3,740	2,436	288	2,148	1,924	512	0.65	15.5
	1987	371.0	61.9	1,932	522	112	410	211	311	0.27	1.4
PALISADES	1972	216.8			78						0.4
Docket 50-255; DPR-20	1973	286.8		975	1,133	16	1,117	661	472	1.16	4.0
1st commercial operation 12/71	1974	10.7	5.5	774	627					0.81	58.6
Type - PWR	1975	302.0	64.5	495	306					0.62	1.0
Capacity - 730 MWe	1976	346.9	55.2	742	696	23	673	109	587	0.94	2.0
	1977	616.6	91.4	332	100	13	87	23	77	0.30	0.2
	1978	320.2	49.7	849	764	52	712	173	591	0.90	2.4
	1979	415.0	59.9	1,599	854	99	755	360	494	0.53	2.1
	1980	288.3	42.9	1,307	424	191	233	312	112	0.32	1.5
	1981	418.2	57.2	2,151	902	167	735	737	165	0.42	2.2
	1982	404.3	54.7	1,554	330	73	257	203	127	0.21	0.8
	1983	454.4	60.3	2,167	977	145	832	494	483	0.45	2.2
	1984	98.7	15.2	1,344	573	79	494	339	334	0.43	5.8
	1985	639.2	83.8	1,355	507	105	402	239	268	0.37	0.8
	1986	102.3	15.1	1,438	672	148	524	204	468	0.47	6.6
	1987	319.2	45.5	1,122	456	85	371	216	240	0.41	1.4
PALO VERDE 1,2	1987	1,638.1	64.9	1,792	669	101	568	437	232	0.37	0.4
Docket 50-528, 50-529; NPF-41, NPF-51											
1st commercial operation 1/86, 9/86											
Type - PWRs											
Capacity - 1221, 1221 MWe											

APPENDIX C (Continued)
PERSONNEL, DOSE AND POWER GENERATION SUMMARY

Reporting Organization	Year	Mega-watt-Years (MW-Yr)	Unit Availa-bility Factor	Total Personnel With Measur-able Doses	Collective Dose (person-rems or cSv)	Person-rems (-cSv) per Work Function		Person-rems (-cSv) per Personnel Type		Average Meas'ble Dose (rems or cSv)	Person rems (-cSv)/ MW-Yr
						Opera-tions	Maint. & Others	Contrac-tor	Station & Utility		
PEACH BOTTOM 2,3	1975	1,234.3	80.9	971	228					0.23	0.2
Docket 50-277, 50-278; DPR-44, -56	1976	1,379.2	73.0	2,136	840	180	660	434	406	0.39	0.6
1st commercial operation 7/74, 12/74	1977	1,052.4	58.7	2,827	2,036	223	1,813	1,374	662	0.72	1.9
Type - BWR	1978	1,636.3	84.0	2,244	1,317	162	1,155	709	608	0.59	0.8
Capacity - 1051, 1035 MWe	1979	1,740.0	84.5	2,276	1,388	245	1,143	717	671	0.61	0.8
	1980	1,374.2	66.3	2,774	2,302	311	1,991	1,596	706	0.83	1.7
	1981	1,161.8	58.0	2,857	2,506	273	2,233	1,880	626	0.88	2.2
	1982	1,583.3	76.9	2,734	1,977	313	1,664	1,347	630	0.72	1.2
	1983	824.7	40.5	3,107	2,963	331	2,632	2,422	541	0.95	3.6
	1984	1,165.8	57.4	3,313	2,450	225	2,225	2,045	405	0.74	2.1
	1985	682.7	42.5	4,209	3,354	396	2,958	2,727	627	0.80	4.9
	1986	1,394.9	71.7	2,454	1,080	294	786	671	409	0.44	0.8
	1987	365.7	19.3	4,363	2,195	178	2,017	1,712	483	0.50	6.0
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	1,317	2,648	66	2,582	2,270	378	2.01	9.2
Capacity - 670 MWe	1977	316.6	61.4	1,875	3,142	146	2,996	2,176	966	1.68	9.9
	1978	519.5	83.1	1,667	1,327	157	1,170	895	432	0.80	2.6
	1979	574.0	89.4	2,458	1,015	131	884	516	499	0.41	1.8
	1980	360.3	56.2	3,549	3,626	207	3,419	3,076	550	1.02	10.1
	1981	408.9	65.9	2,803	1,836	70	1,766	1,418	418	0.66	4.5
	1982	389.9	63.9	2,854	1,539	314	1,225	1,094	445	0.54	3.9
	1983	559.5	87.2	2,326	1,162	296	886	776	386	0.50	2.1
	1984	1.4	0.4	4,542	4,082	647	3,435	3,767	315	0.90	---
	1985	587.3	91.5	2,209	893	13	880	718	175	0.40	1.5
	1986	121.9	18.8	2,635	874	16	764	718	156	0.33	7.2
	1987	0.0	0.0	4,710	1,579	99	1,480	1,485	94	0.34	---

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		
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
Type - PWRs	1974	760.2	81.3	400	295	70	225	81	214	0.74	0.4
Capacity - 485, 485 MWe	1975	801.2	82.9	339	459					1.35	0.6
	1976	857.3	86.7	313	370	58	312	107	263	1.18	0.4
	1977	873.9	87.3	417	429	63	366	212	217	1.03	0.5
	1978	914.4	90.9	336	320	71	249	111	209	0.95	0.3
	1979	808.0	80.8	610	644	65	579	449	195	1.06	0.8
	1980	727.2	82.5	561	598	60	538	420	178	1.07	0.8
	1981	760.4	83.6	773	596	83	513	364	232	0.77	0.8
	1982	757.2	84.3	767	609	72	537	375	234	0.79	0.8
	1983	648.2	72.7	1,702	1,403	81	1,322	1,179	224	0.82	2.2
	1984	788.9	78.6	1,372	789	121	668	457	332	0.58	1.0
	1985	831.3	82.5	671	482	71	411	242	240	0.72	0.6
	1986	858.9	85.7	664	402	50	352	219	183	0.61	0.5
	1987	857.5	85.0	720	554	55	499	369	185	0.77	0.6
PRAIRIE ISLAND 1,2	1974	181.9	43.9	150	18			5	13	0.12	0.1
Docket 50-282, 50-306; DPR-42, -60	1975	836.0	83.3	477	123					0.26	0.1
1st commercial operation 12/73	1976	725.2	76.6	818	447	68	379	235	212	0.55	0.6
Type - PWRs	1977	922.9	87.2	718	300	73	227	60	240	0.42	0.3
Capacity - 503, 500 MWe	1978	941.1	92.2	546	221	43	178	48	173	0.40	0.2
	1979	865.0	86.0	594	180	29	151	49	131	0.30	0.2
	1980	800.7	79.9	983	353	40	313	141	212	0.36	0.4
	1981	844.9	80.5	836	329	153	176	128	201	0.39	0.4
	1982	944.9	90.4	645	229	30	199	68	161	0.36	0.2
	1983	921.1	86.8	654	233	14	219	73	160	0.36	0.3
	1984	972.4	91.7	539	147	18	129	52	95	0.27	0.2
	1985	882.6	84.0	1,082	416	31	385	136	280	0.38	0.5
	1986	930.6	90.3	818	255	11	244	80	175	0.31	0.3
	1987	969.6	91.3	593	135	9	126	51	84	0.23	0.1

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		
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	1,083	1,618	114	1,504	692	926	1.49	1.9
1st commercial operation 2/73, 3/73	1976	951.2	73.1	1,225	1,651	269	1,382	648	1,003	1.35	1.7
Type - BWRs	1977	970.1	84.0	907	1,031	108	923	373	658	1.14	1.1
Capacity - 769, 769 MWe	1978	1,124.5	88.6	1,207	1,618	156	1,462	722	896	1.34	1.4
	1979	1,075.0	84.6	1,688	2,158	215	1,943	1,250	908	1.28	2.0
	1980	866.9	64.4	3,089	4,838	291	4,547	3,657	1,181	1.57	5.6
	1981	1,156.9	81.1	2,246	3,146	100	3,046	2,623	523	1.40	2.7
	1982	1,018.7	76.0	2,314	3,757	177	3,580	2,653	1,104	1.62	3.7
	1983	1,088.5	79.2	1,802	2,491	166	2,325	1,937	554	1.38	2.3
	1984	994.6	65.7	1,678	1,579	122	1,457	1,078	501	0.94	1.6
	1985	1,268.0	82.7	1,184	990	172	818	27	963	0.84	0.8
	1986	1,093.2	71.0	1,451	992	134	858	593	399	0.68	0.9
	1987	1,126.6	74.1	1,429	775	85	690	468	307	0.54	0.7
RANCHO SECO	1976	268.1	30.4	297	58	6	52	17	41	0.20	0.2
Docket 50-312; DPR-54	1977	706.4	77.1	515	390	61	329	248	142	0.76	0.6
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	1,338	787	158	629	604	183	0.59	2.3
	1984	460.0	58.3	802	222	73	149	115	107	0.28	0.5
	1985	238.7	30.8	1,764	756	183	573	583	173	0.43	3.2
	1986	0.0	0.0	1,513	402	17	385	125	277	0.27	---
	1987	0.0	0.0	1,533	300	52	248	216	84	0.20	---
RIVER BEND 1	1987	605.2	66.6	1,268	378	70	308	249	129	0.30	0.6
Docket 50-458; NPF-47											
1st commercial operation 6/86											
Type - BWR											
Capacity - 936 MWe											

APPENDIX C (Continued)
PERSONNEL, DOSE AND POWER GENERATION SUMMARY

Reporting Organization	Year	Mega-watt-Years (MW-Yr)	Unit Availa-bility Factor	Total Personnel With Measur-able Doses	Collective Dose (person-rems or cSv)	Person-rems (-cSv) per Work Function		Person-rems (-cSv) per Personnel Type		Average Meas'ble Dose (rems or cSv)	Person rems (-cSv)/ MW-Yr
						Opera-tions	Maint. & Others	Contrac-tor	Station & Utility		
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	1,142					1.35	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	1,454	1,188	60	1,128	794	394	0.82	2.5
	1980	387.3	62.2	2,009	1,852	79	1,773	1,379	473	0.92	4.8
	1981	426.6	73.0	1,462	733	45	688	513	220	0.50	1.7
	1982	277.5	48.9	2,011	1,426	128	1,298	945	481	0.71	5.1
	1983	409.8	75.5	2,244	923	96	827	628	295	0.41	2.3
	1984	28.0	7.0	4,127	2,880	196	2,684	2,549	331	0.70	102.9
	1985	629.5	87.9	1,378	311	52	259	165	146	0.23	0.5
	1986	577.1	80.3	1,571	539	46	493	340	199	0.34	0.9
	1987	510.1	71.1	1,379	499	54	445	313	186	0.36	1.0
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	1,488	584	100	484	359	225	0.39	2.3
1st commercial operation 6/77	1980	680.6	69.2	1,704	449	55	394	281	168	0.26	0.7
Type - PWRs	1981	743.0	78.1	1,652	254	4	250	152	102	0.15	0.3
Capacity - 1079, 1106 MWe	1982	1,440.4	72.6	3,228	1,203	66	1,137	846	357	0.37	0.8
	1983	742.0	35.4	2,383	581	10	571	463	118	0.24	0.8
	1984	650.1	31.8	1,395	681	10	671	469	212	0.49	1.0
	1985	1,657.7	75.8	1,112	204	26	178	91	113	0.18	0.1
	1986	1,484.3	70.4	3,554	599	10	589	459	140	0.17	0.4
	1987	1,478.2	72.5	2,543	600	8	592	433	167	0.24	0.4
SAN ONOFRE 1,2,3	1969	314.1		123	42	10	32	5	37	0.34	0.1
Docket 50-206, -361, -362;	1970	365.9		251	155	13	142	59	96	0.62	0.4
DPR-13, NPF-10, NPF-15	1971	362.1		121	50	12	38	3	47	0.41	0.1
1st commercial operation 1/68, 8/83, 4/84	1972	338.5		326	256	29	227	117	139	0.79	0.8
Type - PWR	1973	273.7		570	353	40	313	168	185	0.62	1.3
Capacity - 436, 1070, 1080 MWe	1974	377.8	86.1	219	71					0.32	0.2
	1975	389.0	87.4	424	292					0.69	0.8
	1976	297.9	70.2	1,330	880	147	733	629	251	0.66	3.0

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		
SAN ONOFRE 1,2,3 (continued)	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	3,063	2,387	219	2,168	2,018	369	0.78	24.5
	1981	95.9	26.7	2,902	3,223	100	3,123	3,104	119	1.11	33.6
	1982	61.6	15.7	3,055	832	81	751	729	102	0.27	13.5
	1983	0.0	0.0	1,701	155	31	124	113	42	0.09	---
	1984	670.4		7,514	986	105	879	830	154	0.13	1.5
	1985	1,381.8		5,742	722	58	664	581	141	0.13	0.5
	1986	1,698.2	61.1	3,594	824	86	738	574	250	0.23	0.5
	1987	1,983.0	77.8	2,138	696	113	583	408	288	0.33	0.4
SEQUOYAH 1,2	1982	583.5	52.8	1,965	570	67	503	57	513	0.29	1.0
Docket 50-327, -328; DPR-77, -79	1983	1,663.7	75.0	1,772	491	74	417	46	445	0.28	0.3
1st commercial operation 7/81, 6/82	1984	1,481.9	69.0	2,373	1,117	153	964	111	1,006	0.47	0.8
Type - PWR	1985	1,151.3	51.3	1,854	1,071	118	953	243	828	0.58	0.9
Capacity - 1148, 1148 MWe	1986	0.0	0.0	1,735	526	101	425	70	456	0.30	---
	1987	0.0	0.0	2,080	420	55	365	101	319	0.20	---
ST. LUCIE 1,2	1977	649.1	84.7	445	152	26	126	92	60	0.34	0.2
Docket 50-335, -387; DPR-67; NPF-16	1978	606.4	76.5	797	337	15	322	140	197	0.42	0.6
1st commercial operation 12/76, 3/83	1979	592.0	74.0	907	438	25	413	209	229	0.48	0.7
Type - PWRs	1980	627.9	77.5	1,074	532	82	450	195	337	0.50	0.8
Capacity - 827, 837 MWe	1981	599.1	72.7	1,473	929	20	909	556	373	0.63	1.6
	1982	816.8	94.0	1,045	272	17	255	105	167	0.26	0.3
	1983	290.3	15.4	2,211	1,204	5	1,199	924	280	0.54	4.1
	1984	1,183.0	69.6	2,090	1,263	41	1,222	808	455	0.60	1.1
	1985	1,445.8	82.5	1,971	1,344	293	1,046	809	535	0.68	0.9
	1986	1,588.6	89.1	1,279	491	81	410	322	169	0.38	0.3
	1987	1,407.9	80.5	2,012	951	1	950	560	391	0.47	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		
SUMMER 1	1984	504.6	61.1	1,120	295	29	266	202	93	0.26	0.6
Docket 50-395; NPF-12	1985	627.7	71 6	1,201	379	74	305	241	138	0.32	0.6
1st commercial operation 1/84	1986	853.7	95.3	392	23	5	18	12	11	0.06	0.03
Type - PWR	1987	618.7	70.1	1,075	560	34	526	454	106	0.52	0.9
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	1,715	884	72	812			0.52	1.2
1st commercial operation 12/72, 5/73	1975	1,079.0	70.8	1,948	1,649	27	1,622	1,065	584	0.85	1.5
Type - PWRs	1976	930.7	60.4	2,753	3,165	444	2,721	1,873	1,292	1.15	3.4
Capacity - 781, 775 MWe	1977	1,139.0	72.2	1,860	2,307	348	1,959	1,380	927	1.24	2.0
	1978	1,210.6	77.2	2,203	1,837	726	1,111	1,029	808	0.83	1.5
	1979	343.0	42.3	5,065	3,584	173	3,411	2,975	609	0.71	10.4
	1980	568.2	40.3	5,317	3,836	353	3,483	3,117	719	0.72	6.8
	1981	907.6	59.3	3,753	4,244	428	3,816	3,040	1,204	1.13	4.7
	1982	1,323.3	88.5	1,878	1,490	399	1,091	506	984	0.79	1.1
	1983	916.2	61.3	2,754	3,220	571	2,649	1,786	1,434	1.17	3.5
	1984	1,026.7	71.0	3,198	2,247	536	1,711	1,575	672	0.70	2.2
	1985	1,166.4	78.2	3,206	1,815	508	1,307	1,232	583	0.57	1.6
	1986	1,080.5	69.0	3,763	2,356	430	1,926	1,677	679	0.63	2.2
	1987	1,132.7	71.8	2,675	712	192	520	325	387	0.27	0.6
SUSQUEHANNA 1,2	1984	719.9	72.6	2,827	308	71	237	128	180	0.11	0.4
Docket 50-387, 50-388; NPF-14; NPF-22	1985	628.8	62.5	3,669	1,106	77	1,029	790	316	0.30	1.8
1st commercial operation 6/83, 2/85	1986	1,344.7	68.4	2,996	828	80	748	402	426	0.28	0.6
Type - BWR	1987	1,749.5	84.3	2,548	621	36	585	341	280	0.24	0.4
Capacity - 1032, 1032 MWe											

APPENDIX C (Continued)
PERSONNEL, DOSE AND POWER GENERATION SUMMARY

Reporting Organization	Year	Mega-watt-Years (MW-Yr)	Unit Availa-bility Factor	Total Personnel With Measur-able Doses	Collective Dose (person-rems or cSv)	Person-rems (-cSv) per Work Function		Person-rems (-cSv) per Personnel Type		Average Meas'ble Dose (rems or cSv)	Person rems (-cSv)/ MW-Yr
						Opera-tions	Maint. & Others	Contrac-tor	Station & Utility		
THREE MILE ISLAND 1,2	1975	675.9	82.2	131	73			18	55	0.56	0.1
Docket 50-289, -320; DPR-50, -73	1976	530.0	65.4	819	286	23	263	69	217	0.35	0.5
1st commercial operation 9/74, 12/78	1977	664.5	80.9	1,122	359	15	344	128	231	0.32	0.5
Type - PWRs	1978	690.0	85.1	1,929	504	23	481	235	269	0.26	0.7
Capacity - 776, 880 MWe	1979	266.0	21.9	4,024	1,392	197	1,195	907	485	0.35	5.2
	1980	0.0	0.0	2,328	394	29	365	234	160	0.17	---
	1981	0.0	0.0	2,103	376	50	326	190	186	0.18	---
	1982	0.0	0.0	2,123	1,004	62	942	433	571	0.47	---
	1983	0.0	0.0	1,592	1,159	79	1,080	637	522	0.73	---
	1984	0.0	0.0	1,079	688	49	639	330	358	0.64	---
THREE MILE ISLAND 1*	1985	103.6	21.2	864	77	7	70	16	61	.09	0.7
Docket 50-289; DPR-50	1986	585.2	70.9	1,360	213	36	177	89	124	0.16	0.4
1st commercial operation 9/74	1987	610.7	72.5	1,259	149	40	109	50	99	0.12	0.2
Type - PWR											
Capacity - 776 MWe											
THREE MILE ISLAND 2**	1985	0.0	0.0	1,026	780	47	733	565	215	0.76	---
Docket 50-320; DPR-73	1986	0.0	0.0	1,497	915	152	763	613	302	0.61	---
1st commercial operation 12/78	1987	0.0	0.0	1,378	977	90	887	687	290	0.71	---
Type - PWR											
Capacity - 880 MWE											

* Three Mile Island 1 resumed commercial power generation 10/85 after being under regulatory restraint since 1979.

**Three Mile Island 2 has been shut down since the 1979 accident, but is still included in the count of reactors while dose is being accumulated to defuel and decommission the unit.

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		
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	1.6
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	1,159	421	77	344	305	116	0.36	0.6
Capacity - 1080 MWe	1981	775.6	74.1	1,311	609	113	496	363	246	0.46	0.8
	1982	579.5	60.8	977	419	76	343	168	251	0.43	0.7
	1983	494.2	62.4	969	307	35	272	129	178	0.32	0.6
	1984	567.0	54.4	1,042	433	40	393	230	203	0.42	0.8
	1985	829.1	76.7	852	363	31	332	210	153	0.43	0.4
	1986	852.3	79.7	1,321	381	46	335	274	107	0.29	0.4
	1987	525.5	52.9	1,209	363	66	297	266	97	0.30	0.7
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	1,003.7	74.9	1,176	876	270	606	559	317	0.74	0.9
Type - PWRs	1976	974.2	71.2	1,647	1,184	89	1,095	868	316	0.72	1.2
Capacity - 666, 666 MWe	1977	979.5	72.1	1,319	1,036	94	942	522	514	0.79	1.1
	1978	1,000.2	78.8	1,336	1,032	90	942	546	486	0.77	1.0
	1979	811.0	62.4	2,002	1,680	299	1,381	997	683	0.84	2.1
	1980	990.6	73.6	1,803	1,651	232	1,419	1,218	433	0.92	1.7
	1981	654.0	46.8	2,932	2,251	274	1,977	1,854	397	0.77	3.4
	1982	915.7	65.2	2,956	2,119	197	1,922	1,656	463	0.72	2.3
	1983	878.4	62.8	2,930	2,681	272	2,409	2,119	562	0.92	3.1
	1984	946.7	68.5	2,010	1,255	217	1,038	876	379	0.62	1.3
	1985	1,034.9	74.7	1,905	1,253	91	1,162	817	436	0.66	1.2
	1986	754.1	54.9	1,808	946	71	875	716	230	0.52	1.3
	1987	431.3	33.6	1,980	1,371	79	1,292	987	384	0.69	3.2
VERMONT YANKEE	1973	222.1		244	85					0.35	0.4
Docket 50-271; DPR-28	1974	303.5		357	216	24	192	103	113	0.61	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	1.1
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	1,220	1,170	546	624	642	528	0.96	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 Measurable Dose (rems or cSv)	Person rems (-cSv)/ MW-Yr
						Opera-tions	Maint. & Others	Contrac-tor	Station & Utility		
VERMONT YANKEE (continued)	1980	357.8	71.5	1,443	1,338	141	1,197	926	412	0.93	3.7
	1981	429.1	84.6	1,264	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	1,316	1,527	215	1,312	787	740	1.16	4.4
	1984	398.1	79.0	954	603	80	523	307	296	0.63	1.5
	1985	361.4	71.8	1,392	1,051	164	887	898	153	0.76	2.9
	1986	248.1	48.9	1,389	1,188	44	1,144	1,092	96	0.86	4.8
	1987	423.6	83.2	827	303	37	266	226	77	0.37	0.7
WASHINGTON NUCLEAR 2	1985	616.0	87.6	755	119	42	77	42	77	0.16	0.2
Docket 50-397; NPF-21	1986	616.0	74.0	1,013	222	56	166	70	152	0.22	0.4
1st commercial operation 12/84	1987	639.0	68.3	1,201	406	95	311	143	263	0.34	0.6
Type - BWR											
Capacity - 1095 MWe											
WATERFORD 3	1986	875.7	79.1	1,244	223	62	161	178	45	0.18	0.3
Docket 50-382; NPF-38	1987	891.8	80.9	959	156	33	123	106	50	0.16	0.2
1st commercial operation 9/85											
Type - PWR											
Capacity - 1075 MWe											
WOLF CREEK 1	1986	832.8	73.3	681	142	27	115	77	65	0.21	0.2
Docket 50-482; NPF-42	1987	778.8	68.6	671	134	25	109	80	54	0.20	0.2
1st commercial operation 9/85											
Type - PWR											
Capacity - 1128 MWe											

APPENDIX C (Continued)
PERSONNEL, DOSE AND POWER GENERATION SUMMARY

Reporting Organization	Year	Mega-watt-Years (MW-Yr)	Unit Availa-bility Factor	Total Personnel With Measur-able Doses	Collective Dose (person-rems or cSv)	Person-rems (-cSv) per Work Function		Person-rems (-cSv) per Personnel Type		Average Meas'ble Dose (rems or cSv)	Person rems (-cSv)/ MW-Yr
						Opera-tions	Maint. & Others	Contrac-tor	Station & Utility		
YANKEE ROWE	1969	138.3		193	215	83	132	78	133	1.11	1.6
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	89.9	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	0.58	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	33	141	207	0.53	2.8
	1985	144.3	85.3	653	211	17	194	81	130	0.32	1.5
	1986	169.7	95.0	384	45	20	25	2	43	0.12	0.3
	1987	138.7	81.1	593	218	38	180	127	91	0.37	1.6
	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	0.58	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	33	141	207	0.53	2.8
	1985	144.3	85.3	653	211	17	194	81	130	0.32	1.5
	1986	169.7	95.0	384	45	20	25	2	43	0.12	0.3
	1987	138.7	81.1	593	218	38	180	127	91	0.37	1.6

APPENDIX C (Continued)
PERSONNEL, DOSE AND POWER GENERATION SUMMARY

Reporting Organization	Year	Mega-watt-Years (MW-Yr)	Unit Availa-bility Factor	Total Personnel With Measur-able Doses	Collective Dose (person-rems or cSv)	Person-rems (-cSv) per Work Function		Person-rems (-cSv) per Personnel Type		Average Meas'ble Dose (rems or cSv)	Person rems (-cSv)/ MW-Yr
						Opera-tions	Maint. & Others	Contrac-tor	Station & Utility		
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	1,181.5	74.9	436	127	17	110	49	78	0.29	0.1
1st commercial operation 12/73, 9/74	1976	1,134.9	61.9	774	571	64	507	257	314	0.74	0.5
Type - PWRs	1977	1,358.6	75.0	784	1,003	43	960	561	442	1.28	0.7
Capacity - 1040, 1040 MWe	1978	1,613.5	80.2	1,104	1,017	150	867	418	599	0.92	0.6
	1979	1,238.0	67.6	1,472	1,274	168	1,106	747	527	0.87	1.0
	1980	1,411.2	74.1	1,363	920	97	823	560	360	0.67	0.7
	1981	1,366.9	72.3	1,754	1,720	50	1,670	1,155	564	0.98	1.3
	1982	1,186.4	64.3	1,575	2,103	42	2,061	1,688	415	1.34	1.8
	1983	1,222.3	66.8	1,285	1,311	118	1,193	905	406	1.02	1.1
	1984	1,389.9	69.5	1,110	786	23	763	556	230	0.71	0.6
	1985	1,187.9	62.9	1,498	1,166	41	1,125	784	382	0.78	1.0
	1986	588.0	73.2	967	498	22	476	346	152	0.51	0.8
	1987	1,337.0	67.8	1,046	693	40	653	458	235	0.66	0.5

APPENDIX D
Number of Personnel and Collective Dose by Work and Job Function
1987

APPENDIX D

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *ARKANSAS 1,2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	8	1	41		2.017	0.155	8.794	
OPERATING PERSONNEL	44	0	0		14.793	0.000	0.000	
HEALTH PHYSICS PERSONNEL	47	0	82		16.516	0.000	24.091	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.000	0.110	
ENGINEERING PERSONNEL	3	1	6		0.670	0.130	1.695	
TOTAL	102	2	130	234	33.996	0.285	34.690	68.971
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	40	0	59		8.708	0.000	23.585	
OPERATING PERSONNEL	1	0	0		0.540	0.000	0.000	
HEALTH PHYSICS PERSONNEL	15	0	8		2.850	0.000	1.165	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.000	0.225	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	56	0	68	124	12.098	0.000	24.975	37.073
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	0	10		0.105	0.000	1.865	
OPERATING PERSONNEL	2	0	0		0.690	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	5		0.380	0.000	0.700	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	1	20		0.000	0.365	5.375	
TOTAL	4	1	35	40	1.175	0.365	7.940	9.480
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	86	1	115		50.231	0.125	50.774	
OPERATING PERSONNEL	1	0	0		0.540	0.000	0.000	
HEALTH PHYSICS PERSONNEL	31	0	33		13.750	0.000	6.400	
SUPERVISORY PERSONNEL	4	0	1		1.770	0.000	0.230	
ENGINEERING PERSONNEL	4	1	17		1.255	0.305	8.920	
TOTAL	126	2	166	294	67.546	0.430	66.324	134.300
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	11		0.000	0.000	3.490	
OPERATING PERSONNEL	1	0	0		0.540	0.000	0.000	
HEALTH PHYSICS PERSONNEL	16	0	34		13.757	0.000	15.850	
SUPERVISORY PERSONNEL	1	0	0		0.540	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	18	0	45	63	14.837	0.000	19.340	34.177
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	1	0	0		0.540	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	0		0.380	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	2	0	0	2	0.920	0.000	0.000	0.920
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	135 (100)	2 (2)	236 (172)	373 (274)	61.061	0.280	88.508	149.849
OPERATING PERSONNEL	50 (44)	0 0	0 0	50 (44)	17.643	0.000	0.000	17.643
HEALTH PHYSICS PERSONNEL	111 (51)	0 0	162 (95)	273 (146)	47.633	0.000	48.206	95.839
SUPERVISORY PERSONNEL	5 (5)	0 0	3 (1)	8 (6)	2.310	0.000	0.565	2.875
ENGINEERING PERSONNEL	7 (6)	3 (3)	43 (38)	53 (47)	1.925	0.800	15.990	18.715
GRAND TOTALS	308 (206)	5 (5)	444 (306)	757 (517)	130.572	1.080	153.269	284.921

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *BEAVER VALLEY TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	7	0	12		1.915	0.000	3.480	
OPERATING PERSONNEL	39	0	4		8.012	0.000	0.500	
HEALTH PHYSICS PERSONNEL	27	0	30		9.405	0.000	6.490	
SUPERVISORY PERSONNEL	9	0	9		2.185	0.000	1.290	
ENGINEERING PERSONNEL	7	0	0		1.145	0.000	0.000	
TOTAL	89	0	55	144	22.662	0.000	11.760	34.422
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	76	0	81		21.925	0.000	23.606	
OPERATING PERSONNEL	2	0	0		1.125	0.000	0.055	
HEALTH PHYSICS PERSONNEL	6	0	3		2.245	0.000	0.875	
SUPERVISORY PERSONNEL	4	0	9		0.630	0.000	2.105	
ENGINEERING PERSONNEL	1	0	0		0.110	0.000	0.005	
TOTAL	89	0	93	182	26.035	0.000	26.646	52.681
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	48		0.070	0.000	14.865	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	3		0.035	0.000	0.615	
SUPERVISORY PERSONNEL	4	0	13		0.555	0.000	5.010	
ENGINEERING PERSONNEL	0	0	0		0.035	0.000	0.000	
TOTAL	4	0	64	68	0.695	0.000	20.490	21.185
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	1	0	108		0.095	0.000	34.465	
OPERATING PERSONNEL	0	0	1		0.000	0.000	0.120	
HEALTH PHYSICS PERSONNEL	1	0	1		0.270	0.000	0.365	
SUPERVISORY PERSONNEL	3	0	8		0.470	0.000	4.115	
ENGINEERING PERSONNEL	0	0	0		0.020	0.000	0.000	
TOTAL	5	0	118	123	0.855	0.000	39.065	39.920
WASTE PROCESSING								
MAINTENANCE PERSONNEL	2	0	3		0.340	0.000	0.445	
OPERATING PERSONNEL	2	0	0		0.625	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	0		0.185	0.000	0.040	
SUPERVISORY PERSONNEL	0	0	0		0.020	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	5	0	3	8	1.170	0.000	0.485	1.655
REFUELING								
MAINTENANCE PERSONNEL	11	0	18		5.035	0.000	7.790	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.005	
HEALTH PHYSICS PERSONNEL	0	0	0		0.005	0.000	0.010	
SUPERVISORY PERSONNEL	4	0	3		1.080	0.000	2.135	
ENGINEERING PERSONNEL	0	0	1		0.000	0.000	0.585	
TOTAL	15	0	22	37	6.120	0.000	10.525	16.645
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	97	0	270	367	29.380	0.000	84.651	114.031
OPERATING PERSONNEL	43	0	5	48	9.762	0.000	0.680	10.442
HEALTH PHYSICS PERSONNEL	35	0	37	72	12.145	0.000	8.395	20.540
SUPERVISORY PERSONNEL	24	0	42	66	4.940	0.000	14.655	19.595
ENGINEERING PERSONNEL	8	0	1	9	1.310	0.000	0.590	1.900
GRAND TOTALS	207	0	355	562	57.537	0.000	108.971	166.508

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *BIG ROCK POINT TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	2	0	0		0.438	0.010	0.034	
OPERATING PERSONNEL	32	2	0		23.825	0.002	0.000	
HEALTH PHYSICS PERSONNEL	13	0	5		8.916	0.016	2.920	
SUPERVISORY PERSONNEL	9	0	0		1.751	0.051	0.002	
ENGINEERING PERSONNEL	3	0	0		0.809	0.113	0.009	
TOTAL	59	2	5	66	35.739	0.192	2.965	38.896
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	33	10	0		14.027	2.798	0.037	
OPERATING PERSONNEL	2	2	0		0.255	0.224	0.000	
HEALTH PHYSICS PERSONNEL	10	0	7		2.130	0.083	1.780	
SUPERVISORY PERSONNEL	3	1	0		0.981	0.321	0.000	
ENGINEERING PERSONNEL	1	0	0		0.409	0.002	0.000	
TOTAL	49	13	7	69	17.802	3.428	1.817	23.047
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	3	24	21		0.707	22.290	16.338	
OPERATING PERSONNEL	0	0	0		0.051	0.048	0.053	
HEALTH PHYSICS PERSONNEL	5	0	8		1.305	0.089	2.902	
SUPERVISORY PERSONNEL	3	3	1		0.608	1.597	0.161	
ENGINEERING PERSONNEL	2	2	1		1.573	0.894	0.396	
TOTAL	13	29	31	73	4.244	24.918	19.850	49.012
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	24	39	9		21.315	24.363	2.534	
OPERATING PERSONNEL	5	6	0		1.167	1.768	0.012	
HEALTH PHYSICS PERSONNEL	13	1	7		13.066	0.371	2.131	
SUPERVISORY PERSONNEL	3	4	0		2.178	0.973	0.062	
ENGINEERING PERSONNEL	5	0	0		1.491	0.008	0.070	
TOTAL	50	50	16	116	39.217	27.483	4.809	71.509
WASTE PROCESSING								
MAINTENANCE PERSONNEL	12	2	0		3.011	0.305	0.000	
OPERATING PERSONNEL	1	1	0		0.160	0.222	0.000	
HEALTH PHYSICS PERSONNEL	6	0	1		1.821	0.006	0.160	
SUPERVISORY PERSONNEL	0	0	0		0.079	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.019	0.000	0.025	
TOTAL	19	3	1	23	5.090	0.533	0.185	5.808
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.066	0.005	0.000	
OPERATING PERSONNEL	17	0	0		0.014	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.220	0.000	0.029	
SUPERVISORY PERSONNEL	0	0	0		0.086	0.000	0.000	
ENGINEERING PERSONNEL	1	2	2		0.207	0.660	0.621	
TOTAL	18	2	2	22	0.593	0.665	0.650	1.908
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	74	75	30	179	39.564	49.771	18.943	108.278
OPERATING PERSONNEL	57	11	0	68	25.472	2.264	0.065	27.801
HEALTH PHYSICS PERSONNEL	47	1	28	76	27.458	0.565	9.922	37.945
SUPERVISORY PERSONNEL	18	8	1	27	5.683	2.942	0.225	8.850
ENGINEERING PERSONNEL	12	4	3	19	4.508	1.677	1.121	7.306
GRAND TOTALS	208	99	62	369	102.685	57.219	30.276	190.180

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

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

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	775	34	18		55.229	1.516	0.513	
OPERATING PERSONNEL	65	1	8		7.766	0.087	1.108	
HEALTH PHYSICS PERSONNEL	132	2	41		45.869	0.203	10.329	
SUPERVISORY PERSONNEL	13	2	1		1.393	0.184	0.053	
ENGINEERING PERSONNEL	132	1	173		10.021	0.017	28.666	
TOTAL	1117	40	241	1398	120.278	2.007	40.669	162.954
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	895	34	48		410.051	5.387	5.908	
OPERATING PERSONNEL	63	1	7		1.079	0.084	0.056	
HEALTH PHYSICS PERSONNEL	129	1	40		16.365	0.006	2.984	
SUPERVISORY PERSONNEL	11	1	3		0.891	0.000	0.024	
ENGINEERING PERSONNEL	122	5	155		17.444	0.609	16.942	
TOTAL	1220	42	253	1515	445.830	6.086	25.914	477.830
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	138	27	3		12.258	5.977	0.499	
OPERATING PERSONNEL	3	0	1		0.003	0.000	0.025	
HEALTH PHYSICS PERSONNEL	59	1	22		0.386	0.005	0.174	
SUPERVISORY PERSONNEL	5	0	0		0.487	0.000	0.000	
ENGINEERING PERSONNEL	13	3	20		0.426	0.039	6.803	
TOTAL	218	31	46	295	13.560	6.021	7.501	27.082
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	637	21	115		177.342	6.927	89.462	
OPERATING PERSONNEL	35	0	1		0.797	0.000	0.000	
HEALTH PHYSICS PERSONNEL	106	1	37		24.368	0.001	11.114	
SUPERVISORY PERSONNEL	8	0	1		1.239	0.000	0.030	
ENGINEERING PERSONNEL	92	3	75		15.450	0.628	16.745	
TOTAL	878	25	229	1132	219.196	7.556	117.351	344.103
WASTE PROCESSING								
MAINTENANCE PERSONNEL	93	0	7		2.844	0.000	0.327	
OPERATING PERSONNEL	12	0	1		1.004	0.000	0.005	
HEALTH PHYSICS PERSONNEL	72	0	11		1.251	0.000	0.090	
SUPERVISORY PERSONNEL	4	0	0		0.214	0.000	0.000	
ENGINEERING PERSONNEL	10	0	15		0.481	0.000	0.207	
TOTAL	191	0	34	225	5.794	0.000	0.629	6.423
REFUELING								
MAINTENANCE PERSONNEL	51	0	0		5.971	0.000	0.000	
OPERATING PERSONNEL	30	0	0		0.570	0.000	0.000	
HEALTH PHYSICS PERSONNEL	28	0	12		0.633	0.000	0.385	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	17	1	16		0.573	0.005	0.326	
TOTAL	126	1	28	155	7.747	0.005	0.711	8.463
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	2589	116	191	2896	663.695	19.807	96.709	780.211
OPERATING PERSONNEL	208	2	18	228	11.219	0.171	1.194	12.584
HEALTH PHYSICS PERSONNEL	526	5	163	694	88.872	0.215	25.076	114.163
SUPERVISORY PERSONNEL	41	3	5	49	4.224	0.184	0.107	4.515
ENGINEERING PERSONNEL	386	13	454	853	44.395	1.298	69.689	115.382
GRAND TOTALS	3750	139	831	4720	812.405	21.675	192.775	1026.855

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *BRUNSWICK 1,2 TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	2	0	3		0.555	0.000	0.883	
OPERATING PERSONNEL	98	0	52		63.692	0.000	37.475	
HEALTH PHYSICS PERSONNEL	27	0	6		22.187	0.000	4.844	
SUPERVISORY PERSONNEL	4	0	0		0.485	0.000	0.000	
ENGINEERING PERSONNEL	11	2	5		4.489	0.413	1.180	
TOTAL	142	2	66	210	91.408	0.413	44.382	136.203
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	304	55	317		194.782	33.749	191.755	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	11	0	17		3.235	0.000	9.097	
SUPERVISORY PERSONNEL	4	0	3		0.532	0.000	0.925	
ENGINEERING PERSONNEL	4	3	0		1.212	0.781	0.000	
TOTAL	323	58	337	718	199.761	34.530	201.777	436.068
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	13	25	68		7.013	19.643	64.270	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	10	0	11		6.023	0.000	3.115	
SUPERVISORY PERSONNEL	1	0	1		0.310	0.000	0.416	
ENGINEERING PERSONNEL	8	5	52		10.272	2.170	42.201	
TOTAL	32	30	132	194	23.618	21.813	110.002	155.433
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	105	3	399		83.716	1.915	338.847	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	21	0	61		3.257	0.000	10.445	
SUPERVISORY PERSONNEL	1	0	6		0.303	0.000	3.449	
ENGINEERING PERSONNEL	16	4	66		4.787	0.957	27.426	
TOTAL	143	7	532	682	92.063	2.872	380.167	475.102
WASTE PROCESSING								
MAINTENANCE PERSONNEL	42	2	34		29.284	0.968	13.961	
OPERATING PERSONNEL	12	0	6		6.820	0.000	4.992	
HEALTH PHYSICS PERSONNEL	10	0	7		5.816	0.000	10.518	
SUPERVISORY PERSONNEL	2	0	1		0.982	0.000	0.330	
ENGINEERING PERSONNEL	1	0	2		0.593	0.000	0.608	
TOTAL	67	2	50	119	43.495	0.968	30.409	74.872
REFUELING								
MAINTENANCE PERSONNEL	10	0	73		10.444	0.000	26.909	
OPERATING PERSONNEL	8	0	9		4.007	0.000	7.037	
HEALTH PHYSICS PERSONNEL	3	0	3		1.130	0.000	1.215	
SUPERVISORY PERSONNEL	3	0	3		0.502	0.000	0.630	
ENGINEERING PERSONNEL	2	1	16		0.780	0.175	11.509	
TOTAL	26	1	104	131	16.863	0.175	47.300	64.338
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	476	85	894	1455	325.794	56.275	636.625	1018.694
OPERATING PERSONNEL	118	0	67	185	74.519	0.000	49.504	124.023
HEALTH PHYSICS PERSONNEL	82	0	105	187	41.648	0.000	39.234	80.882
SUPERVISORY PERSONNEL	15	0	14	29	3.114	0.000	5.750	8.864
ENGINEERING PERSONNEL	42	15	141	198	22.133	4.496	82.924	109.553
GRAND TOTALS	733	100	1221	2054	467.208	60.771	814.037	1342.016

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM
BY WORK AND JOB FUNCTION
1987

PLANT: *BYRON TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	1	0	1		0.220	0.000	0.160	
OPERATING PERSONNEL	35	0	2		5.930	0.000	2.130	
HEALTH PHYSICS PERSONNEL	3	0	1		1.500	0.000	0.180	
SUPERVISORY PERSONNEL	2	0	0		0.530	0.000	0.000	
ENGINEERING PERSONNEL	2	0	1		0.340	0.000	0.020	
TOTAL	43	0	5	48	8.520	0.000	2.490	11.010
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	51	0	138		20.830	0.000	92.710	
OPERATING PERSONNEL	43	0	42		7.210	0.000	34.960	
HEALTH PHYSICS PERSONNEL	36	0	39		17.840	0.000	25.590	
SUPERVISORY PERSONNEL	16	0	0		4.650	0.000	0.000	
ENGINEERING PERSONNEL	10	15	24		2.260	0.080	7.330	
TOTAL	156	15	243	414	52.790	0.080	160.590	213.460
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	0	29		0.040	0.000	19.080	
OPERATING PERSONNEL	1	0	1		0.010	0.000	0.030	
HEALTH PHYSICS PERSONNEL	0	0	1		0.000	0.000	0.100	
SUPERVISORY PERSONNEL	1	0	0		0.200	0.000	0.000	
ENGINEERING PERSONNEL	1	0	4		0.130	0.000	1.350	
TOTAL	4	0	35	39	0.380	0.000	20.560	20.940
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	53	0	630		23.280	0.000	420.850	
OPERATING PERSONNEL	3	0	3		0.440	0.000	2.650	
HEALTH PHYSICS PERSONNEL	4	0	29		1.930	0.000	18.670	
SUPERVISORY PERSONNEL	11	0	0		3.400	0.000	0.000	
ENGINEERING PERSONNEL	19	8	24		4.030	0.040	7.470	
TOTAL	90	8	686	784	33.080	0.040	449.640	482.760
WASTE PROCESSING								
MAINTENANCE PERSONNEL	1	0	2		0.040	0.000	1.390	
OPERATING PERSONNEL	4	0	12		0.690	0.000	10.160	
HEALTH PHYSICS PERSONNEL	1	0	1		0.640	0.000	0.060	
SUPERVISORY PERSONNEL	1	0	0		0.120	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	7	0	15	22	1.490	0.000	11.610	13.100
REFUELING								
MAINTENANCE PERSONNEL	1	0	1		0.090	0.000	0.160	
OPERATING PERSONNEL	6	0	1		1.140	0.000	0.040	
HEALTH PHYSICS PERSONNEL	1	0	1		0.010	0.000	0.050	
SUPERVISORY PERSONNEL	1	0	0		0.320	0.000	0.000	
ENGINEERING PERSONNEL	1	1	1		0.230	0.010	0.430	
TOTAL	10	1	4	15	1.790	0.010	0.680	2.480
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	108	0	801	909	44.500	0.000	534.350	578.850
OPERATING PERSONNEL	92	0	61	153	15.420	0.000	49.970	65.390
HEALTH PHYSICS PERSONNEL	45	0	72	117	21.920	0.000	44.650	66.570
SUPERVISORY PERSONNEL	32	0	0	32	9.220	0.000	0.000	9.220
ENGINEERING PERSONNEL	33	24	54	111	6.990	0.130	16.600	23.720
GRAND TOTALS	310	24	988	1322	98.050	0.130	645.570	743.750

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *CALLAWAY TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	10	0	24		0.776	0.000	9.371	
OPERATING PERSONNEL	62	1	36		21.899	0.131	9.711	
HEALTH PHYSICS PERSONNEL	34	0	40		23.253	0.000	13.808	
SUPERVISORY PERSONNEL	17	1	0		5.218	0.227	0.020	
ENGINEERING PERSONNEL	7	0	4		2.481	0.011	1.097	
TOTAL	130	2	104	236	53.627	0.369	34.007	88.003
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	84	0	128		38.615	0.000	46.872	
OPERATING PERSONNEL	20	0	29		6.461	0.009	8.945	
HEALTH PHYSICS PERSONNEL	6	0	0		2.157	0.000	0.387	
SUPERVISORY PERSONNEL	2	0	1		0.779	0.012	0.110	
ENGINEERING PERSONNEL	4	0	13		1.199	0.000	3.429	
TOTAL	116	0	171	287	49.211	0.021	59.743	108.975
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	4	0	65		1.607	0.000	30.848	
OPERATING PERSONNEL	7	0	21		1.788	0.031	5.786	
HEALTH PHYSICS PERSONNEL	0	0	0		0.018	0.000	0.031	
SUPERVISORY PERSONNEL	2	0	0		0.899	0.092	0.000	
ENGINEERING PERSONNEL	2	0	79		1.036	0.005	42.307	
TOTAL	15	0	165	180	5.348	0.128	78.972	84.448
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	3	0	3		0.816	0.000	1.241	
OPERATING PERSONNEL	2	0	12		0.944	0.000	3.557	
HEALTH PHYSICS PERSONNEL	0	0	0		0.147	0.000	0.018	
SUPERVISORY PERSONNEL	2	1	0		0.903	0.359	0.005	
ENGINEERING PERSONNEL	8	0	28		4.802	0.000	10.098	
TOTAL	15	1	43	59	7.612	0.359	14.919	22.890
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	3		0.307	0.000	0.774	
OPERATING PERSONNEL	21	0	25		6.244	0.000	5.245	
HEALTH PHYSICS PERSONNEL	5	0	0		1.242	0.000	0.101	
SUPERVISORY PERSONNEL	2	0	0		0.941	0.000	0.000	
ENGINEERING PERSONNEL	0	0	3		0.000	0.000	0.851	
TOTAL	28	0	31	59	8.734	0.000	6.971	15.705
REFUELING								
MAINTENANCE PERSONNEL	15	0	56		9.602	0.000	42.252	
OPERATING PERSONNEL	10	0	4		4.138	0.016	1.242	
HEALTH PHYSICS PERSONNEL	5	0	3		1.097	0.000	0.781	
SUPERVISORY PERSONNEL	2	0	0		0.943	0.026	0.080	
ENGINEERING PERSONNEL	6	0	30		1.421	0.151	8.459	
TOTAL	38	0	93	131	17.201	0.193	52.814	70.208
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	116	0	279	395	51.723	0.000	131.358	183.081
OPERATING PERSONNEL	122	1	127	250	41.474	0.187	34.486	76.147
HEALTH PHYSICS PERSONNEL	50	0	43	93	27.914	0.000	15.126	43.040
SUPERVISORY PERSONNEL	27	2	1	30	9.683	0.716	0.215	10.614
ENGINEERING PERSONNEL	27	0	157	184	10.939	0.167	66.241	77.347
GRAND TOTALS	342	3	607	952	141.733	1.070	247.426	390.229

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *CALVERT CLIFFS 1,2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	0	3	1		0.000	0.570	0.186	
OPERATING PERSONNEL	51	0	2		15.561	0.000	0.277	
HEALTH PHYSICS PERSONNEL	19	0	7		5.755	0.000	1.085	
SUPERVISORY PERSONNEL	3	0	0		0.805	0.000	0.000	
ENGINEERING PERSONNEL	6	0	0		1.042	0.000	0.000	
TOTAL	79	3	10	92	23.163	0.570	1.548	25.281
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	15	0	7		2.110	0.000	1.413	
OPERATING PERSONNEL	4	0	0		0.586	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	2	0	0		0.231	0.000	0.000	
ENGINEERING PERSONNEL	2	0	0		0.271	0.000	0.000	
TOTAL	23	0	7	30	3.198	0.000	1.413	4.611
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	11	19	33		2.810	9.596	12.226	
OPERATING PERSONNEL	1	0	0		0.811	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	7		0.679	0.000	1.297	
SUPERVISORY PERSONNEL	0	1	1		0.000	0.377	0.488	
ENGINEERING PERSONNEL	5	0	4		2.649	0.000	0.846	
TOTAL	21	20	45	86	6.949	9.973	14.857	31.779
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	156	61	89		91.097	32.657	27.947	
OPERATING PERSONNEL	21	1	0		4.618	0.125	0.000	
HEALTH PHYSICS PERSONNEL	31	0	20		14.859	0.000	5.295	
SUPERVISORY PERSONNEL	13	1	0		5.372	0.427	0.000	
ENGINEERING PERSONNEL	25	0	3		7.687	0.000	0.687	
TOTAL	246	63	112	421	123.633	33.209	33.929	190.771
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	8		0.000	0.000	2.260	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	18	0	28		13.412	0.000	14.221	
SUPERVISORY PERSONNEL	3	0	0		1.720	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.117	0.000	0.000	
TOTAL	22	0	36	58	15.249	0.000	16.481	31.730
REFUELING								
MAINTENANCE PERSONNEL	56	33	25		29.836	8.229	9.125	
OPERATING PERSONNEL	2	4	0		0.386	0.754	0.000	
HEALTH PHYSICS PERSONNEL	23	0	50		7.259	0.000	17.568	
SUPERVISORY PERSONNEL	4	0	0		1.227	0.000	0.000	
ENGINEERING PERSONNEL	0	0	4		0.000	0.000	1.020	
TOTAL	85	37	79	201	38.708	8.983	27.713	75.404
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	238 (176)	116 (85)	163 (133)	517 (394)	125.853	51.052	53.157	230.062
OPERATING PERSONNEL	79 (74)	5 (5)	2 (4)	86 (83)	21.962	0.879	0.277	23.118
HEALTH PHYSICS PERSONNEL	95 (43)	0 0	112 (89)	207 (132)	41.964	0.000	39.466	81.430
SUPERVISORY PERSONNEL	25 (19)	2 (2)	1 (2)	28 (23)	9.355	0.804	0.488	10.647
ENGINEERING PERSONNEL	39 (31)	0 0	11 (11)	50 (42)	11.766	0.000	2.553	14.319
GRAND TOTALS	476 (343)	123 (92)	289 (239)	888 (674)	210.900	52.735	95.941	359.576

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *CATAWBA 1,2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	135	433	145		2.150	2.700	0.145	
OPERATING PERSONNEL	87	1	35		11.465	0.005	0.355	
HEALTH PHYSICS PERSONNEL	54	1	125		10.320	0.000	6.585	
SUPERVISORY PERSONNEL	1	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	82	21	12		4.148	1.017	0.115	
TOTAL	359	456	317	1132	28.083	3.722	7.200	39.005
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	135	437	124		13.948	56.341	41.590	
OPERATING PERSONNEL	58	1	39		1.490	0.020	2.265	
HEALTH PHYSICS PERSONNEL	51	0	106		3.520	0.000	16.390	
SUPERVISORY PERSONNEL	1	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	70	12	13		5.200	0.515	3.510	
TOTAL	315	450	282	1047	24.158	56.876	63.755	144.789
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	20	108	15		0.045	5.055	0.295	
OPERATING PERSONNEL	8	0	0		0.000	0.020	0.000	
HEALTH PHYSICS PERSONNEL	20	0	28		0.645	0.000	1.255	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	34	7	2		2.015	0.430	0.330	
TOTAL	82	115	45	242	2.705	5.505	1.880	10.090
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	126	365	97		18.229	52.410	18.085	
OPERATING PERSONNEL	65	1	36		3.985	0.115	9.755	
HEALTH PHYSICS PERSONNEL	46	0	99		7.305	0.000	18.215	
SUPERVISORY PERSONNEL	1	0	0		0.125	0.000	0.000	
ENGINEERING PERSONNEL	51	13	6		3.030	3.965	0.835	
TOTAL	289	379	238	906	32.674	56.490	46.890	136.054
WASTE PROCESSING								
MAINTENANCE PERSONNEL	30	47	1		0.160	0.080	0.000	
OPERATING PERSONNEL	22	0	36		1.370	0.000	1.480	
HEALTH PHYSICS PERSONNEL	31	0	33		2.530	0.000	2.380	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	7	3	0		0.055	0.000	0.760	
TOTAL	90	50	70	210	4.115	0.080	4.620	8.815
REFUELING								
MAINTENANCE PERSONNEL	124	423	83		16.595	97.109	29.015	
OPERATING PERSONNEL	64	1	35		8.785	0.690	17.075	
HEALTH PHYSICS PERSONNEL	39	1	115		2.895	0.145	25.256	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	75	12	9		11.420	1.255	2.020	
TOTAL	302	437	242	981	39.695	99.199	73.366	212.260
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	570 (138)	1813 (444)	465 (144)	2848 (726)	51.127	213.695	89.130	353.952
OPERATING PERSONNEL	304 (85)	4 (4)	181 (39)	489 (128)	27.095	0.850	30.930	58.875
HEALTH PHYSICS PERSONNEL	241 (54)	2 (1)	506 (125)	749 (180)	27.215	0.145	70.081	97.441
SUPERVISORY PERSONNEL	3 (1)	0 0	0 0	3 (1)	0.125	0.000	0.000	0.125
ENGINEERING PERSONNEL	319 (83)	68 (21)	42 (21)	429 (125)	25.868	7.182	7.570	40.620
GRAND TOTALS	1437 (361)	1887 (470)	1194 (329)	4518 (1160)	131.430	221.872	197.711	551.013

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *COOK 1,2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	9	0	8		2.002	0.000	1.376	
OPERATING PERSONNEL	75	0	40		23.138	0.000	9.732	
HEALTH PHYSICS PERSONNEL	15	0	80		4.606	0.000	35.887	
SUPERVISORY PERSONNEL	2	0	0		0.410	0.000	0.000	
ENGINEERING PERSONNEL	8	0	6		1.135	0.000	1.322	
TOTAL	109	0	134	243	31.291	0.000	48.317	79.608
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	108	0	384		76.364	0.000	212.888	
OPERATING PERSONNEL	39	1	53		8.609	0.751	13.477	
HEALTH PHYSICS PERSONNEL	9	0	65		2.102	0.000	21.866	
SUPERVISORY PERSONNEL	8	0	3		2.431	0.000	0.372	
ENGINEERING PERSONNEL	14	3	12		2.786	0.671	3.078	
TOTAL	178	4	517	699	92.292	1.422	251.681	345.395
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	15	0	150		4.992	0.000	96.803	
OPERATING PERSONNEL	4	0	21		0.787	0.000	13.568	
HEALTH PHYSICS PERSONNEL	2	0	30		1.140	0.000	11.746	
SUPERVISORY PERSONNEL	1	0	0		0.440	0.000	0.000	
ENGINEERING PERSONNEL	2	1	1		0.565	0.149	0.520	
TOTAL	24	1	202	227	7.924	0.149	122.637	130.710
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	11	0	39		3.543	0.000	16.095	
OPERATING PERSONNEL	1	0	0		0.360	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	15		0.000	0.000	2.090	
SUPERVISORY PERSONNEL	1	0	1		0.170	0.000	0.225	
ENGINEERING PERSONNEL	2	2	5		0.314	0.495	1.060	
TOTAL	15	2	60	77	4.387	0.495	19.470	24.352
WASTE PROCESSING								
MAINTENANCE PERSONNEL	8	0	128		2.130	0.000	70.683	
OPERATING PERSONNEL	0	0	6		0.000	0.000	6.032	
HEALTH PHYSICS PERSONNEL	2	0	22		0.345	0.000	4.994	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.000	0.140	
ENGINEERING PERSONNEL	3	0	2		1.157	0.000	0.655	
TOTAL	13	0	159	172	3.632	0.000	82.504	86.136
REFUELING								
MAINTENANCE PERSONNEL	0	0	3		0.000	0.000	0.574	
OPERATING PERSONNEL	3	0	30		0.632	0.000	5.485	
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		0.132	0.000	0.000	
TOTAL	4	0	33	37	0.764	0.000	6.059	6.823
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	151 (110)	0 (0)	712 (539)	863 (649)	89.031	0.000	398.419	487.450
OPERATING PERSONNEL	122 (95)	1 (1)	150 (94)	273 (190)	33.526	0.751	48.294	82.571
HEALTH PHYSICS PERSONNEL	28 (18)	0 (0)	212 (98)	240 (116)	8.193	0.000	76.583	84.776
SUPERVISORY PERSONNEL	12 (9)	0 (0)	5 (3)	17 (12)	3.451	0.000	0.737	4.188
ENGINEERING PERSONNEL	30 (24)	6 (5)	26 (19)	62 (48)	6.089	1.315	6.635	14.039
GRAND TOTALS	343 (256)	7 (6)	1105 (753)	1455 (1015)	140.290	2.066	530.668	673.024

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *COOPER STATION TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	12	0	1		0.156	0.000	0.010	
OPERATING PERSONNEL	34	0	0		11.711	0.000	0.000	
HEALTH PHYSICS PERSONNEL	21	0	0		6.163	0.000	0.000	
SUPERVISORY PERSONNEL	10	0	0		2.367	0.000	0.000	
ENGINEERING PERSONNEL	3	2	5		1.184	0.005	0.541	
TOTAL	80	2	6	88	21.581	0.005	0.551	22.137
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	67	0	18		36.592	0.000	8.021	
OPERATING PERSONNEL	3	0	0		0.033	0.000	0.000	
HEALTH PHYSICS PERSONNEL	15	0	0		8.871	0.000	0.000	
SUPERVISORY PERSONNEL	4	0	1		0.655	0.000	0.191	
ENGINEERING PERSONNEL	0	10	3		0.000	2.437	0.220	
TOTAL	89	10	22	121	46.151	2.437	8.432	57.020
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	0	1		0.005	0.000	0.157	
OPERATING PERSONNEL	1	0	0		0.015	0.000	0.000	
HEALTH PHYSICS PERSONNEL	7	0	0		0.459	0.000	0.000	
SUPERVISORY PERSONNEL	1	0	0		0.122	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.089	0.000	0.000	
TOTAL	11	0	1	12	0.690	0.000	0.157	0.847
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	11	0	0		4.446	0.000	0.000	
HEALTH PHYSICS PERSONNEL	12	0	0		3.235	0.000	0.000	
SUPERVISORY PERSONNEL	2	0	0		0.008	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	25	0	0	25	7.689	0.000	0.000	7.689
WASTE PROCESSING								
MAINTENANCE PERSONNEL	3	0	0		0.028	0.000	0.000	
OPERATING PERSONNEL	1	0	0		0.005	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	4	0	0	4	0.033	0.000	0.000	0.033
REFUELING								
MAINTENANCE PERSONNEL	0	0	1		0.000	0.000	0.108	
OPERATING PERSONNEL	1	0	0		0.009	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	1	0	0		0.001	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	2	0	1	3	0.010	0.000	0.108	0.118
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	83 (67)	0	0	21 (19)	104 (86)	36.781	0.000	8.296	45.077
OPERATING PERSONNEL	51 (38)	0	0	0	51 (38)	16.219	0.000	0.000	16.219
HEALTH PHYSICS PERSONNEL	55 (21)	0	0	0	55 (21)	18.728	0.000	0.000	18.728
SUPERVISORY PERSONNEL	18 (10)	0	0	1 (1)	19 (11)	3.153	0.000	0.191	3.344
ENGINEERING PERSONNEL	4 (3)	12 (10)		8 (5)	24 (18)	1.273	2.442	0.761	4.476
GRAND TOTALS	211 (139)	12 (10)		30 (25)	253 (174)	76.154	2.442	9.248	87.844

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *CRYSTAL RIVER 3 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	2	0	6		1.613	0.335	4.673	
OPERATING PERSONNEL	25	0	0		7.007	0.011	0.060	
HEALTH PHYSICS PERSONNEL	8	0	60		2.346	0.000	29.688	
SUPERVISORY PERSONNEL	4	0	2		1.389	0.064	0.996	
ENGINEERING PERSONNEL	0	0	2		0.149	0.123	0.434	
TOTAL	39	0	70	109	12.504	0.533	35.851	48.888
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	139	75	316		51.638	68.456	166.586	
OPERATING PERSONNEL	25	0	1		8.594	0.000	1.038	
HEALTH PHYSICS PERSONNEL	22	0	73		9.548	0.000	32.236	
SUPERVISORY PERSONNEL	5	0	30		3.369	0.000	14.497	
ENGINEERING PERSONNEL	3	3	38		0.874	1.029	30.930	
TOTAL	194	78	458	730	74.023	69.485	245.287	388.795
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	0	15		0.180	0.024	4.131	
OPERATING PERSONNEL	7	0	0		2.052	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	2		0.110	0.000	0.823	
SUPERVISORY PERSONNEL	2	0	1		0.242	0.005	0.347	
ENGINEERING PERSONNEL	0	0	10		0.031	0.070	4.445	
TOTAL	11	0	28	39	2.615	0.099	9.746	12.460
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	9	1	3		4.428	0.543	1.047	
OPERATING PERSONNEL	0	0	0		1.666	0.000	2.309	
HEALTH PHYSICS PERSONNEL	1	0	7		1.243	0.000	1.547	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	10	1	10	21	7.337	0.543	4.903	12.783
REFUELING								
MAINTENANCE PERSONNEL	13	50	1		2.970	13.853	0.373	
OPERATING PERSONNEL	0	0	0		0.059	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	2		0.151	0.000	1.360	
SUPERVISORY PERSONNEL	5	0	2		1.376	0.098	0.927	
ENGINEERING PERSONNEL	0	0	11		0.137	0.000	2.869	
TOTAL	18	50	16	84	4.693	13.951	5.529	24.173
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	164	126	341	631	60.829	83.211	176.810	320.850
OPERATING PERSONNEL	57	0	1	58	19.378	0.011	3.407	22.796
HEALTH PHYSICS PERSONNEL	32	0	144	176	13.398	0.000	65.654	79.052
SUPERVISORY PERSONNEL	16	0	35	51	6.376	0.167	16.767	23.310
ENGINEERING PERSONNEL	3	3	61	67	1.191	1.222	38.678	41.091
GRAND TOTALS	272	129	582	983	101.172	84.611	301.316	487.099

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *DAVIS-BESSE TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	121	12	221		0.336	0.199	3.210	
OPERATING PERSONNEL	92	0	0		0.785	0.000	0.000	
HEALTH PHYSICS PERSONNEL	40	0	72		1.121	0.000	8.625	
SUPERVISORY PERSONNEL	37	2	3		0.236	0.095	0.227	
ENGINEERING PERSONNEL	37	0	10		0.345	0.000	0.102	
TOTAL	327	14	306	647	2.823	0.294	12.164	15.281
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	181	14	573		5.545	0.116	11.290	
OPERATING PERSONNEL	22	0	0		3.412	0.000	0.000	
HEALTH PHYSICS PERSONNEL	45	0	0		3.422	0.000	0.000	
SUPERVISORY PERSONNEL	42	5	16		0.121	0.036	0.275	
ENGINEERING PERSONNEL	30	0	22		0.202	0.000	0.365	
TOTAL	320	19	611	950	12.702	0.152	11.930	24.784
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	140	8	450		5.638	0.195	12.490	
OPERATING PERSONNEL	26	0	0		0.914	0.000	0.000	
HEALTH PHYSICS PERSONNEL	25	0	0		2.439	0.000	0.000	
SUPERVISORY PERSONNEL	12	3	12		0.794	0.026	0.657	
ENGINEERING PERSONNEL	9	0	27		0.376	0.000	0.428	
TOTAL	212	11	489	712	10.161	0.221	13.575	23.957
WASTE PROCESSING								
MAINTENANCE PERSONNEL	6	0	0		0.362	0.000	0.000	
OPERATING PERSONNEL	5	0	0		0.458	0.000	0.000	
HEALTH PHYSICS PERSONNEL	12	0	0		1.255	0.000	0.000	
SUPERVISORY PERSONNEL	3	0	0		0.325	0.000	0.000	
ENGINEERING PERSONNEL	2	0	0		0.140	0.000	0.000	
TOTAL	28	0	0	28	2.540	0.000	0.000	2.540
REFUEL'NG								
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	448	34	1244	1726	11.881	0.510	26.990	39.381
OPERATING PERSONNEL	145	0	0	145	5.569	0.000	0.000	5.569
HEALTH PHYSICS PERSONNEL	122	0	72	194	8.237	0.000	8.625	16.862
SUPERVISORY PERSONNEL	94	10	31	135	1.476	0.157	1.159	2.792
ENGINEERING PERSONNEL	78	0	59	137	1.063	0.000	0.895	1.958
GRAND TOTALS	887	44	1406	2337	28.226	0.667	37.669	66.562

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *DIABLO CANYON 1,2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	2	0	1		0.000	0.000	0.000	
OPERATING PERSONNEL	9	0	0		1.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	19	0	1		3.000	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	30	0	2	32	4.000	0.000	0.000	4.000
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	38	12	48		7.000	3.000	9.000	
OPERATING PERSONNEL	13	2	6		2.000	0.000	1.000	
HEALTH PHYSICS PERSONNEL	23	0	35		3.000	0.000	5.000	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.000	0.000	
ENGINEERING PERSONNEL	1	1	2		0.000	0.000	0.000	
TOTAL	75	15	92	182	12.000	3.000	15.000	30.000
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	20	2		0.000	3.000	0.000	
OPERATING PERSONNEL	5	0	1		2.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	1	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.000	0.000	0.000	
TOTAL	8	20	3	31	2.000	3.000	0.000	5.000
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	65	64	311		17.000	18.000	128.000	
OPERATING PERSONNEL	11	7	5		1.000	2.000	1.000	
HEALTH PHYSICS PERSONNEL	34	0	90		14.000	0.000	35.000	
SUPERVISORY PERSONNEL	1	0	2		0.000	0.000	0.000	
ENGINEERING PERSONNEL	7	4	13		2.000	1.000	4.000	
TOTAL	118	75	421	614	34.000	21.000	168.000	223.000
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	1	1		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	9		0.000	0.000	1.000	
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	10	13	0.000	0.000	1.000	1.000
REFUELING								
MAINTENANCE PERSONNEL	30	5	9		8.000	1.000	2.000	
OPERATING PERSONNEL	19	2	1		3.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	16		1.000	0.000	3.000	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	1		0.000	0.000	0.000	
TOTAL	53	7	28	88	12.000	1.000	5.000	18.000
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	136 (97)	101 (78)	371 (367)	608 (542)	32.000	25.000	139.000	196.000
OPERATING PERSONNEL	57 (78)	12 (10)	14 (12)	83 (100)	9.000	2.000	2.000	13.000
HEALTH PHYSICS PERSONNEL	82 (73)	0 0	151 (106)	233 (179)	21.000	0.000	44.000	65.000
SUPERVISORY PERSONNEL	2 (2)	0 0	4 (3)	6 (5)	0.000	0.000	0.000	0.000
ENGINEERING PERSONNEL	9 (11)	5 (5)	16 (16)	30 (32)	2.000	1.000	4.000	7.000
GRAND TOTALS	286 (261)	118 (93)	556 (504)	960 (858)	64.000	28.000	189.000	281.000

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *DRESDEN 1,2,3 TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	36	54	114		23.065	14.237	67.218	
OPERATING PERSONNEL	82	0	4		74.139	0.000	1.100	
HEALTH PHYSICS PERSONNEL	19	0	0		25.404	0.000	0.000	
SUPERVISORY PERSONNEL	34	0	0		20.925	0.000	0.000	
ENGINEERING PERSONNEL	24	9	15		10.257	1.366	3.203	
TOTAL	195	63	133	391	153.790	15.603	71.521	240.914
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	315	72	278		200.759	19.120	164.218	
OPERATING PERSONNEL	29	0	5		26.360	0.000	1.220	
HEALTH PHYSICS PERSONNEL	26	0	0		34.635	0.000	0.000	
SUPERVISORY PERSONNEL	69	0	0		42.965	0.000	0.000	
ENGINEERING PERSONNEL	22	12	20		9.646	1.741	4.100	
TOTAL	461	84	303	848	314.365	20.861	169.538	504.764
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	1	166		0.471	0.037	98.418	
OPERATING PERSONNEL	1	0	2		0.220	0.000	0.580	
HEALTH PHYSICS PERSONNEL	1	0	0		0.644	0.000	0.000	
SUPERVISORY PERSONNEL	1	0	0		0.907	0.000	0.000	
ENGINEERING PERSONNEL	4	4	4		1.882	0.699	0.818	
TOTAL	8	5	172	185	4.124	0.736	99.816	104.676
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	6	14	273		4.001	3.876	161.405	
OPERATING PERSONNEL	1	0	1		0.110	0.000	0.280	
HEALTH PHYSICS PERSONNEL	4	0	0		3.435	0.000	0.000	
SUPERVISORY PERSONNEL	2	0	0		1.395	0.000	0.000	
ENGINEERING PERSONNEL	3	3	8		1.412	0.593	1.508	
TOTAL	16	17	282	315	10.353	4.469	163.193	178.015
WASTE PROCESSING								
MAINTENANCE PERSONNEL	2	0	48		1.177	0.000	28.682	
OPERATING PERSONNEL	9	0	64		8.347	0.000	15.938	
HEALTH PHYSICS PERSONNEL	5	0	0		6.798	0.000	0.000	
SUPERVISORY PERSONNEL	4	0	0		2.371	0.000	0.000	
ENGINEERING PERSONNEL	1	1	1		0.282	0.093	0.128	
TOTAL	21	1	113	135	18.975	0.093	44.748	63.816
REFUELING								
MAINTENANCE PERSONNEL	9	0	71		5.884	0.000	42.179	
OPERATING PERSONNEL	1	0	3		0.660	0.000	0.880	
HEALTH PHYSICS PERSONNEL	1	0	0		0.644	0.000	0.000	
SUPERVISORY PERSONNEL	2	0	0		1.395	0.000	0.000	
ENGINEERING PERSONNEL	1	1	1		0.047	0.139	0.986	
TOTAL	14	1	75	90	8.630	0.139	44.045	52.814
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	369	141	950	1460	235.357	37.270	562.120	834.747
OPERATING PERSONNEL	123	0	79	202	109.836	0.000	19.998	129.834
HEALTH PHYSICS PERSONNEL	56	0	0	56	71.560	0.000	0.000	71.560
SUPERVISORY PERSONNEL	112	0	0	112	69.958	0.000	0.000	69.958
ENGINEERING PERSONNEL	55	30	49	134	23.526	4.631	10.743	38.900
GRAND TOTALS	715	171	1078	1964	510.237	41.901	592.861	1144.999

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *DUANE ARNOLD TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	18	0	115		13.768	0.000	118.838	
OPERATING PERSONNEL	32	0	5		32.262	0.000	4.348	
HEALTH PHYSICS PERSONNEL	8	0	31		7.447	0.000	15.413	
SUPERVISORY PERSONNEL	8	0	11		2.099	0.000	9.010	
ENGINEERING PERSONNEL	22	0	18		19.681	0.016	18.711	
TOTAL	88	0	180	268	75.257	0.016	166.320	241.593
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	69	1	67		49.100	0.120	51.995	
OPERATING PERSONNEL	2	0	2		1.005	0.000	1.773	
HEALTH PHYSICS PERSONNEL	11	0	9		8.641	0.000	5.328	
SUPERVISORY PERSONNEL	2	0	5		0.338	0.000	2.690	
ENGINEERING PERSONNEL	9	1	7		6.931	0.064	2.845	
TOTAL	93	2	90	185	66.015	0.184	64.631	130.830
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	0	11		0.435	0.000	10.839	
OPERATING PERSONNEL	0	0	0		0.010	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	1		0.908	0.000	0.433	
SUPERVISORY PERSONNEL	0	0	0		0.071	0.000	0.103	
ENGINEERING PERSONNEL	2	0	1		1.571	0.000	0.386	
TOTAL	4	0	13	17	2.995	0.000	11.761	14.756
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	21	0	229		19.989	0.000	205.450	
OPERATING PERSONNEL	1	0	1		0.591	0.000	0.439	
HEALTH PHYSICS PERSONNEL	6	0	24		5.567	0.000	12.521	
SUPERVISORY PERSONNEL	3	0	6		0.510	0.000	2.429	
ENGINEERING PERSONNEL	20	0	19		9.175	0.027	8.915	
TOTAL	51	0	279	330	35.832	0.027	229.754	265.613
WASTE PROCESSING								
MAINTENANCE PERSONNEL	8	0	0		2.725	0.000	0.213	
OPERATING PERSONNEL	8	0	4		4.190	0.000	4.502	
HEALTH PHYSICS PERSONNEL	1	0	2		0.643	0.000	1.027	
SUPERVISORY PERSONNEL	1	0	1		0.098	0.000	0.156	
ENGINEERING PERSONNEL	0	0	0		0.209	0.000	0.004	
TOTAL	18	0	7	25	7.865	0.000	5.902	13.767
REFUELING								
MAINTENANCE PERSONNEL	1	0	0		0.277	0.000	0.019	
OPERATING PERSONNEL	1	0	0		0.296	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.031	0.000	0.033	
SUPERVISORY PERSONNEL	0	0	0		0.006	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.189	0.000	0.004	
TOTAL	3	0	0	3	0.799	0.000	0.056	0.855
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	118	1	422	541	86.294	0.120	387.354	473.768
OPERATING PERSONNEL	44	0	12	56	38.354	0.000	11.062	49.416
HEALTH PHYSICS PERSONNEL	27	0	67	94	23.237	0.000	34.755	57.992
SUPERVISORY PERSONNEL	14	0	23	37	3.122	0.000	14.388	17.510
ENGINEERING PERSONNEL	54	1	45	100	37.756	0.107	30.865	68.728
GRAND TOTALS	257	2	569	828	188.763	0.227	478.424	667.414

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *FARLEY 1,2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	94	1	81		2.780	0.010	2.770	
OPERATING PERSONNEL	242	1	9		35.630	0.010	0.250	
HEALTH PHYSICS PERSONNEL	87	0	125		27.130	0.000	25.540	
SUPERVISORY PERSONNEL	68	24	12		5.970	0.710	0.260	
ENGINEERING PERSONNEL	54	8	68		2.080	0.160	2.030	
TOTAL	545	34	295	874	73.590	0.890	30.850	105.330
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	180	7	142		15.690	0.340	8.920	
OPERATING PERSONNEL	137	0	12		30.100	0.000	1.600	
HEALTH PHYSICS PERSONNEL	43	0	56		6.950	0.000	1.710	
SUPERVISORY PERSONNEL	22	6	4		1.310	0.110	0.040	
ENGINEERING PERSONNEL	24	5	117		0.600	0.170	5.790	
TOTAL	406	18	331	755	54.650	0.620	18.060	73.330
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	13	1	58		0.230	0.010	3.660	
OPERATING PERSONNEL	24	0	1		0.470	0.000	0.030	
HEALTH PHYSICS PERSONNEL	4	0	10		0.040	0.000	0.080	
SUPERVISORY PERSONNEL	5	2	2		0.120	0.040	0.200	
ENGINEERING PERSONNEL	15	1	64		1.630	0.070	6.020	
TOTAL	61	4	135	200	2.490	0.120	9.990	12.600
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	186	6	452		74.250	0.240	171.320	
OPERATING PERSONNEL	99	0	5		6.930	0.000	2.130	
HEALTH PHYSICS PERSONNEL	50	0	74		13.800	0.000	18.910	
SUPERVISORY PERSONNEL	29	9	9		2.450	1.570	2.080	
ENGINEERING PERSONNEL	40	6	382		4.380	1.990	88.900	
TOTAL	404	21	922	1347	101.810	3.800	283.340	388.950
WASTE PROCESSING								
MAINTENANCE PERSONNEL	6	0	16		1.130	0.000	0.200	
OPERATING PERSONNEL	36	0	0		1.020	0.000	0.000	
HEALTH PHYSICS PERSONNEL	32	0	18		5.730	0.000	1.030	
SUPERVISORY PERSONNEL	7	0	0		0.980	0.000	0.000	
ENGINEERING PERSONNEL	4	0	12		0.100	0.000	0.250	
TOTAL	85	0	46	131	8.960	0.000	1.480	10.440
REFUELING								
MAINTENANCE PERSONNEL	30	4	17		1.630	0.040	1.740	
OPERATING PERSONNEL	24	0	1		0.860	0.000	0.020	
HEALTH PHYSICS PERSONNEL	13	0	10		0.710	0.000	0.370	
SUPERVISORY PERSONNEL	14	1	1		0.440	0.010	0.020	
ENGINEERING PERSONNEL	6	1	16		0.130	0.020	0.870	
TOTAL	87	6	45	138	3.770	0.070	3.020	6.860
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	509	19	766	1294	95.710	0.640	188.610	284.960
OPERATING PERSONNEL	562	1	28	591	75.010	0.010	4.030	79.050
HEALTH PHYSICS PERSONNEL	229	0	293	522	54.360	0.000	47.640	102.000
SUPERVISORY PERSONNEL	145	42	28	215	11.270	2.440	2.600	16.310
ENGINEERING PERSONNEL	143	21	659	823	8.920	2.410	103.860	115.190
GRAND TOTALS	1588	83	1774	3445	245.270	5.500	346.740	597.510

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *FITZPATRICK TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	113	49	313		15.638	0.254	13.000	
OPERATING PERSONNEL	121	21	6		41.751	0.049	0.309	
HEALTH PHYSICS PERSONNEL	38	5	79		21.439	0.143	53.333	
SUPERVISORY PERSONNEL	34	13	79		1.608	0.184	6.159	
ENGINEERING PERSONNEL	18	6	18		2.084	0.070	2.605	
TOTAL	324	94	495	913	82.520	0.700	75.406	158.626
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	129	85	472		117.129	1.464	103.364	
OPERATING PERSONNEL	85	19	16		5.701	0.028	1.201	
HEALTH PHYSICS PERSONNEL	23	1	50		2.483	0.000	3.259	
SUPERVISORY PERSONNEL	22	5	79		3.164	0.000	16.878	
ENGINEERING PERSONNEL	16	7	10		2.118	0.053	0.651	
TOTAL	275	117	627	1019	130.595	1.545	125.353	257.493
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	53	22	316		4.217	1.494	77.352	
OPERATING PERSONNEL	39	1	13		1.233	0.017	3.031	
HEALTH PHYSICS PERSONNEL	18	3	29		1.853	0.078	2.357	
SUPERVISORY PERSONNEL	13	5	57		1.742	0.183	4.288	
ENGINEERING PERSONNEL	12	3	23		0.558	0.230	0.792	
TOTAL	135	34	438	607	9.603	2.002	87.820	99.425
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	59	19	491		11.376	1.730	258.567	
OPERATING PERSONNEL	13	2	1		0.676	0.033	0.087	
HEALTH PHYSICS PERSONNEL	11	1	28		1.093	0.000	3.597	
SUPERVISORY PERSONNEL	5	2	423		1.073	0.623	9.978	
ENGINEERING PERSONNEL	11	4	18		0.656	0.347	1.503	
TOTAL	99	28	961	1088	14.874	2.733	273.732	291.339
WASTE PROCESSING								
MAINTENANCE PERSONNEL	93	97	186		38.258	0.000	18.500	
OPERATING PERSONNEL	29	3	8		2.213	0.000	4.260	
HEALTH PHYSICS PERSONNEL	18	3	32		1.646	0.039	1.164	
SUPERVISORY PERSONNEL	7	0	19		0.161	0.000	0.250	
ENGINEERING PERSONNEL	3	0	6		0.054	0.000	0.315	
TOTAL	150	103	251	504	42.332	0.039	24.489	66.860
REFUELING								
MAINTENANCE PERSONNEL	84	25	50		15.237	0.076	4.862	
OPERATING PERSONNEL	99	9	16		8.263	0.273	2.402	
HEALTH PHYSICS PERSONNEL	19	3	22		2.363	0.090	2.062	
SUPERVISORY PERSONNEL	22	7	42		0.327	0.070	0.941	
ENGINEERING PERSONNEL	6	2	5		0.150	0.020	0.009	
TOTAL	230	46	135	411	26.340	0.529	10.276	37.145
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	531 0	297 0	1828 0	2656 0	201.855	5.018	475.645	682.518
OPERATING PERSONNEL	386 0	55 0	60 0	501 0	59.837	0.400	11.290	71.527
HEALTH PHYSICS PERSONNEL	127 0	16 0	240 0	383 0	30.877	0.350	65.772	96.999
SUPERVISORY PERSONNEL	103 0	32 0	699 0	834 0	8.075	1.060	38.494	47.629
ENGINEERING PERSONNEL	66 0	22 0	80 0	168 0	5.620	0.720	5.875	12.215
GRAND TOTALS	1213 0	422 0	2907 0	4542 0	306.264	7.548	597.076	910.888

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *FORT CALHOUN TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	3	0	8		1.925	0.799	3.549	
OPERATING PERSONNEL	30	0	0		15.570	0.000	0.038	
HEALTH PHYSICS PERSONNEL	22	0	51		23.231	0.005	30.417	
SUPERVISORY PERSONNEL	1	0	0		0.890	0.023	0.003	
ENGINEERING PERSONNEL	13	6	25		6.920	2.176	7.764	
TOTAL	69	6	84	159	48.536	3.003	41.771	93.310
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	52	30	67		25.466	13.043	40.648	
OPERATING PERSONNEL	0	0	0		0.143	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	51		0.393	0.012	24.589	
SUPERVISORY PERSONNEL	1	0	0		0.217	0.000	0.000	
ENGINEERING PERSONNEL	1	2	8		1.094	0.875	2.183	
TOTAL	55	32	126	213	27.313	13.930	67.420	108.663
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	3	39		0.182	0.992	26.590	
OPERATING PERSONNEL	2	0	0		0.450	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	2		0.200	0.005	0.955	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.490	0.065	0.205	
TOTAL	5	3	41	49	1.322	1.062	27.750	30.134
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	40	35	97		21.956	19.708	66.814	
OPERATING PERSONNEL	6	0	0		2.484	0.000	0.005	
HEALTH PHYSICS PERSONNEL	11	1	29		9.527	0.143	12.785	
SUPERVISORY PERSONNEL	0	0	1		0.150	0.010	0.182	
ENGINEERING PERSONNEL	5	6	26		3.251	2.020	11.990	
TOTAL	62	42	153	257	37.368	21.881	91.776	151.025
WASTE PROCESSING								
MAINTENANCE PERSONNEL	5	4	6		1.686	1.496	4.423	
OPERATING PERSONNEL	3	0	0		0.943	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	22		2.540	0.000	21.887	
SUPERVISORY PERSONNEL	0	0	0		0.030	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.045	0.030	0.035	
TOTAL	11	4	28	43	5.244	1.526	26.345	33.115
REFUELING								
MAINTENANCE PERSONNEL	22	21	28		10.081	12.647	10.327	
OPERATING PERSONNEL	23	0	0		5.510	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	5		0.274	0.000	0.908	
SUPERVISORY PERSONNEL	1	0	0		0.500	0.020	0.000	
ENGINEERING PERSONNEL	9	1	11		2.046	0.242	3.301	
TOTAL	56	22	44	122	18.411	12.909	14.536	45.856
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	123	93	245	461	61.296	48.685	152.351	262.332
OPERATING PERSONNEL	64	0	0	64	25.100	0.000	0.043	25.143
HEALTH PHYSICS PERSONNEL	39	1	160	200	36.165	0.165	91.541	127.871
SUPERVISORY PERSONNEL	3	0	1	4	1.787	0.053	0.185	2.025
ENGINEERING PERSONNEL	29	15	70	114	13.846	5.408	25.478	44.732
GRAND TOTALS	258	109	476	843	138.194	54.311	269.598	462.103

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *FORT ST. VRAIN TYPE: HTGR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	0	0	0		0.000	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	0		0.140	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	1	0	0	1	0.140	0.000	0.000	0.140
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	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		0.000	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
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	1	0	0	1	0.140	0.000	0.000	0.140
OPERATING PERSONNEL	0	0	0	0	0.000	0.000	0.000	0.000
HEALTH PHYSICS PERSONNEL	0	0	0	0	0.000	0.000	0.000	0.000
SUPERVISORY PERSONNEL	0	0	0	0	0.000	0.000	0.000	0.000
ENGINEERING PERSONNEL	0	0	0	0	0.000	0.000	0.000	0.000
GRAND TOTALS	1	0	0	1	0.140	0.000	0.000	0.140

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *GINNA TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	54	70	105		6.935	1.652	1.995	
OPERATING PERSONNEL	23	0	0		9.974	0.000	0.000	
HEALTH PHYSICS PERSONNEL	12	0	28		4.508	0.000	3.168	
SUPERVISORY PERSONNEL	16	13	24		2.570	0.487	1.552	
ENGINEERING PERSONNEL	0	4	10		0.000	0.084	0.331	
TOTAL	105	87	167	359	23.987	2.223	7.046	33.256
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	51	141	144		16.148	19.048	29.498	
OPERATING PERSONNEL	8	0	0		0.322	0.000	0.000	
HEALTH PHYSICS PERSONNEL	12	3	28		2.758	0.330	4.429	
SUPERVISORY PERSONNEL	16	15	26		2.233	3.042	4.468	
ENGINEERING PERSONNEL	0	3	34		0.000	0.351	10.982	
TOTAL	87	162	232	481	21.461	22.771	49.377	93.609
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	18	49	42		0.285	4.089	3.686	
OPERATING PERSONNEL	2	0	0		0.002	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	15		0.156	0.000	0.595	
SUPERVISORY PERSONNEL	8	6	6		0.166	0.379	0.105	
ENGINEERING PERSONNEL	0	2	5		0.000	0.150	0.020	
TOTAL	32	57	68	157	0.609	4.618	4.406	9.633
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	49	142	132		8.401	63.306	46.635	
OPERATING PERSONNEL	12	0	0		0.122	0.000	0.000	
HEALTH PHYSICS PERSONNEL	10	2	26		1.504	0.000	1.832	
SUPERVISORY PERSONNEL	13	12	24		0.855	0.617	4.657	
ENGINEERING PERSONNEL	0	4	15		0.000	0.150	0.648	
TOTAL	84	160	197	441	10.882	64.073	53.772	128.727
WASTE PROCESSING								
MAINTENANCE PERSONNEL	22	13	24		0.460	0.183	4.560	
OPERATING PERSONNEL	5	0	0		0.047	0.000	0.000	
HEALTH PHYSICS PERSONNEL	6	3	6		0.095	0.575	2.554	
SUPERVISORY PERSONNEL	5	2	1		0.097	0.175	0.092	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	38	18	31	87	0.699	0.933	7.206	8.838
REFUELING								
MAINTENANCE PERSONNEL	29	130	61		3.645	24.293	7.031	
OPERATING PERSONNEL	3	0	0		0.001	0.000	0.000	
HEALTH PHYSICS PERSONNEL	8	0	19		1.957	0.000	2.328	
SUPERVISORY PERSONNEL	2	7	15		0.365	0.075	1.280	
ENGINEERING PERSONNEL	0	1	21		0.000	0.015	9.705	
TOTAL	42	138	116	296	5.968	24.383	20.344	50.695
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	223 (54)	545 (153)	508 (159)	1276 (366)	35.874	112.571	93.405	241.850
OPERATING PERSONNEL	53 (23)	0 0	0 0	53 (23)	10.468	0.000	0.000	10.468
HEALTH PHYSICS PERSONNEL	52 (12)	8 (3)	122 (28)	182 (43)	10.978	0.905	14.906	26.789
SUPERVISORY PERSONNEL	60 (16)	55 (15)	96 (28)	211 (59)	6.286	4.775	12.154	23.215
ENGINEERING PERSONNEL	0 0	14 (4)	85 (34)	99 (38)	0.000	0.750	21.686	22.436
GRAND TOTALS	388 (105)	622 (175)	811 (249)	1821 (529)	63.606	119.001	142.151	324.758

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

APPENDIX D (Continued)

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *GRAND GULF TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	20	0	74		2.970	0.000	17.850	
OPERATING PERSONNEL	65	0	0		26.460	0.000	0.000	
HEALTH PHYSICS PERSONNEL	42	0	37		34.860	0.000	15.970	
SUPERVISORY PERSONNEL	5	2	7		0.830	1.060	1.100	
ENGINEERING PERSONNEL	1	0	0		0.110	0.000	0.000	
TOTAL	133	2	118	253	65.230	1.060	34.920	101.210
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	99	0	260		32.920	0.000	146.000	
OPERATING PERSONNEL	0	0	2		0.000	0.000	0.540	
HEALTH PHYSICS PERSONNEL	0	0	3		0.000	0.000	0.550	
SUPERVISORY PERSONNEL	0	0	4		0.000	0.000	1.240	
ENGINEERING PERSONNEL	1	0	1		0.590	0.000	0.110	
TOTAL	100	0	270	370	33.510	0.000	148.440	181.950
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	3	0	61		0.390	0.000	33.900	
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	1	0	17		0.160	0.000	7.820	
ENGINEERING PERSONNEL	0	0	3		0.000	0.000	2.010	
TOTAL	4	0	81	85	0.550	0.000	43.730	44.280
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	24	0	145		7.000	0.000	42.330	
OPERATING PERSONNEL	0	0	2		0.000	0.000	1.020	
HEALTH PHYSICS PERSONNEL	0	0	1		0.000	0.000	0.440	
SUPERVISORY PERSONNEL	0	0	7		0.000	0.000	1.870	
ENGINEERING PERSONNEL	4	0	3		0.610	0.000	1.400	
TOTAL	28	0	158	186	7.610	0.000	47.060	54.670
WASTE PROCESSING								
MAINTENANCE PERSONNEL	18	0	18		3.310	0.000	5.650	
OPERATING PERSONNEL	1	0	2		0.120	0.000	0.890	
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	19	0	20	39	3.430	0.000	6.540	9.970
REFUELING								
MAINTENANCE PERSONNEL	0	0	15		0.000	0.000	6.710	
OPERATING PERSONNEL	0	0	2		0.000	0.000	0.390	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	2		0.000	0.000	0.320	
ENGINEERING PERSONNEL	0	0	2		0.000	0.000	0.650	
TOTAL	0	0	21	21	0.000	0.000	8.070	8.070
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	164	0	573	737	46.590	0.000	252.440	299.030
OPERATING PERSONNEL	66	0	8	74	26.580	0.000	2.840	29.420
HEALTH PHYSICS PERSONNEL	42	0	41	83	34.860	0.000	16.960	51.820
SUPERVISORY PERSONNEL	6	2	37	45	0.990	1.060	12.350	14.400
ENGINEERING PERSONNEL	6	0	9	15	1.310	0.000	4.170	5.480
GRAND TOTALS	284	2	668	954	110.330	1.060	288.760	400.150

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *HADDAM NECK TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	10	0	6		3.990	0.400	3.660	
OPERATING PERSONNEL	39	0	1		35.980	0.340	0.580	
HEALTH PHYSICS PERSONNEL	20	3	72		9.200	2.250	37.020	
SUPERVISORY PERSONNEL	1	0	0		0.420	0.000	0.040	
ENGINEERING PERSONNEL	6	2	4		1.740	1.620	1.880	
TOTAL	76	5	83	164	51.330	4.610	43.180	99.120
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	56	17	179		52.240	7.600	101.950	
OPERATING PERSONNEL	14	0	2		4.050	0.070	0.720	
HEALTH PHYSICS PERSONNEL	21	0	76		8.840	0.290	30.820	
SUPERVISORY PERSONNEL	1	0	1		0.270	0.000	0.870	
ENGINEERING PERSONNEL	4	7	15		1.380	4.320	7.800	
TOTAL	96	24	273	393	66.780	12.280	142.160	221.220
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	29	7	154		22.160	2.630	121.720	
OPERATING PERSONNEL	1	1	4		0.180	0.450	2.210	
HEALTH PHYSICS PERSONNEL	7	2	46		2.810	1.030	20.310	
SUPERVISORY PERSONNEL	0	0	0		0.010	0.000	0.030	
ENGINEERING PERSONNEL	6	6	101		3.020	2.180	84.140	
TOTAL	43	16	305	364	28.180	6.290	228.410	262.880
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	6	9	157		3.600	2.360	78.640	
OPERATING PERSONNEL	2	0	1		1.170	0.010	0.330	
HEALTH PHYSICS PERSONNEL	1	0	0		0.440	0.020	0.790	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.000	0.330	
ENGINEERING PERSONNEL	3	7	18		0.430	2.080	6.500	
TOTAL	12	16	177	205	5.640	4.470	86.590	96.700
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	2		0.110	0.010	1.280	
OPERATING PERSONNEL	0	0	0		0.500	0.000	0.010	
HEALTH PHYSICS PERSONNEL	15	0	52		11.070	0.070	18.750	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.040	0.200	
TOTAL	15	0	54	69	11.680	0.120	20.240	32.040
REFUELING								
MAINTENANCE PERSONNEL	13	1	25		5.210	0.300	17.890	
OPERATING PERSONNEL	0	0	5		0.090	0.000	3.910	
HEALTH PHYSICS PERSONNEL	0	0	8		0.050	0.000	2.470	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	9		0.020	0.130	6.790	
TOTAL	13	1	47	61	5.370	0.430	31.060	36.860
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	114	34	523	671	87.310	13.300	325.140	425.750
OPERATING PERSONNEL	56	1	13	70	41.970	0.870	7.760	50.600
HEALTH PHYSICS PERSONNEL	64	5	254	323	32.410	3.660	110.160	146.230
SUPERVISORY PERSONNEL	2	0	2	4	0.700	0.000	1.270	1.970
ENGINEERING PERSONNEL	19	22	147	188	6.590	10.370	107.310	124.270
GRAND TOTALS	255	62	939	1256	168.980	28.200	551.640	748.820

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *HARRIS TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	2	0	12		0.566	0.042	7.436	
OPERATING PERSONNEL	22	0	4		6.901	0.198	3.625	
HEALTH PHYSICS PERSONNEL	13	1	30		8.115	0.256	8.339	
SUPERVISORY PERSONNEL	0	0	0		0.020	0.039	0.022	
ENGINEERING PERSONNEL	3	0	3		2.039	0.132	1.369	
TOTAL	40	1	49	90	17.641	0.667	20.791	39.099
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	11	0	16		3.983	0.019	4.743	
OPERATING PERSONNEL	0	0	0		0.154	0.020	0.050	
HEALTH PHYSICS PERSONNEL	0	0	0		0.269	0.022	0.539	
SUPERVISORY PERSONNEL	0	0	0		0.007	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.292	0.090	0.206	
TOTAL	12	0	16	28	4.705	0.151	5.538	10.394
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	1		0.284	0.000	0.753	
OPERATING PERSONNEL	0	0	0		0.070	0.000	0.025	
HEALTH PHYSICS PERSONNEL	0	0	4		0.033	0.000	0.670	
SUPERVISORY PERSONNEL	0	0	0		0.011	0.000	0.000	
ENGINEERING PERSONNEL	2	1	0		1.337	0.621	0.295	
TOTAL	2	1	5	8	1.735	0.621	1.743	4.099
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	17	0	15		4.217	0.053	6.044	
OPERATING PERSONNEL	0	0	0		0.045	0.000	0.100	
HEALTH PHYSICS PERSONNEL	0	0	7		0.434	0.058	1.988	
SUPERVISORY PERSONNEL	0	0	0		0.017	0.000	0.000	
ENGINEERING PERSONNEL	3	0	1		0.723	0.138	0.543	
TOTAL	20	0	23	43	5.436	0.249	8.675	14.360
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.065	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.020	
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	0.055	
TOTAL	0	0	0	0	0.000	0.000	0.140	0.140
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	30	0	44	74	9.050	0.114	19.041	28.205
OPERATING PERSONNEL	22	0	4	26	7.170	0.218	3.820	11.208
HEALTH PHYSICS PERSONNEL	13	1	41	55	8.851	0.336	11.536	20.723
SUPERVISORY PERSONNEL	0	0	0	0	0.055	0.039	0.022	0.116
ENGINEERING PERSONNEL	9	1	4	14	4.391	0.981	2.468	7.840
GRAND TOTALS	74	2	93	169	29.517	1.688	36.887	68.092

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *HATCH 1,2 TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	53	1	27		32.742	0.422	12.922	
OPERATING PERSONNEL	105	0	2		59.450	0.040	0.811	
HEALTH PHYSICS PERSONNEL	64	0	53		45.471	0.026	31.796	
SUPERVISORY PERSONNEL	21	0	5		9.684	0.337	1.469	
ENGINEERING PERSONNEL	29	3	15		13.643	0.886	4.866	
TOTAL	272	4	102	378	160.990	1.711	51.864	214.565
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	141	2	215		65.682	0.973	94.122	
OPERATING PERSONNEL	21	0	1		7.582	0.000	0.230	
HEALTH PHYSICS PERSONNEL	39	0	31		31.640	0.000	12.881	
SUPERVISORY PERSONNEL	16	0	4		6.498	0.064	4.302	
ENGINEERING PERSONNEL	9	1	21		3.387	0.448	5.869	
TOTAL	226	3	272	501	114.789	1.485	117.404	233.678
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	18	1	15		6.853	0.250	6.999	
OPERATING PERSONNEL	7	0	1		1.829	0.000	0.218	
HEALTH PHYSICS PERSONNEL	11	0	8		4.781	0.000	1.987	
SUPERVISORY PERSONNEL	5	0	1		2.486	0.026	0.295	
ENGINEERING PERSONNEL	2	1	9		0.746	0.779	3.842	
TOTAL	43	2	34	79	16.695	1.055	13.341	31.091
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	41	3	389		17.958	0.865	206.687	
OPERATING PERSONNEL	8	0	1		2.102	0.000	0.218	
HEALTH PHYSICS PERSONNEL	17	0	16		12.195	0.000	5.153	
SUPERVISORY PERSONNEL	6	0	8		3.611	0.086	4.219	
ENGINEERING PERSONNEL	4	3	58		2.426	3.130	22.224	
TOTAL	76	6	472	554	38.292	4.081	238.501	280.874
WASTE PROCESSING								
MAINTENANCE PERSONNEL	25	1	16		10.864	0.250	8.475	
OPERATING PERSONNEL	7	0	1		1.829	0.000	0.242	
HEALTH PHYSICS PERSONNEL	14	0	9		7.835	0.000	2.012	
SUPERVISORY PERSONNEL	5	0	1		2.669	0.026	0.392	
ENGINEERING PERSONNEL	2	0	4		0.746	0.052	0.856	
TOTAL	53	1	31	85	23.943	0.328	11.977	36.248
REFUELING								
MAINTENANCE PERSONNEL	38	1	34		20.971	0.250	12.982	
OPERATING PERSONNEL	7	0	1		1.829	0.000	0.218	
HEALTH PHYSICS PERSONNEL	14	0	8		6.554	0.000	2.089	
SUPERVISORY PERSONNEL	4	0	2		1.682	0.026	0.489	
ENGINEERING PERSONNEL	3	0	15		1.099	0.052	3.107	
TOTAL	66	1	60	127	32.135	0.328	18.885	51.348
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	316	9	696	1021	155.070	3.010	342.187	500.267
OPERATING PERSONNEL	155	0	7	162	74.621	0.040	1.937	76.598
HEALTH PHYSICS PERSONNEL	159	0	125	284	108.476	0.026	55.918	164.420
SUPERVISORY PERSONNEL	57	0	21	78	26.630	0.565	11.166	38.361
ENGINEERING PERSONNEL	49	8	122	179	22.047	5.347	40.764	68.158
GRAND TOTALS	736	17	971	1724	386.844	8.988	451.972	847.804

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *HOPE CREEK TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	8	0	2		3.793	0.080	3.099	
OPERATING PERSONNEL	36	0	0		9.425	0.000	0.441	
HEALTH PHYSICS PERSONNEL	9	0	0		2.687	0.009	0.026	
SUPERVISORY PERSONNEL	0	0	0		0.209	0.011	0.009	
ENGINEERING PERSONNEL	0	0	0		0.908	0.059	0.039	
TOTAL	53	0	2	55	17.022	0.159	3.614	20.795
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	13	0	0		4.245	0.062	0.917	
OPERATING PERSONNEL	1	0	0		0.998	0.000	0.009	
HEALTH PHYSICS PERSONNEL	25	0	4		6.533	0.000	1.624	
SUPERVISORY PERSONNEL	0	0	0		0.015	0.000	0.004	
ENGINEERING PERSONNEL	3	0	0		0.910	0.000	0.081	
TOTAL	42	0	4	46	12.701	0.062	2.635	15.398
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	3	0	9		1.181	0.019	3.030	
OPERATING PERSONNEL	0	0	0		0.216	0.000	0.394	
HEALTH PHYSICS PERSONNEL	0	0	0		0.339	0.000	0.053	
SUPERVISORY PERSONNEL	0	0	0		0.083	0.000	0.095	
ENGINEERING PERSONNEL	2	0	0		0.651	0.124	0.013	
TOTAL	5	0	9	14	2.470	0.143	3.585	6.198
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	69	1	79		23.466	0.173	25.029	
OPERATING PERSONNEL	18	0	5		3.942	0.000	0.000	
HEALTH PHYSICS PERSONNEL	26	0	5		8.920	0.000	1.944	
SUPERVISORY PERSONNEL	1	0	2		0.240	0.000	0.440	
ENGINEERING PERSONNEL	6	7	1		2.030	1.897	0.387	
TOTAL	120	8	92	220	38.598	2.070	27.800	68.468
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	0		0.394	0.000	0.233	
OPERATING PERSONNEL	1	0	0		0.529	0.000	0.027	
HEALTH PHYSICS PERSONNEL	4	0	2		1.583	0.000	1.449	
SUPERVISORY PERSONNEL	0	0	0		0.089	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.488	0.000	0.026	
TOTAL	6	0	2	8	3.083	0.000	1.735	4.818
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.150	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.009	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.004	0.000	0.000	
TOTAL	0	0	0	0	0.163	0.000	0.000	0.163
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	93	1	90	184	33.229	0.334	32.308	65.871
OPERATING PERSONNEL	56	0	5	61	15.110	0.000	0.871	15.981
HEALTH PHYSICS PERSONNEL	64	0	11	75	20.071	0.009	5.096	25.176
SUPERVISORY PERSONNEL	1	0	2	3	0.636	0.011	0.548	1.195
ENGINEERING PERSONNEL	12	7	1	20	4.991	2.080	0.546	7.617
GRAND TOTALS	226	8	109	343	74.037	2.434	39.369	115.840

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM
BY WORK AND JOB FUNCTION
1987

PLANT: *HUMBOLDT BAY TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	0	0	0		0.000	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	2	0	0		0.400	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	0		0.100	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	3	0	0	3	0.500	0.000	0.000	0.500
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	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		0.000	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
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	2	0	0	0	0	0	2	0	0.400	0.000	0.000	0.400
OPERATING PERSONNEL	0	0	0	0	0	0	0	0	0.000	0.000	0.000	0.000
HEALTH PHYSICS PERSONNEL	1	0	0	0	0	0	1	0	0.100	0.000	0.000	0.100
SUPERVISORY PERSONNEL	0	0	0	0	0	0	0	0	0.000	0.000	0.000	0.000
ENGINEERING PERSONNEL	0	0	0	0	0	0	0	0	0.000	0.000	0.000	0.000
GRAND TOTALS	3	0	0	0	0	0	3	0	0.500	0.000	0.000	0.500

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *INDIAN POINT 2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	87	174	223		14.122	18.575	25.423	
OPERATING PERSONNEL	66	3	2		53.598	1.020	0.040	
HEALTH PHYSICS PERSONNEL	21	0	55		7.745	0.005	7.248	
SUPERVISORY PERSONNEL	28	5	2		7.699	0.410	0.235	
ENGINEERING PERSONNEL	21	7	4		5.266	0.887	0.400	
TOTAL	223	189	286	698	88.430	20.897	33.346	142.673
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	68	200	144		18.579	69.409	13.375	
OPERATING PERSONNEL	3	5	1		0.120	1.092	0.165	
HEALTH PHYSICS PERSONNEL	7	0	8		0.095	0.750	0.309	
SUPERVISORY PERSONNEL	8	4	6		0.424	0.537	0.459	
ENGINEERING PERSONNEL	17	4	1		1.020	1.249	0.045	
TOTAL	103	213	160	476	20.238	73.037	14.353	107.628
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	20	61	118		2.963	7.147	18.926	
OPERATING PERSONNEL	7	2	2		0.910	0.100	0.230	
HEALTH PHYSICS PERSONNEL	2	0	7		0.010	0.230	0.710	
SUPERVISORY PERSONNEL	4	3	6		0.310	0.831	0.911	
ENGINEERING PERSONNEL	14	5	2		3.741	0.943	1.117	
TOTAL	47	71	135	253	7.934	9.251	21.894	39.079
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	85	289	628		47.806	128.496	431.501	
OPERATING PERSONNEL	24	5	3		1.973	1.114	0.410	
HEALTH PHYSICS PERSONNEL	8	0	54		0.650	0.090	8.548	
SUPERVISORY PERSONNEL	18	6	10		4.396	0.484	5.568	
ENGINEERING PERSONNEL	20	9	8		2.878	2.656	5.476	
TOTAL	155	309	703	1167	57.703	132.840	451.503	642.046
WASTE PROCESSING								
MAINTENANCE PERSONNEL	49	33	236		7.147	1.731	120.486	
OPERATING PERSONNEL	18	0	0		0.945	0.000	0.000	
HEALTH PHYSICS PERSONNEL	19	0	99		6.637	0.000	72.619	
SUPERVISORY PERSONNEL	20	1	3		3.750	0.040	0.920	
ENGINEERING PERSONNEL	9	6	3		2.785	1.385	0.775	
TOTAL	115	40	341	496	21.264	3.156	194.800	219.220
REFUELING								
MAINTENANCE PERSONNEL	26	65	323		5.190	5.003	172.209	
OPERATING PERSONNEL	29	1	2		2.966	0.310	0.305	
HEALTH PHYSICS PERSONNEL	18	0	71		3.684	0.000	9.221	
SUPERVISORY PERSONNEL	10	6	4		1.342	1.664	0.512	
ENGINEERING PERSONNEL	13	4	8		3.338	1.564	1.886	
TOTAL	96	76	408	580	16.520	8.541	184.133	209.194
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	335 (106)	822 (297)	1672 (790)	2829 (1193)	95.807	230.361	781.920	1108.088
OPERATING PERSONNEL	147 (70)	16 (6)	10 (3)	173 (79)	60.512	3.636	1.150	65.298
HEALTH PHYSICS PERSONNEL	75 (23)	0 0	294 (105)	369 (128)	18.821	1.075	98.655	118.551
SUPERVISORY PERSONNEL	88 (36)	25 (8)	31 (13)	144 (57)	17.921	3.966	8.605	30.492
ENGINEERING PERSONNEL	94 (30)	35 (16)	26 (11)	155 (57)	19.028	8.684	9.699	37.411
GRAND TOTALS	739 (265)	898 (327)	2033 (922)	3670 (1514)	212.089	247.722	900.029	1359.840

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *INDIAN POINT 3 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	5	0	2		1.610	0.000	0.170	
OPERATING PERSONNEL	47	0	0		15.500	0.000	0.000	
HEALTH PHYSICS PERSONNEL	21	0	59		16.900	0.000	31.710	
SUPERVISORY PERSONNEL	14	0	0		4.850	0.000	0.000	
ENGINEERING PERSONNEL	2	0	1		0.660	0.000	0.110	
TOTAL	89	0	62	151	39.520	0.000	31.990	71.510
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	16	0	84		5.610	0.000	36.080	
OPERATING PERSONNEL	26	0	4		4.610	0.000	0.580	
HEALTH PHYSICS PERSONNEL	3	0	1		0.320	0.000	0.140	
SUPERVISORY PERSONNEL	4	0	2		0.760	0.000	0.350	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	49	0	91	140	11.300	0.000	37.150	48.450
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	2	0	43		0.210	0.000	8.650	
OPERATING PERSONNEL	11	8	19		2.050	2.650	3.300	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	1	0	3		0.150	0.000	0.390	
ENGINEERING PERSONNEL	2	0	7		0.300	0.000	0.940	
TOTAL	16	8	72	96	2.710	2.650	13.280	18.640
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	53	1	424		34.720	0.170	180.020	
OPERATING PERSONNEL	12	3	29		1.400	0.920	8.850	
HEALTH PHYSICS PERSONNEL	13	0	3		3.060	0.000	0.810	
SUPERVISORY PERSONNEL	14	0	7		3.460	0.000	1.860	
ENGINEERING PERSONNEL	3	0	2		1.620	0.000	0.460	
TOTAL	95	4	465	564	44.260	1.090	192.000	237.350
WASTE PROCESSING								
MAINTENANCE PERSONNEL	11	0	26		3.490	0.000	5.060	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	0		0.300	0.000	0.000	
SUPERVISORY PERSONNEL	1	0	1		0.420	0.000	0.200	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	15	0	27	42	4.210	0.000	5.260	9.470
REFUELING								
MAINTENANCE PERSONNEL	17	0	68		3.910	0.000	28.520	
OPERATING PERSONNEL	5	4	7		0.530	1.300	1.520	
HEALTH PHYSICS PERSONNEL	2	0	0		0.420	0.000	0.000	
SUPERVISORY PERSONNEL	3	0	2		2.210	0.000	0.540	
ENGINEERING PERSONNEL	1	0	0		0.200	0.000	0.000	
TOTAL	28	4	77	109	7.270	1.300	30.580	39.150
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	104	1	647	752	49.550	0.170	258.500	308.220
OPERATING PERSONNEL	101	15	59	175	24.090	4.870	14.250	43.210
HEALTH PHYSICS PERSONNEL	42	0	63	105	21.000	0.000	32.660	53.660
SUPERVISORY PERSONNEL	37	0	15	52	11.850	0.000	3.340	15.190
ENGINEERING PERSONNEL	8	0	10	18	2.780	0.000	1.510	4.290
GRAND TOTALS	292	16	794	1102	109.270	5.040	310.260	424.570

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *KEWAUNEE TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	4	2	5		0.175	0.000	0.564	
OPERATING PERSONNEL	16	2	1		3.542	0.000	0.002	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	5	1	0		0.644	0.168	0.000	
ENGINEERING PERSONNEL	6	10	2		0.364	1.404	0.149	
TOTAL	31	15	8	54	4.725	1.572	0.715	7.012
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	45	14	123		8.339	2.726	61.746	
OPERATING PERSONNEL	12	1	11		1.607	0.120	6.488	
HEALTH PHYSICS PERSONNEL	17	0	25		8.305	0.000	12.357	
SUPERVISORY PERSONNEL	1	0	2		0.007	0.000	0.738	
ENGINEERING PERSONNEL	6	1	12		0.445	0.000	6.869	
TOTAL	81	16	173	270	18.703	2.846	88.198	109.747
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	5	0	29		0.100	0.000	2.491	
OPERATING PERSONNEL	1	0	6		0.008	0.000	1.091	
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	1	0		0.000	0.005	0.000	
TOTAL	6	1	35	42	0.108	0.005	3.582	3.695
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	43	11	168		7.144	0.462	54.808	
OPERATING PERSONNEL	5	1	8		1.467	0.274	1.796	
HEALTH PHYSICS PERSONNEL	2	0	0		3.435	0.000	0.000	
SUPERVISORY PERSONNEL	7	0	2		0.384	0.000	0.286	
ENGINEERING PERSONNEL	2	5	15		0.789	0.405	3.425	
TOTAL	59	17	193	269	13.219	1.141	60.315	74.675
WASTE PROCESSING								
MAINTENANCE PERSONNEL	4	7	4		0.351	0.024	0.693	
OPERATING PERSONNEL	19	0	0		2.691	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	0		1.437	0.000	0.000	
SUPERVISORY PERSONNEL	8	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	34	7	4	45	4.479	0.024	0.693	5.196
REFUELING								
MAINTENANCE PERSONNEL	0	6	14		1.036	1.493	6.770	
OPERATING PERSONNEL	10	0	1		0.125	0.000	0.022	
HEALTH PHYSICS PERSONNEL	5	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.023	0.000	0.000	
ENGINEERING PERSONNEL	1	1	2		0.005	0.000	0.161	
TOTAL	16	7	17	40	1.189	1.493	6.953	9.635
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	101	40	343	484	17.145	4.705	127.072	148.922
OPERATING PERSONNEL	63	4	27	94	9.440	0.394	9.399	19.233
HEALTH PHYSICS PERSONNEL	27	0	25	52	13.177	0.000	12.357	25.534
SUPERVISORY PERSONNEL	21	1	4	26	1.058	0.168	1.024	2.250
ENGINEERING PERSONNEL	15	18	31	64	1.603	1.814	10.604	14.021
GRAND TOTALS	227	63	430	720	42.423	7.081	160.456	209.960

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *LACROSSE TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	14	0	0		4.065	0.000	0.000	
OPERATING PERSONNEL	21	0	2		20.309	0.000	1.703	
HEALTH PHYSICS PERSONNEL	9	0	0		8.579	0.000	0.000	
SUPERVISORY PERSONNEL	7	0	0		4.419	0.000	0.030	
ENGINEERING PERSONNEL	4	0	0		1.700	0.000	0.326	
TOTAL	55	0	2	57	39.072	0.000	2.059	41.131
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	10	0	0		2.984	0.000	0.000	
OPERATING PERSONNEL	4	0	0		1.196	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	0		0.155	0.000	0.000	
SUPERVISORY PERSONNEL	1	0	0		0.232	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.173	0.000	0.020	
TOTAL	17	0	0	17	4.740	0.000	0.020	4.760
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.067	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		0.002	0.000	0.000	
TOTAL	0	0	0	0	0.069	0.000	0.000	0.069
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	3	0	0		1.686	0.000	0.000	
OPERATING PERSONNEL	2	0	0		0.420	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	0		0.265	0.000	0.000	
SUPERVISORY PERSONNEL	3	0	0		0.673	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.240	0.000	0.122	
TOTAL	9	0	0	9	3.284	0.000	0.122	3.406
WASTE PROCESSING								
MAINTENANCE PERSONNEL	11	0	0		2.707	0.000	0.000	
OPERATING PERSONNEL	2	0	0		0.702	0.000	0.000	
HEALTH PHYSICS PERSONNEL	5	0	0		3.933	0.000	0.000	
SUPERVISORY PERSONNEL	4	0	0		1.583	0.000	0.000	
ENGINEERING PERSONNEL	2	0	0		0.511	0.000	0.005	
TOTAL	24	0	0	24	9.436	0.000	0.005	9.441
REFUELING								
MAINTENANCE PERSONNEL	9	0	0		5.787	0.000	0.000	
OPERATING PERSONNEL	2	0	0		1.260	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	0		0.457	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.047	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.285	0.000	0.000	
TOTAL	12	0	0	12	7.836	0.000	0.000	7.836
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	47 (19)	0	0	0 0	47 (19)	17.229	0.000	0.000	17.229
OPERATING PERSONNEL	31 (20)	0	0	2 (2)	33 (22)	23.954	0.000	1.703	25.657
HEALTH PHYSICS PERSONNEL	17 (9)	0	0	0 0	17 (9)	13.389	0.000	0.000	13.389
SUPERVISORY PERSONNEL	15 (12)	0	0	0 0	15 (12)	6.954	0.000	0.030	6.984
ENGINEERING PERSONNEL	7 (7)	0	0	0 0	7 (7)	2.911	0.000	0.473	3.384
GRAND TOTALS	117 (67)	0	0	2 (2)	119 (69)	64.437	0.000	2.206	66.643

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

APPENDIX D (Continued)

NUMBER OF PERSONNEL AND PERSON-REM
BY WORK AND JOB FUNCTION
1987

PLANT: *LASALLE 1,2 TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	29	10	55		20.020	4.080	51.190	
OPERATING PERSONNEL	40	0	12		48.850	0.000	1.570	
HEALTH PHYSICS PERSONNEL	20	0	21		30.230	0.000	18.990	
SUPERVISORY PERSONNEL	25	0	0		11.250	0.000	0.000	
ENGINEERING PERSONNEL	19	6	24		9.690	4.160	13.670	
TOTAL	133	16	112	261	120.040	8.240	85.420	213.700
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	110	9	358		129.980	1.610	424.440	
OPERATING PERSONNEL	14	0	1		14.730	0.000	0.190	
HEALTH PHYSICS PERSONNEL	11	0	10		14.710	0.000	9.130	
SUPERVISORY PERSONNEL	45	0	0		28.770	0.000	0.000	
ENGINEERING PERSONNEL	15	3	21		6.150	1.550	10.580	
TOTAL	195	12	390	597	194.340	3.160	444.340	641.840
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	2	1	11		0.350	0.010	13.780	
OPERATING PERSONNEL	1	0	0		0.070	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	0		0.050	0.000	0.000	
SUPERVISORY PERSONNEL	2	0	0		0.310	0.000	0.000	
ENGINEERING PERSONNEL	2	3	12		0.550	1.200	9.860	
TOTAL	8	4	23	35	1.330	1.210	23.640	26.180
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	3	2	291		4.080	0.820	369.840	
OPERATING PERSONNEL	2	0	0		1.490	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	1		0.710	0.000	0.060	
SUPERVISORY PERSONNEL	2	0	0		0.860	0.000	0.000	
ENGINEERING PERSONNEL	6	2	49		1.420	1.120	29.670	
TOTAL	14	4	341	359	8.560	1.940	399.570	410.070
WASTE PROCESSING								
MAINTENANCE PERSONNEL	2	6	19		0.560	2.430	17.160	
OPERATING PERSONNEL	26	0	2		30.750	0.000	1.740	
HEALTH PHYSICS PERSONNEL	5	0	0		7.620	0.000	0.000	
SUPERVISORY PERSONNEL	4	0	0		2.030	0.000	0.000	
ENGINEERING PERSONNEL	1	1	1		0.090	0.070	1.160	
TOTAL	38	7	22	67	41.050	2.500	20.060	63.610
REFUELING								
MAINTENANCE PERSONNEL	5	5	2		8.720	2.310	2.320	
OPERATING PERSONNEL	4	0	0		4.570	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	0		1.090	0.000	0.000	
SUPERVISORY PERSONNEL	2	0	0		1.700	0.000	0.000	
ENGINEERING PERSONNEL	2	0	1		0.450	0.000	0.210	
TOTAL	14	5	3	22	16.530	2.310	2.530	21.370
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	151	33	736	920	163.710	11.260	878.730	1053.700
OPERATING PERSONNEL	87	0	15	102	100.460	0.000	3.500	103.960
HEALTH PHYSICS PERSONNEL	39	0	32	71	54.410	0.000	28.180	82.590
SUPERVISORY PERSONNEL	80	0	0	80	44.920	0.000	0.000	44.920
ENGINEERING PERSONNEL	45	15	108	168	18.350	8.100	65.150	91.600
GRAND TOTALS	402	48	891	1341	381.850	19.360	975.560	1376.770

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *LIMERICK TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	0	4	11		0.000	0.849	0.937	
OPERATING PERSONNEL	14	0	9		1.241	0.000	0.912	
HEALTH PHYSICS PERSONNEL	10	0	1		3.369	0.000	0.009	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.000	0.010	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	24	4	22	50	4.610	0.849	1.868	7.327
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	8	361	787		0.615	24.069	63.543	
OPERATING PERSONNEL	89	58	373		7.053	3.590	26.690	
HEALTH PHYSICS PERSONNEL	50	9	74		8.380	0.644	8.890	
SUPERVISORY PERSONNEL	6	2	27		0.256	0.026	0.719	
ENGINEERING PERSONNEL	48	60	145		3.012	5.262	8.029	
TOTAL	201	490	1406	2097	19.316	33.591	107.871	160.778
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	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	3	14		0.000	0.481	0.770	
OPERATING PERSONNEL	7	0	18		0.911	0.000	3.076	
HEALTH PHYSICS PERSONNEL	1	0	1		0.388	0.000	0.016	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	1	1		0.000	0.024	0.056	
TOTAL	8	4	34	46	1.299	0.505	3.918	5.722
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	8 (8)	368 (368)	812 (802)	1188 (1178)	0.615	25.399	65.250	91.264
OPERATING PERSONNEL	110 (103)	58 (58)	400 (385)	568 (546)	9.205	3.590	30.678	43.473
HEALTH PHYSICS PERSONNEL	61 (57)	9 (9)	76 (75)	146 (141)	12.137	0.644	8.915	21.696
SUPERVISORY PERSONNEL	6 (6)	2 (2)	28 (28)	36 (36)	0.256	0.026	0.729	1.011
ENGINEERING PERSONNEL	48 (48)	61 (61)	146 (146)	255 (255)	3.012	5.286	8.085	16.383
GRAND TOTALS	233 (222)	498 (498)	1462 (1436)	2193 (2156)	25.225	34.945	113.657	173.827

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *MAINE YANKEE TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	2	0	0		0.870	0.000	0.225	
OPERATING PERSONNEL	35	0	0		31.733	0.000	0.000	
HEALTH PHYSICS PERSONNEL	9	0	0		2.633	0.000	0.220	
SUPERVISORY PERSONNEL	5	0	2		1.775	0.000	0.970	
ENGINEERING PERSONNEL	4	0	0		1.020	0.000	0.090	
TOTAL	55	0	2	57	38.031	0.000	1.505	39.536
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	34	0	37		14.490	0.000	13.163	
OPERATING PERSONNEL	7	0	0		2.142	0.000	0.000	
HEALTH PHYSICS PERSONNEL	10	0	3		3.390	0.000	0.811	
SUPERVISORY PERSONNEL	10	0	4		3.220	0.000	1.905	
ENGINEERING PERSONNEL	5	0	1		2.081	0.000	0.400	
TOTAL	66	0	45	111	25.323	0.000	16.279	41.602
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	3	0	62		2.230	0.000	50.272	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	5		0.000	0.000	1.765	
SUPERVISORY PERSONNEL	2	0	4		0.620	0.000	1.375	
ENGINEERING PERSONNEL	6	0	32		2.090	0.000	22.170	
TOTAL	11	0	103	114	4.940	0.000	75.582	80.522
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	2	0	150		0.905	0.000	125.647	
OPERATING PERSONNEL	0	0	1		0.165	0.000	1.215	
HEALTH PHYSICS PERSONNEL	5	0	9		1.715	0.000	3.362	
SUPERVISORY PERSONNEL	9	0	18		2.992	0.000	8.260	
ENGINEERING PERSONNEL	3	0	48		2.460	0.000	36.358	
TOTAL	19	0	226	245	8.237	0.000	174.842	183.079
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	5		0.145	0.000	2.275	
OPERATING PERSONNEL	2	0	0		0.960	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	11		1.595	0.000	5.685	
SUPERVISORY PERSONNEL	8	0	0		4.145	0.000	0.045	
ENGINEERING PERSONNEL	0	0	0		0.030	0.000	0.095	
TOTAL	13	0	16	29	6.875	0.000	8.100	14.975
REFUELING								
MAINTENANCE PERSONNEL	37	0	227		43.115	0.000	180.189	
OPERATING PERSONNEL	42	0	0		30.194	0.000	0.020	
HEALTH PHYSICS PERSONNEL	17	0	49		11.722	0.000	40.977	
SUPERVISORY PERSONNEL	24	0	40		10.440	0.000	25.301	
ENGINEERING PERSONNEL	21	0	19		13.267	0.005	12.226	
TOTAL	141	0	335	476	108.738	0.005	258.713	367.456
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	78	0	481	559	61.755	0.000	371.771	433.526
OPERATING PERSONNEL	86	0	1	87	65.194	0.000	1.235	66.429
HEALTH PHYSICS PERSONNEL	44	0	77	121	21.055	0.000	52.820	73.875
SUPERVISORY PERSONNEL	58	0	68	126	23.192	0.000	37.856	61.048
ENGINEERING PERSONNEL	39	0	100	139	20.948	0.005	71.339	92.292
GRAND TOTALS	305	0	727	1032	192.144	0.005	535.021	727.170

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *MCGUIRE 1,2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	141	535	333		1.860	3.815	1.410	
OPERATING PERSONNEL	101	10	51		17.905	1.225	0.905	
HEALTH PHYSICS PERSONNEL	64	0	151		7.105	0.000	6.285	
SUPERVISORY PERSONNEL	9	0	0		0.920	0.000	0.000	
ENGINEERING PERSONNEL	96	28	93		4.040	0.010	0.005	
TOTAL	411	573	628	1612	31.830	5.050	8.605	45.485
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	148	543	364		37.545	174.620	170.676	
OPERATING PERSONNEL	94	5	70		16.875	3.095	61.540	
HEALTH PHYSICS PERSONNEL	64	0	126		25.710	0.000	71.470	
SUPERVISORY PERSONNEL	9	0	0		1.950	0.000	0.000	
ENGINEERING PERSONNEL	97	21	87		29.050	2.905	33.840	
TOTAL	412	569	647	1628	111.130	180.620	337.526	629.276
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	11	170	71		0.625	65.704	9.995	
OPERATING PERSONNEL	3	0	16		0.010	0.000	0.180	
HEALTH PHYSICS PERSONNEL	19	0	90		2.155	0.000	12.560	
SUPERVISORY PERSONNEL	1	0	0		0.005	0.000	0.000	
ENGINEERING PERSONNEL	47	16	106		7.810	3.610	68.690	
TOTAL	81	186	283	550	10.605	69.314	91.425	171.344
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	134	513	315		14.560	173.898	103.563	
OPERATING PERSONNEL	35	3	42		1.440	0.110	2.955	
HEALTH PHYSICS PERSONNEL	55	0	134		10.885	0.000	35.337	
SUPERVISORY PERSONNEL	8	0	0		0.840	0.000	0.000	
ENGINEERING PERSONNEL	79	17	89		21.570	1.840	27.010	
TOTAL	311	533	580	1424	49.295	175.848	168.865	394.008
WASTE PROCESSING								
MAINTENANCE PERSONNEL	19	74	32		0.030	0.925	0.130	
OPERATING PERSONNEL	29	4	36		0.515	0.230	6.195	
HEALTH PHYSICS PERSONNEL	37	0	29		6.825	0.000	3.020	
SUPERVISORY PERSONNEL	3	0	0		0.270	0.000	0.000	
ENGINEERING PERSONNEL	9	1	1		0.000	0.000	0.000	
TOTAL	97	79	98	274	7.640	1.155	9.345	18.140
REFUELING								
MAINTENANCE PERSONNEL	26	58	33		0.355	0.825	0.275	
OPERATING PERSONNEL	23	0	10		2.490	0.010	0.675	
HEALTH PHYSICS PERSONNEL	31	0	45		0.155	0.000	0.295	
SUPERVISORY PERSONNEL	2	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	26	1	12		0.055	0.000	0.320	
TOTAL	108	59	100	267	3.055	0.835	1.565	5.455
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	479 (149)	1893 (571)	1148 (386)	3520 (1106)	54.975	419.787	286.049	760.811
OPERATING PERSONNEL	285 (100)	22 (10)	225 (79)	532 (189)	39.235	4.670	72.450	116.355
HEALTH PHYSICS PERSONNEL	270 (64)	0 0	575 (148)	845 (212)	52.835	0.000	128.967	181.802
SUPERVISORY PERSONNEL	32 (9)	0 0	0 0	32 (9)	3.985	0.000	0.000	3.985
ENGINEERING PERSONNEL	354 (98)	84 (26)	388 (146)	826 (270)	62.525	8.365	129.865	200.755
GRAND TOTALS	1420 (420)	1999 (607)	2336 (759)	5755 (1786)	213.555	432.822	617.331	1263.708

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *MILLSTONE POINT TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	16	1	8		4.760	0.860	3.640	
OPERATING PERSONNEL	43	1	2		26.490	1.750	0.520	
HEALTH PHYSICS PERSONNEL	21	0	30		6.160	0.100	9.420	
SUPERVISORY PERSONNEL	0	0	0		0.090	0.000	0.070	
ENGINEERING PERSONNEL	3	4	4		0.760	1.280	2.480	
TOTAL	83	6	44	133	38.260	3.990	16.130	58.380
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	13	0	11		3.570	0.150	3.910	
OPERATING PERSONNEL	3	0	0		0.820	0.040	0.050	
HEALTH PHYSICS PERSONNEL	2	0	2		0.940	0.000	1.370	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	1		0.080	0.180	0.260	
TOTAL	18	0	14	32	5.410	0.370	5.590	11.370
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	152		0.000	0.000	64.700	
OPERATING PERSONNEL	0	0	2		0.150	0.000	0.560	
HEALTH PHYSICS PERSONNEL	0	0	15		0.260	0.020	5.970	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.040	
ENGINEERING PERSONNEL	2	5	36		0.630	2.430	26.460	
TOTAL	2	5	205	212	1.040	2.450	97.730	101.220
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	82	16	600		66.990	5.350	327.280	
OPERATING PERSONNEL	10	1	16		4.280	0.300	11.070	
HEALTH PHYSICS PERSONNEL	17	0	119		6.390	0.230	46.110	
SUPERVISORY PERSONNEL	0	0	1		0.140	0.000	0.700	
ENGINEERING PERSONNEL	8	21	45		2.860	7.280	21.870	
TOTAL	117	38	781	936	80.660	13.160	407.030	500.850
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	14		0.100	0.000	4.710	
OPERATING PERSONNEL	15	0	1		4.300	0.070	1.410	
HEALTH PHYSICS PERSONNEL	11	0	17		6.740	0.000	10.530	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	3		0.010	0.190	0.790	
TOTAL	26	0	35	61	11.150	0.260	17.440	28.850
REFUELING								
MAINTENANCE PERSONNEL	11	1	2		3.060	0.250	0.780	
OPERATING PERSONNEL	24	0	0		5.970	0.010	0.000	
HEALTH PHYSICS PERSONNEL	0	0	4		0.350	0.020	2.270	
SUPERVISORY PERSONNEL	0	0	0		0.030	0.000	0.000	
ENGINEERING PERSONNEL	4	2	2		1.060	0.780	0.670	
TOTAL	39	3	8	50	10.470	1.060	3.720	15.250
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	122	18	787	927	78.480	6.610	405.020	490.110
OPERATING PERSONNEL	95	2	21	118	42.010	2.170	13.610	57.790
HEALTH PHYSICS PERSONNEL	51	0	187	238	20.840	0.370	75.670	96.880
SUPERVISORY PERSONNEL	0	0	1	1	0.260	0.000	0.810	1.070
ENGINEERING PERSONNEL	17	32	91	140	5.400	12.140	52.530	70.070
GRAND TOTALS	285	52	1087	1424	146.990	21.290	547.640	715.920

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *MILLSTONE POINT 2,3 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	0	0	0		0.070	0.070	0.060	
OPERATING PERSONNEL	36	0	1		11.360	0.000	0.400	
HEALTH PHYSICS PERSONNEL	9	1	9		3.080	0.320	4.320	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.170	
ENGINEERING PERSONNEL	0	1	0		0.010	0.210	0.070	
TOTAL	45	2	10	57	14.520	0.600	5.020	20.140
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	44	0	199		24.910	0.540	81.490	
OPERATING PERSONNEL	38	0	10		12.370	0.070	6.170	
HEALTH PHYSICS PERSONNEL	24	2	57		6.480	0.820	17.760	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	6	6	25		3.040	2.660	12.550	
TOTAL	112	8	291	411	46.800	4.090	117.970	168.860
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	15	2	113		3.450	0.290	38.380	
OPERATING PERSONNEL	3	0	2		1.230	0.000	2.560	
HEALTH PHYSICS PERSONNEL	9	0	14		3.390	0.010	5.980	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.000	0.110	
ENGINEERING PERSONNEL	2	8	45		0.860	2.870	24.100	
TOTAL	29	10	175	214	8.930	3.170	71.130	83.230
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	42	8	265		16.590	3.450	126.670	
OPERATING PERSONNEL	4	0	1		1.570	0.000	0.830	
HEALTH PHYSICS PERSONNEL	15	1	56		7.070	0.230	14.260	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.080	
ENGINEERING PERSONNEL	1	13	44		0.280	3.270	18.820	
TOTAL	62	22	366	450	25.510	6.950	160.660	193.120
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	5		0.170	0.010	2.230	
OPERATING PERSONNEL	8	0	1		2.910	0.000	0.220	
HEALTH PHYSICS PERSONNEL	24	0	28		10.690	0.020	7.720	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	4		0.060	0.140	0.740	
TOTAL	32	0	38	70	13.830	0.170	10.910	24.910
REFUELING								
MAINTENANCE PERSONNEL	17	1	25		9.540	0.770	8.560	
OPERATING PERSONNEL	1	0	0		0.990	0.000	0.130	
HEALTH PHYSICS PERSONNEL	8	0	33		2.870	0.030	9.200	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	4	4		0.270	0.740	1.250	
TOTAL	26	5	62	93	13.670	1.540	19.140	34.350
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	118	11	607	736	54.730	5.130	257.390	317.250
OPERATING PERSONNEL	90	0	15	105	30.430	0.070	10.310	40.810
HEALTH PHYSICS PERSONNEL	89	4	197	290	33.580	1.430	59.240	94.250
SUPERVISORY PERSONNEL	0	0	1	1	0.000	0.000	0.360	0.360
ENGINEERING PERSONNEL	9	32	122	163	4.520	9.890	57.530	71.940
GRAND TOTALS	306	47	942	1295	123.260	16.520	384.830	524.610

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *MONTICELLO TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	41	102	1		14.835	30.890	1.920	
OPERATING PERSONNEL	49	0	12		20.570	0.010	1.975	
HEALTH PHYSICS PERSONNEL	20	0	12		8.284	0.000	2.740	
SUPERVISORY PERSONNEL	18	9	10		5.431	2.355	4.386	
ENGINEERING PERSONNEL	8	0	0		2.927	0.036	0.015	
TOTAL	136	111	35	282	52.047	33.291	11.036	96.374
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	34	193	38		18.572	66.942	16.254	
OPERATING PERSONNEL	3	0	0		1.943	0.000	0.000	
HEALTH PHYSICS PERSONNEL	10	0	4		2.249	0.000	1.036	
SUPERVISORY PERSONNEL	7	2	14		2.199	0.797	3.958	
ENGINEERING PERSONNEL	1	0	0		0.415	0.012	0.027	
TOTAL	55	195	56	306	25.378	67.751	21.275	114.404
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	2	18		0.028	1.660	9.192	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	1		0.009	0.000	0.635	
SUPERVISORY PERSONNEL	0	0	11		0.224	0.098	6.904	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	2	30	32	0.261	1.758	16.731	18.750
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	31	261	53		20.165	166.992	23.470	
OPERATING PERSONNEL	31	0	0		13.172	0.000	0.000	
HEALTH PHYSICS PERSONNEL	9	0	16		3.617	0.000	13.046	
SUPERVISORY PERSONNEL	23	15	46		14.578	6.014	20.470	
ENGINEERING PERSONNEL	10	2	1		5.455	0.394	0.518	
TOTAL	104	278	116	498	56.987	173.400	57.504	287.891
WASTE PROCESSING								
MAINTENANCE PERSONNEL	22	0	0		4.762	0.700	0.022	
OPERATING PERSONNEL	1	0	0		0.795	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	1		0.738	0.000	0.283	
SUPERVISORY PERSONNEL	0	0	1		0.032	0.000	1.002	
ENGINEERING PERSONNEL	0	0	0		0.003	0.000	0.000	
TOTAL	26	0	2	28	6.330	0.700	1.307	8.337
REFUELING								
MAINTENANCE PERSONNEL	5	8	0		1.491	3.467	0.027	
OPERATING PERSONNEL	18	0	0		5.205	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	2		0.424	0.000	0.555	
SUPERVISORY PERSONNEL	1	0	0		0.490	0.050	0.044	
ENGINEERING PERSONNEL	0	0	0		0.028	0.004	0.000	
TOTAL	25	8	2	35	7.638	3.521	0.626	11.785
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	133	566	110	809	59.853	270.651	50.885	381.389
OPERATING PERSONNEL	102	0	12	114	41.685	0.010	1.975	43.670
HEALTH PHYSICS PERSONNEL	43	0	36	79	15.321	0.000	18.295	33.616
SUPERVISORY PERSONNEL	49	26	82	157	22.954	9.314	36.764	69.032
ENGINEERING PERSONNEL	19	2	1	22	8.828	0.446	0.560	9.834
GRAND TOTALS	346	594	241	1181	148.641	280.421	108.479	537.541

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *NINE MILE POINT 1 TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	310	0	4		2.353	0.000	0.035	
OPERATING PERSONNEL	1105	0	5		11.610	0.000	0.028	
HEALTH PHYSICS PERSONNEL	1204	1	115		7.188	0.020	0.988	
SUPERVISORY PERSONNEL	109	0	1		1.808	0.000	0.010	
ENGINEERING PERSONNEL	327	8	24		3.236	0.028	0.548	
TOTAL	3055	9	149	3213	26.195	0.048	1.609	27.852
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	1889	0	131		20.823	0.000	1.971	
OPERATING PERSONNEL	158	0	2		1.565	0.000	0.010	
HEALTH PHYSICS PERSONNEL	463	0	12		4.636	0.000	0.120	
SUPERVISORY PERSONNEL	77	0	7		0.891	0.000	0.110	
ENGINEERING PERSONNEL	575	6	98		3.951	0.015	0.964	
TOTAL	3162	6	250	3418	31.866	0.015	3.175	35.056
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	74	0	6		2.974	0.000	0.048	
OPERATING PERSONNEL	36	0	0		1.288	0.000	0.000	
HEALTH PHYSICS PERSONNEL	29	0	10		0.277	0.000	0.229	
SUPERVISORY PERSONNEL	25	0	2		0.472	0.000	0.021	
ENGINEERING PERSONNEL	31	29	26		0.412	0.246	0.360	
TOTAL	195	29	44	268	5.423	0.246	0.658	6.327
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	145	0	939		1.477	0.000	18.729	
OPERATING PERSONNEL	24	0	0		0.243	0.000	0.000	
HEALTH PHYSICS PERSONNEL	336	0	49		4.067	0.000	0.475	
SUPERVISORY PERSONNEL	27	0	69		0.156	0.000	1.075	
ENGINEERING PERSONNEL	104	19	238		1.813	0.154	3.661	
TOTAL	636	19	1295	1950	7.756	0.154	23.940	31.850
WASTE PROCESSING								
MAINTENANCE PERSONNEL	35	0	47		0.170	0.000	1.114	
OPERATING PERSONNEL	1173	0	13		7.393	0.000	0.150	
HEALTH PHYSICS PERSONNEL	479	1	14		2.236	0.005	0.266	
SUPERVISORY PERSONNEL	23	0	3		0.189	0.000	0.040	
ENGINEERING PERSONNEL	38	0	15		0.169	0.000	0.300	
TOTAL	1748	1	92	1841	10.157	0.005	1.870	12.032
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	2453 (192)	0	0	1127 (74) 3580 (266)	27.797	0.000	21.897	49.694
OPERATING PERSONNEL	2496 (61)	0	0	20 (2) 2516 (63)	22.099	0.000	0.188	22.287
HEALTH PHYSICS PERSONNEL	2511 (74)	2 (2)		200 (9) 2713 (85)	18.404	0.025	2.078	20.507
SUPERVISORY PERSONNEL	261 (48)	0	0	82 (6) 343 (54)	3.516	0.000	1.256	4.772
ENGINEERING PERSONNEL	1075 (129)	62 (29)		401 (52) 1538 (210)	9.581	0.443	5.833	15.857
GRAND TOTALS	8796 (504)	64 (31)		1830 (143)10690 (678)	81.397	0.468	31.252	113.117

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *NORTH ANNA 1,2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	119	25	160		6.004	0.823	2.645	
OPERATING PERSONNEL	220	1	1		27.359	0.005	0.003	
HEALTH PHYSICS PERSONNEL	63	5	244		14.041	0.033	13.143	
SUPERVISORY PERSONNEL	66	4	2		2.324	0.041	0.049	
ENGINEERING PERSONNEL	59	8	24		1.241	0.034	0.325	
TOTAL	527	43	431	1001	50.969	0.936	16.165	68.070
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	176	135	1126		198.995	93.673	599.279	
OPERATING PERSONNEL	163	2	8		74.220	0.090	2.506	
HEALTH PHYSICS PERSONNEL	73	2	276		23.825	0.070	183.107	
SUPERVISORY PERSONNEL	58	4	9		11.484	0.153	5.550	
ENGINEERING PERSONNEL	57	23	66		8.902	0.809	15.769	
TOTAL	527	166	1485	2178	317.426	94.795	806.211	1218.432
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	11	8	101		0.170	1.079	25.897	
OPERATING PERSONNEL	14	0	0		1.516	0.000	0.000	
HEALTH PHYSICS PERSONNEL	12	0	68		0.125	0.000	5.912	
SUPERVISORY PERSONNEL	2	0	0		0.397	0.000	0.000	
ENGINEERING PERSONNEL	17	3	10		6.061	0.275	5.342	
TOTAL	56	11	179	246	8.269	1.354	37.151	46.774
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	21	11	654		1.431	0.432	261.787	
OPERATING PERSONNEL	20	2	2		1.843	0.343	0.338	
HEALTH PHYSICS PERSONNEL	20	0	147		0.380	0.000	26.436	
SUPERVISORY PERSONNEL	6	1	4		0.104	0.015	2.075	
ENGINEERING PERSONNEL	16	8	28		0.707	0.765	5.371	
TOTAL	83	22	835	940	4.465	1.555	296.007	302.027
WASTE PROCESSING								
MAINTENANCE PERSONNEL	21	9	20		0.474	0.120	0.422	
OPERATING PERSONNEL	25	0	1		3.780	0.000	2.116	
HEALTH PHYSICS PERSONNEL	29	1	31		9.666	0.002	1.456	
SUPERVISORY PERSONNEL	4	0	0		0.737	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	79	10	52	141	14.657	0.122	3.994	18.773
REFUELING								
MAINTENANCE PERSONNEL	30	2	145		1.566	0.013	43.116	
OPERATING PERSONNEL	55	2	0		4.466	0.255	0.000	
HEALTH PHYSICS PERSONNEL	8	0	78		0.072	0.000	5.971	
SUPERVISORY PERSONNEL	14	1	2		0.786	0.124	0.575	
ENGINEERING PERSONNEL	3	9	13		0.032	0.650	2.655	
TOTAL	110	14	238	362	6.922	1.042	52.317	60.281
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	378	190	2206	2774	208.640	96.140	933.146	1237.926
OPERATING PERSONNEL	497	7	12	516	113.184	0.693	4.963	118.840
HEALTH PHYSICS PERSONNEL	205	8	844	1057	48.109	0.105	236.025	284.239
SUPERVISORY PERSONNEL	150	10	17	177	15.832	0.333	8.249	24.414
ENGINEERING PERSONNEL	152	51	141	344	16.943	2.533	29.462	48.938
GRAND TOTALS	1382	266	3220	4868	402.708	99.804	1211.845	1714.357

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *OCONEE 1,2,3 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	155	582	307		0.775	1.500	0.335	
OPERATING PERSONNEL	95	1	25		35.050	0.775	0.635	
HEALTH PHYSICS PERSONNEL	64	1	120		8.435	0.000	3.495	
SUPERVISORY PERSONNEL	18	2	0		0.735	0.035	0.000	
ENGINEERING PERSONNEL	101	24	44		8.570	0.075	0.305	
TOTAL	433	610	496	1539	53.565	2.385	4.770	60.720
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	174	685	272		89.524	212.408	43.340	
OPERATING PERSONNEL	93	0	59		16.010	0.160	58.595	
HEALTH PHYSICS PERSONNEL	64	1	120		16.045	0.110	47.665	
SUPERVISORY PERSONNEL	18	2	0		2.365	0.000	0.000	
ENGINEERING PERSONNEL	89	23	38		23.625	2.270	2.005	
TOTAL	438	711	489	1638	147.569	214.948	151.605	514.122
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	10	167	79		0.305	19.260	13.980	
OPERATING PERSONNEL	6	0	9		0.085	0.000	0.075	
HEALTH PHYSICS PERSONNEL	24	0	85		1.745	0.000	6.140	
SUPERVISORY PERSONNEL	1	0	0		0.010	0.000	0.000	
ENGINEERING PERSONNEL	47	10	26		10.780	10.925	6.645	
TOTAL	88	177	199	464	12.925	30.185	26.840	69.950
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	137	625	320		33.835	284.831	159.025	
OPERATING PERSONNEL	48	1	40		3.215	0.060	3.280	
HEALTH PHYSICS PERSONNEL	41	0	114		7.860	0.000	38.145	
SUPERVISORY PERSONNEL	13	2	0		2.415	0.695	0.000	
ENGINEERING PERSONNEL	77	21	40		17.710	3.710	18.715	
TOTAL	316	649	514	1479	65.035	289.296	219.165	573.496
WASTE PROCESSING								
MAINTENANCE PERSONNEL	33	83	6		0.315	1.730	0.110	
OPERATING PERSONNEL	39	0	50		6.640	0.000	9.985	
HEALTH PHYSICS PERSONNEL	44	0	22		4.920	0.000	1.510	
SUPERVISORY PERSONNEL	2	1	0		0.060	0.005	0.000	
ENGINEERING PERSONNEL	8	1	0		0.015	0.010	0.000	
TOTAL	126	85	78	289	11.950	1.745	11.605	25.300
REFUELING								
MAINTENANCE PERSONNEL	117	385	159		12.475	46.400	17.275	
OPERATING PERSONNEL	81	1	14		10.336	0.070	0.485	
HEALTH PHYSICS PERSONNEL	37	0	94		0.520	0.000	9.365	
SUPERVISORY PERSONNEL	10	1	0		0.660	0.000	0.000	
ENGINEERING PERSONNEL	57	8	19		5.170	0.405	3.755	
TOTAL	302	395	286	983	29.161	46.875	30.880	106.916
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	626 (174)	2527 (703)	1143 (413)	4296 (1290)	137.229	566.129	234.065	937.423
OPERATING PERSONNEL	362 (111)	3 (1)	197 (65)	562 (177)	71.336	1.065	73.055	145.456
HEALTH PHYSICS PERSONNEL	274 (64)	2 (1)	555 (120)	831 (185)	39.525	0.110	106.320	145.955
SUPERVISORY PERSONNEL	62 (21)	8 (2)	0 0	70 (23)	6.245	0.735	0.000	6.980
ENGINEERING PERSONNEL	379 (106)	87 (29)	167 (58)	633 (193)	65.870	17.395	31.425	114.690
GRAND TOTALS	1703 (476)	2627 (736)	2062 (656)	6392 (1868)	320.205	585.434	444.865	1350.504

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *OYSTER CREEK TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	252	15	330		20.623	0.011	7.992	
OPERATING PERSONNEL	304	0	34		46.701	0.000	0.559	
HEALTH PHYSICS PERSONNEL	80	0	32		26.504	0.000	7.880	
SUPERVISORY PERSONNEL	123	1	49		6.281	0.000	1.010	
ENGINEERING PERSONNEL	169	0	77		6.411	0.000	1.658	
TOTAL	928	16	522	1466	106.520	0.011	19.099	125.630
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	287	19	447		99.659	0.367	43.519	
OPERATING PERSONNEL	262	0	63		19.454	0.000	1.090	
HEALTH PHYSICS PERSONNEL	65	0	26		5.099	0.000	1.085	
SUPERVISORY PERSONNEL	114	1	40		11.245	0.000	0.792	
ENGINEERING PERSONNEL	143	0	96		5.638	0.000	3.729	
TOTAL	871	20	672	1563	141.095	0.367	50.215	191.677
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	54	0	103		3.509	0.000	3.279	
OPERATING PERSONNEL	33	0	2		1.369	0.000	0.050	
HEALTH PHYSICS PERSONNEL	5	0	3		0.261	0.000	0.020	
SUPERVISORY PERSONNEL	13	0	3		0.643	0.000	0.007	
ENGINEERING PERSONNEL	10	0	5		0.244	0.000	0.188	
TOTAL	115	0	116	231	6.026	0.000	3.544	9.570
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	186	20	371		55.370	0.618	137.167	
OPERATING PERSONNEL	92	0	7		13.256	0.000	0.782	
HEALTH PHYSICS PERSONNEL	48	0	17		9.005	0.000	1.994	
SUPERVISORY PERSONNEL	42	1	17		6.857	0.035	1.611	
ENGINEERING PERSONNEL	46	0	29		4.593	0.000	7.703	
TOTAL	414	21	441	876	89.081	0.653	149.257	238.991
WASTE PROCESSING								
MAINTENANCE PERSONNEL	105	0	51		2.594	0.000	11.492	
OPERATING PERSONNEL	36	0	3		1.010	0.000	3.302	
HEALTH PHYSICS PERSONNEL	33	0	10		1.087	0.000	0.301	
SUPERVISORY PERSONNEL	13	0	4		0.457	0.000	0.010	
ENGINEERING PERSONNEL	5	0	3		0.506	0.000	0.532	
TOTAL	192	0	71	263	5.654	0.000	15.637	21.291
REFUELING								
MAINTENANCE PERSONNEL	9	0	0		0.078	0.000	0.000	
OPERATING PERSONNEL	15	0	0		0.154	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	0		0.025	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	2	0	0		0.025	0.000	0.000	
TOTAL	29	0	0	29	0.282	0.000	0.000	0.282
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	893 (316)	54 (22)	1302 (635)	2249 (973)	181.833	0.996	203.449	386.278
OPERATING PERSONNEL	742 (327)	0 0	109 (75)	851 (402)	81.944	0.000	5.783	87.727
HEALTH PHYSICS PERSONNEL	234 (84)	0 0	88 (42)	322 (126)	41.981	0.000	11.280	53.261
SUPERVISORY PERSONNEL	305 (142)	3 (1)	113 (61)	421 (204)	25.483	0.035	3.430	28.948
ENGINEERING PERSONNEL	375 (186)	0 0	210 (116)	585 (302)	17.417	0.000	13.810	31.227
GRAND TOTALS	2549 (1055)	57 (23)	1822 (929)	4428 (2007)	348.658	1.031	237.752	587.441

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *PALISADES TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	17	0	30		6.017	0.054	9.399	
OPERATING PERSONNEL	52	0	10		27.913	0.055	3.998	
HEALTH PHYSICS PERSONNEL	20	0	21		7.247	0.007	6.388	
SUPERVISORY PERSONNEL	31	1	6		8.949	0.480	1.159	
ENGINEERING PERSONNEL	11	2	3		2.874	0.947	2.117	
TOTAL	131	3	70	204	53.000	1.543	23.061	77.604
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	106	65	156		72.133	60.313	73.966	
OPERATING PERSONNEL	5	0	12		2.119	0.097	6.136	
HEALTH PHYSICS PERSONNEL	21	0	58		9.257	0.000	24.836	
SUPERVISORY PERSONNEL	10	6	2		3.410	1.498	0.717	
ENGINEERING PERSONNEL	5	8	79		1.690	3.402	46.374	
TOTAL	147	79	307	533	88.609	65.310	152.029	305.948
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.118	0.124	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	18		0.051	0.000	3.722	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.007	
ENGINEERING PERSONNEL	0	2	28		0.000	1.093	16.568	
TOTAL	0	2	46	48	0.051	1.211	20.421	21.683
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	3	0	0		1.266	0.041	0.106	
OPERATING PERSONNEL	0	0	1		0.472	0.000	0.112	
HEALTH PHYSICS PERSONNEL	2	0	1		0.734	0.000	0.307	
SUPERVISORY PERSONNEL	0	0	1		0.202	0.023	0.214	
ENGINEERING PERSONNEL	0	0	5		0.192	0.000	0.997	
TOTAL	5	0	8	13	2.866	0.064	1.736	4.666
WASTE PROCESSING								
MAINTENANCE PERSONNEL	5	0	0		3.876	0.003	0.000	
OPERATING PERSONNEL	0	0	0		0.232	0.076	0.070	
HEALTH PHYSICS PERSONNEL	4	0	0		2.514	0.000	0.007	
SUPERVISORY PERSONNEL	1	0	0		0.417	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	10	0	0	10	7.039	0.079	0.077	7.195
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	131	65	186	382	83.292	60.529	83.595	227.416
OPERATING PERSONNEL	57	0	23	80	30.736	0.228	10.316	41.280
HEALTH PHYSICS PERSONNEL	47	0	98	145	19.803	0.007	35.260	55.070
SUPERVISORY PERSONNEL	42	7	9	58	12.978	2.001	2.097	17.076
ENGINEERING PERSONNEL	16	12	115	143	4.756	5.442	66.056	76.254
GRAND TOTALS	293	84	431	808	151.565	68.207	197.324	417.096

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *PALO VERDE 1,2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	178	4	203		13.239	0.280	8.964	
OPERATING PERSONNEL	208	3	91		24.958	0.205	7.665	
HEALTH PHYSICS PERSONNEL	68	0	170		17.886	0.000	25.256	
SUPERVISORY PERSONNEL	3	0	7		0.125	0.000	1.147	
ENGINEERING PERSONNEL	22	2	10		2.416	0.045	0.355	
TOTAL	479	9	481	969	58.624	0.530	43.387	102.541
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	197	6	433		22.508	0.337	90.865	
OPERATING PERSONNEL	60	2	46		1.972	0.134	2.246	
HEALTH PHYSICS PERSONNEL	33	0	110		1.558	0.000	6.360	
SUPERVISORY PERSONNEL	1	0	7		0.035	0.000	0.168	
ENGINEERING PERSONNEL	14	0	10		0.809	0.000	1.316	
TOTAL	305	8	606	919	26.882	0.471	100.955	128.308
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	115	4	253		16.993	0.239	72.735	
OPERATING PERSONNEL	24	0	34		1.577	0.000	9.060	
HEALTH PHYSICS PERSONNEL	29	0	89		3.179	0.000	11.385	
SUPERVISORY PERSONNEL	1	0	2		0.271	0.000	0.110	
ENGINEERING PERSONNEL	9	1	4		2.583	0.070	0.628	
TOTAL	178	5	382	565	24.603	0.309	93.918	118.830
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	138	6	333		73.785	2.814	131.345	
OPERATING PERSONNEL	42	2	61		2.690	0.535	4.607	
HEALTH PHYSICS PERSONNEL	28	0	103		3.722	0.000	16.997	
SUPERVISORY PERSONNEL	2	0	5		0.020	0.000	1.372	
ENGINEERING PERSONNEL	9	0	14		1.534	0.000	1.577	
TOTAL	219	8	516	743	81.751	3.349	155.898	240.998
WASTE PROCESSING								
MAINTENANCE PERSONNEL	89	3	104		7.518	0.350	5.274	
OPERATING PERSONNEL	56	0	103		14.996	0.000	19.852	
HEALTH PHYSICS PERSONNEL	26	0	59		1.216	0.000	5.061	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	2	0	1		0.032	0.000	0.005	
TOTAL	173	3	267	443	23.762	0.350	30.192	54.304
REFUELING								
MAINTENANCE PERSONNEL	72	3	87		13.017	0.115	9.594	
OPERATING PERSONNEL	24	1	28		0.800	0.030	4.302	
HEALTH PHYSICS PERSONNEL	4	0	38		0.140	0.000	5.409	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.000	0.030	
ENGINEERING PERSONNEL	3	0	8		1.104	0.000	0.216	
TOTAL	103	4	162	269	15.061	0.145	19.551	34.757
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	789 (265)	26 (8)	1413 (685)	2228 (958)	147.060	4.135	318.777	469.972
OPERATING PERSONNEL	414 (269)	8 (4)	363 (207)	785 (480)	46.993	0.904	47.732	95.629
HEALTH PHYSICS PERSONNEL	188 (73)	0 0	569 (188)	757 (261)	27.701	0.000	70.468	98.169
SUPERVISORY PERSONNEL	7 (3)	0 0	22 (12)	29 (15)	0.451	0.000	2.827	3.278
ENGINEERING PERSONNEL	59 (46)	3 (5)	47 (35)	109 (86)	8.478	0.115	4.097	12.690
GRAND TOTALS	1457 (656)	37 (17)	2414 (1127)	3908 (1800)	230.683	5.154	443.901	679.738

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *PEACH BOTTOM 2,3 TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	5	60	138		0.779	25.545	49.307	
OPERATING PERSONNEL	59	6	24		36.265	0.979	4.985	
HEALTH PHYSICS PERSONNEL	33	0	45		21.461	0.000	23.162	
SUPERVISORY PERSONNEL	1	0	2		0.079	0.000	0.178	
ENGINEERING PERSONNEL	11	2	1		4.282	0.057	0.090	
TOTAL	109	68	210	387	62.866	26.581	77.722	167.169
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	11	560	1172		1.188	145.626	695.292	
OPERATING PERSONNEL	103	75	290		29.886	12.229	62.984	
HEALTH PHYSICS PERSONNEL	103	9	228		45.998	1.156	120.035	
SUPERVISORY PERSONNEL	8	8	32		0.221	0.178	2.341	
ENGINEERING PERSONNEL	49	34	39		15.006	6.142	12.825	
TOTAL	274	686	1761	2721	92.299	165.331	893.477	1151.107
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	8		0.000	0.000	1.748	
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	8	8	0.000	0.000	1.748	1.748
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	2	126	764		0.153	81.235	529.116	
OPERATING PERSONNEL	15	5	30		2.576	1.763	16.724	
HEALTH PHYSICS PERSONNEL	13	1	132		8.218	0.183	75.965	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	5	3	2		2.487	0.555	2.112	
TOTAL	35	135	928	1098	13.434	83.736	623.917	721.087
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	4	26		0.000	0.908	7.105	
OPERATING PERSONNEL	2	1	1		0.554	0.026	0.409	
HEALTH PHYSICS PERSONNEL	4	1	6		2.437	0.091	3.538	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	6	6	33	45	2.991	1.025	11.052	15.068
REFUELING								
MAINTENANCE PERSONNEL	0	14	5		0.000	5.251	0.992	
OPERATING PERSONNEL	0	0	1		0.000	0.000	0.112	
HEALTH PHYSICS PERSONNEL	2	0	1		0.345	0.000	0.026	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	2	14	7	23	0.345	5.251	1.130	6.726
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	18 (13)	764 (657)	2113 (2481)	2895 (3151)	2.120	258.565	1283.560	1544.245
OPERATING PERSONNEL	179 (148)	87 (81)	346 (328)	612 (557)	69.281	14.997	85.214	169.492
HEALTH PHYSICS PERSONNEL	155 (126)	11 (10)	412 (336)	578 (472)	78.459	1.430	222.726	302.615
SUPERVISORY PERSONNEL	9 (9)	8 (8)	34 (33)	51 (50)	0.300	0.178	2.519	2.997
ENGINEERING PERSONNEL	65 (55)	39 (37)	42 (41)	146 (133)	21.775	6.754	15.027	43.556
GRAND TOTALS	426 (351)	909 (793)	2947 (3219)	4282 (4363)	171.935	281.924	1609.046	2062.905

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *PILGRIM TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	0	0	10		0.210	0.075	5.515	
OPERATING PERSONNEL	23	20	16		7.665	11.350	7.873	
HEALTH PHYSICS PERSONNEL	11	1	108		2.530	0.770	44.882	
SUPERVISORY PERSONNEL	0	0	4		0.245	0.065	1.605	
ENGINEERING PERSONNEL	1	0	1		0.525	0.170	0.745	
TOTAL	35	21	139	195	11.175	12.430	60.620	84.225
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	33	3	678		13.560	1.310	328.620	
OPERATING PERSONNEL	23	19	98		6.170	4.585	46.285	
HEALTH PHYSICS PERSONNEL	14	2	106		4.825	0.425	40.055	
SUPERVISORY PERSONNEL	2	2	12		1.095	0.540	4.850	
ENGINEERING PERSONNEL	3	3	45		1.350	0.940	16.075	
TOTAL	75	29	939	1043	27.000	7.800	435.885	470.685
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	3	0	364		0.900	0.075	205.340	
OPERATING PERSONNEL	0	0	41		0.070	0.065	27.515	
HEALTH PHYSICS PERSONNEL	0	0	31		0.210	0.135	9.320	
SUPERVISORY PERSONNEL	0	0	6		0.050	0.125	4.025	
ENGINEERING PERSONNEL	3	1	19		0.970	0.965	10.425	
TOTAL	6	1	461	468	2.200	1.365	256.625	260.190
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	4	0	628		1.515	0.090	316.743	
OPERATING PERSONNEL	3	0	70		0.875	0.410	32.635	
HEALTH PHYSICS PERSONNEL	7	1	42		1.845	0.310	15.020	
SUPERVISORY PERSONNEL	1	0	16		0.425	0.070	5.385	
ENGINEERING PERSONNEL	0	1	47		0.300	0.330	17.786	
TOTAL	15	2	803	820	4.960	1.210	387.569	393.739
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	25		0.395	0.055	11.140	
OPERATING PERSONNEL	9	0	5		2.980	0.010	1.710	
HEALTH PHYSICS PERSONNEL	1	0	24		0.285	0.015	9.715	
SUPERVISORY PERSONNEL	1	0	2		0.155	0.000	0.530	
ENGINEERING PERSONNEL	0	0	1		0.165	0.000	0.320	
TOTAL	11	0	57	68	3.980	0.080	23.415	27.475
REFUELING								
MAINTENANCE PERSONNEL	2	0	132		1.385	0.130	69.969	
OPERATING PERSONNEL	3	3	33		1.730	0.790	14.320	
HEALTH PHYSICS PERSONNEL	6	3	29		1.745	0.585	10.300	
SUPERVISORY PERSONNEL	2	0	6		0.910	0.110	2.225	
ENGINEERING PERSONNEL	2	1	6		0.690	0.130	3.520	
TOTAL	15	7	206	228	6.460	1.745	100.334	108.539
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	42	3	1837	1882	17.965	1.735	937.327	957.027
OPERATING PERSONNEL	61	42	263	366	19.490	17.210	130.338	167.038
HEALTH PHYSICS PERSONNEL	39	7	340	386	11.440	2.240	129.292	142.972
SUPERVISORY PERSONNEL	6	2	46	54	2.880	0.910	18.620	22.410
ENGINEERING PERSONNEL	9	6	119	134	4.000	2.535	48.871	55.406
GRAND TOTALS	157	60	2605	2822	55.775	24.630	1264.448	1344.853

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *POINT BEACH 1,2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.070	
OPERATING PERSONNEL	0	0	0		28.900	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		23.060	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		1.110	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	0	0	53.070	0.000	0.070	53.140
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	0	0	0		70.260	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	70.260	0.000	0.000	70.260
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	0		6.430	0.000	14.710	
OPERATING PERSONNEL	0	0	0		7.240	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		2.720	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.180	0.000	0.000	
TOTAL	0	0	0	0	16.570	0.000	14.710	31.280
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	0	0	0		11.280	0.000	329.520	
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	11.280	0.000	329.520	340.800
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	10.170	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.920	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	0.920	0.000	10.170	11.090
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		21.040	0.000	0.000	
OPERATING PERSONNEL	0	0	0		3.510	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.260	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.030	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.600	0.000	0.000	
TOTAL	0	0	0	0	25.440	0.000	0.000	25.440
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	0 (101)	0	0	0 (329)	0 (430)	109.010	0.000	354.470	463.480
OPERATING PERSONNEL	0 (69)	0	0	0 0	0 (69)	39.650	0.000	0.000	39.650
HEALTH PHYSICS PERSONNEL	0 (35)	0	0	0 0	0 (35)	24.240	0.000	0.000	24.240
SUPERVISORY PERSONNEL	0 (9)	0	0	0 0	0 (9)	3.860	0.000	0.000	3.860
ENGINEERING PERSONNEL	0 (2)	0	0	0 0	0 (2)	0.780	0.000	0.000	0.780
GRAND TOTALS	0 (216)	0	0	0 (329)	0 (545)	177.540	0.000	354.470	532.010

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

APPENDIX D (Continued)

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *PRAIRIE ISLAND 1,2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	1	0	0		2.009	0.428	0.114	
OPERATING PERSONNEL	2	0	0		1.941	0.000	0.119	
HEALTH PHYSICS PERSONNEL	7	0	1		1.851	0.000	0.676	
SUPERVISORY PERSONNEL	5	0	0		1.253	0.252	0.204	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	15	0	1	16	7.054	0.680	1.113	8.847
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	14	20	0		4.258	7.976	0.014	
OPERATING PERSONNEL	0	0	0		0.034	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.009	0.000	0.042	
SUPERVISORY PERSONNEL	1	0	3		0.377	0.037	1.053	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	15	20	3	38	4.678	8.013	1.109	13.800
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	33	48	30		1.397	4.204	18.365	
OPERATING PERSONNEL	1	0	0		0.041	0.000	0.000	
HEALTH PHYSICS PERSONNEL	6	0	2		0.121	0.000	1.254	
SUPERVISORY PERSONNEL	11	0	25		0.392	0.044	0.530	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	51	48	57	156	1.951	4.248	20.149	26.348
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	3	0	0		10.621	17.884	12.927	
OPERATING PERSONNEL	0	0	0		0.114	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	1		2.746	0.010	1.772	
SUPERVISORY PERSONNEL	0	0	0		3.340	0.358	9.376	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	6	0	1	7	16.821	18.252	24.075	59.148
WASTE PROCESSING								
MAINTENANCE PERSONNEL	12	34	0		2.295	0.085	0.000	
OPERATING PERSONNEL	8	0	0		0.110	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	12		0.893	0.000	0.338	
SUPERVISORY PERSONNEL	1	1	0		0.038	0.004	0.010	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	23	35	12	70	3.336	0.089	0.348	3.773
REFUELING								
MAINTENANCE PERSONNEL	3	13	46		4.232	9.887	0.005	
OPERATING PERSONNEL	0	0	0		2.662	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	6		0.669	0.000	2.983	
SUPERVISORY PERSONNEL	1	0	3		0.390	0.265	0.421	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	4	13	55	72	7.953	10.152	3.409	21.514
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	66	115	76	257	24.812	40.464	31.425	96.701
OPERATING PERSONNEL	11	0	0	11	4.902	0.000	0.119	5.021
HEALTH PHYSICS PERSONNEL	18	0	22	40	6.289	0.010	7.065	13.364
SUPERVISORY PERSONNEL	19	1	31	51	5.790	0.960	11.594	18.344
ENGINEERING PERSONNEL	0	0	0	0	0.000	0.000	0.000	0.000
GRAND TOTALS	114	116	129	359	41.793	41.434	50.203	133.430

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *QUAD CITIES 1,2 TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	3	2	8		1.770	0.340	3.680	
OPERATING PERSONNEL	51	0	2		26.370	0.000	1.290	
HEALTH PHYSICS PERSONNEL	10	0	23		12.580	0.000	14.770	
SUPERVISORY PERSONNEL	27	0	0		10.430	0.000	0.000	
ENGINEERING PERSONNEL	11	2	6		3.970	0.140	1.770	
TOTAL	102	4	39	145	55.120	0.480	21.510	77.110
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	108	14	390		99.590	3.460	200.000	
OPERATING PERSONNEL	20	0	1		10.600	0.000	0.150	
HEALTH PHYSICS PERSONNEL	18	0	54		22.320	0.000	34.700	
SUPERVISORY PERSONNEL	36	0	0		14.260	0.000	0.000	
ENGINEERING PERSONNEL	31	15	33		10.930	0.740	9.890	
TOTAL	213	29	478	720	157.700	4.200	244.740	406.640
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	2	0	142		0.250	0.000	70.370	
OPERATING PERSONNEL	1	0	0		0.080	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	1		1.350	0.000	0.010	
SUPERVISORY PERSONNEL	2	0	0		0.820	0.000	0.000	
ENGINEERING PERSONNEL	4	15	15		1.050	0.730	4.570	
TOTAL	11	15	158	184	3.550	0.730	74.950	79.230
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	18	12	111		14.710	2.820	55.180	
OPERATING PERSONNEL	1	0	11		0.140	0.000	9.890	
HEALTH PHYSICS PERSONNEL	1	0	0		0.580	0.000	0.000	
SUPERVISORY PERSONNEL	4	0	0		1.310	0.000	0.000	
ENGINEERING PERSONNEL	6	6	29		1.880	0.320	8.710	
TOTAL	30	18	151	199	18.620	3.140	73.780	95.540
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	1		0.000	0.000	0.690	
OPERATING PERSONNEL	25	0	10		12.640	0.000	8.810	
HEALTH PHYSICS PERSONNEL	4	0	1		3.640	0.000	0.010	
SUPERVISORY PERSONNEL	8	0	0		3.000	0.000	0.000	
ENGINEERING PERSONNEL	1	1	0		0.070	0.060	0.000	
TOTAL	38	1	12	51	19.350	0.060	9.510	28.920
REFUELING								
MAINTENANCE PERSONNEL	12	0	1		10.050	0.000	0.170	
OPERATING PERSONNEL	5	0	0		2.240	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	0		1.080	0.000	0.000	
SUPERVISORY PERSONNEL	5	0	0		1.810	0.000	0.000	
ENGINEERING PERSONNEL	1	1	0		0.210	0.020	0.000	
TOTAL	25	1	1	27	15.390	0.020	0.170	15.580
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	143	28	653	824	126.370	6.620	330.090	463.080
OPERATING PERSONNEL	103	0	24	127	52.070	0.000	20.140	72.210
HEALTH PHYSICS PERSONNEL	37	0	79	116	41.550	0.000	49.490	91.040
SUPERVISORY PERSONNEL	82	0	0	82	31.630	0.000	0.000	31.630
ENGINEERING PERSONNEL	54	40	83	177	18.110	2.010	24.940	45.060
GRAND TOTALS	419	68	839	1326	269.730	8.630	424.660	703.020

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *RANCHO SECO TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	44	0	110		0.905	0.000	3.423	
OPERATING PERSONNEL	31	0	0		12.608	0.000	0.000	
HEALTH PHYSICS PERSONNEL	27	0	37		6.730	0.000	21.206	
SUPERVISORY PERSONNEL	0	0	2		0.000	0.000	0.631	
ENGINEERING PERSONNEL	8	0	17		0.491	0.000	0.505	
TOTAL	110	0	166	276	20.734	0.000	25.765	46.499
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	92	0	346		23.777	0.000	46.205	
OPERATING PERSONNEL	2	0	1		0.010	0.000	0.320	
HEALTH PHYSICS PERSONNEL	22	0	11		0.248	0.000	0.693	
SUPERVISORY PERSONNEL	0	0	5		0.000	0.000	0.556	
ENGINEERING PERSONNEL	12	0	34		1.065	0.000	5.199	
TOTAL	128	0	397	525	25.100	0.000	52.973	78.073
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	17	0	90		0.631	0.000	7.612	
OPERATING PERSONNEL	1	0	0		0.083	0.000	0.000	
HEALTH PHYSICS PERSONNEL	6	0	7		0.775	0.000	0.642	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.000	0.041	
ENGINEERING PERSONNEL	3	0	1		0.605	0.000	0.056	
TOTAL	27	0	99	126	2.094	0.000	8.351	10.445
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	84	0	385		20.587	0.000	82.255	
OPERATING PERSONNEL	2	0	1		0.035	0.000	0.025	
HEALTH PHYSICS PERSONNEL	17	0	17		0.359	0.000	2.947	
SUPERVISORY PERSONNEL	0	0	5		0.000	0.000	0.351	
ENGINEERING PERSONNEL	8	0	29		0.257	0.000	3.100	
TOTAL	111	0	437	548	21.238	0.000	88.678	109.916
WASTE PROCESSING								
MAINTENANCE PERSONNEL	34	0	117		0.653	0.000	17.650	
OPERATING PERSONNEL	5	0	0		0.090	0.000	0.000	
HEALTH PHYSICS PERSONNEL	25	0	3		5.642	0.000	0.202	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	2	0	3		0.006	0.000	0.030	
TOTAL	66	0	123	189	6.391	0.000	17.882	24.273
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	271	0	1048	1319	46.553	0.000	157.145	203.698
OPERATING PERSONNEL	41	0	2	43	12.826	0.000	0.345	13.171
HEALTH PHYSICS PERSONNEL	97	0	75	172	13.754	0.000	25.690	39.444
SUPERVISORY PERSONNEL	0	0	13	13	0.000	0.000	1.579	1.579
ENGINEERING PERSONNEL	33	0	84	117	2.424	0.000	8.890	11.314
GRAND TOTALS	442	0	1222	1664	75.557	0.000	193.649	269.206

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *RIVER BEND TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	6	0	7		3.379	0.040	2.883	
OPERATING PERSONNEL	31	0	3		14.781	0.000	0.437	
HEALTH PHYSICS PERSONNEL	21	0	43		14.351	0.000	35.940	
SUPERVISORY PERSONNEL	1	1	1		0.255	0.160	0.586	
ENGINEERING PERSONNEL	4	0	6		1.003	0.050	1.345	
TOTAL	63	1	60	124	33.769	0.250	41.191	75.210
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	14	1	53		6.029	0.275	21.346	
OPERATING PERSONNEL	2	0	0		0.490	0.000	0.020	
HEALTH PHYSICS PERSONNEL	1	0	1		0.449	0.000	0.734	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.005	
ENGINEERING PERSONNEL	3	0	16		0.733	0.000	5.114	
TOTAL	20	1	70	91	7.701	0.275	27.219	35.195
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	16	0	55		6.285	0.000	45.482	
OPERATING PERSONNEL	0	0	0		0.045	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	2		2.590	0.000	1.200	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	2	1	18		0.535	0.150	12.553	
TOTAL	21	1	75	97	9.455	0.150	59.235	68.840
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	82	2	161		70.893	1.688	101.903	
OPERATING PERSONNEL	6	0	0		2.376	0.000	0.050	
HEALTH PHYSICS PERSONNEL	9	0	15		6.731	0.000	10.551	
SUPERVISORY PERSONNEL	1	0	1		0.230	0.000	0.140	
ENGINEERING PERSONNEL	8	1	33		2.065	0.095	14.505	
TOTAL	106	3	210	319	82.295	1.783	127.149	211.227
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	0		0.050	0.000	0.090	
OPERATING PERSONNEL	1	0	8		0.208	0.000	4.548	
HEALTH PHYSICS PERSONNEL	2	0	1		1.305	0.000	0.790	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.015	
TOTAL	3	0	9	12	1.563	0.000	5.443	7.006
REFUELING								
MAINTENANCE PERSONNEL	0	0	16		0.070	0.000	3.878	
OPERATING PERSONNEL	0	0	0		0.066	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	2		0.470	0.000	0.805	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.010	
ENGINEERING PERSONNEL	0	0	9		0.035	0.000	2.007	
TOTAL	1	0	27	28	0.641	0.000	6.700	7.341
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	118	3	292	413	86.706	2.003	175.582	264.291
OPERATING PERSONNEL	40	0	11	51	17.966	0.000	5.055	23.021
HEALTH PHYSICS PERSONNEL	37	0	64	101	25.896	0.000	50.020	75.916
SUPERVISORY PERSONNEL	2	1	2	5	0.485	0.160	0.741	1.386
ENGINEERING PERSONNEL	17	2	82	101	4.371	0.295	35.539	40.205
GRAND TOTALS	214	6	451	671	135.424	2.458	266.937	404.819

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *ROBINSON TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	16	3	3		5.965	1.340	1.660	
OPERATING PERSONNEL	21	0	5		14.695	0.005	4.273	
HEALTH PHYSICS PERSONNEL	18	0	15		8.325	0.065	6.935	
SUPERVISORY PERSONNEL	0	0	0		0.435	0.000	0.010	
ENGINEERING PERSONNEL	24	5	8		8.085	1.895	2.035	
TOTAL	79	8	31	118	37.505	3.305	14.913	55.723
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	18	5	9		5.465	1.450	7.600	
OPERATING PERSONNEL	0	0	0		0.005	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	1		0.935	0.000	0.715	
SUPERVISORY PERSONNEL	0	0	0		0.005	0.000	0.010	
ENGINEERING PERSONNEL	1	0	1		0.460	0.030	0.705	
TOTAL	21	5	11	37	6.870	1.480	9.030	17.380
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	3	1	41		1.185	0.245	17.210	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	1		0.720	0.000	0.230	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.010	
ENGINEERING PERSONNEL	5	0	17		2.169	0.065	6.220	
TOTAL	11	1	59	71	4.074	0.310	23.670	28.054
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	73	37	179		56.300	21.445	84.330	
OPERATING PERSONNEL	24	0	1		11.120	0.000	0.150	
HEALTH PHYSICS PERSONNEL	43	0	48		25.945	0.000	26.315	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.075	
ENGINEERING PERSONNEL	17	4	66		7.245	1.095	35.540	
TOTAL	157	41	294	492	100.610	22.540	146.410	269.560
WASTE PROCESSING								
MAINTENANCE PERSONNEL	5	0	3		1.285	0.150	1.520	
OPERATING PERSONNEL	0	0	2		0.080	0.000	0.510	
HEALTH PHYSICS PERSONNEL	6	0	1		3.925	0.000	0.380	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	1		0.065	0.010	1.520	
TOTAL	11	0	7	18	5.355	0.160	3.930	9.445
REFUELING								
MAINTENANCE PERSONNEL	15	3	89		3.445	0.930	64.250	
OPERATING PERSONNEL	6	0	0		1.840	0.010	0.100	
HEALTH PHYSICS PERSONNEL	0	0	16		0.205	0.000	6.382	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	16	3	58		4.345	0.440	57.625	
TOTAL	37	6	163	206	9.835	1.380	128.357	139.572
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	130	49	324	503	73.645	25.560	176.570	275.775
OPERATING PERSONNEL	51	0	8	59	27.740	0.015	5.033	32.788
HEALTH PHYSICS PERSONNEL	72	0	82	154	40.055	0.065	40.957	81.077
SUPERVISORY PERSONNEL	0	0	0	0	0.440	0.000	0.105	0.545
ENGINEERING PERSONNEL	63	12	151	226	22.369	3.535	103.645	129.549
GRAND TOTALS	316	61	565	942	164.249	29.175	326.310	519.734

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *SALEM 1,2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	0	0	0		0.275	0.000	0.066	
OPERATING PERSONNEL	30	0	0		6.018	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.295	0.000	0.013	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.019	0.000	
ENGINEERING PERSONNEL	0	0	0		0.054	0.000	0.000	
TOTAL	30	0	0	30	6.642	0.019	0.079	6.740
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	37	2	325		16.489	0.303	122.706	
OPERATING PERSONNEL	23	0	4		5.553	0.000	2.571	
HEALTH PHYSICS PERSONNEL	23	0	23		6.520	0.000	6.259	
SUPERVISORY PERSONNEL	0	1	2		0.031	0.132	0.548	
ENGINEERING PERSONNEL	5	1	0		2.673	0.307	0.151	
TOTAL	88	4	354	446	31.266	0.742	132.235	164.243
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	36		0.059	0.000	13.628	
OPERATING PERSONNEL	0	0	1		0.291	0.000	0.223	
HEALTH PHYSICS PERSONNEL	0	0	0		0.644	0.000	0.036	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.361	0.058	0.150	
TOTAL	0	0	37	37	1.355	0.058	14.037	15.450
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	9	0	173		3.825	0.039	75.285	
OPERATING PERSONNEL	0	0	0		0.088	0.000	0.046	
HEALTH PHYSICS PERSONNEL	10	0	1		4.437	0.000	0.619	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.004	0.065	
ENGINEERING PERSONNEL	0	0	0		0.323	0.029	0.058	
TOTAL	19	0	174	193	8.673	0.072	76.073	84.818
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	11		0.028	0.010	3.129	
OPERATING PERSONNEL	0	0	0		0.037	0.000	0.000	
HEALTH PHYSICS PERSONNEL	14	0	5		5.003	0.000	1.489	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.008	0.000	
ENGINEERING PERSONNEL	1	0	0		0.545	0.000	0.000	
TOTAL	15	0	16	31	5.613	0.018	4.618	10.249
REFUELING								
MAINTENANCE PERSONNEL	116	1	258		73.232	0.420	96.823	
OPERATING PERSONNEL	2	0	0		0.635	0.000	0.153	
HEALTH PHYSICS PERSONNEL	13	0	66		5.288	0.000	31.262	
SUPERVISORY PERSONNEL	0	1	2		0.022	0.125	1.078	
ENGINEERING PERSONNEL	12	1	3		3.135	0.463	1.907	
TOTAL	143	3	329	475	82.312	1.008	131.223	214.543
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	162	3	803	968	93.908	0.772	311.637	406.317
OPERATING PERSONNEL	55	0	5	60	12.622	0.000	2.993	15.615
HEALTH PHYSICS PERSONNEL	60	0	95	155	22.187	0.000	39.678	61.865
SUPERVISORY PERSONNEL	0	2	4	6	0.053	0.288	1.691	2.032
ENGINEERING PERSONNEL	18	2	3	23	7.091	0.857	2.266	10.214
GRAND TOTALS	295	7	910	1212	135.861	1.917	358.265	496.043

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *SAN ONOFRE 1,2,3 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	57	0	21		5.936	0.000	1.993	
OPERATING PERSONNEL	55	0	2		15.496	0.000	0.516	
HEALTH PHYSICS PERSONNEL	94	4	113		32.534	0.485	46.225	
SUPERVISORY PERSONNEL	1	0	0		0.163	0.000	0.000	
ENGINEERING PERSONNEL	23	1	9		1.985	0.070	1.700	
TOTAL	230	5	145	380	56.114	0.555	50.434	107.103
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	206	2	353		86.274	0.631	150.025	
OPERATING PERSONNEL	25	0	2		0.691	0.000	0.018	
HEALTH PHYSICS PERSONNEL	77	4	103		13.312	0.834	14.343	
SUPERVISORY PERSONNEL	2	1	0		1.753	0.097	0.000	
ENGINEERING PERSONNEL	111	3	150		27.949	2.443	61.982	
TOTAL	421	10	608	1039	129.979	4.005	226.368	360.352
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	101	1	125		11.420	0.028	19.294	
OPERATING PERSONNEL	18	0	1		0.488	0.000	0.028	
HEALTH PHYSICS PERSONNEL	28	1	19		2.057	0.042	1.517	
SUPERVISORY PERSONNEL	1	1	0		0.495	0.009	0.000	
ENGINEERING PERSONNEL	97	0	48		12.215	0.000	6.863	
TOTAL	245	3	193	441	26.675	0.079	27.702	54.456
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	136	1	140		20.595	0.565	28.846	
OPERATING PERSONNEL	6	0	3		0.373	0.000	1.990	
HEALTH PHYSICS PERSONNEL	40	0	47		3.694	0.000	3.028	
SUPERVISORY PERSONNEL	1	0	0		0.448	0.000	0.000	
ENGINEERING PERSONNEL	50	0	22		4.550	0.000	7.162	
TOTAL	233	1	212	446	29.660	0.565	41.026	71.251
WASTE PROCESSING								
MAINTENANCE PERSONNEL	24	0	52		0.728	0.000	5.734	
OPERATING PERSONNEL	0	0	1		0.000	0.000	0.325	
HEALTH PHYSICS PERSONNEL	44	4	71		21.155	2.334	25.291	
SUPERVISORY PERSONNEL	2	0	0		0.161	0.000	0.000	
ENGINEERING PERSONNEL	8	1	21		0.302	0.062	5.956	
TOTAL	78	5	145	228	22.346	2.396	37.306	62.048
REFUELING								
MAINTENANCE PERSONNEL	13	0	41		0.637	0.000	3.013	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	6		0.079	0.000	0.161	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	7	0	16		0.730	0.000	0.889	
TOTAL	24	0	63	87	1.446	0.000	4.063	5.509
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	537 (209)	4 (2)	732 (370)	1273 (581)	125.590	1.224	208.905	335.719
OPERATING PERSONNEL	104 (55)	0 0	9 (6)	113 (61)	17.048	0.000	2.877	19.925
HEALTH PHYSICS PERSONNEL	287 (101)	13 (5)	359 (163)	659 (269)	72.831	3.695	90.565	167.091
SUPERVISORY PERSONNEL	7 (2)	2 (1)	0 0	9 (3)	3.020	0.106	0.000	3.126
ENGINEERING PERSONNEL	296 (126)	5 (3)	266 (174)	567 (303)	47.731	2.575	84.552	134.858
GRAND TOTALS	1231 (493)	24 (11)	1366 (713)	2621 (1217)	266.220	7.600	386.899	660.719

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *SEQUOYAH 1,2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	583	5	4		19.386	0.063	0.045	
OPERATING PERSONNEL	55	9	0		5.644	0.243	0.000	
HEALTH PHYSICS PERSONNEL	57	15	0		13.032	2.933	0.000	
SUPERVISORY PERSONNEL	12	0	0		1.102	0.000	0.000	
ENGINEERING PERSONNEL	87	16	110		3.128	0.642	5.800	
TOTAL	794	45	114	953	42.292	3.881	5.845	52.018
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	637	7	3		69.521	0.321	0.230	
OPERATING PERSONNEL	33	1	0		0.386	0.002	0.000	
HEALTH PHYSICS PERSONNEL	61	15	0		4.294	0.555	0.000	
SUPERVISORY PERSONNEL	11	0	1		0.189	0.000	0.000	
ENGINEERING PERSONNEL	77	21	85		2.222	0.199	1.687	
TOTAL	819	44	89	952	76.612	1.077	1.917	79.606
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	94	0	1		23.833	0.000	0.072	
OPERATING PERSONNEL	2	0	0		0.072	0.000	0.000	
HEALTH PHYSICS PERSONNEL	38	8	0		19.691	0.061	0.000	
SUPERVISORY PERSONNEL	6	1	2		1.003	0.220	0.565	
ENGINEERING PERSONNEL	19	11	57		1.614	8.661	48.604	
TOTAL	159	20	60	239	46.213	8.942	49.241	104.396
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	596	8	5		101.780	0.435	0.769	
OPERATING PERSONNEL	23	1	0		0.136	0.006	0.000	
HEALTH PHYSICS PERSONNEL	49	8	0		2.606	0.109	0.000	
SUPERVISORY PERSONNEL	4	0	0		0.031	0.000	0.000	
ENGINEERING PERSONNEL	75	27	162		9.507	2.057	35.711	
TOTAL	747	44	167	958	114.060	2.607	36.480	153.147
WASTE PROCESSING								
MAINTENANCE PERSONNEL	112	0	0		2.225	0.000	0.000	
OPERATING PERSONNEL	5	0	6		5.048	0.000	2.861	
HEALTH PHYSICS PERSONNEL	30	1	0		1.116	0.004	0.000	
SUPERVISORY PERSONNEL	4	0	0		0.211	0.000	0.000	
ENGINEERING PERSONNEL	3	0	1		0.000	0.000	0.000	
TOTAL	154	1	7	162	8.600	0.004	2.861	11.465
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	2022 (706)	20 (9)	13 (5)	2055 (720)	216.745	0.819	1.116	218.680
OPERATING PERSONNEL	118 (8)	11 (1)	6 (6)	135 (15)	11.286	0.251	2.861	14.398
HEALTH PHYSICS PERSONNEL	235 (52)	47 (5)	0 0	282 (57)	40.739	3.662	0.000	44.401
SUPERVISORY PERSONNEL	37 (7)	1 (1)	3 (2)	41 (10)	2.536	0.220	0.565	3.321
ENGINEERING PERSONNEL	261 (65)	75 (13)	415 (194)	751 (272)	16.471	11.559	91.802	119.832
GRAND TOTALS	2673 (838)	154 (29)	437 (207)	3264 (1074)	287.777	16.511	96.344	400.632

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *ST. LUCIE 1,2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	0	0	0		0.355	0.020	0.030	
OPERATING PERSONNEL	0	0	0		0.295	0.000	0.010	
HEALTH PHYSICS PERSONNEL	1	0	0		0.435	0.000	0.045	
SUPERVISORY PERSONNEL	0	0	0		0.055	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.035	0.000	0.000	
TOTAL	1	0	0	1	1.175	0.020	0.085	1.280
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	149	19	114		59.117	4.885	43.171	
OPERATING PERSONNEL	46	0	60		20.223	0.235	22.826	
HEALTH PHYSICS PERSONNEL	24	0	49		14.670	0.000	17.482	
SUPERVISORY PERSONNEL	17	1	6		6.804	0.220	1.949	
ENGINEERING PERSONNEL	5	0	7		1.235	0.281	3.740	
TOTAL	241	20	236	497	102.049	5.621	89.168	196.838
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	0	6		0.200	0.045	2.149	
OPERATING PERSONNEL	3	1	29		1.680	0.270	46.800	
HEALTH PHYSICS PERSONNEL	0	0	0		0.015	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	5		0.025	0.025	2.485	
ENGINEERING PERSONNEL	2	0	20		0.435	0.120	23.315	
TOTAL	6	1	60	67	2.355	0.460	74.749	77.564
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	58	12	145		17.356	2.590	75.535	
OPERATING PERSONNEL	3	0	22		0.760	0.015	13.610	
HEALTH PHYSICS PERSONNEL	1	0	1		0.980	0.000	0.305	
SUPERVISORY PERSONNEL	6	1	7		1.865	0.435	2.775	
ENGINEERING PERSONNEL	0	0	16		0.015	0.230	15.650	
TOTAL	68	13	191	272	20.976	3.270	107.875	132.121
WASTE PROCESSING								
MAINTENANCE PERSONNEL	8	0	1		2.285	0.000	0.601	
OPERATING PERSONNEL	2	0	2		0.550	0.000	0.774	
HEALTH PHYSICS PERSONNEL	3	0	0		1.320	0.000	0.190	
SUPERVISORY PERSONNEL	4	0	2		1.975	0.000	0.505	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	17	0	5	22	6.130	0.000	2.070	8.200
REFUELING								
MAINTENANCE PERSONNEL	186	60	307		158.876	55.732	181.577	
OPERATING PERSONNEL	64	1	126		30.450	0.385	67.925	
HEALTH PHYSICS PERSONNEL	23	0	96		17.296	0.000	57.817	
SUPERVISORY PERSONNEL	36	3	19		16.850	1.110	9.127	
ENGINEERING PERSONNEL	7	3	40		2.802	1.167	19.905	
TOTAL	316	67	588	971	226.274	58.394	336.351	621.019
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	402 (227)	91 (60)	573 (468)	1066 (755)	238.189	63.272	303.063	604.524
OPERATING PERSONNEL	118 (85)	2 (2)	239 (173)	359 (260)	53.958	0.905	151.945	206.808
HEALTH PHYSICS PERSONNEL	52 (29)	0 0	146 (117)	198 (146)	34.716	0.000	75.839	110.555
SUPERVISORY PERSONNEL	63 (38)	5 (3)	39 (30)	107 (71)	27.574	1.790	16.841	46.205
ENGINEERING PERSONNEL	14 (9)	3 (3)	83 (67)	100 (79)	4.522	1.798	62.610	68.930
GRAND TOTALS	649 (388)	101 (68)	1080 (855)	1830 (1311)	358.959	67.765	610.298	1037.022

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *SUMMER TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	90	0	93		3.046	0.000	2.862	
OPERATING PERSONNEL	75	1	58		8.136	0.005	1.458	
HEALTH PHYSICS PERSONNEL	22	2	118		2.470	0.270	14.875	
SUPERVISORY PERSONNEL	9	3	9		0.250	0.080	0.101	
ENGINEERING PERSONNEL	13	23	25		0.515	0.709	0.449	
TOTAL	209	29	303	541	14.417	1.064	19.745	35.226
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	165	2	382		9.269	0.085	27.146	
OPERATING PERSONNEL	7	0	0		0.135	0.000	0.000	
HEALTH PHYSICS PERSONNEL	10	2	74		0.865	0.020	2.792	
SUPERVISORY PERSONNEL	3	0	3		0.045	0.000	0.009	
ENGINEERING PERSONNEL	11	27	22		0.302	0.848	1.062	
TOTAL	196	31	481	708	10.616	0.953	31.009	42.578
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	48	1	89		4.645	0.070	6.045	
OPERATING PERSONNEL	19	0	0		0.492	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	63		0.095	0.000	3.675	
SUPERVISORY PERSONNEL	1	0	1		0.040	0.000	0.005	
ENGINEERING PERSONNEL	5	13	35		0.435	2.601	3.795	
TOTAL	77	14	188	279	5.707	2.671	13.520	21.898
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	160	1	442		42.566	0.025	298.843	
OPERATING PERSONNEL	47	0	1		2.660	0.000	0.025	
HEALTH PHYSICS PERSONNEL	11	3	99		1.369	0.718	55.080	
SUPERVISORY PERSONNEL	5	2	2		0.332	0.055	0.011	
ENGINEERING PERSONNEL	11	22	33		1.820	5.764	8.582	
TOTAL	234	28	577	839	48.747	6.562	362.541	417.850
WASTE PROCESSING								
MAINTENANCE PERSONNEL	49	0	56		3.220	0.000	4.605	
OPERATING PERSONNEL	4	0	3		0.074	0.000	0.384	
HEALTH PHYSICS PERSONNEL	11	1	52		1.300	0.040	5.183	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	1	9	1		0.040	0.172	0.035	
TOTAL	65	10	112	187	4.634	0.212	10.207	15.053
REFUELING								
MAINTENANCE PERSONNEL	49	1	101		10.915	0.080	22.663	
OPERATING PERSONNEL	12	0	0		0.502	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	53		0.301	0.000	3.385	
SUPERVISORY PERSONNEL	2	0	0		0.350	0.000	0.000	
ENGINEERING PERSONNEL	2	8	26		0.036	1.315	2.475	
TOTAL	69	9	180	258	12.104	1.395	28.523	42.022
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	561	5	1163	1729	73.661	0.260	362.164	436.085
OPERATING PERSONNEL	164	1	62	227	11.999	0.005	1.867	13.871
HEALTH PHYSICS PERSONNEL	62	8	459	529	6.400	1.048	84.990	92.438
SUPERVISORY PERSONNEL	20	5	15	40	1.017	0.135	0.126	1.278
ENGINEERING PERSONNEL	43	102	142	287	3.148	11.409	16.398	30.955
GRAND TOTALS	850	121	1841	2812	96.225	12.857	465.545	574.627

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *SUSQUEHANNA 1,2 TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	3	0	0		1.270	0.000	0.000	
OPERATING PERSONNEL	68	1	3		31.163	0.337	0.594	
HEALTH PHYSICS PERSONNEL	3	0	8		1.543	0.000	2.621	
SUPERVISORY PERSONNEL	1	1	0		0.546	0.126	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	75	2	11	88	34.522	0.463	3.215	38.200
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	79	212	278		54.253	116.840	99.035	
OPERATING PERSONNEL	40	1	13		13.253	0.831	5.812	
HEALTH PHYSICS PERSONNEL	30	0	124		30.980	0.000	67.868	
SUPERVISORY PERSONNEL	17	0	0		4.864	0.000	0.000	
ENGINEERING PERSONNEL	8	1	0		2.481	0.770	0.000	
TOTAL	174	214	415	803	105.831	118.441	172.715	396.987
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	2	0	198		0.597	0.000	109.628	
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	2	1	0		0.447	0.120	0.000	
ENGINEERING PERSONNEL	1	0	1		0.172	0.000	0.287	
TOTAL	5	1	199	205	1.216	0.120	109.915	111.251
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	4	48	155		1.332	33.534	67.047	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	4		0.000	0.000	1.413	
SUPERVISORY PERSONNEL	3	0	0		0.871	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	7	48	159	214	2.203	33.534	68.460	104.197
WASTE PROCESSING								
MAINTENANCE PERSONNEL	3	3	3		0.895	2.050	1.110	
OPERATING PERSONNEL	0	0	5		0.000	0.000	5.598	
HEALTH PHYSICS PERSONNEL	1	0	11		0.472	0.000	5.125	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	4	3	19	26	1.367	2.050	11.833	15.250
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	1	0	0		0.190	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	1	0	0	1	0.190	0.000	0.000	0.190
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	91	263	634	988	58.347	152.424	276.820	487.591
OPERATING PERSONNEL	109	2	21	132	44.606	1.168	12.004	57.778
HEALTH PHYSICS PERSONNEL	34	0	147	181	32.995	0.000	77.027	110.022
SUPERVISORY PERSONNEL	23	2	0	25	6.728	0.246	0.000	6.974
ENGINEERING PERSONNEL	9	1	1	11	2.653	0.770	0.287	3.710
GRAND TOTALS	266	268	803	1337	145.329	154.608	366.138	666.075

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *SURRY 1,2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	56	9	79		2.256	0.095	5.273	
OPERATING PERSONNEL	260	17	45		68.831	0.152	1.431	
HEALTH PHYSICS PERSONNEL	85	5	141		42.513	0.044	40.074	
SUPERVISORY PERSONNEL	60	5	8		9.221	0.842	0.096	
ENGINEERING PERSONNEL	69	27	28		4.714	0.391	1.239	
TOTAL	530	63	301	894	127.535	1.524	48.113	177.172
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	178	80	612		145.315	21.708	144.250	
OPERATING PERSONNEL	107	12	65		21.208	1.446	10.176	
HEALTH PHYSICS PERSONNEL	47	1	123		23.148	0.021	69.329	
SUPERVISORY PERSONNEL	34	1	7		5.405	0.024	1.858	
ENGINEERING PERSONNEL	26	9	23		3.848	0.174	1.986	
TOTAL	392	103	830	1325	198.924	23.373	227.599	449.896
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	6	0	39		0.167	0.000	0.496	
OPERATING PERSONNEL	3	0	27		0.092	0.000	0.602	
HEALTH PHYSICS PERSONNEL	12	0	21		0.081	0.000	0.164	
SUPERVISORY PERSONNEL	5	0	0		0.373	0.000	0.000	
ENGINEERING PERSONNEL	9	1	3		0.785	0.001	0.204	
TOTAL	35	1	90	126	1.498	0.001	1.466	2.965
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	25	0	248		0.194	0.000	13.053	
OPERATING PERSONNEL	10	1	20		0.672	0.008	2.170	
HEALTH PHYSICS PERSONNEL	28	0	42		2.091	0.000	3.068	
SUPERVISORY PERSONNEL	3	0	0		0.057	0.000	0.000	
ENGINEERING PERSONNEL	3	1	1		0.010	0.006	0.021	
TOTAL	69	2	311	382	3.024	0.014	18.312	21.350
WASTE PROCESSING								
MAINTENANCE PERSONNEL	7	0	14		0.069	0.000	2.239	
OPERATING PERSONNEL	12	0	1		1.086	0.000	0.040	
HEALTH PHYSICS PERSONNEL	11	0	15		0.218	0.000	1.680	
SUPERVISORY PERSONNEL	5	0	0		0.113	0.000	0.000	
ENGINEERING PERSONNEL	0	1	0		0.000	0.001	0.000	
TOTAL	35	1	30	66	1.486	0.001	3.959	5.446
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	4	0	0		0.086	0.092	0.000	
HEALTH PHYSICS PERSONNEL	0	3	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	4	3	0	7	0.086	0.092	0.000	0.178
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	272	89	992	1353	148.001	21.803	165.311	335.115
OPERATING PERSONNEL	396	30	158	584	91.975	1.698	14.419	108.092
HEALTH PHYSICS PERSONNEL	183	9	342	534	68.051	0.065	114.315	182.431
SUPERVISORY PERSONNEL	107	6	15	128	15.169	0.866	1.954	17.989
ENGINEERING PERSONNEL	107	39	55	201	9.357	0.573	3.450	13.380
GRAND TOTALS	1065	173	1562	2800	332.553	25.005	299.449	657.007

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *THREE MILE ISLAND 1 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	96	0	42		1.130	0.000	0.094	
OPERATING PERSONNEL	85	2	3		14.717	0.004	0.005	
HEALTH PHYSICS PERSONNEL	89	3	9		20.954	0.005	0.058	
SUPERVISORY PERSONNEL	167	12	34		5.652	0.042	0.150	
ENGINEERING PERSONNEL	73	19	26		3.628	0.065	0.099	
TOTAL	510	36	114	660	46.081	0.116	0.406	46.603
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	150	0	111		23.572	0.000	3.305	
OPERATING PERSONNEL	29	1	3		0.126	0.000	0.035	
HEALTH PHYSICS PERSONNEL	33	1	5		1.010	0.008	0.048	
SUPERVISORY PERSONNEL	69	3	21		1.397	0.002	0.156	
ENGINEERING PERSONNEL	34	6	24		0.433	0.029	0.679	
TOTAL	315	11	164	490	26.538	0.039	4.223	30.800
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	94	1	46		0.719	0.000	3.284	
OPERATING PERSONNEL	17	3	4		0.139	0.010	0.274	
HEALTH PHYSICS PERSONNEL	7	0	1		0.017	0.000	0.010	
SUPERVISORY PERSONNEL	120	14	31		1.265	0.033	0.573	
ENGINEERING PERSONNEL	55	18	38		0.867	0.042	2.136	
TOTAL	293	36	120	449	3.007	0.085	6.277	9.369
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	132	0	413		8.243	0.000	43.002	
OPERATING PERSONNEL	30	0	2		1.500	0.000	0.006	
HEALTH PHYSICS PERSONNEL	19	0	1		0.472	0.000	0.055	
SUPERVISORY PERSONNEL	59	1	32		1.676	0.000	2.403	
ENGINEERING PERSONNEL	43	12	42		1.076	0.142	1.204	
TOTAL	283	13	490	786	12.967	0.142	46.670	59.779
WASTE PROCESSING								
MAINTENANCE PERSONNEL	81	0	27		2.761	0.000	0.028	
OPERATING PERSONNEL	45	0	3		11.024	0.000	0.547	
HEALTH PHYSICS PERSONNEL	45	0	15		0.945	0.000	0.004	
SUPERVISORY PERSONNEL	23	0	5		0.618	0.000	0.001	
ENGINEERING PERSONNEL	9	1	3		0.157	0.000	0.000	
TOTAL	203	1	53	257	15.505	0.000	0.580	16.085
REFUELING								
MAINTENANCE PERSONNEL	47	0	2		4.919	0.000	0.014	
OPERATING PERSONNEL	60	0	1		2.474	0.000	0.006	
HEALTH PHYSICS PERSONNEL	3	0	0		0.061	0.000	0.000	
SUPERVISORY PERSONNEL	30	3	1		3.127	0.004	0.017	
ENGINEERING PERSONNEL	7	7	2		0.288	0.071	0.075	
TOTAL	147	10	6	163	10.869	0.075	0.112	11.056
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	600 (196)	1 (1)	641 (434)	1242 (631)	41.344	0.000	49.727	91.071
OPERATING PERSONNEL	266 (106)	6 (4)	16 (8)	288 (118)	29.980	0.014	0.873	30.867
HEALTH PHYSICS PERSONNEL	196 (95)	4 (4)	31 (25)	231 (124)	23.459	0.013	0.175	23.647
SUPERVISORY PERSONNEL	468 (229)	33 (29)	124 (72)	625 (330)	13.735	0.081	3.300	17.116
ENGINEERING PERSONNEL	221 (94)	63 (44)	135 (58)	419 (196)	6.449	0.349	4.193	10.991
GRAND TOTALS	1751 (720)	107 (82)	947 (597)	2805 (1399)	114.967	0.457	58.268	173.692

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *THREE MILE ISLAND 2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	24	0	255		0.728	0.000	43.559	
OPERATING PERSONNEL	87	0	3		21.481	0.000	0.585	
HEALTH PHYSICS PERSONNEL	68	0	113		7.335	0.000	18.405	
SUPERVISORY PERSONNEL	55	3	47		1.820	0.211	2.925	
ENGINEERING PERSONNEL	9	0	15		1.303	0.000	7.023	
TOTAL	243	3	433	679	32.667	0.211	72.497	105.375
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	91	1	256		13.080	0.000	9.697	
OPERATING PERSONNEL	87	0	5		11.927	0.000	0.470	
HEALTH PHYSICS PERSONNEL	100	1	126		6.404	0.008	18.568	
SUPERVISORY PERSONNEL	150	37	93		2.444	0.130	1.874	
ENGINEERING PERSONNEL	39	13	87		0.643	0.114	0.708	
TOTAL	467	52	567	1086	34.498	0.252	31.317	66.067
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	6	0	64		0.132	0.000	7.227	
OPERATING PERSONNEL	0	0	1		0.000	0.000	0.069	
HEALTH PHYSICS PERSONNEL	16	0	48		0.277	0.000	1.604	
SUPERVISORY PERSONNEL	8	0	6		0.062	0.000	0.608	
ENGINEERING PERSONNEL	3	0	0		0.002	0.000	2.499	
TOTAL	33	0	119	152	0.473	0.000	12.007	12.480
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	79	1	363		64.414	0.000	456.862	
OPERATING PERSONNEL	106	0	9		104.906	0.000	5.952	
HEALTH PHYSICS PERSONNEL	63	0	101		39.946	0.000	79.004	
SUPERVISORY PERSONNEL	91	12	100		4.259	0.308	65.928	
ENGINEERING PERSONNEL	18	9	127		0.729	0.093	54.015	
TOTAL	357	22	700	1079	214.254	0.401	661.761	876.416
WASTE PROCESSING								
MAINTENANCE PERSONNEL	91	1	161		34.353	0.003	15.831	
OPERATING PERSONNEL	73	0	3		9.132	0.000	0.060	
HEALTH PHYSICS PERSONNEL	69	0	100		9.412	0.000	8.027	
SUPERVISORY PERSONNEL	106	15	52		3.425	0.000	2.392	
ENGINEERING PERSONNEL	25	12	68		0.745	0.013	2.110	
TOTAL	364	28	384	776	57.067	0.016	28.420	85.503
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	291 (105)	3 (2)	1099 (387)	1393 (494)	112.707	0.003	533.176	645.886
OPERATING PERSONNEL	353 (122)	0 (0)	21 (9)	374 (131)	147.446	0.000	7.136	154.582
HEALTH PHYSICS PERSONNEL	316 (105)	1 (1)	488 (131)	805 (237)	63.374	0.008	125.608	188.990
SUPERVISORY PERSONNEL	410 (181)	67 (55)	298 (128)	775 (364)	12.010	0.649	73.727	86.386
ENGINEERING PERSONNEL	94 (43)	34 (25)	297 (165)	425 (233)	3.422	0.220	66.355	69.997
GRAND TOTALS	1464 (556)	105 (83)	2203 (820)	3772 (1459)	338.959	0.880	806.002	1145.841

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *TROJAN TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	9	0	60		3.330	0.020	18.400	
OPERATING PERSONNEL	23	0	0		7.130	0.010	0.020	
HEALTH PHYSICS PERSONNEL	23	0	88		8.820	0.000	36.140	
SUPERVISORY PERSONNEL	6	2	10		3.580	0.680	5.850	
ENGINEERING PERSONNEL	4	5	6		1.080	1.730	3.660	
TOTAL	65	7	164	236	23.940	2.440	64.070	90.450
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	114	4	284		59.860	1.190	152.200	
OPERATING PERSONNEL	0	0	0		0.490	0.000	0.000	
HEALTH PHYSICS PERSONNEL	13	0	61		5.620	0.010	34.340	
SUPERVISORY PERSONNEL	8	4	39		2.060	2.220	14.810	
ENGINEERING PERSONNEL	3	8	30		1.230	1.920	19.800	
TOTAL	138	16	414	568	69.260	5.340	221.150	295.750
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	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	1	0	23		0.790	0.000	9.140	
OPERATING PERSONNEL	0	0	0		0.260	0.000	0.000	
HEALTH PHYSICS PERSONNEL	30	0	9		11.370	0.070	4.300	
SUPERVISORY PERSONNEL	0	0	0		0.070	0.020	0.190	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.110	
TOTAL	31	0	32	63	12.490	0.090	13.740	26.320
REFUELING								
MAINTENANCE PERSONNEL	13	0	47		7.010	0.010	36.980	
OPERATING PERSONNEL	9	0	0		2.520	0.000	0.000	
HEALTH PHYSICS PERSONNEL	16	0	37		6.700	0.020	24.270	
SUPERVISORY PERSONNEL	3	4	6		1.040	0.590	3.880	
ENGINEERING PERSONNEL	2	0	2		0.480	0.130	0.360	
TOTAL	43	4	92	139	17.750	0.750	65.490	83.990
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	137 (101)	4 (3)	414 (290)	555 (394)	70.990	1.220	216.720	288.930
OPERATING PERSONNEL	32 (21)	0 0	0 0	32 (21)	10.400	0.010	0.020	10.430
HEALTH PHYSICS PERSONNEL	82 (42)	0 0	195 (128)	277 (170)	32.510	0.100	99.050	131.660
SUPERVISORY PERSONNEL	17 (9)	10 (5)	55 (38)	82 (52)	6.750	3.510	24.730	34.990
ENGINEERING PERSONNEL	9 (6)	13 (8)	38 (34)	60 (48)	2.790	3.780	23.930	30.500
GRAND TOTALS	277 (179)	27 (16)	702 (490)	1006 (685)	123.440	8.620	364.450	496.510

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *TURKEY POINT 3,4 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	48	2	30		9.315	0.880	12.515	
OPERATING PERSONNEL	21	1	1		17.545	0.850	0.185	
HEALTH PHYSICS PERSONNEL	16	0	38		8.283	0.000	16.350	
SUPERVISORY PERSONNEL	2	0	7		3.815	0.030	5.925	
ENGINEERING PERSONNEL	11	2	27		5.250	1.255	13.305	
TOTAL	98	5	103	206	44.208	3.015	48.280	95.503
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	237	23	297		204.485	19.235	102.595	
OPERATING PERSONNEL	33	1	1		10.485	0.585	0.640	
HEALTH PHYSICS PERSONNEL	27	0	136		10.685	0.000	98.520	
SUPERVISORY PERSONNEL	18	0	22		6.830	0.055	3.025	
ENGINEERING PERSONNEL	18	6	38		7.095	1.595	16.585	
TOTAL	333	30	494	857	239.580	21.470	221.365	482.415
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	4	0	145		6.455	0.010	68.190	
OPERATING PERSONNEL	1	0	1		0.315	0.000	0.195	
HEALTH PHYSICS PERSONNEL	0	0	14		0.310	0.000	6.480	
SUPERVISORY PERSONNEL	4	0	12		1.215	0.175	4.685	
ENGINEERING PERSONNEL	1	3	3		1.250	0.890	2.200	
TOTAL	10	3	175	188	9.545	1.075	81.750	92.370
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	76	3	683		32.715	1.585	652.991	
OPERATING PERSONNEL	5	0	1		1.845	0.080	0.145	
HEALTH PHYSICS PERSONNEL	7	0	86		3.495	0.000	53.765	
SUPERVISORY PERSONNEL	8	1	84		3.625	0.170	50.265	
ENGINEERING PERSONNEL	10	6	75		3.920	3.185	45.355	
TOTAL	106	10	929	1045	45.600	5.020	802.521	853.141
WASTE PROCESSING								
MAINTENANCE PERSONNEL	4	0	4		1.910	0.155	2.590	
OPERATING PERSONNEL	1	0	0		0.370	0.000	0.055	
HEALTH PHYSICS PERSONNEL	9	0	4		5.330	0.000	1.965	
SUPERVISORY PERSONNEL	1	0	0		0.885	0.000	0.050	
ENGINEERING PERSONNEL	2	0	1		0.995	0.005	2.275	
TOTAL	17	0	9	26	9.490	0.160	6.935	16.585
REFUELING								
MAINTENANCE PERSONNEL	79	14	50		58.935	10.455	10.330	
OPERATING PERSONNEL	28	1	0		6.995	0.115	0.080	
HEALTH PHYSICS PERSONNEL	1	0	22		0.235	0.000	6.015	
SUPERVISORY PERSONNEL	9	0	16		3.050	0.000	7.680	
ENGINEERING PERSONNEL	4	2	6		1.860	0.390	2.235	
TOTAL	121	17	94	232	71.075	10.960	26.340	108.375
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	448 (251)	42 (23)	1209 (814)	1699 (1088)	313.815	32.320	849.211	1195.346
OPERATING PERSONNEL	89 (57)	3 (2)	4 (3)	96 (62)	37.555	1.630	1.300	40.485
HEALTH PHYSICS PERSONNEL	60 (28)	0 0	300 (163)	360 (191)	28.338	0.000	183.095	211.433
SUPERVISORY PERSONNEL	42 (19)	1 (1)	141 (87)	184 (107)	19.420	0.430	71.630	91.480
ENGINEERING PERSONNEL	46 (29)	19 (12)	150 (101)	215 (142)	20.370	7.320	81.955	109.645
GRAND TOTALS	685 (384)	65 (38)	1804 (1168)	2554 (1590)	419.498	41.700	1187.191	1648.389

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *VERMONT YANKEE TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	9	0	29		2.128	0.000	10.661	
OPERATING PERSONNEL	38	0	3		13.117	0.000	1.351	
HEALTH PHYSICS PERSONNEL	16	0	9		4.850	0.000	4.274	
SUPERVISORY PERSONNEL	0	0	0		0.166	0.000	0.000	
ENGINEERING PERSONNEL	2	0	1		0.517	0.000	0.274	
TOTAL	65	0	42	107	20.778	0.000	16.560	37.338
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	42	0	269		22.281	0.068	90.764	
OPERATING PERSONNEL	14	0	1		5.624	0.000	0.724	
HEALTH PHYSICS PERSONNEL	14	0	49		5.848	0.000	15.812	
SUPERVISORY PERSONNEL	1	0	0		0.195	0.000	0.030	
ENGINEERING PERSONNEL	3	0	11		0.723	0.000	2.820	
TOTAL	74	0	330	404	34.671	0.068	110.150	144.889
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	0	90		0.470	0.072	45.239	
OPERATING PERSONNEL	0	0	0		0.005	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	2		0.070	0.000	0.992	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	10		0.000	0.000	4.699	
TOTAL	1	0	102	103	0.545	0.072	50.930	51.547
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	12	0	86		4.395	0.008	31.890	
OPERATING PERSONNEL	3	0	0		1.526	0.000	0.062	
HEALTH PHYSICS PERSONNEL	4	0	8		1.544	0.000	2.353	
SUPERVISORY PERSONNEL	0	0	0		0.065	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.302	0.000	0.141	
TOTAL	19	0	94	113	7.832	0.008	34.446	42.286
WASTE PROCESSING								
MAINTENANCE PERSONNEL	4	0	6		1.036	0.000	1.914	
OPERATING PERSONNEL	9	0	0		1.916	0.000	0.050	
HEALTH PHYSICS PERSONNEL	4	0	4		2.755	0.000	1.905	
SUPERVISORY PERSONNEL	0	0	0		0.005	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	17	0	10	27	5.712	0.000	3.869	9.581
REFUELING								
MAINTENANCE PERSONNEL	18	0	28		4.763	0.000	8.201	
OPERATING PERSONNEL	2	0	0		1.071	0.000	0.136	
HEALTH PHYSICS PERSONNEL	3	0	5		0.713	0.000	1.782	
SUPERVISORY PERSONNEL	0	0	0		0.065	0.000	0.005	
ENGINEERING PERSONNEL	3	0	0		0.451	0.000	0.028	
TOTAL	26	0	33	59	7.063	0.000	10.152	17.215
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	86	0	508	594	35.073	0.148	188.669	223.890
OPERATING PERSONNEL	66	0	4	70	23.259	0.000	2.323	25.582
HEALTH PHYSICS PERSONNEL	41	0	77	118	15.780	0.000	27.118	42.898
SUPERVISORY PERSONNEL	1	0	0	1	0.496	0.000	0.035	0.531
ENGINEERING PERSONNEL	8	0	22	30	1.993	0.000	7.962	9.955
GRAND TOTALS	202	0	611	813	76.601	0.148	226.107	302.856

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *WASHINGTON NUCLEAR 2 TYPE: BWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	26	0	47		9.726	0.009	22.591	
OPERATING PERSONNEL	28	0	0		15.058	0.000	0.000	
HEALTH PHYSICS PERSONNEL	22	1	8		14.777	0.153	4.238	
SUPERVISORY PERSONNEL	10	3	2		4.731	1.183	0.223	
ENGINEERING PERSONNEL	7	18	17		3.805	6.398	6.746	
TOTAL	93	22	74	189	48.097	7.743	33.798	89.638
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	74	0	63		46.007	0.036	24.231	
OPERATING PERSONNEL	7	0	0		3.203	0.089	0.000	
HEALTH PHYSICS PERSONNEL	10	0	14		13.506	0.018	10.530	
SUPERVISORY PERSONNEL	1	0	0		0.257	0.027	0.004	
ENGINEERING PERSONNEL	6	5	4		3.138	1.296	1.255	
TOTAL	98	5	81	184	66.111	1.466	36.020	103.597
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	7	0	5		2.245	0.000	2.969	
OPERATING PERSONNEL	0	0	0		0.152	0.009	0.000	
HEALTH PHYSICS PERSONNEL	0	0	1		0.484	0.000	0.210	
SUPERVISORY PERSONNEL	1	0	0		0.112	0.107	0.000	
ENGINEERING PERSONNEL	1	1	2		0.264	0.381	0.631	
TOTAL	9	1	8	18	3.257	0.497	3.810	7.564
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	109	0	87		93.545	0.000	32.060	
OPERATING PERSONNEL	2	1	0		1.129	0.124	0.000	
HEALTH PHYSICS PERSONNEL	6	0	21		7.376	0.000	20.198	
SUPERVISORY PERSONNEL	1	2	1		0.485	0.694	0.891	
ENGINEERING PERSONNEL	9	7	7		3.563	3.008	3.640	
TOTAL	127	10	116	253	106.098	3.826	56.789	166.713
WASTE PROCESSING								
MAINTENANCE PERSONNEL	5	0	0		3.454	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.004	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	0		0.639	0.000	0.367	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.000	3.768	
ENGINEERING PERSONNEL	0	0	0		0.018	0.081	0.000	
TOTAL	6	0	1	7	4.115	0.081	4.135	8.331
REFUELING								
MAINTENANCE PERSONNEL	8	0	0		5.314	0.000	0.009	
OPERATING PERSONNEL	1	0	0		0.603	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	1		0.586	0.000	0.519	
SUPERVISORY PERSONNEL	1	0	0		0.613	0.009	0.018	
ENGINEERING PERSONNEL	1	0	0		0.323	0.125	0.049	
TOTAL	12	0	1	13	7.439	0.134	0.595	8.168
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	229	0	202	431	160.291	0.045	81.860	242.196
OPERATING PERSONNEL	38	1	0	39	20.149	0.222	0.000	20.371
HEALTH PHYSICS PERSONNEL	40	1	45	86	37.368	0.171	36.062	73.601
SUPERVISORY PERSONNEL	14	5	4	23	6.198	2.020	4.904	13.122
ENGINEERING PERSONNEL	24	31	30	85	11.111	11.289	12.321	34.721
GRAND TOTALS	345	38	281	664	235.117	13.747	135.147	384.011

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *WATERFORD 3 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	0	0	1		0.696	0.000	1.501	
OPERATING PERSONNEL	28	0	0		7.521	0.059	1.176	
HEALTH PHYSICS PERSONNEL	16	0	33		7.148	0.000	10.210	
SUPERVISORY PERSONNEL	0	0	1		0.122	0.000	0.135	
ENGINEERING PERSONNEL	0	0	1		0.065	0.005	0.740	
TOTAL	44	0	36	80	15.552	0.064	13.762	29.378
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	37	0	108		11.962	0.000	35.767	
OPERATING PERSONNEL	13	0	2		3.637	0.000	1.436	
HEALTH PHYSICS PERSONNEL	9	0	6		3.053	0.000	2.272	
SUPERVISORY PERSONNEL	1	0	0		0.303	0.000	0.000	
ENGINEERING PERSONNEL	0	0	1		0.107	0.040	0.385	
TOTAL	60	0	117	177	19.062	0.040	39.860	58.962
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	0	12		0.418	0.000	4.269	
OPERATING PERSONNEL	0	0	0		0.055	0.000	0.037	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.038	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.194	
TOTAL	1	0	12	13	0.473	0.000	4.538	5.011
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	1	0	22		0.632	0.000	8.464	
OPERATING PERSONNEL	0	0	0		0.077	0.000	0.212	
HEALTH PHYSICS PERSONNEL	0	0	1		0.082	0.000	0.259	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.115	0.006	0.275	
TOTAL	2	0	23	25	0.906	0.006	9.210	10.122
WASTE PROCESSING								
MAINTENANCE PERSONNEL	2	0	6		0.768	0.000	3.840	
OPERATING PERSONNEL	9	0	26		4.298	0.000	9.346	
HEALTH PHYSICS PERSONNEL	3	0	18		1.858	0.000	3.845	
SUPERVISORY PERSONNEL	1	0	0		0.212	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.125	
TOTAL	15	0	50	65	7.136	0.000	17.156	24.292
REFUELING								
MAINTENANCE PERSONNEL	3	0	9		1.101	0.000	4.056	
OPERATING PERSONNEL	0	0	0		0.044	0.000	0.255	
HEALTH PHYSICS PERSONNEL	0	0	0		0.013	0.000	0.039	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	13		0.015	0.000	4.293	
TOTAL	3	0	22	25	1.173	0.000	8.643	9.816
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	44 (42)	0	0	158 (179)	202 (221)	15.577	0.000	57.897	73.474
OPERATING PERSONNEL	50 (46)	0	0	28 (33)	78 (79)	15.632	0.059	12.462	28.153
HEALTH PHYSICS PERSONNEL	28 (18)	0	0	58 (51)	86 (69)	12.154	0.000	16.663	28.817
SUPERVISORY PERSONNEL	2 (1)	0	0	1 (1)	3 (2)	0.637	0.000	0.135	0.772
ENGINEERING PERSONNEL	1 (1)	0	0	15 (17)	16 (18)	0.302	0.051	6.012	6.365
GRAND TOTALS	125 (108)	0	0	260 (281)	385 (389)	44.302	0.110	93.169	137.581

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *WOLF CREEK 1 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	0	0	0		1.417	0.000	0.888	
OPERATING PERSONNEL	9	0	1		3.038	0.000	0.300	
HEALTH PHYSICS PERSONNEL	16	2	37		4.844	0.321	9.347	
SUPERVISORY PERSONNEL	1	0	2		0.880	0.144	0.444	
ENGINEERING PERSONNEL	3	1	1		0.765	0.664	0.413	
TOTAL	29	3	41	73	10.944	1.129	11.392	23.465
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	16	0	6		5.396	0.000	4.497	
OPERATING PERSONNEL	1	0	0		0.168	0.000	0.042	
HEALTH PHYSICS PERSONNEL	0	0	0		0.761	0.009	0.218	
SUPERVISORY PERSONNEL	0	0	0		0.551	0.021	0.183	
ENGINEERING PERSONNEL	0	0	0		0.185	0.014	0.241	
TOTAL	17	0	6	23	7.061	0.044	5.181	12.286
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	48		0.741	0.000	18.629	
OPERATING PERSONNEL	0	0	1		0.031	0.000	0.249	
HEALTH PHYSICS PERSONNEL	0	0	0		0.178	0.057	0.009	
SUPERVISORY PERSONNEL	2	0	3		0.490	0.000	0.869	
ENGINEERING PERSONNEL	0	0	10		0.120	0.000	4.725	
TOTAL	2	0	62	64	1.560	0.057	24.481	26.098
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	37	0	50		9.974	0.000	17.472	
OPERATING PERSONNEL	1	0	0		0.339	0.000	0.078	
HEALTH PHYSICS PERSONNEL	0	0	0		0.836	0.022	0.071	
SUPERVISORY PERSONNEL	4	0	1		1.456	0.019	0.453	
ENGINEERING PERSONNEL	2	0	5		0.663	0.004	1.962	
TOTAL	44	0	56	100	13.268	0.045	20.036	33.349
WASTE PROCESSING								
MAINTENANCE PERSONNEL	3	0	0		1.284	0.000	0.184	
OPERATING PERSONNEL	0	0	1		0.229	0.000	0.381	
HEALTH PHYSICS PERSONNEL	11	0	5		2.874	0.004	1.397	
SUPERVISORY PERSONNEL	0	0	0		0.098	0.000	0.003	
ENGINEERING PERSONNEL	0	0	0		0.002	0.068	0.005	
TOTAL	14	0	6	20	4.487	0.072	1.970	6.529
REFUELING								
MAINTENANCE PERSONNEL	31	0	21		7.925	0.000	8.379	
OPERATING PERSONNEL	7	0	1		1.423	0.000	0.176	
HEALTH PHYSICS PERSONNEL	1	0	1		0.204	0.000	0.286	
SUPERVISORY PERSONNEL	6	0	1		1.447	0.050	0.349	
ENGINEERING PERSONNEL	2	0	6		0.475	0.041	1.598	
TOTAL	47	0	30	77	11.474	0.091	10.788	22.353
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	87 (75)	0	0	125 (114)	212 (189)	26.737	0.000	50.049	76.786
OPERATING PERSONNEL	18 (16)	0	0	4 (3)	22 (19)	5.228	0.000	1.226	6.454
HEALTH PHYSICS PERSONNEL	28 (28)	2 (2)		43 (43)	73 (73)	9.697	0.413	11.328	21.438
SUPERVISORY PERSONNEL	13 (16)	0	0	7 (6)	20 (22)	4.922	0.234	2.301	7.457
ENGINEERING PERSONNEL	7 (10)	1 (1)		22 (24)	30 (35)	2.210	0.791	8.944	11.945
GRAND TOTALS	153 (145)	3 (3)		201 (190)	357 (338)	48.794	1.438	73.848	124.080

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

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *YANKEE-ROWE TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	15	0	10		3.951	0.025	6.065	
OPERATING PERSONNEL	33	0	1		10.085	0.150	2.081	
HEALTH PHYSICS PERSONNEL	12	0	16		4.449	0.019	4.275	
SUPERVISORY PERSONNEL	1	0	0		0.814	0.011	0.007	
ENGINEERING PERSONNEL	7	1	0		1.666	0.997	0.390	
TOTAL	68	1	27	96	20.965	1.202	12.818	34.985
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	20	0	61		7.871	0.000	37.354	
OPERATING PERSONNEL	10	0	1		3.564	0.000	0.258	
HEALTH PHYSICS PERSONNEL	12	0	23		6.986	0.041	17.791	
SUPERVISORY PERSONNEL	6	0	0		3.348	0.000	0.000	
ENGINEERING PERSONNEL	10	5	1		6.300	0.955	0.285	
TOTAL	58	5	86	149	28.069	0.996	55.688	84.753
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	5	0	25		1.160	0.000	10.032	
OPERATING PERSONNEL	1	0	0		1.293	0.000	0.008	
HEALTH PHYSICS PERSONNEL	2	0	0		0.777	0.000	0.153	
SUPERVISORY PERSONNEL	0	0	0		0.074	0.000	0.000	
ENGINEERING PERSONNEL	1	2	2		0.503	0.867	0.403	
TOTAL	9	2	27	38	3.807	0.867	10.596	15.270
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	1	0	21		0.574	0.000	6.073	
OPERATING PERSONNEL	2	0	0		0.914	0.000	0.011	
HEALTH PHYSICS PERSONNEL	0	0	0		0.514	0.000	0.117	
SUPERVISORY PERSONNEL	1	0	0		0.232	0.000	0.000	
ENGINEERING PERSONNEL	2	4	1		0.803	1.440	0.216	
TOTAL	6	4	22	32	3.037	1.440	6.417	10.894
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	0		0.524	0.000	0.408	
OPERATING PERSONNEL	8	0	0		2.287	0.000	0.001	
HEALTH PHYSICS PERSONNEL	3	0	25		2.608	0.000	11.093	
SUPERVISORY PERSONNEL	0	0	0		0.125	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.809	0.198	0.000	
TOTAL	12	0	25	37	6.353	0.198	11.502	18.053
REFUELING								
MAINTENANCE PERSONNEL	23	0	44		7.349	0.000	14.454	
OPERATING PERSONNEL	13	0	0		3.841	0.000	0.588	
HEALTH PHYSICS PERSONNEL	11	0	17		3.202	0.000	5.762	
SUPERVISORY PERSONNEL	2	0	0		0.659	0.000	0.016	
ENGINEERING PERSONNEL	6	1	0		2.476	0.760	0.111	
TOTAL	55	1	61	117	17.527	0.760	20.931	39.218
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	64	0	161	225	21.429	0.025	74.386	95.840
OPERATING PERSONNEL	67	0	2	69	21.984	0.150	2.947	25.081
HEALTH PHYSICS PERSONNEL	40	0	81	121	18.536	0.060	39.191	57.787
SUPERVISORY PERSONNEL	10	0	0	10	5.252	0.011	0.023	5.286
ENGINEERING PERSONNEL	27	13	4	44	12.557	5.217	1.405	19.179
GRAND TOTALS	208	13	248	469	79.758	5.463	117.952	203.173

*Workers may be counted in more than one category.

NUMBER OF PERSONNEL AND PERSON-REM BY WORK AND JOB FUNCTION 1987

PLANT: *ZION 1,2 TYPE: PWR

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL (>100 mREM) STATION	UTILITY	CONTRACT	TOTAL	TOTAL PERSON-REM STATION	UTILITY	CONTRACT	TOTAL
REACTOR OPS & SURV								
MAINTENANCE PERSONNEL	6	1	6		4.860	0.080	4.630	
OPERATING PERSONNEL	23	0	8		14.100	0.000	0.380	
HEALTH PHYSICS PERSONNEL	3	0	3		2.700	0.000	2.210	
SUPERVISORY PERSONNEL	12	0	0		6.120	0.000	0.000	
ENGINEERING PERSONNEL	4	2	1		1.990	0.060	0.450	
TOTAL	48	3	18	69	29.770	0.140	7.670	37.580
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	88	1	169		69.310	0.220	131.800	
OPERATING PERSONNEL	9	0	1		3.410	0.000	0.040	
HEALTH PHYSICS PERSONNEL	27	0	65		20.360	0.000	60.150	
SUPERVISORY PERSONNEL	23	0	0		10.560	0.000	0.000	
ENGINEERING PERSONNEL	9	10	68		3.960	0.430	33.570	
TOTAL	156	11	303	470	107.600	0.650	225.560	333.810
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	1	120		0.210	0.010	92.970	
OPERATING PERSONNEL	1	0	1		0.150	0.000	0.010	
HEALTH PHYSICS PERSONNEL	1	0	10		0.170	0.000	9.440	
SUPERVISORY PERSONNEL	1	0	0		0.080	0.000	0.000	
ENGINEERING PERSONNEL	13	2	33		5.440	0.100	15.810	
TOTAL	17	3	164	184	6.050	0.110	118.230	124.390
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	9	9	73		6.910	1.740	56.710	
OPERATING PERSONNEL	4	0	1		1.720	0.000	0.010	
HEALTH PHYSICS PERSONNEL	3	0	1		2.530	0.000	0.710	
SUPERVISORY PERSONNEL	7	0	0		4.100	0.000	0.000	
ENGINEERING PERSONNEL	7	6	14		3.300	0.250	6.860	
TOTAL	30	15	89	134	18.560	1.990	64.290	84.840
WASTE PROCESSING								
MAINTENANCE PERSONNEL	1	0	9		0.060	0.000	7.310	
OPERATING PERSONNEL	1	0	2		0.100	0.000	0.090	
HEALTH PHYSICS PERSONNEL	1	0	1		0.700	0.000	0.100	
SUPERVISORY PERSONNEL	1	0	0		0.520	0.000	0.000	
ENGINEERING PERSONNEL	1	0	1		0.100	0.000	0.030	
TOTAL	5	0	13	18	1.480	0.000	7.530	9.010
REFUELING								
MAINTENANCE PERSONNEL	43	0	2		33.990	0.000	1.510	
OPERATING PERSONNEL	9	0	0		3.660	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	2		2.830	0.000	1.850	
SUPERVISORY PERSONNEL	14	0	0		7.890	0.000	0.000	
ENGINEERING PERSONNEL	8	1	0		3.750	0.010	0.000	
TOTAL	78	1	4	83	52.120	0.010	3.360	55.490
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	148 (148)	12 (12)	379 (379)	539 (539)	115.340	2.050	294.930	412.320
OPERATING PERSONNEL	47 (60)	0 0	13 (13)	60 (73)	23.140	0.000	0.530	23.670
HEALTH PHYSICS PERSONNEL	39 (39)	0 0	82 (82)	121 (121)	29.290	0.000	74.460	103.750
SUPERVISORY PERSONNEL	58 (55)	0 0	0 0	58 (55)	29.270	0.000	0.000	29.270
ENGINEERING PERSONNEL	42 (42)	21 (21)	117 (117)	180 (180)	18.540	0.850	56.720	76.110
GRAND TOTALS	334 (344)	33 (33)	591 (591)	958 (968)	215.580	2.900	426.640	645.120

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

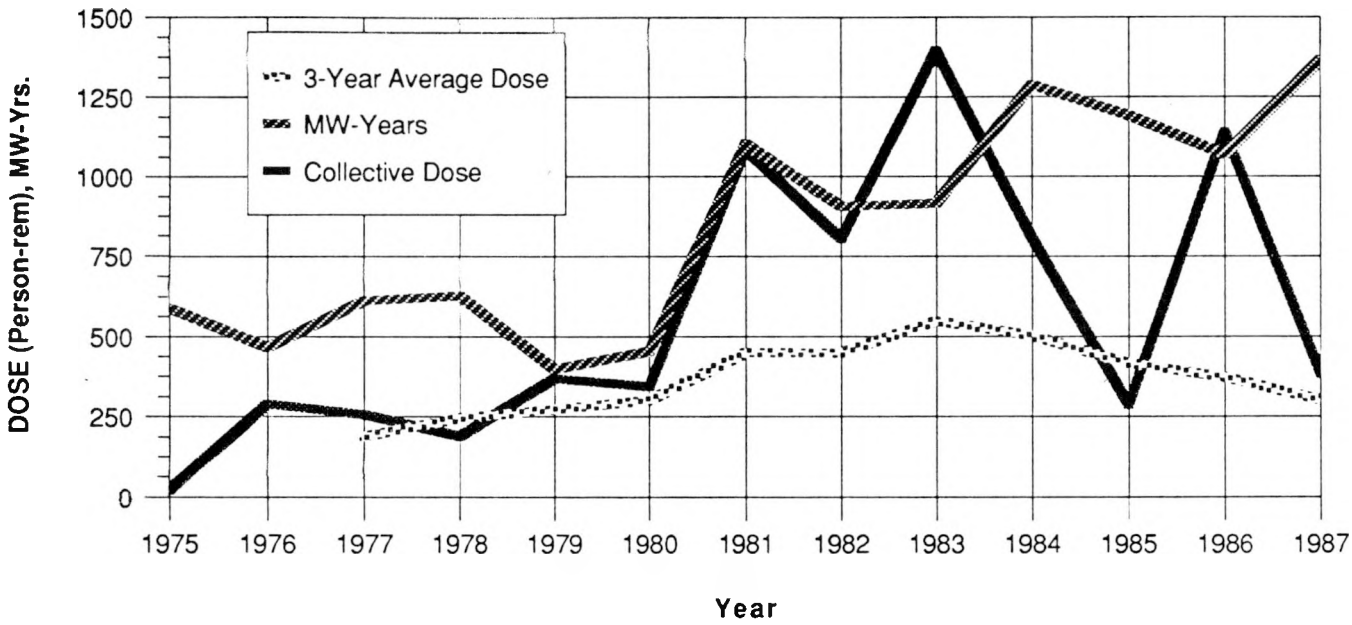
APPENDIX E
Graphical Respresentation of Collective Dose Trends by Year and Job Function for Each Site
1987

APPENDIX E

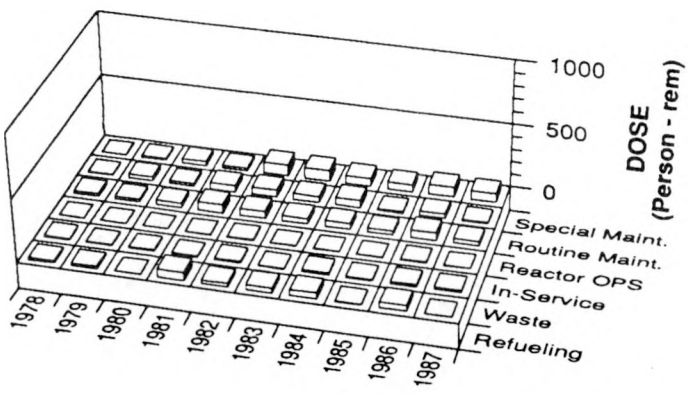
ARKANSAS 1,2

PWR

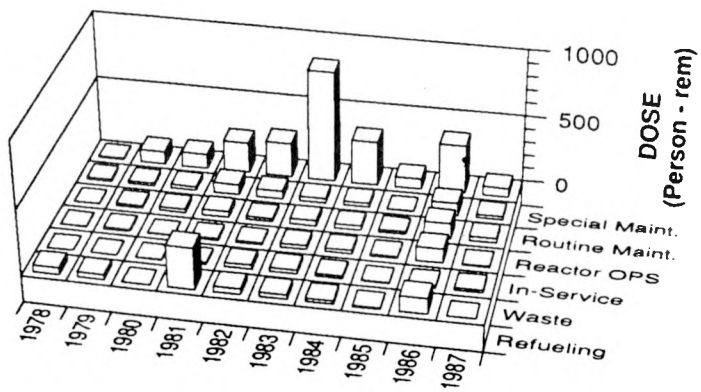
Dose-Performance Indicators



Breakdown By Job Function



Plant



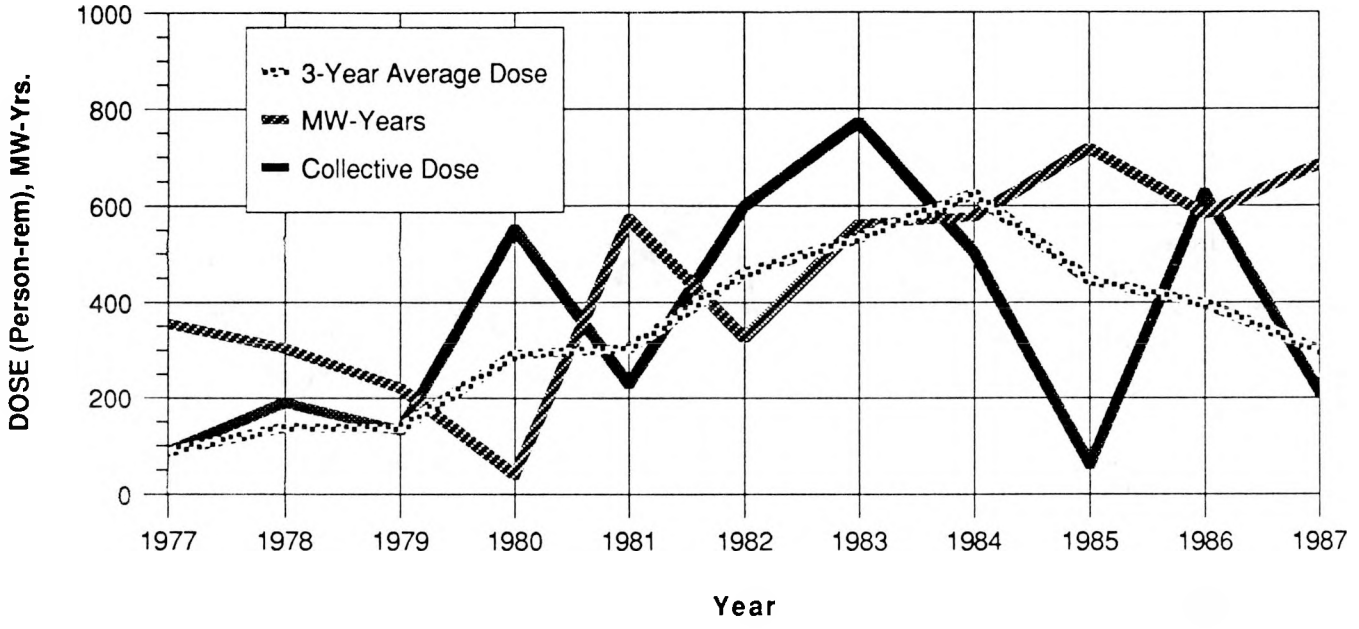
Contract

APPENDIX E (continued)

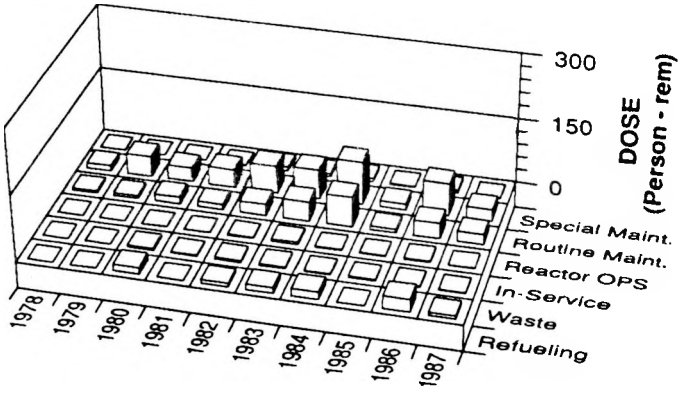
BEAVER VALLEY

PWR

Dose-Performance Indicators



Breakdown By Job Function



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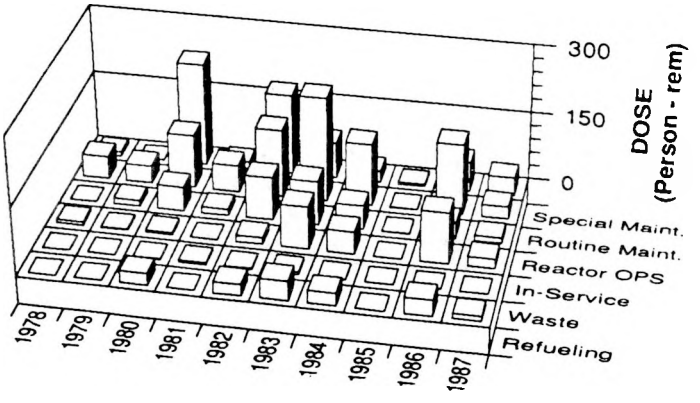


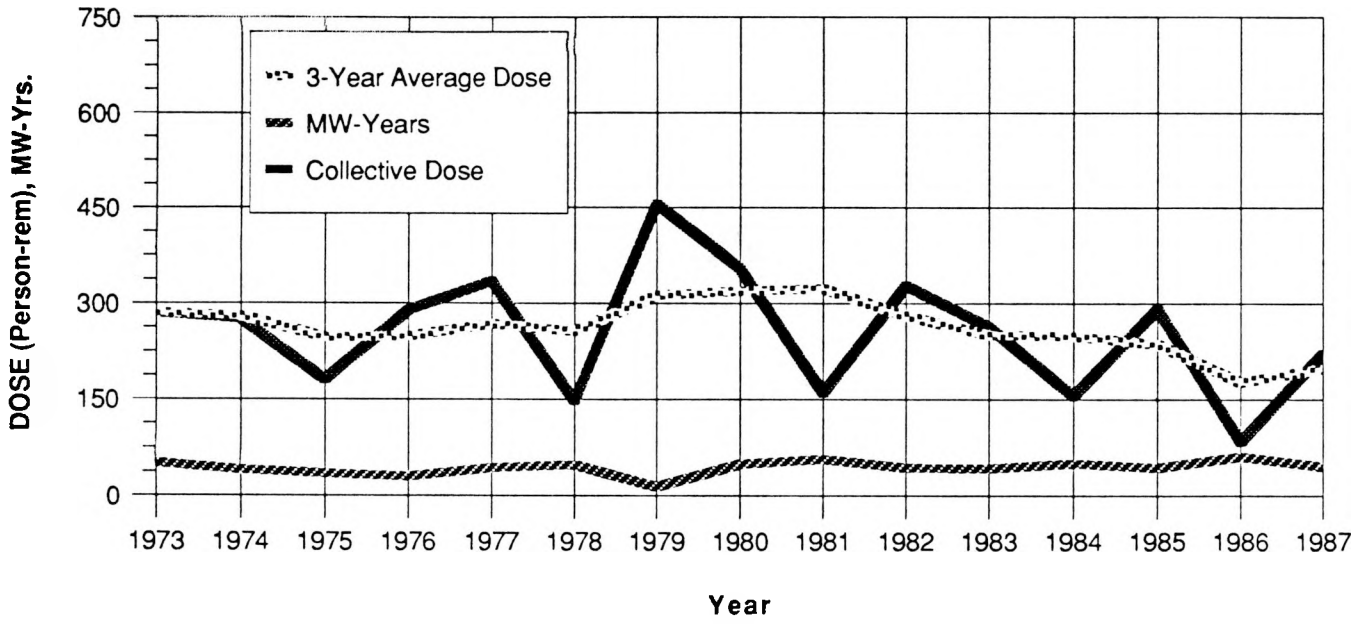
Contract

APPENDIX E (continued)

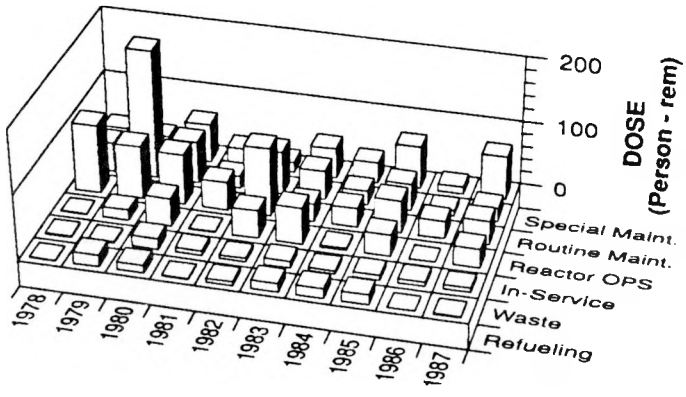
BIG ROCK POINT

BWR

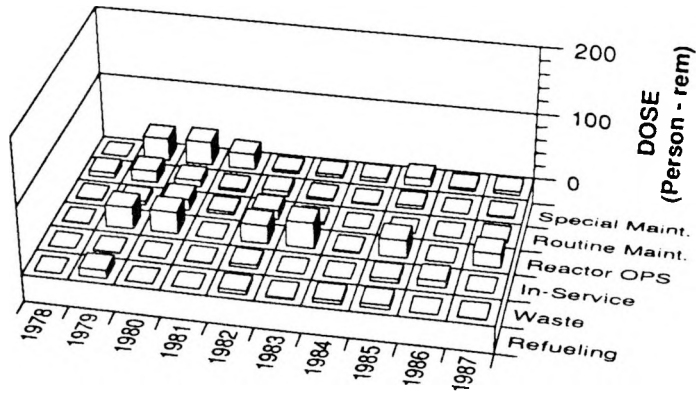
Dose-Performance Indicators



Breakdown By Job Function



Plant



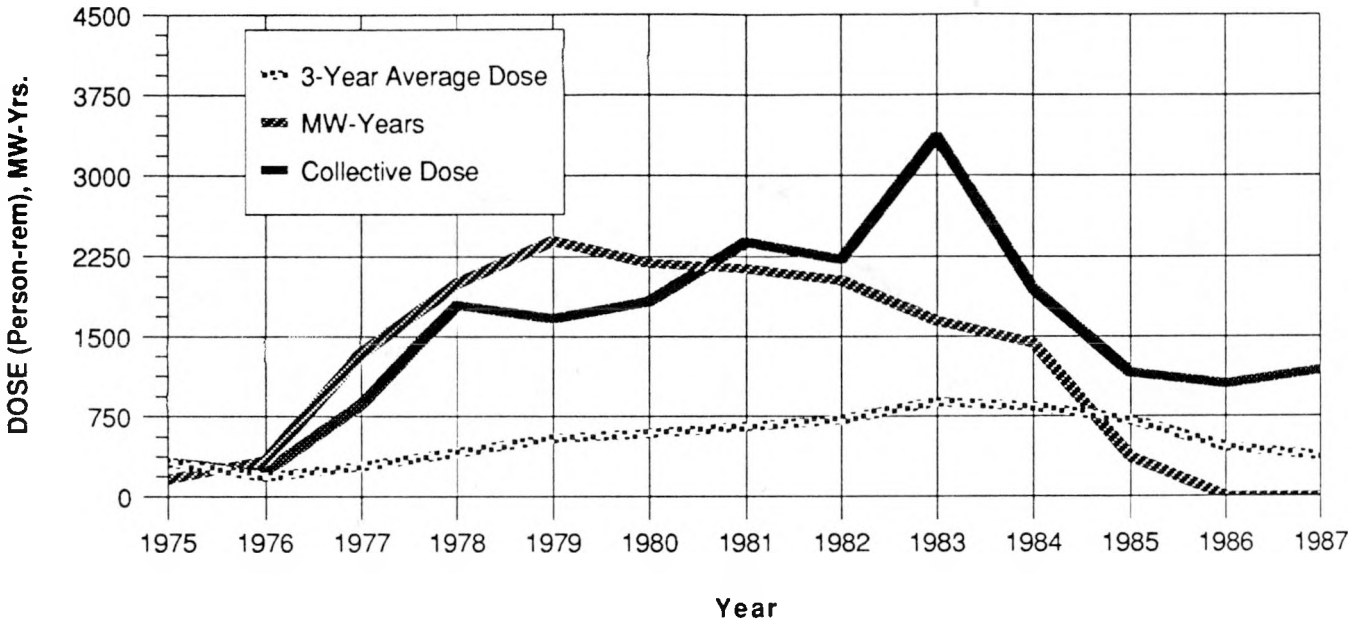
Contract

APPENDIX E (continued)

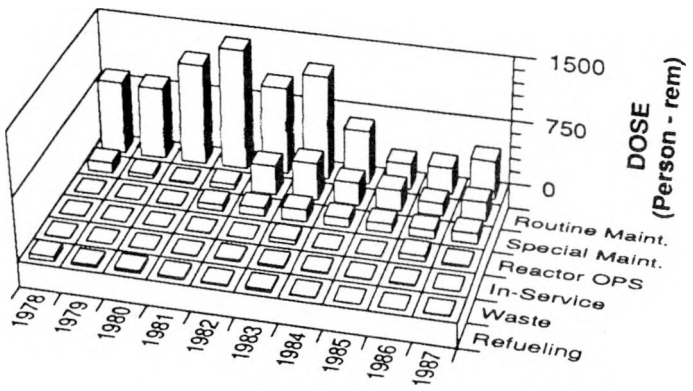
BROWNS FERRY 1,2,3

BWR

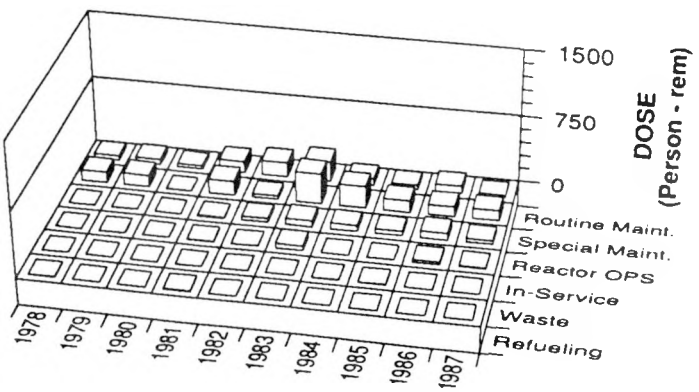
Dose-Performance Indicators



Breakdown By Job Function



Plant



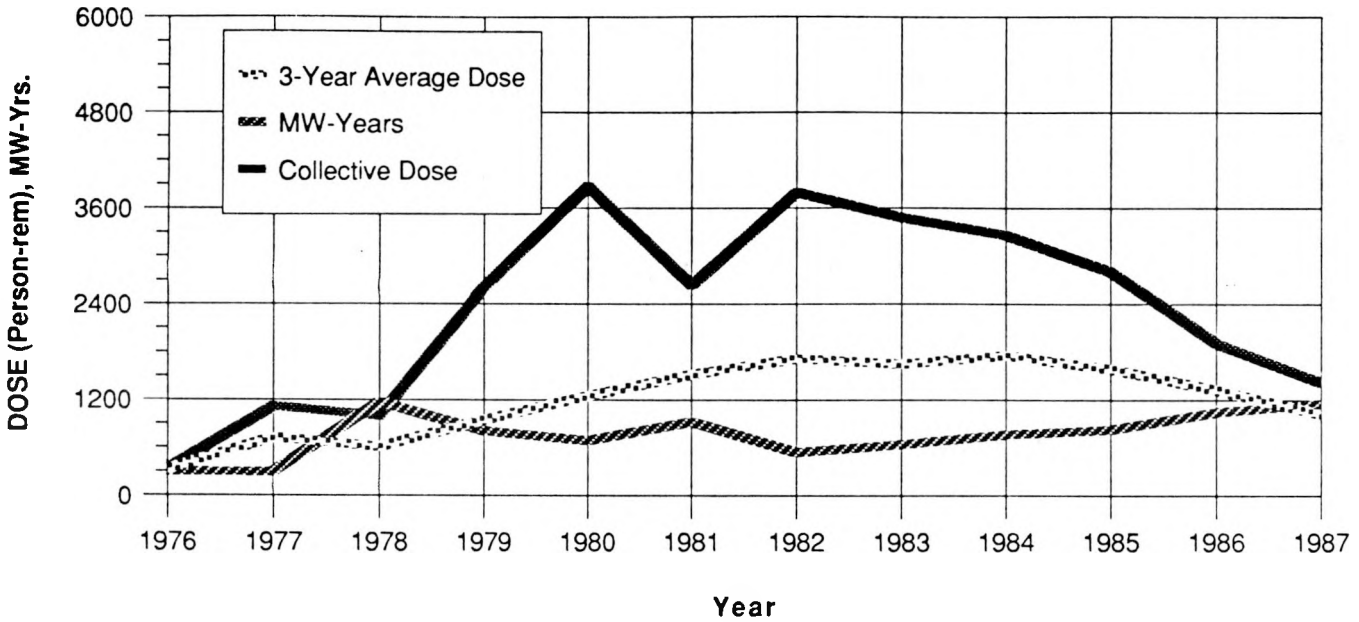
Contract

APPENDIX E (continued)

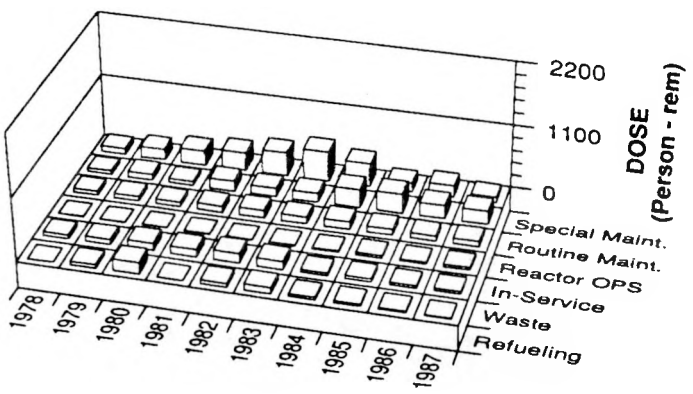
BRUNSWICK 1,2

BWR

Dose-Performance Indicators



Breakdown By Job Function



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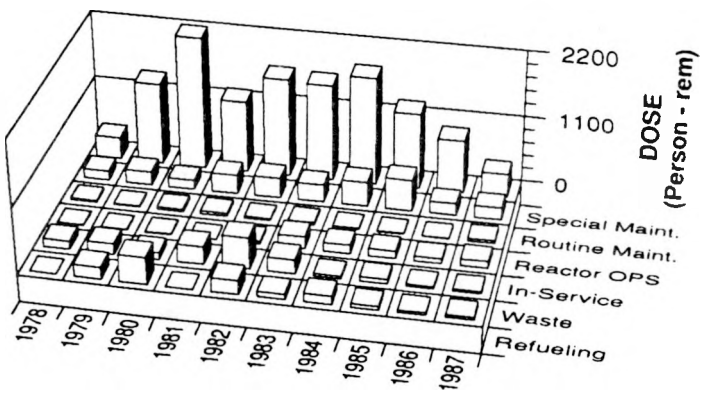


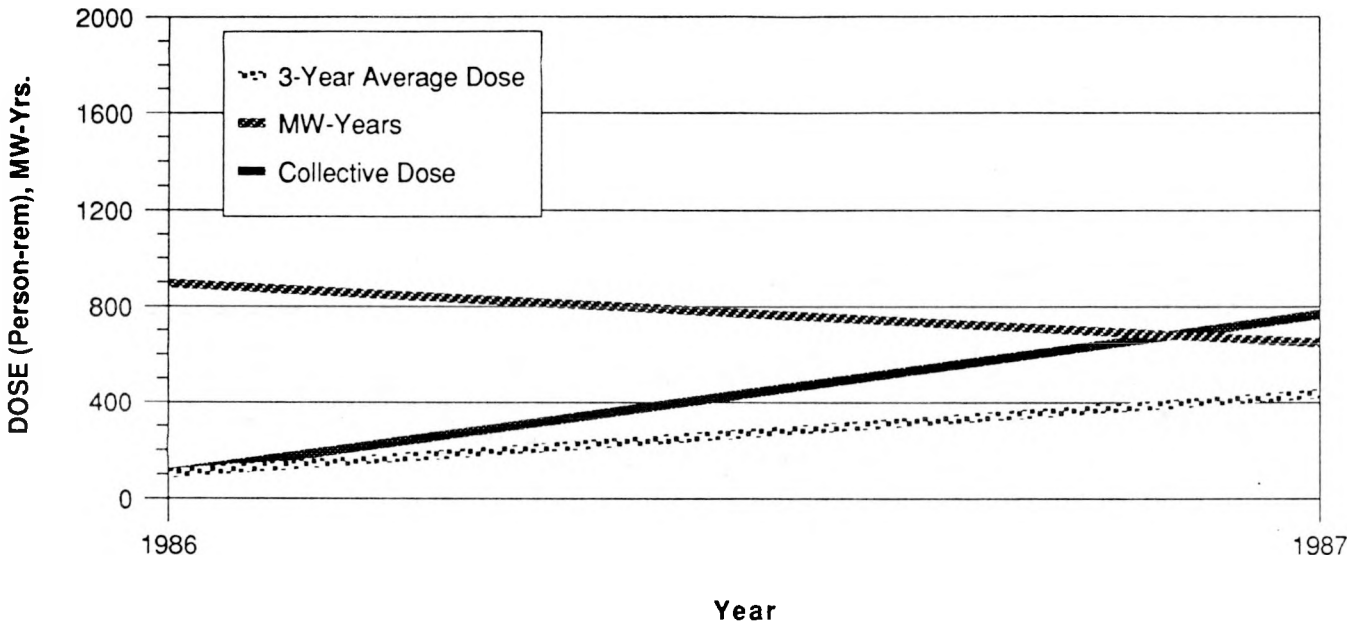
Contract

APPENDIX E (continued)

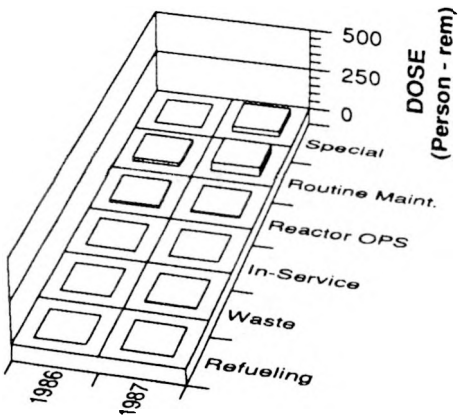
BYRON

PWR

Dose-Performance Indicators



Breakdown By Job Function



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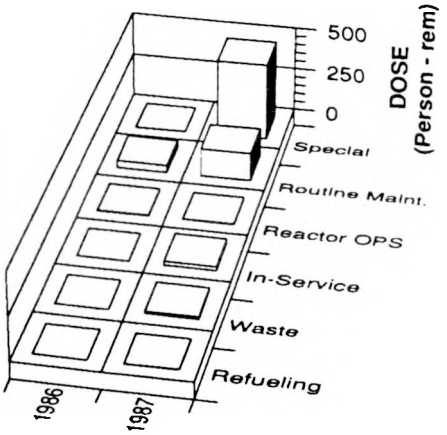


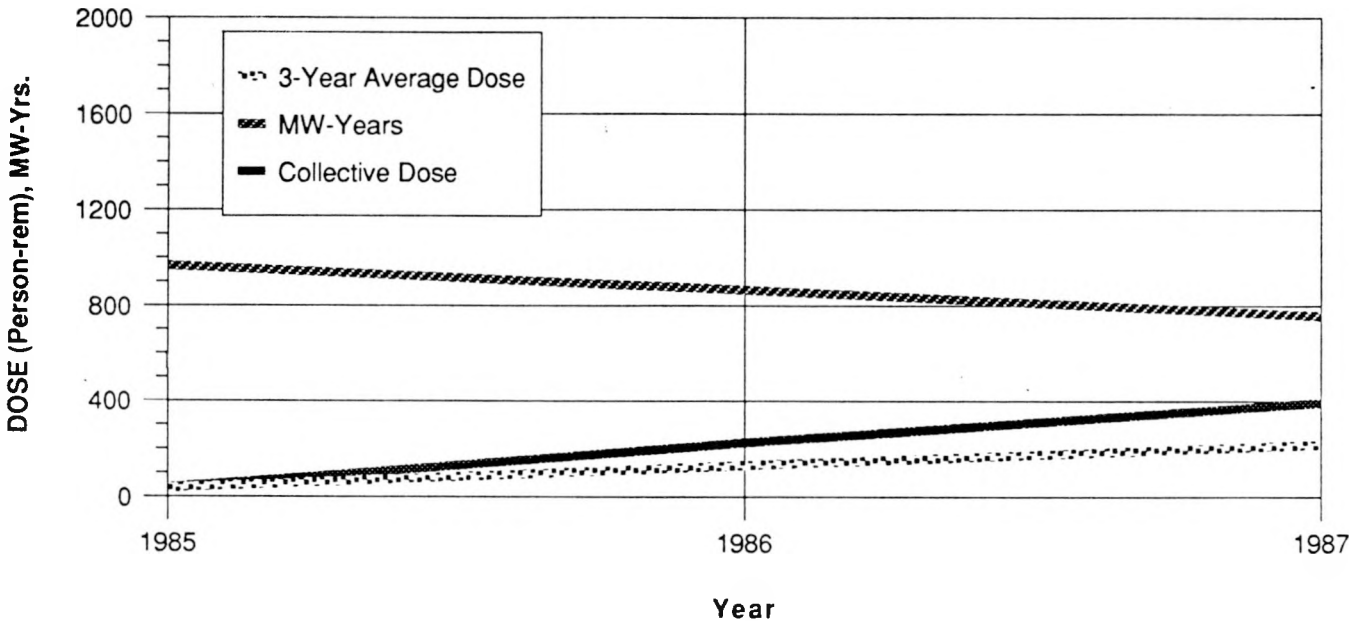
Contract

APPENDIX E (continued)

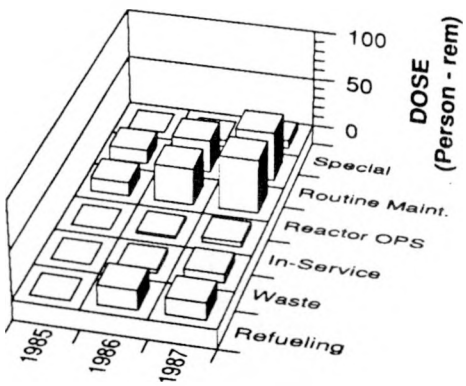
CALLAWAY

PWR

Dose-Performance Indicators



Breakdown By Job Function



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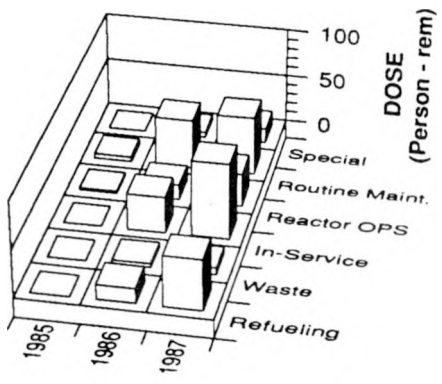


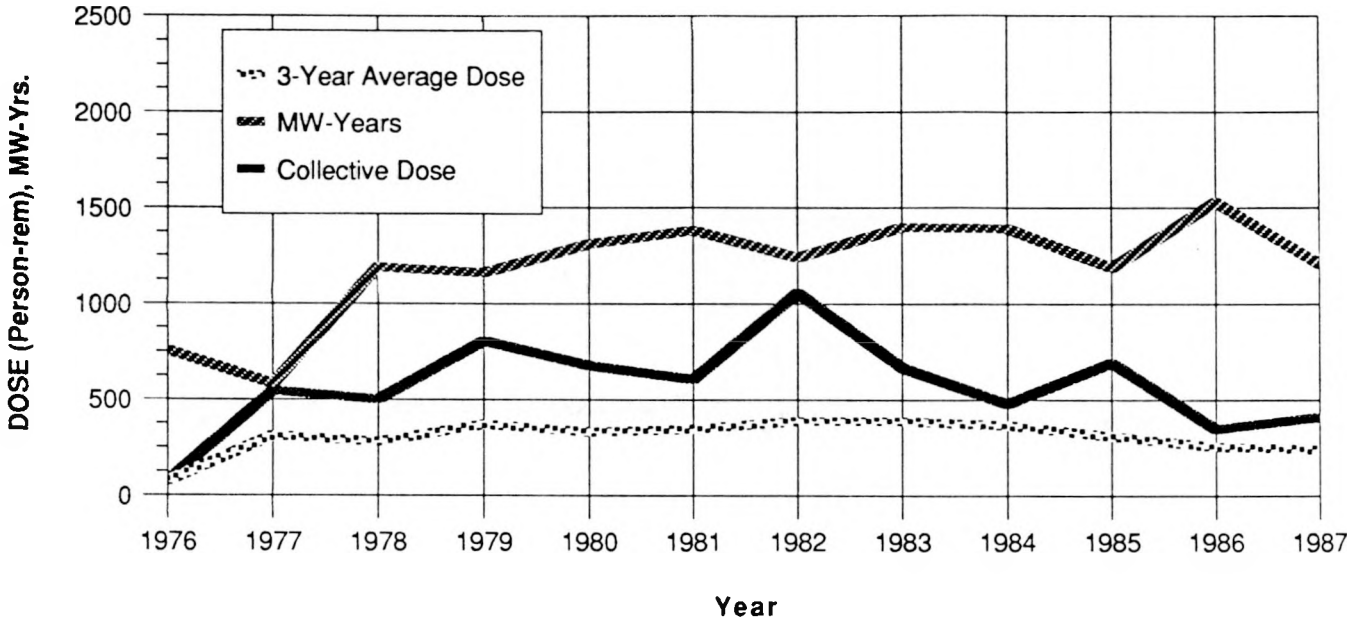
Contract

APPENDIX E (continued)

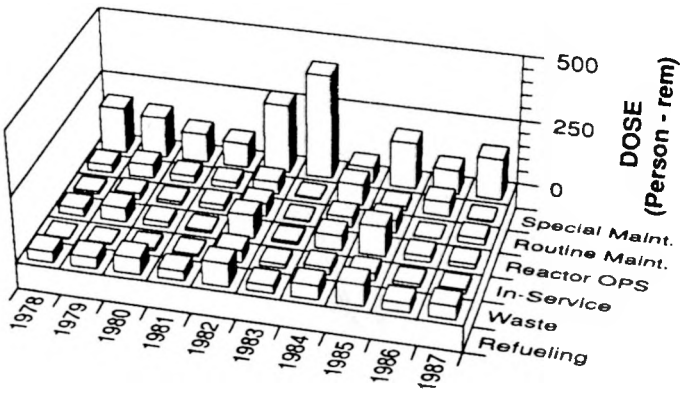
CALVERT CLIFFS 1,2

PWR

Dose-Performance Indicators



Breakdown By Job Function



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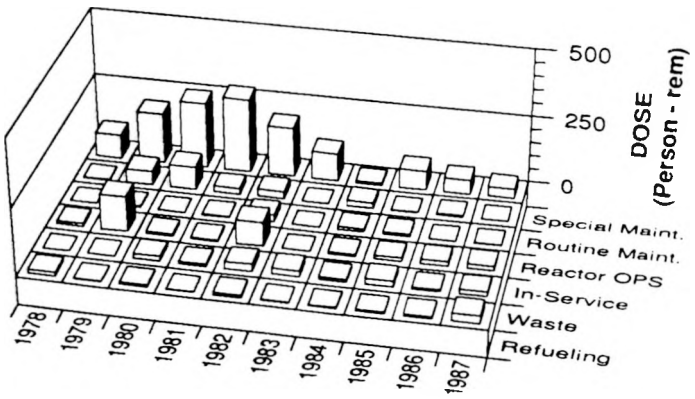


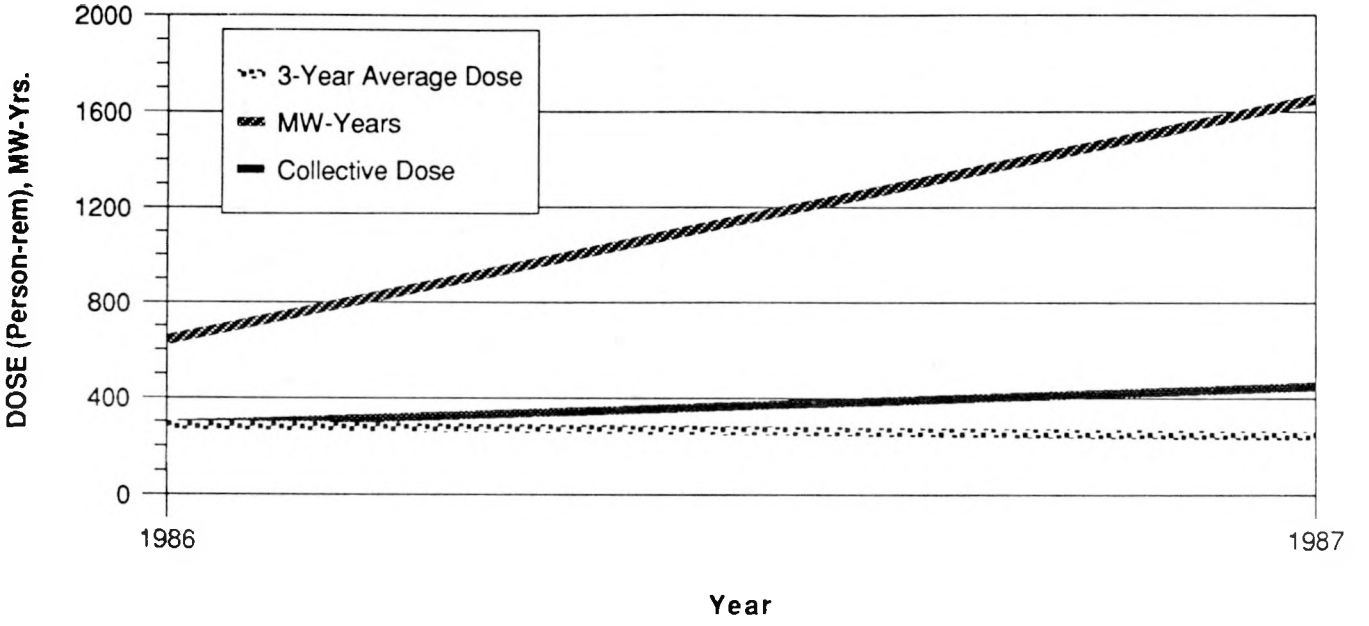
Contract

APPENDIX E (continued)

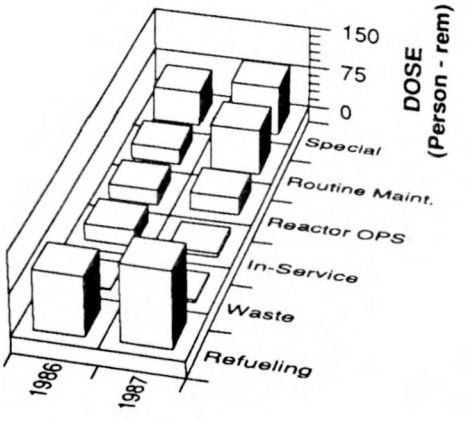
CATAWBA 1,2

PWR

Dose-Performance Indicators



Breakdown By Job Function



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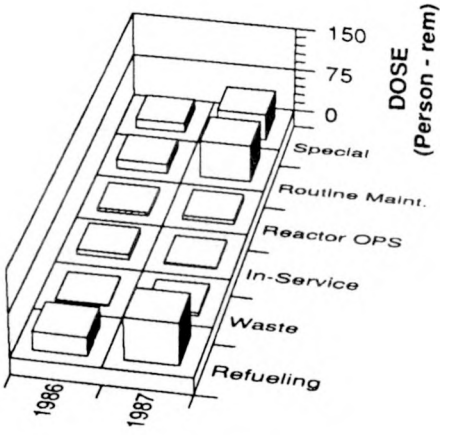


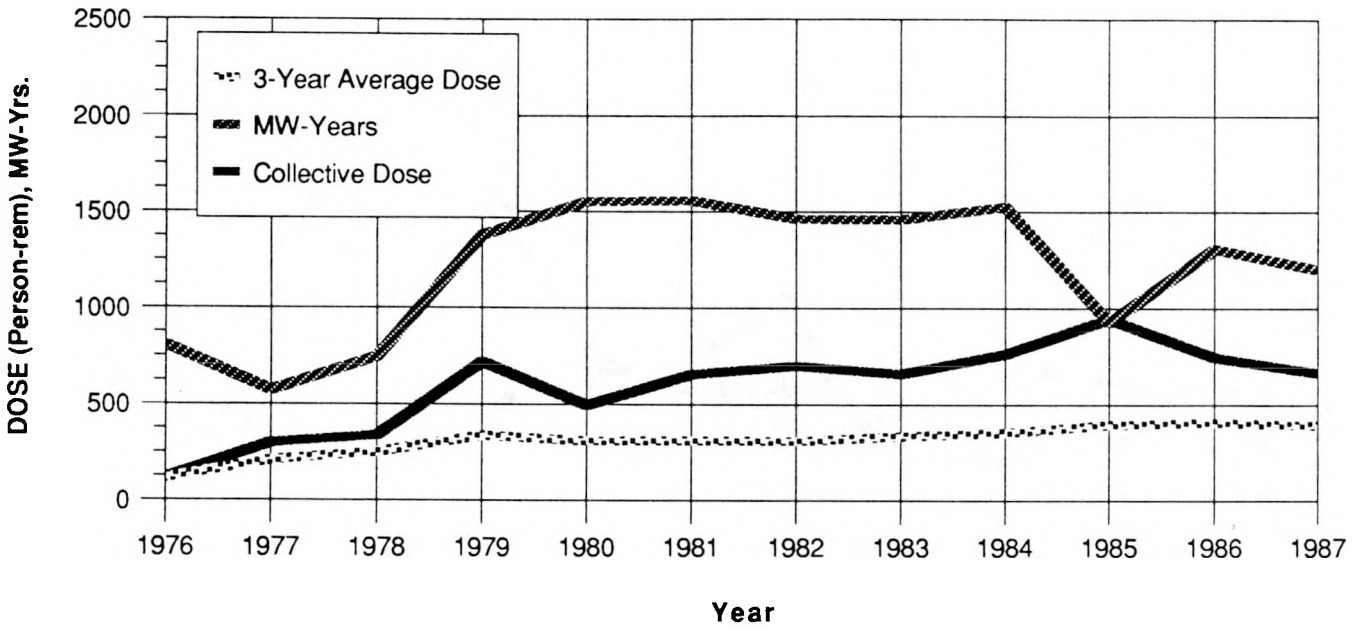
Contract

APPENDIX E (continued)

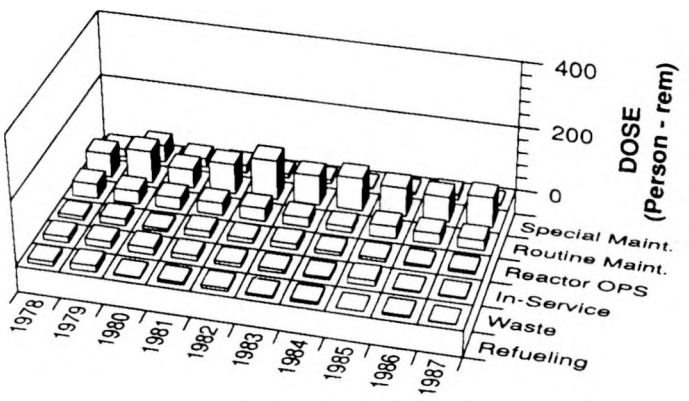
COOK 1,2

PWR

Dose-Performance Indicators



Breakdown By Job Function



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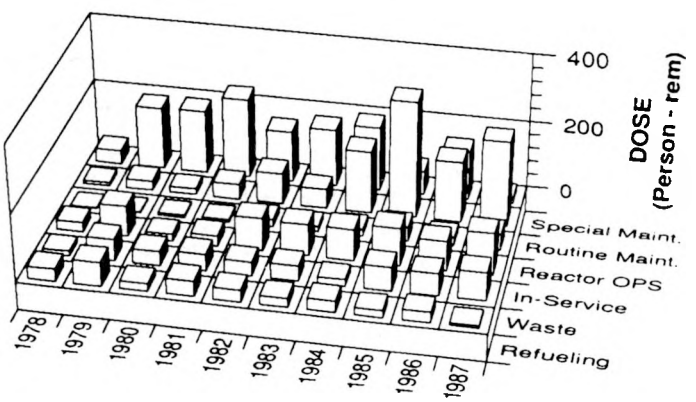


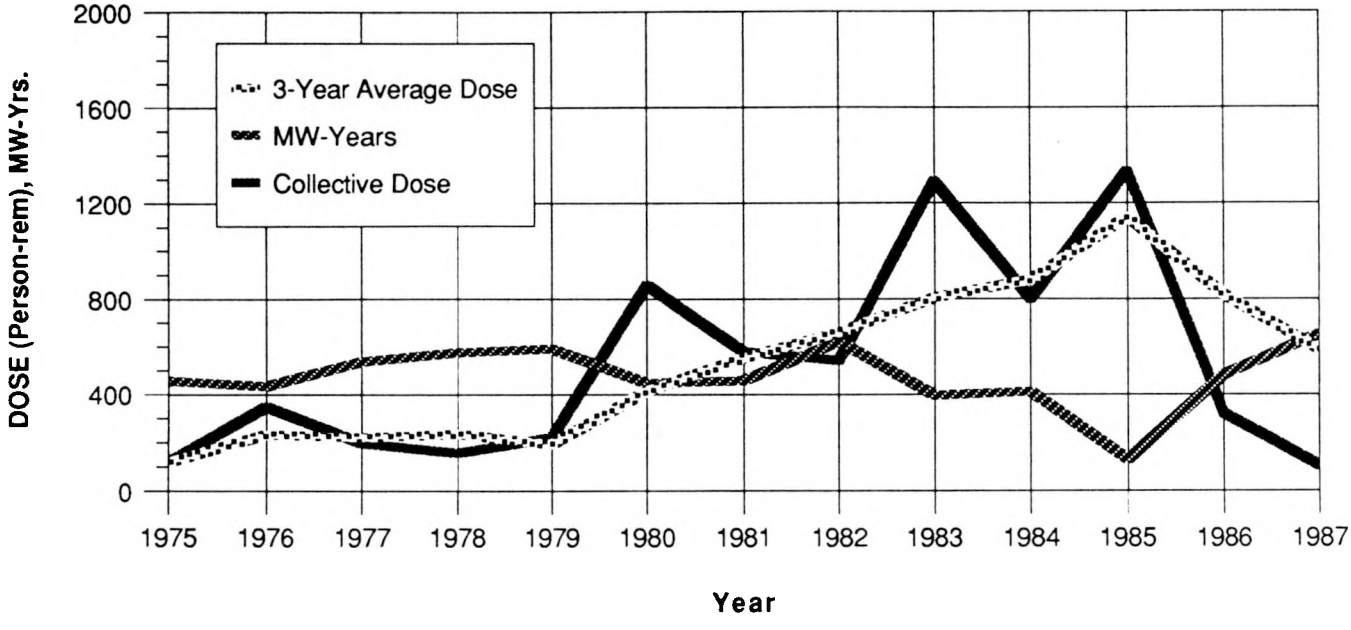
Contract

APPENDIX E (continued)

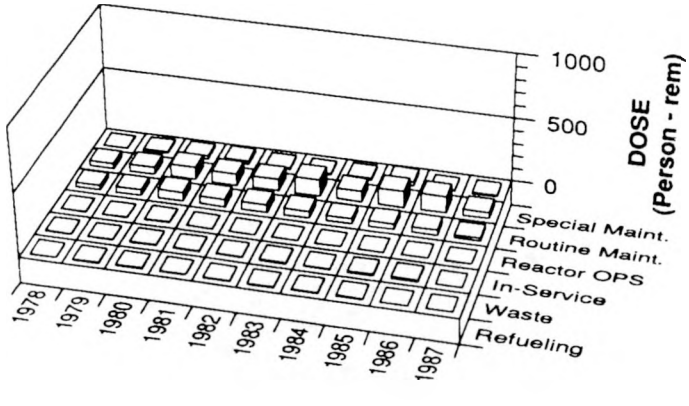
COOPER STATION

BWR

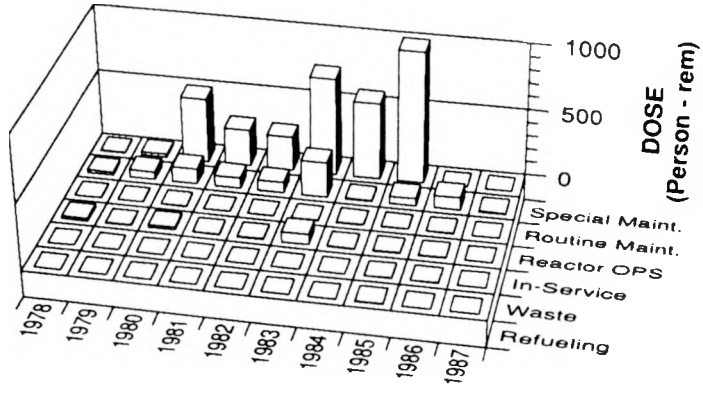
Dose-Performance Indicators



Breakdown By Job Function



Plant



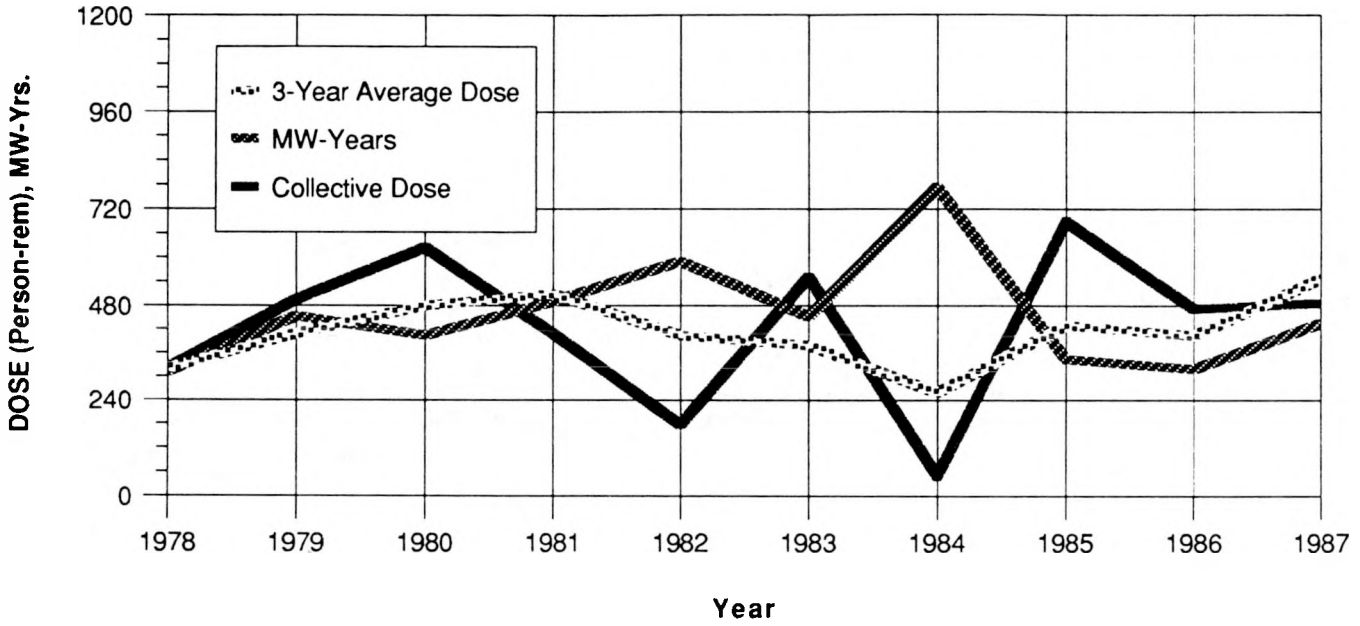
Contract

APPENDIX E (continued)

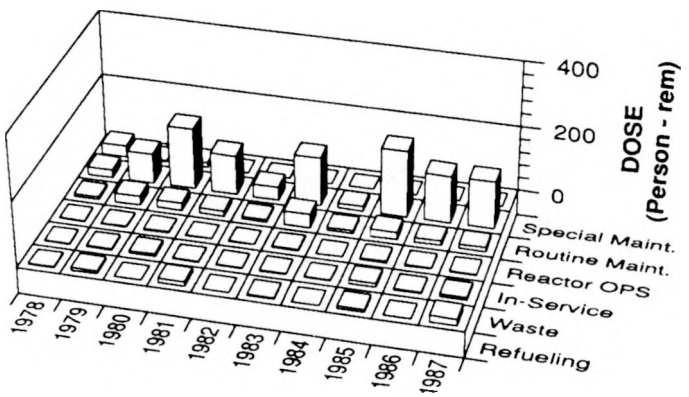
CRYSTAL RIVER 3

PWR

Dose-Performance Indicators



Breakdown By Job Function



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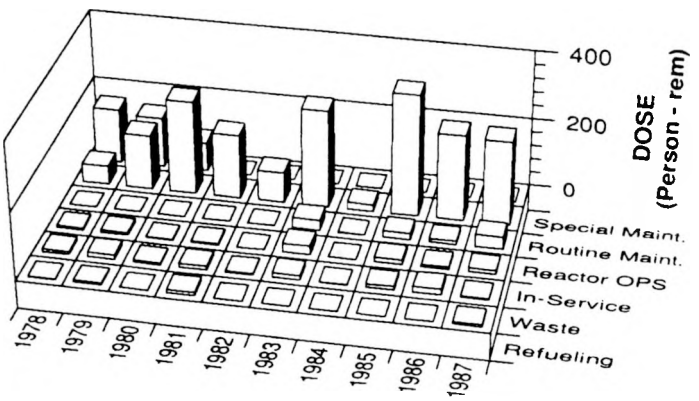


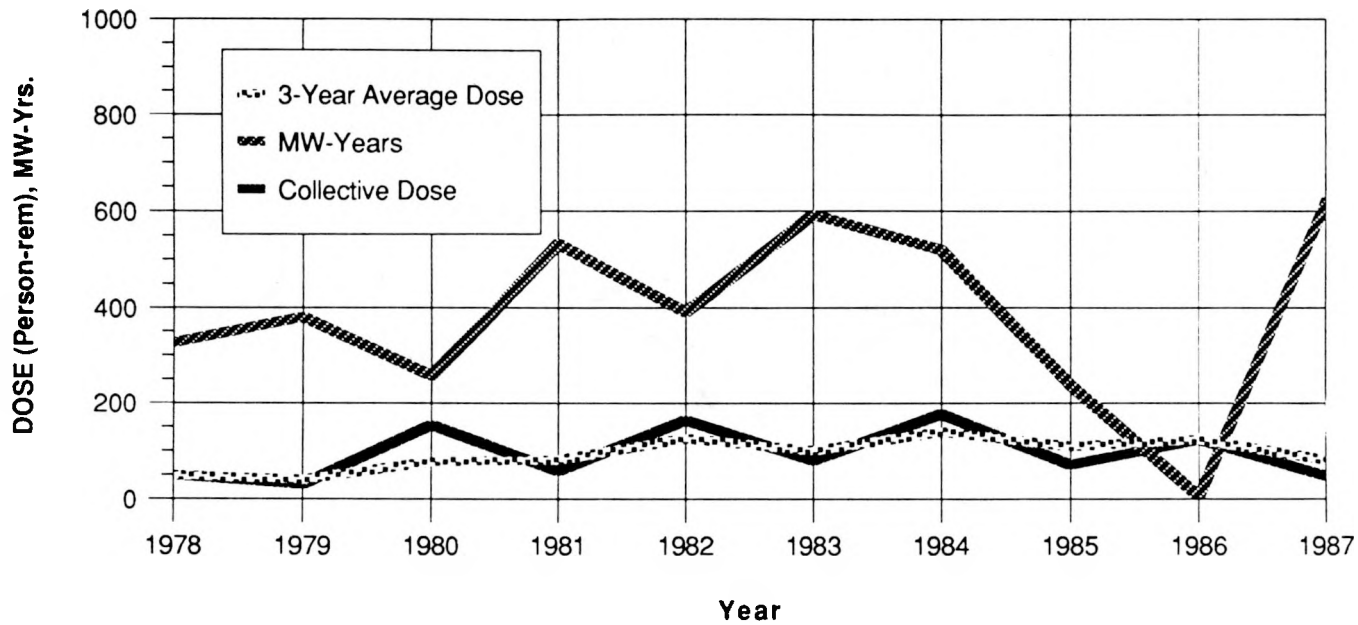
Contract

APPENDIX E (continued)

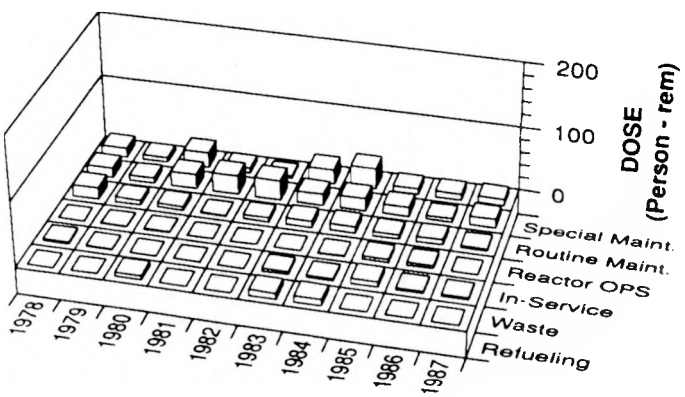
DAVIS-BESSE

PWR

Dose-Performance Indicators



Breakdown By Job Function



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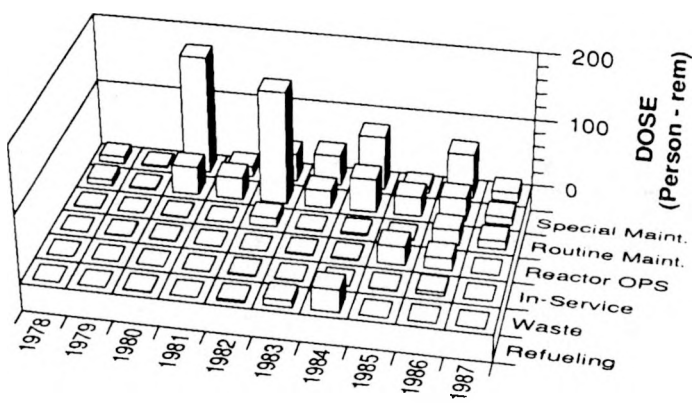


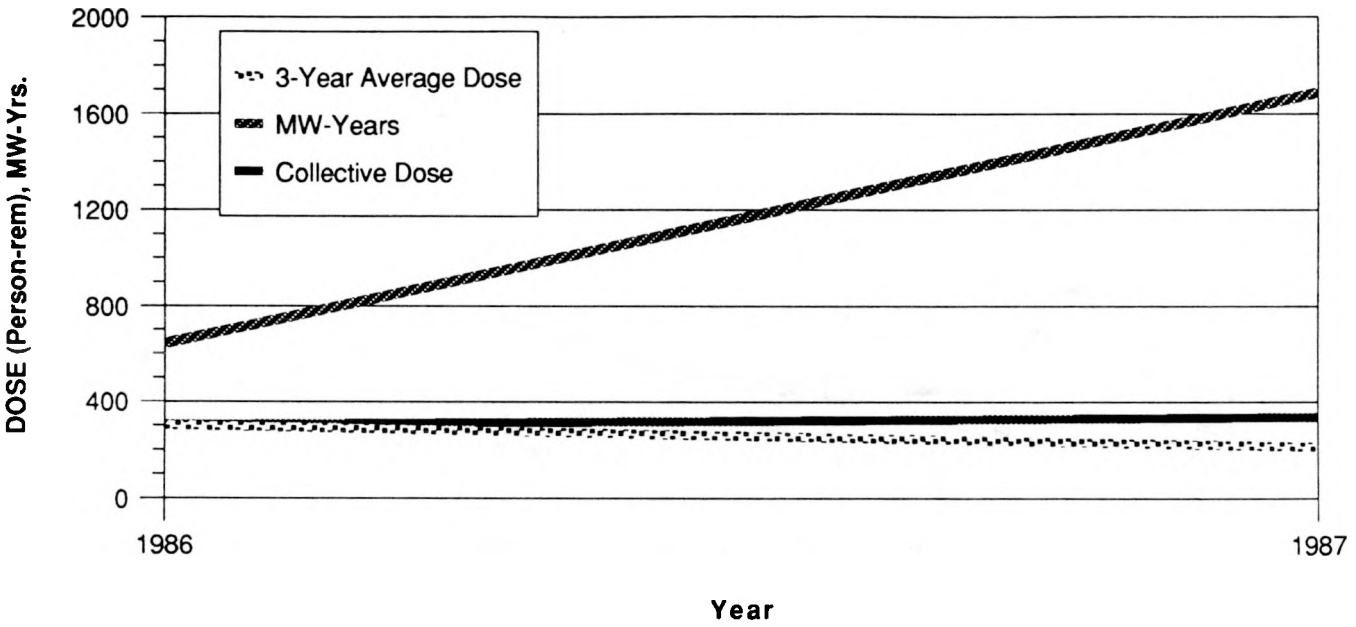
Contract

APPENDIX E (continued)

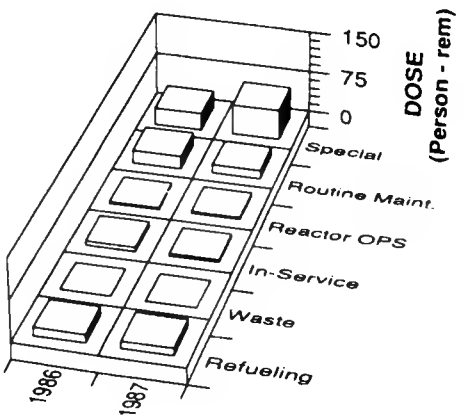
DIABLO CANYON 1,2

PWR

Dose-Performance Indicators



Breakdown By Job Function



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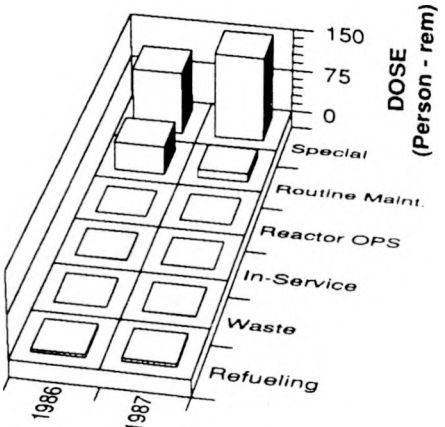


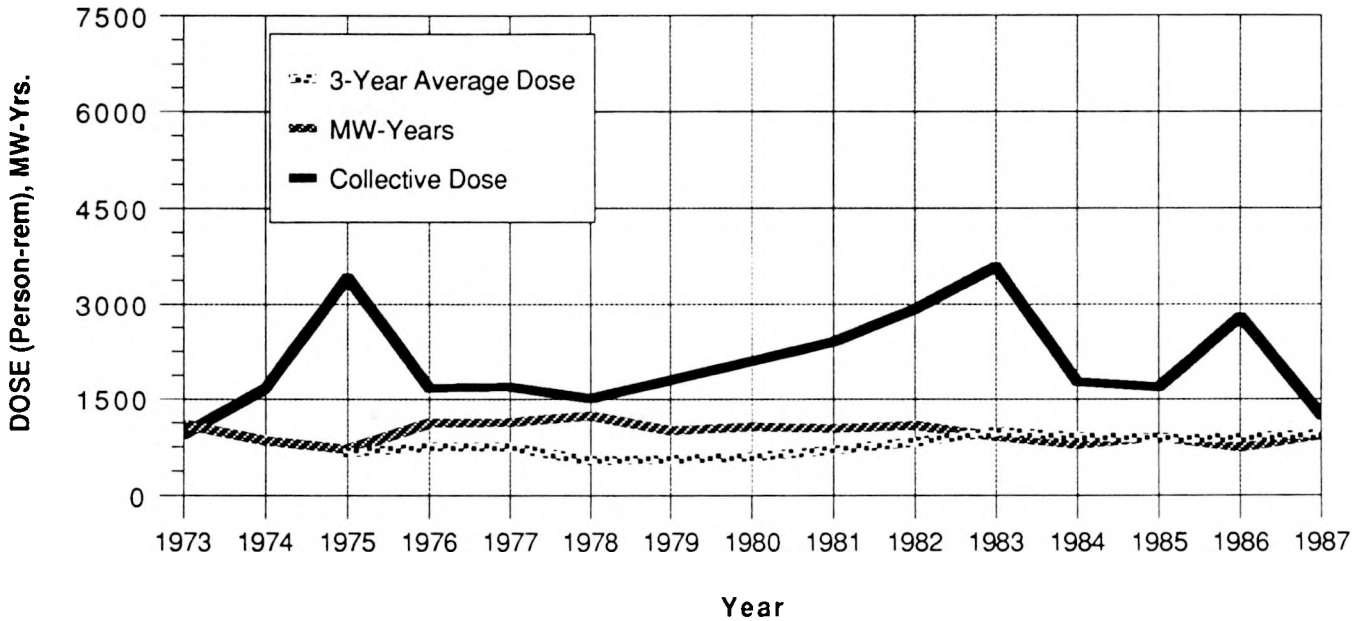
Contract

APPENDIX E (continued)

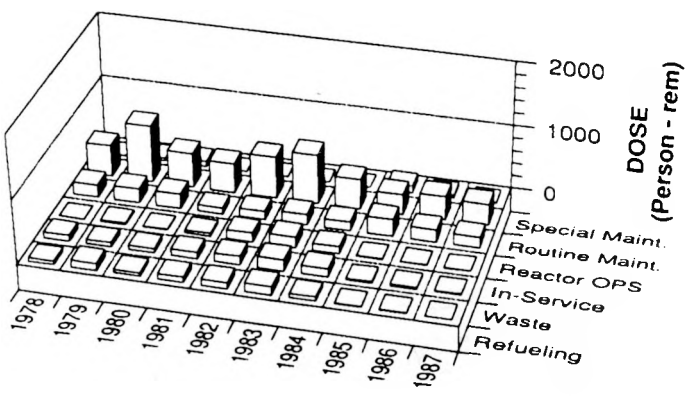
DRESDEN 2,3

BWR

Dose-Performance Indicators



Breakdown By Job Function



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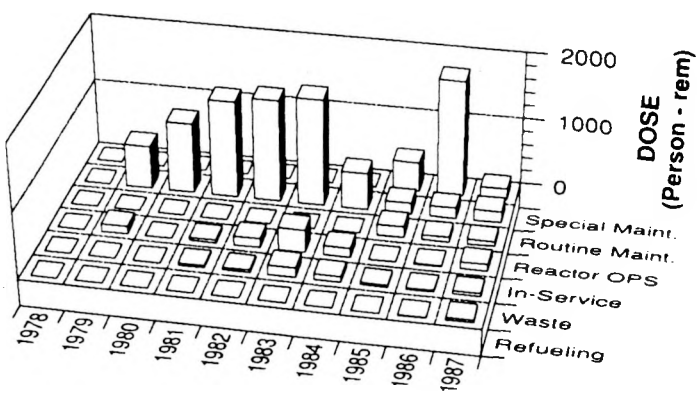


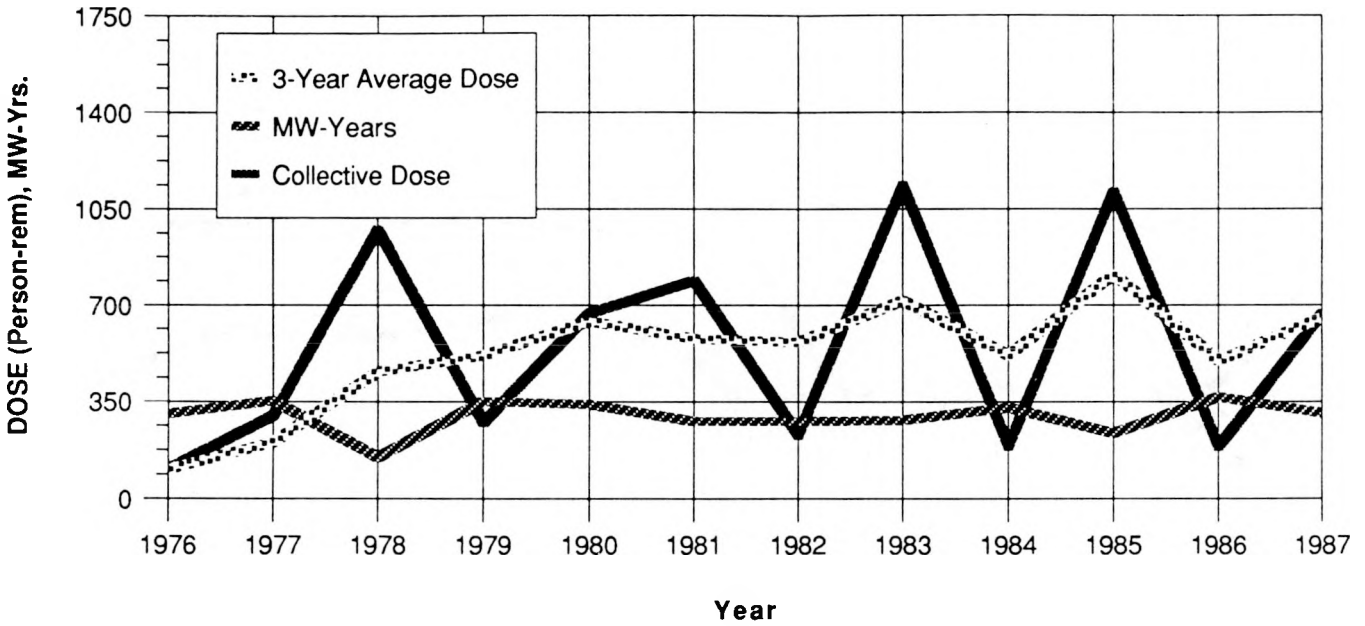
Contract

APPENDIX E (continued)

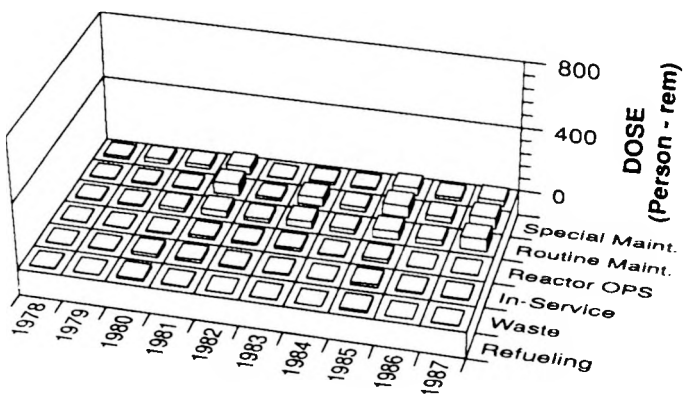
DUANE ARNOLD

BWR

Dose-Performance Indicators



Breakdown By Job Function



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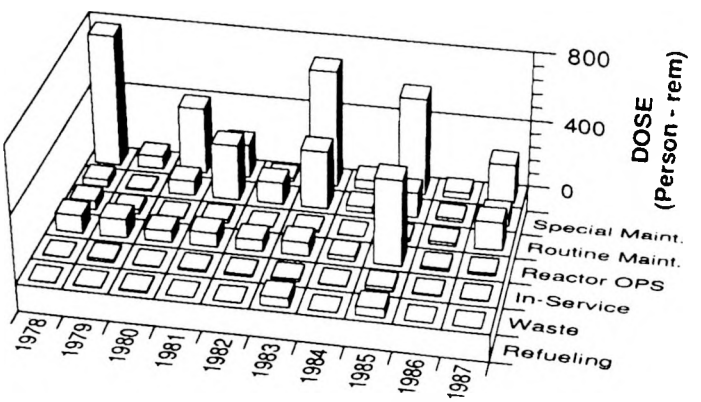


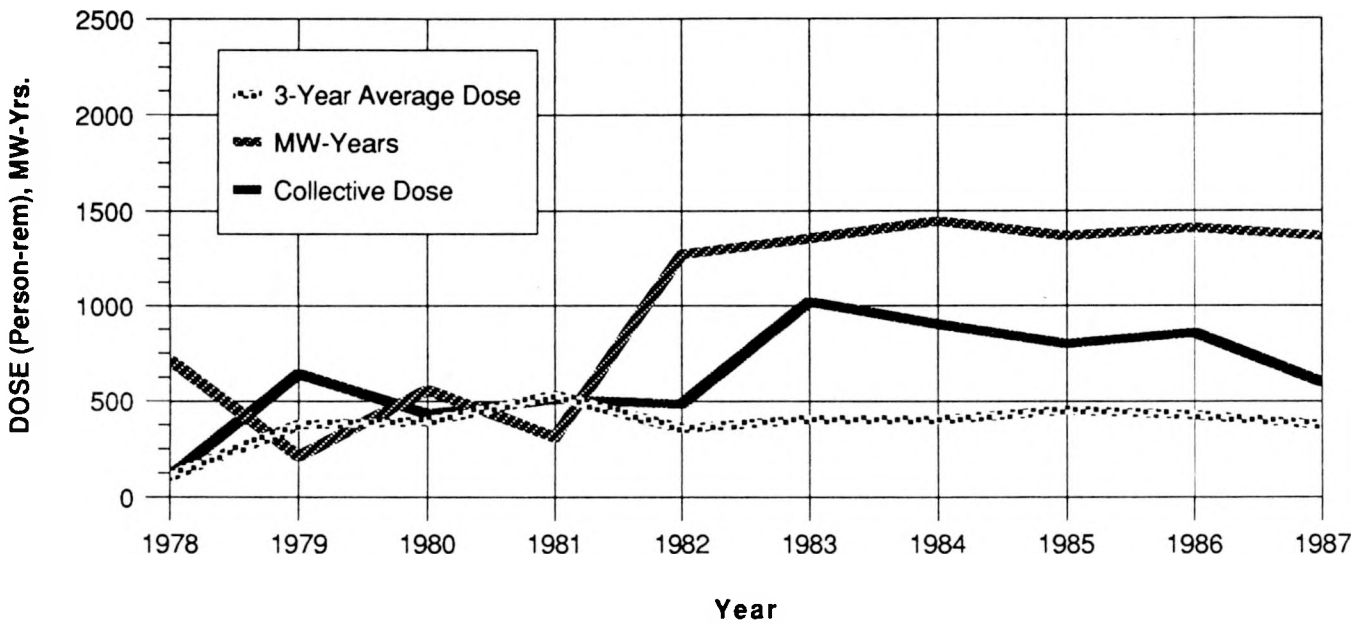
Contract

APPENDIX E (continued)

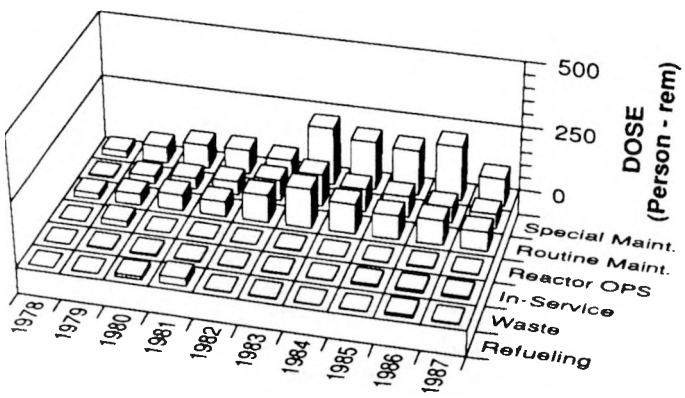
FARLEY 1,2

PWR

Dose-Performance Indicators



Breakdown By Job Function



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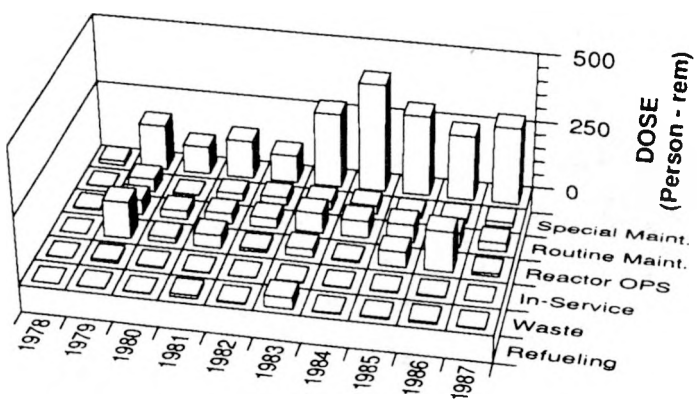


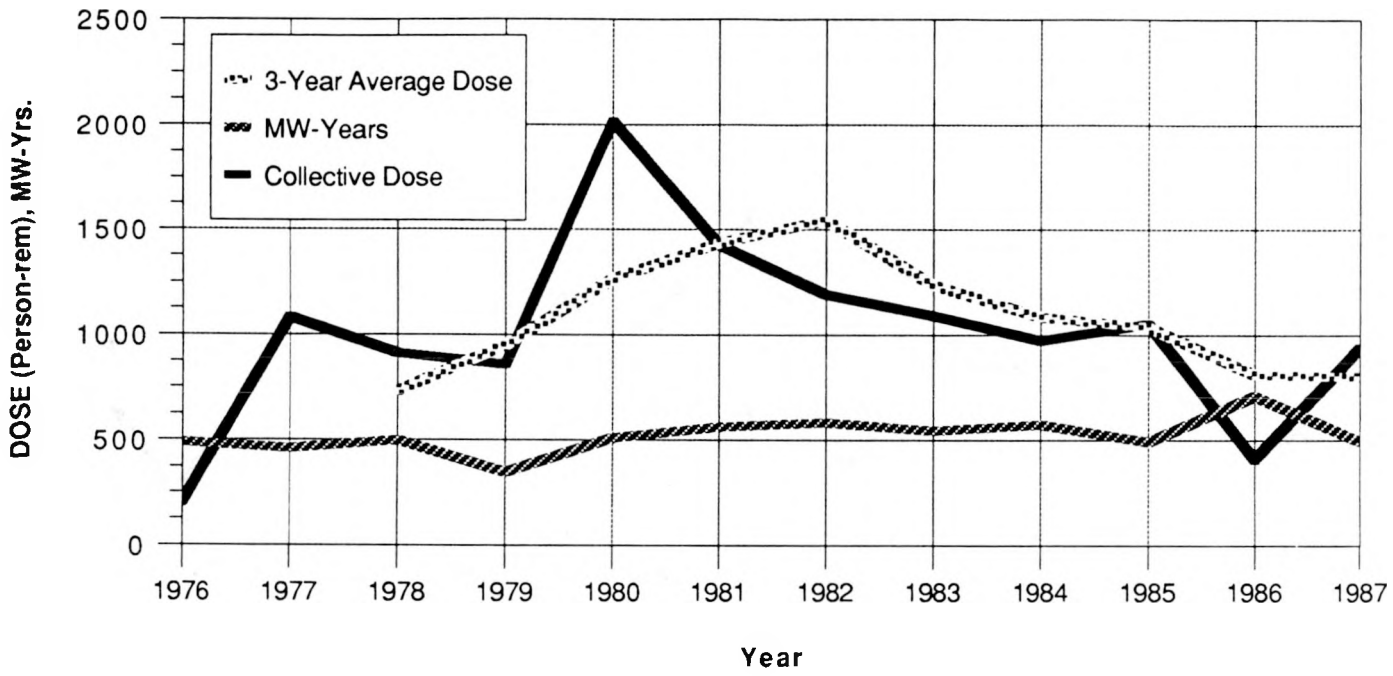
Contract

APPENDIX E (continued)

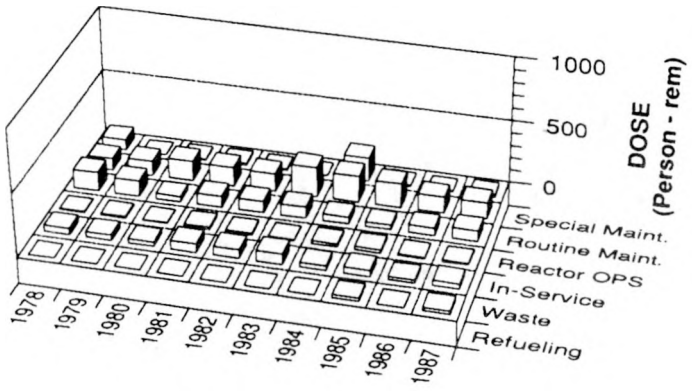
FITZPATRICK

BWR

Dose-Performance Indicators



Breakdown By Job Function



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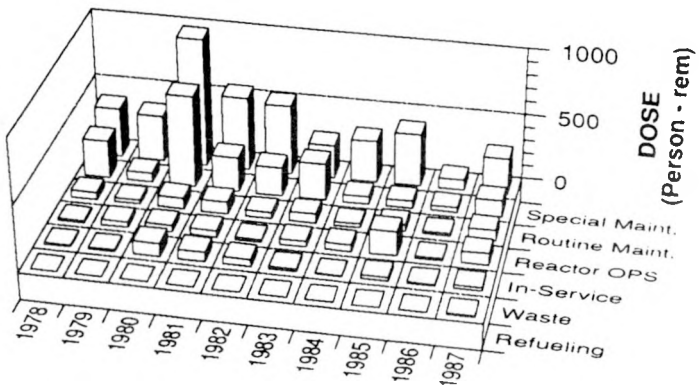


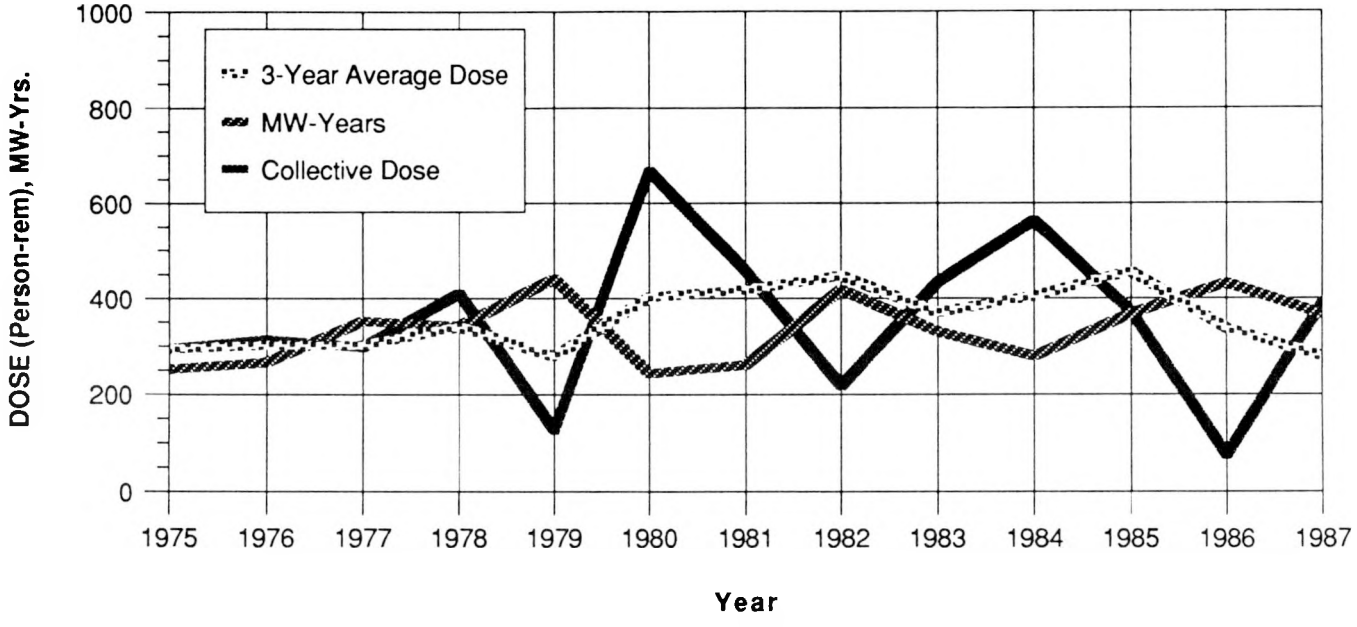
Contract

APPENDIX E (continued)

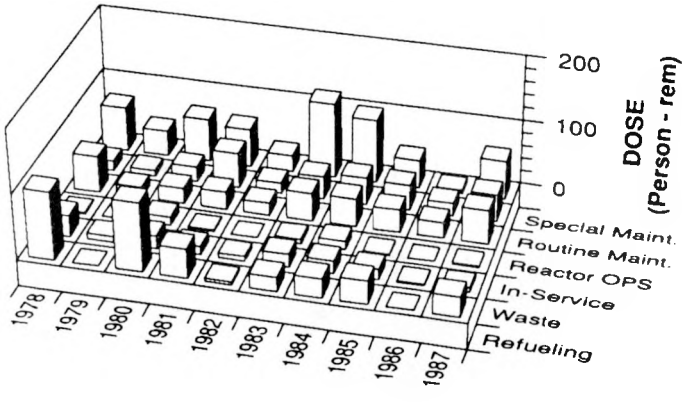
FORT CALHOUN

PWR

Dose-Performance Indicators



Breakdown By Job Function



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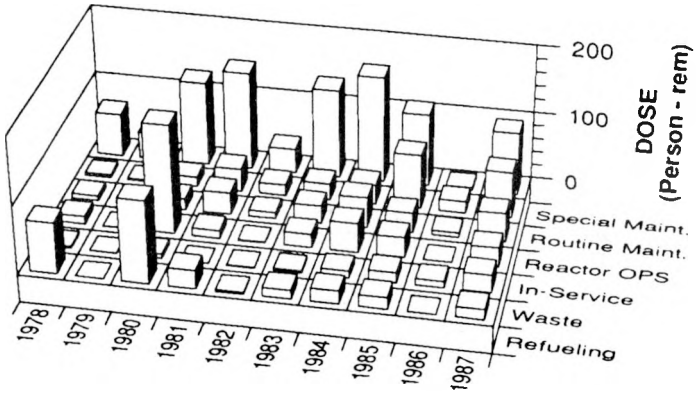


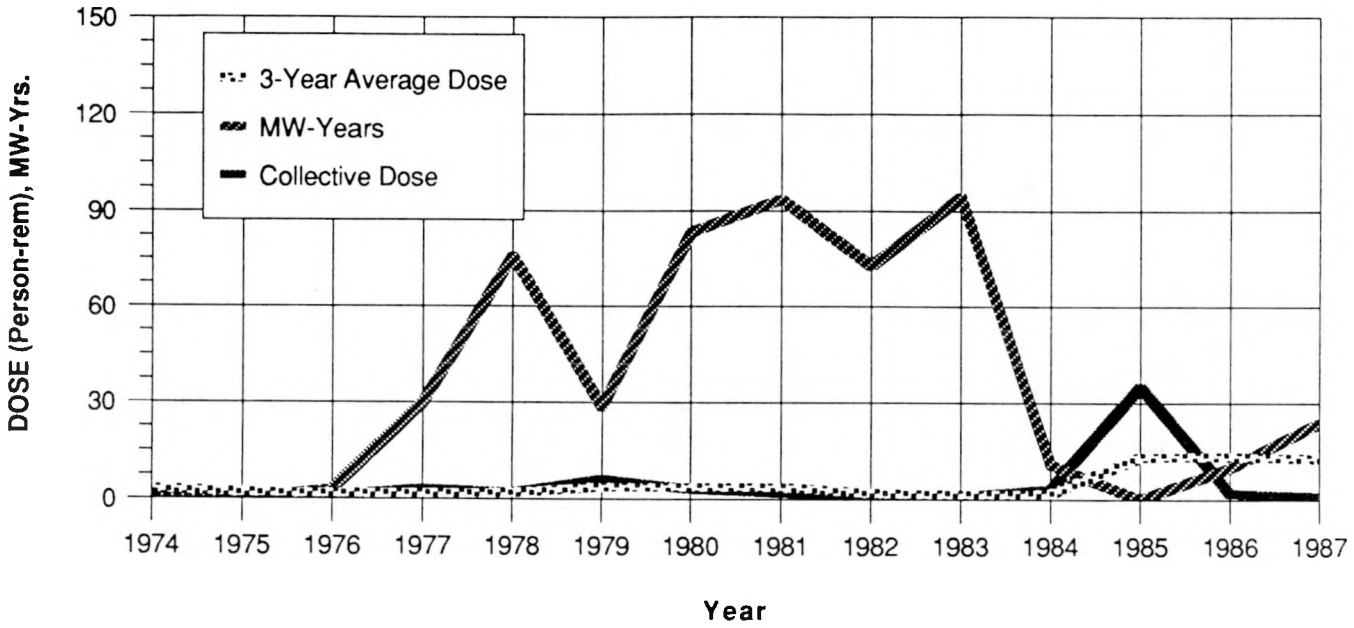
Contract

APPENDIX E (continued)

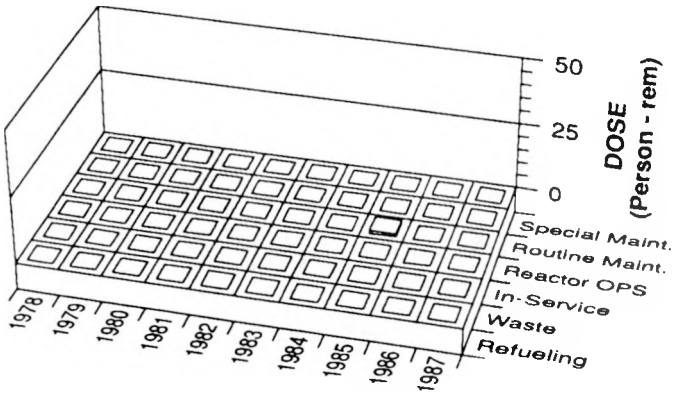
FORT ST. VRAIN

HTGR

Dose-Performance Indicators



Breakdown By Job Function



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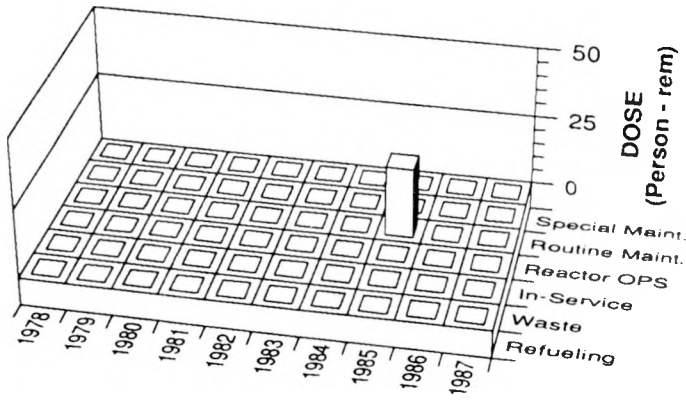


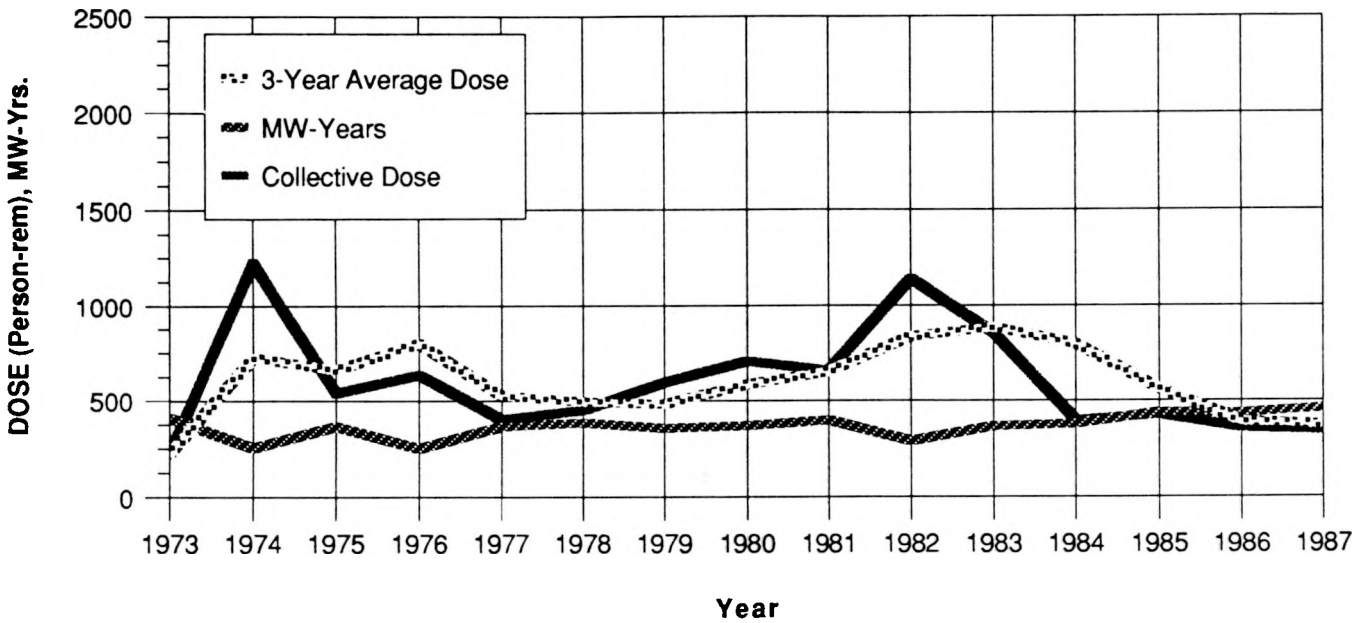
Contract

APPENDIX E (continued)

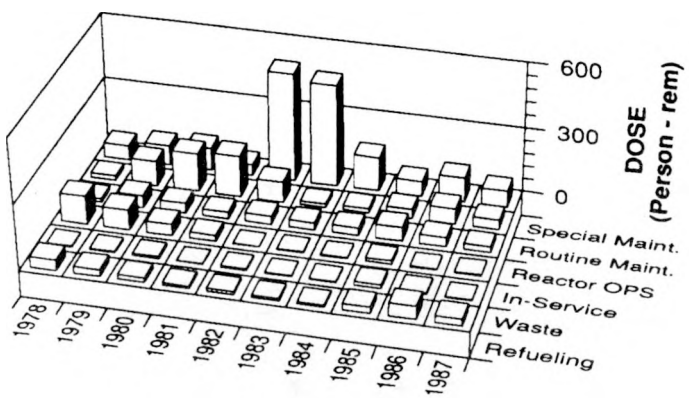
GINNA

PWR

Dose-Performance Indicators



Breakdown By Job Function



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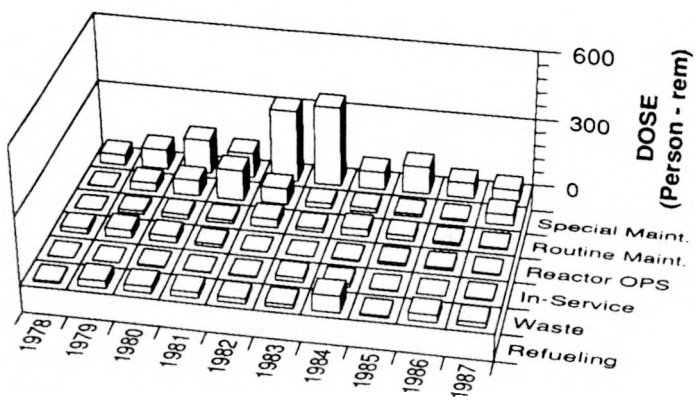


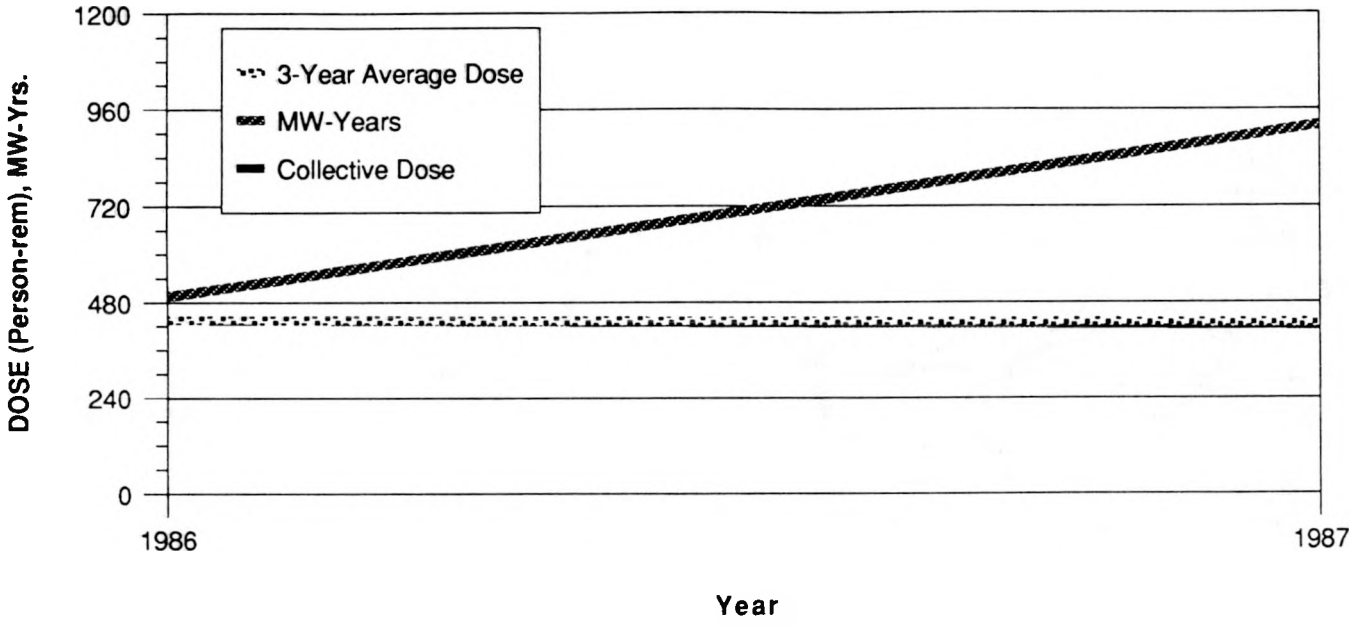
Contract

APPENDIX E (continued)

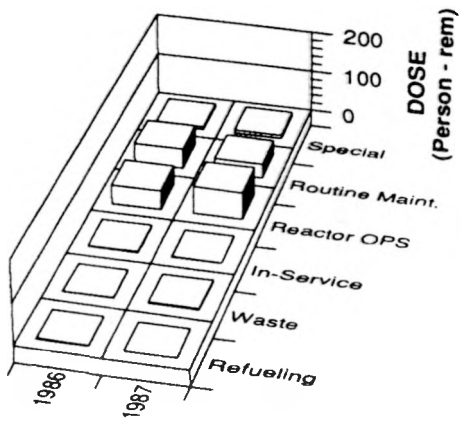
GRAND GULF

BWR

Dose-Performance Indicators



Breakdown By Job Function



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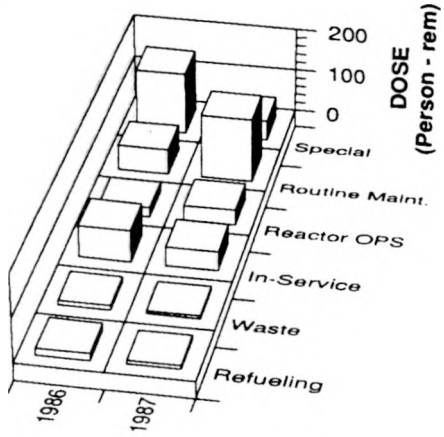


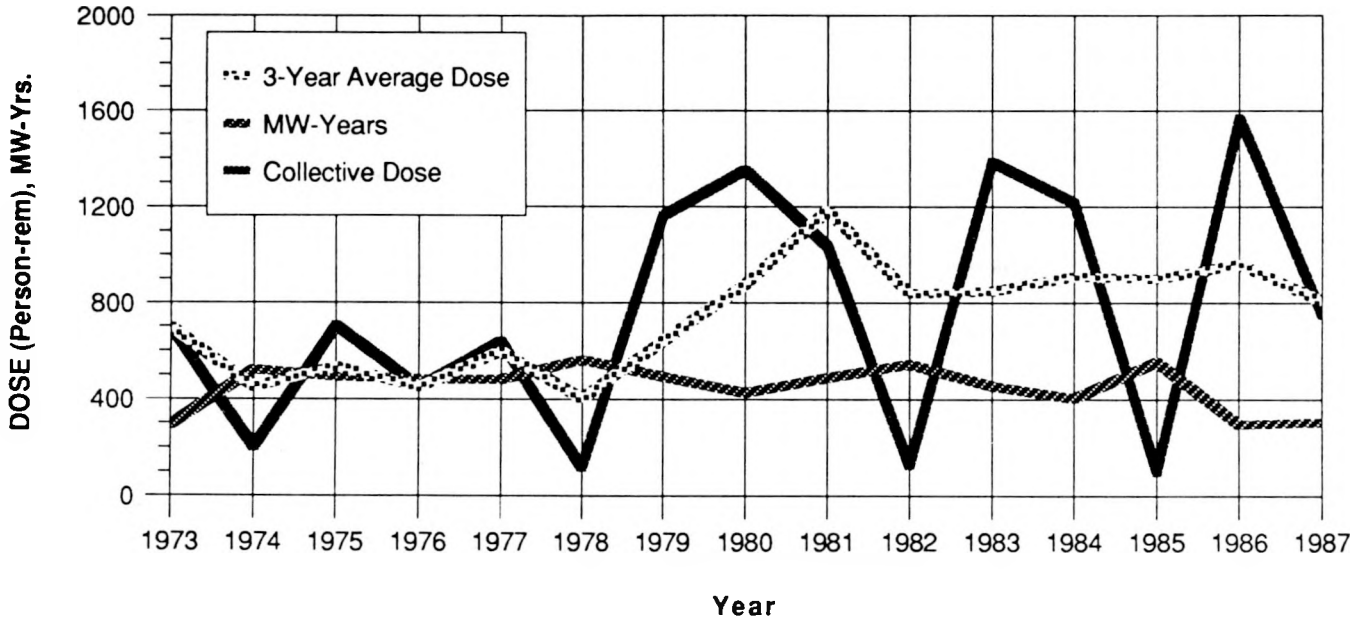
Contract

APPENDIX E (continued)

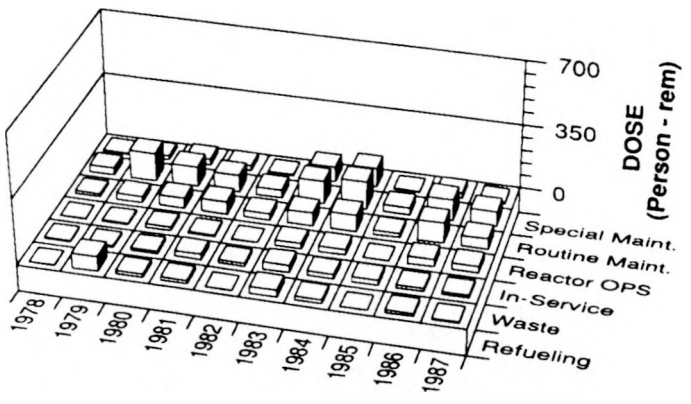
HADDAM NECK

PWR

Dose-Performance Indicators



Breakdown By Job Function



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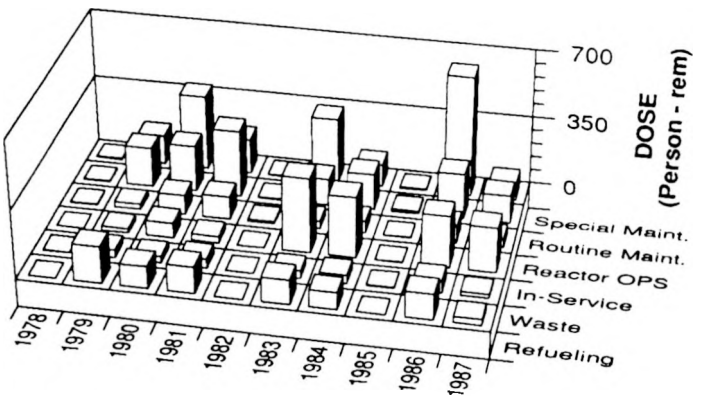


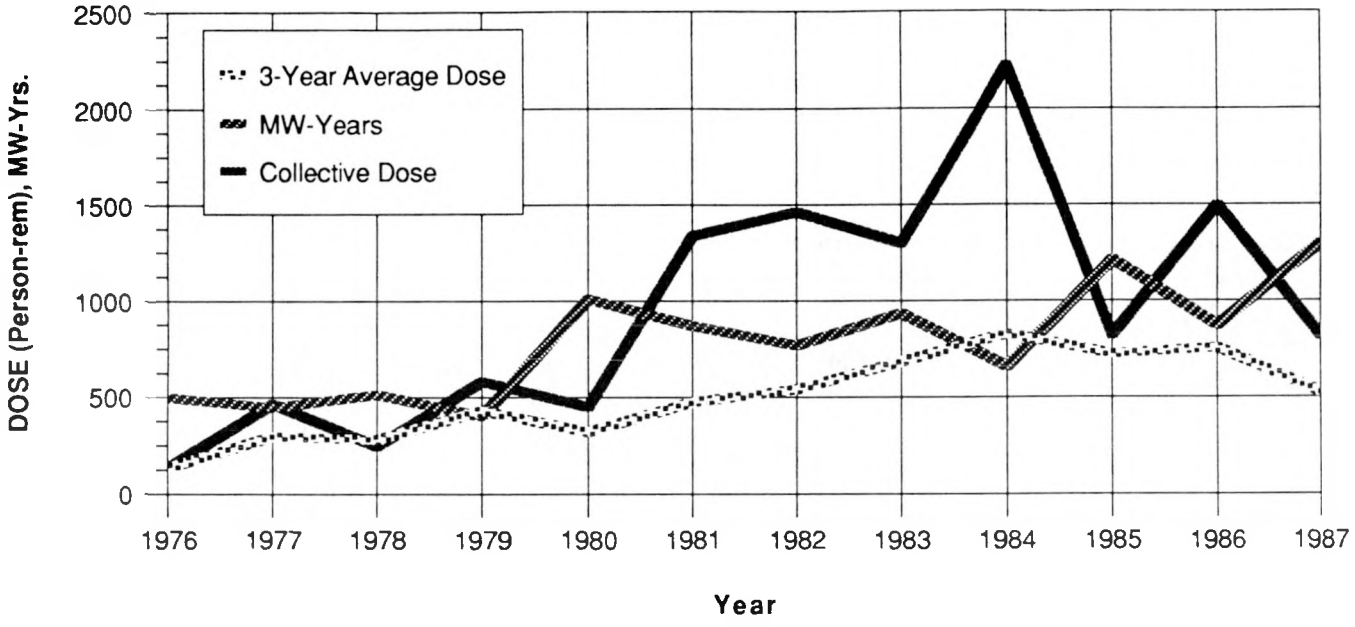
Contract

APPENDIX E (continued)

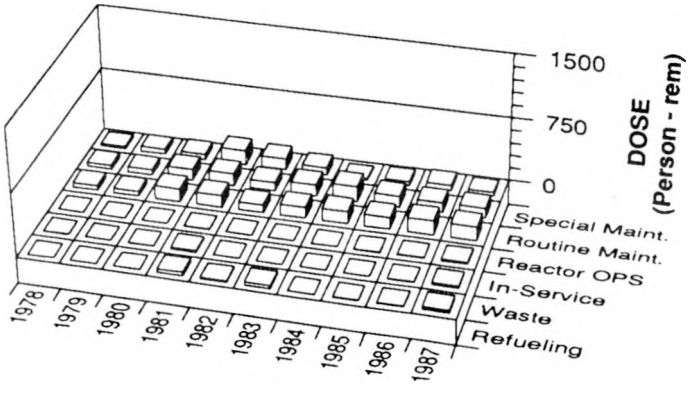
HATCH 1,2

BWR

Dose-Performance Indicators



Breakdown By Job Function



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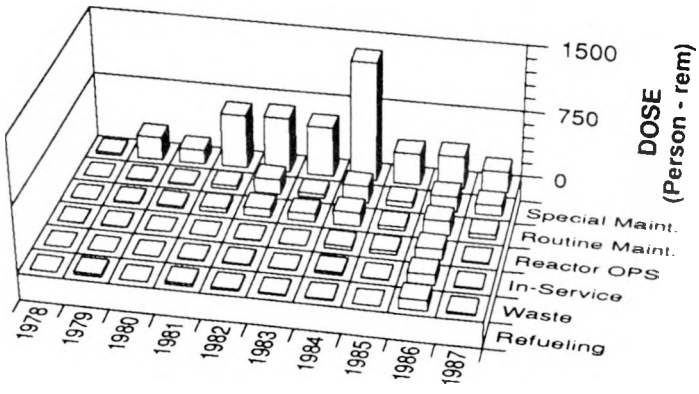


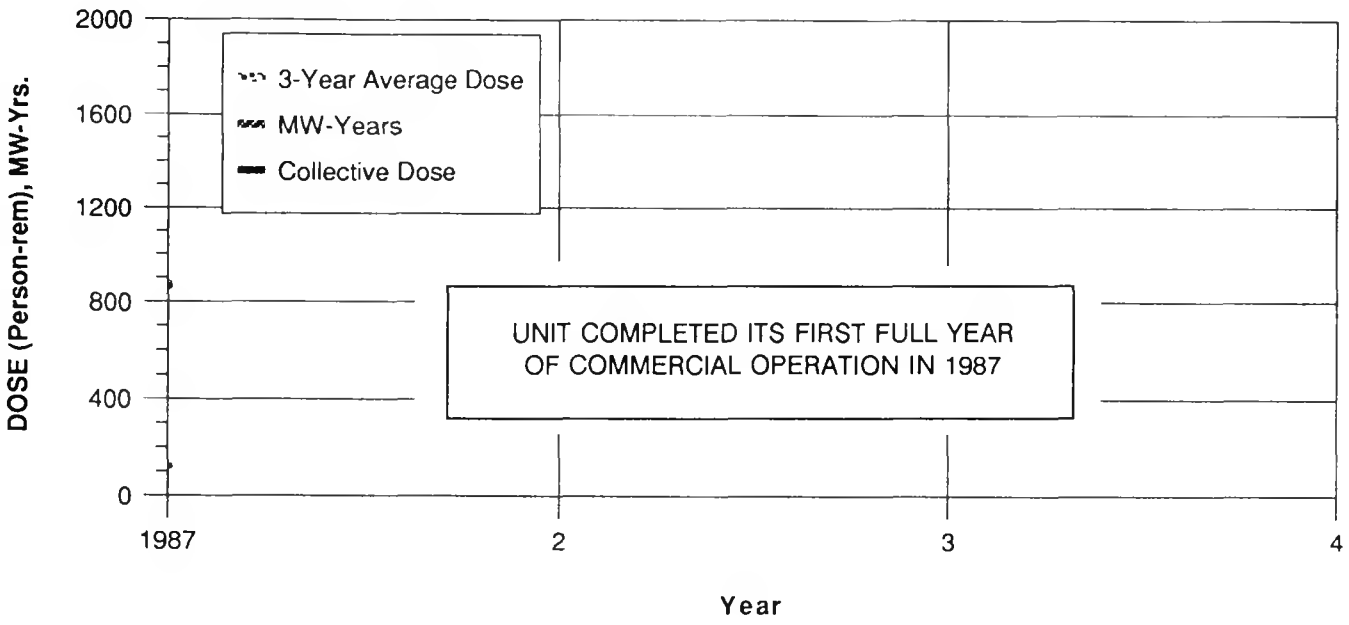
Contract

APPENDIX E (continued)

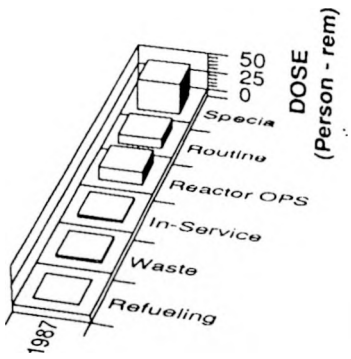
HOPE CREEK

BWR

Dose-Performance Indicators



Breakdown By Job Function



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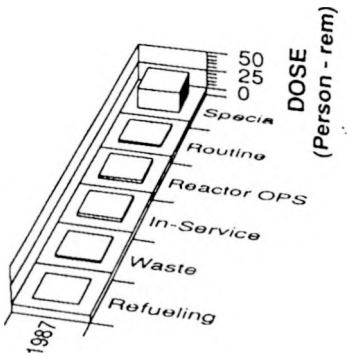


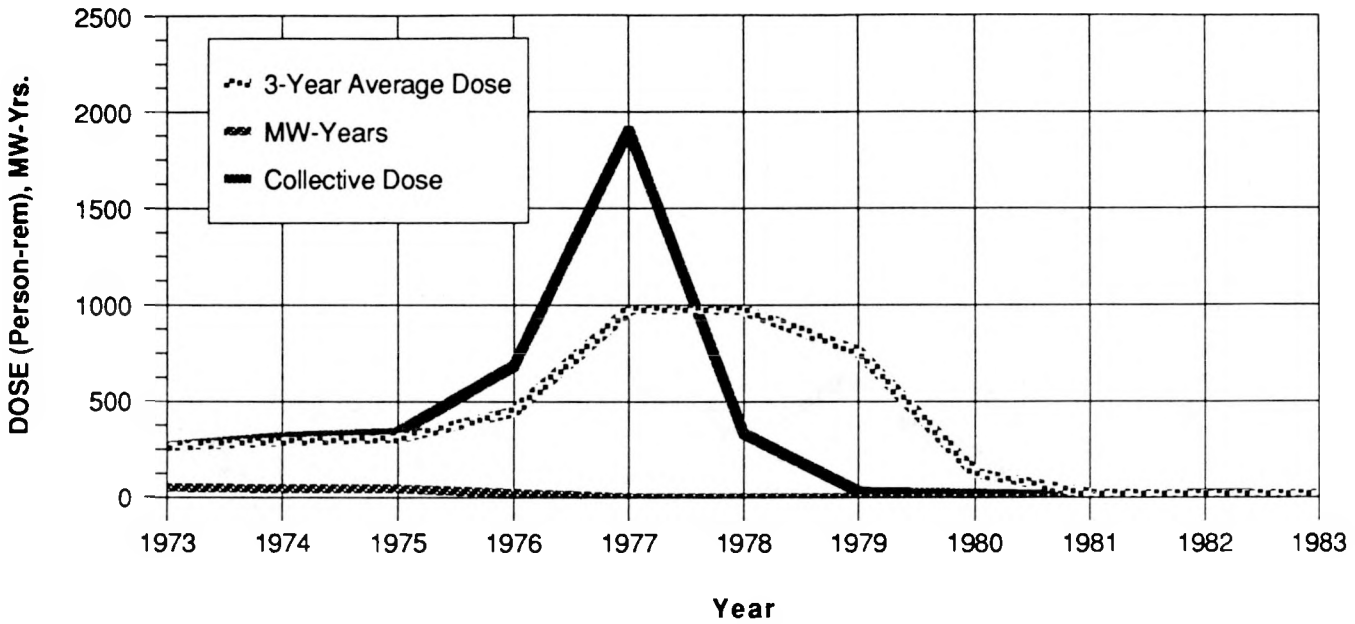
Contract

APPENDIX E (continued)

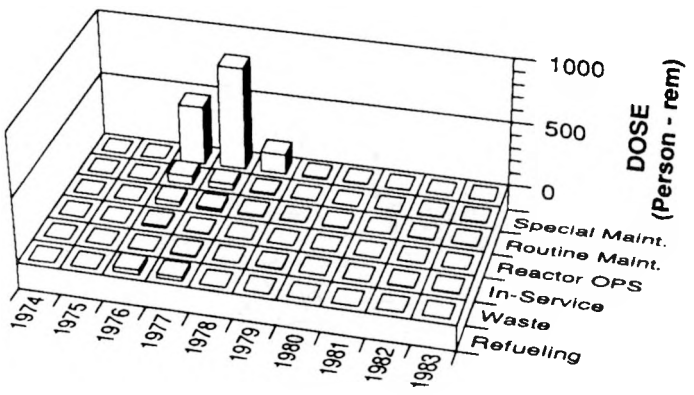
HUMBOLDT BAY

BWR

Dose-Performance Indicators



Breakdown By Job Function



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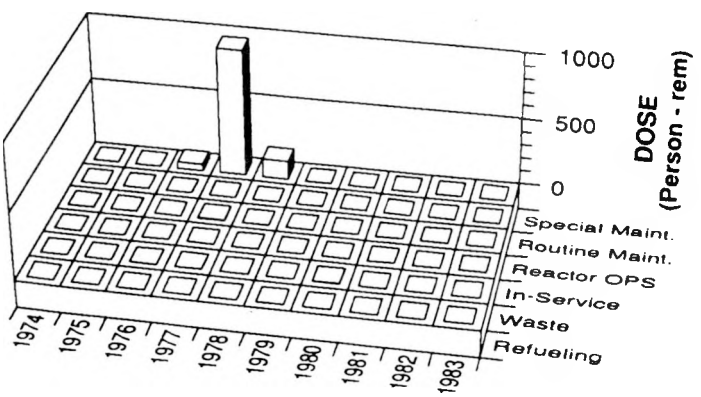


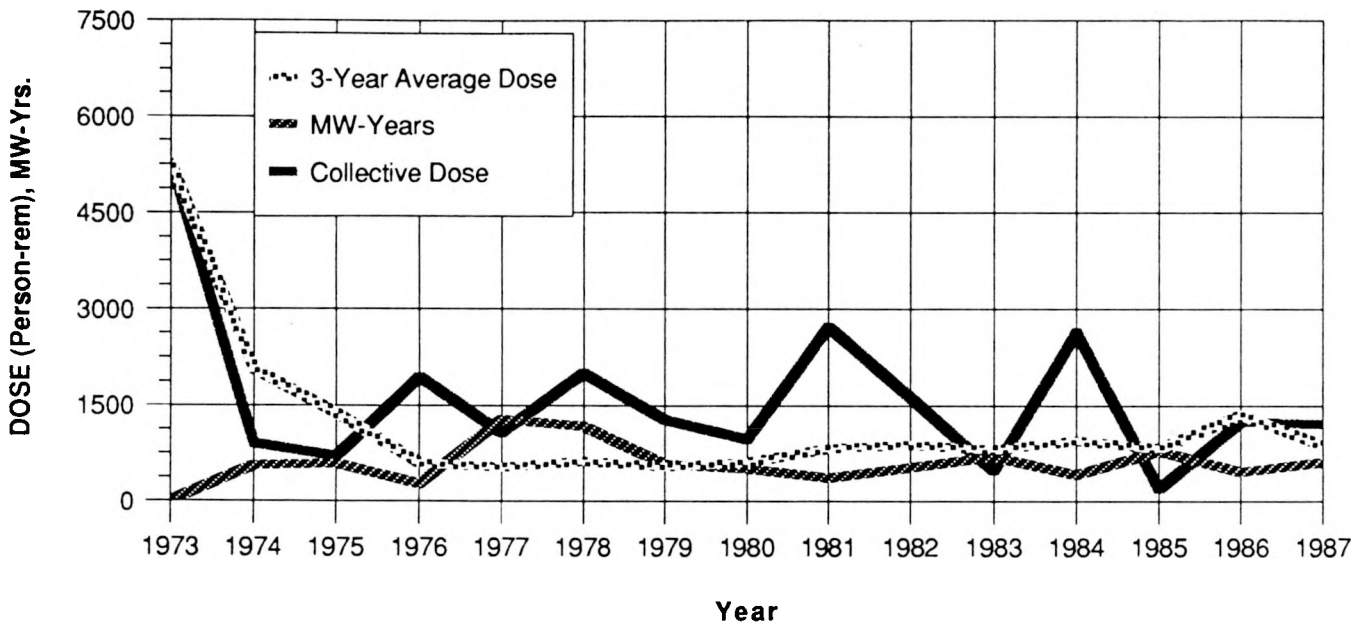
Contract

APPENDIX E (continued)

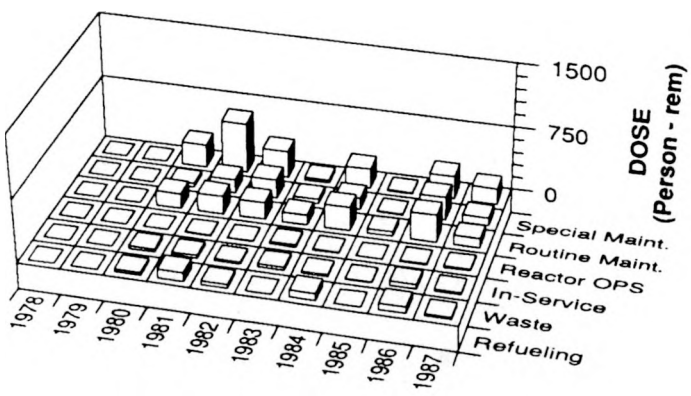
INDIAN POINT 2

PWR

Dose-Performance Indicators



Breakdown By Job Function



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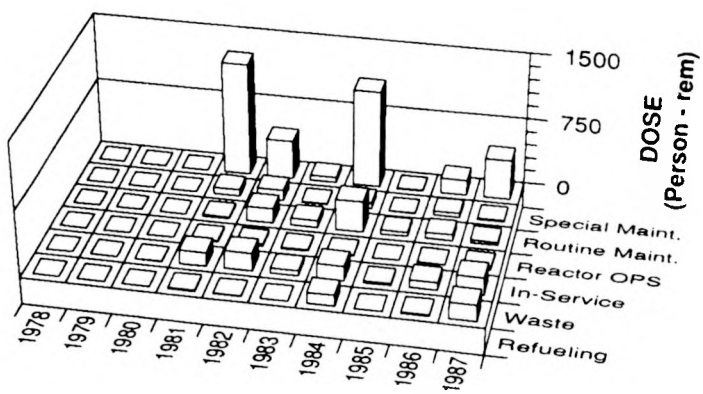


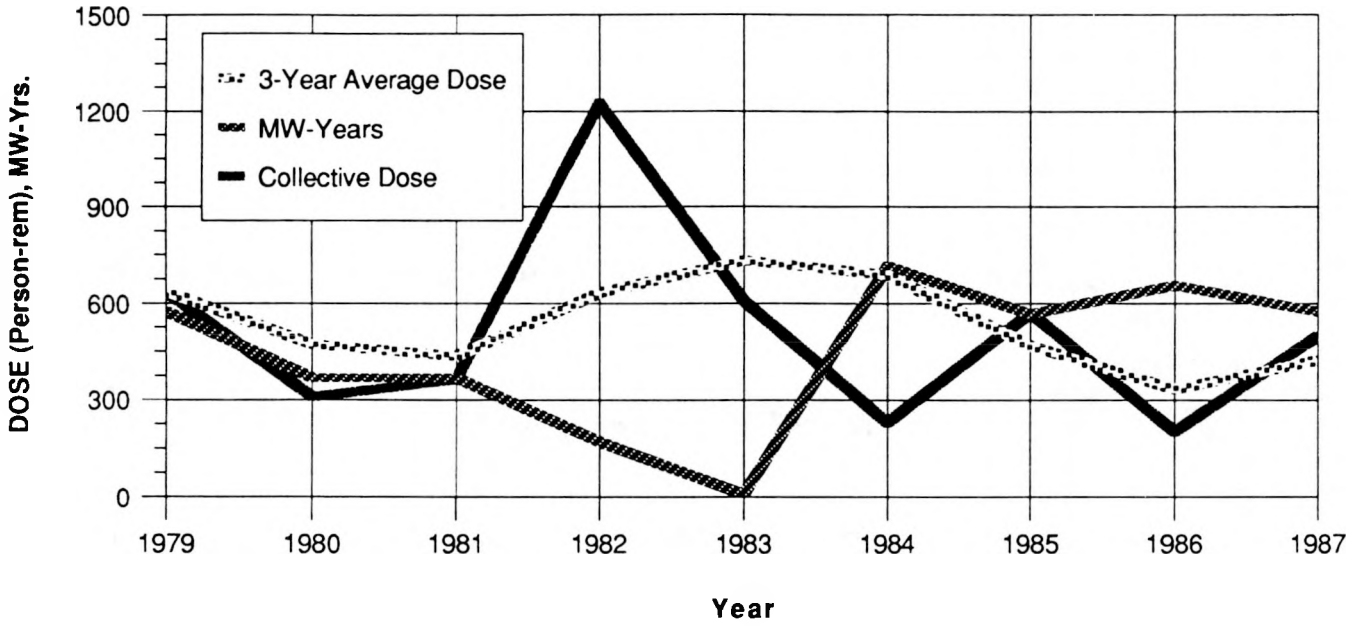
Contract

APPENDIX E (continued)

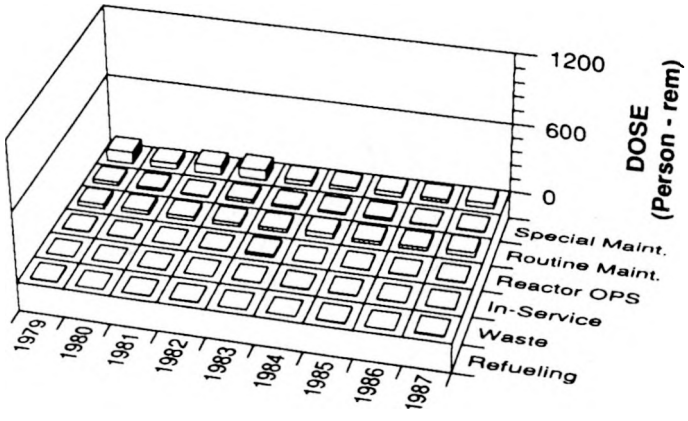
INDIAN POINT 3

PWR

Dose-Performance Indicators



Breakdown By Job Function



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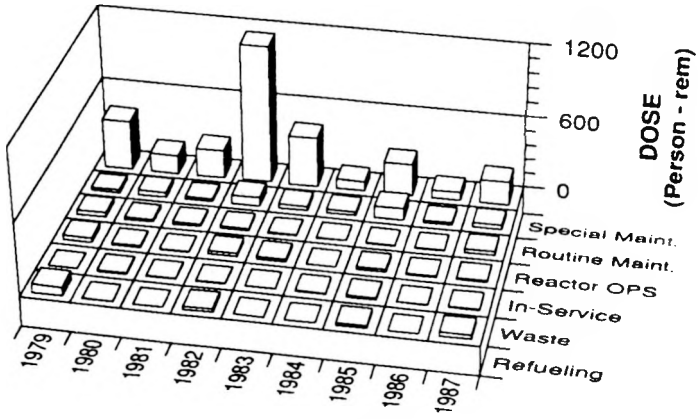


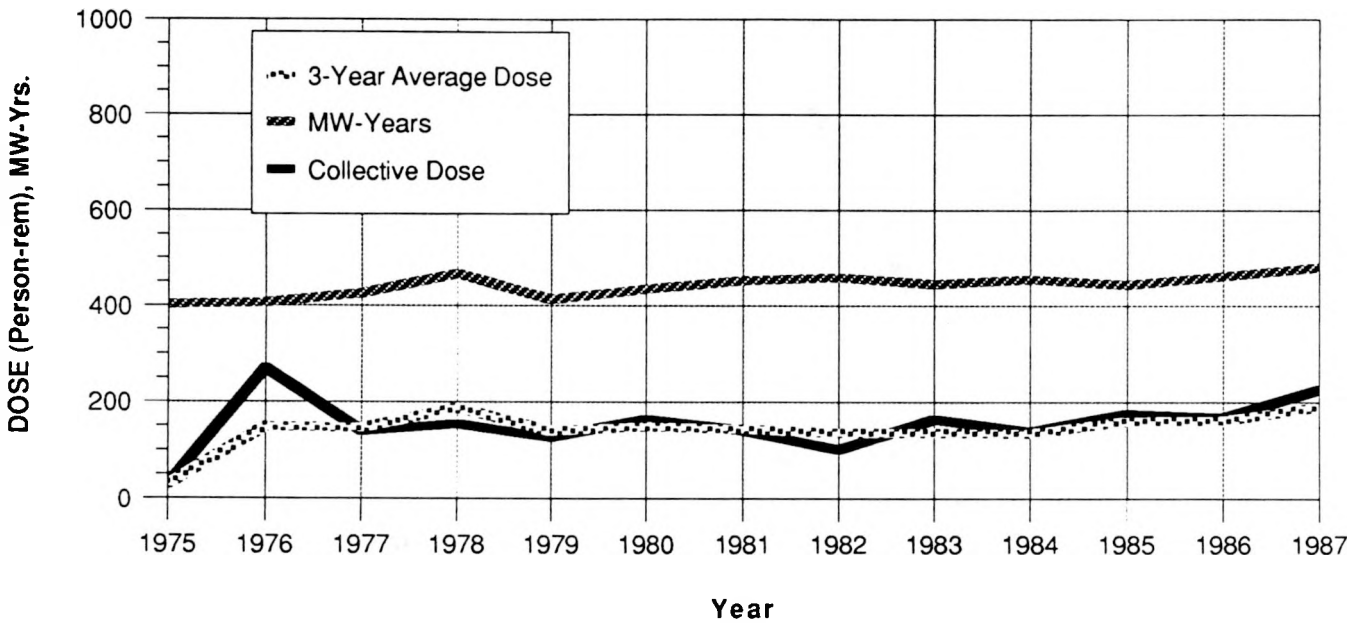
Contract

APPENDIX E (continued)

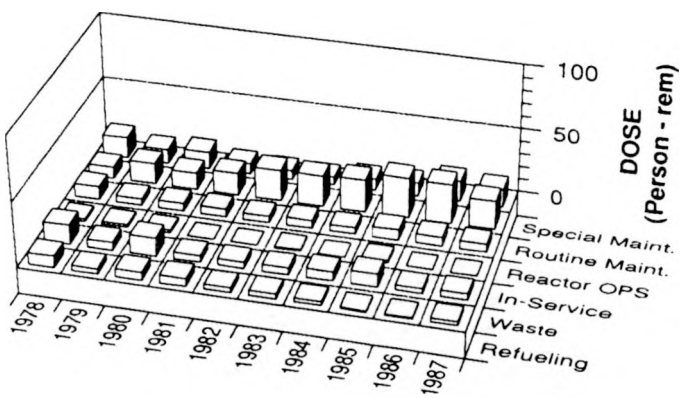
KEWAUNEE

PWR

Dose-Performance Indicators



Breakdown By Job Function



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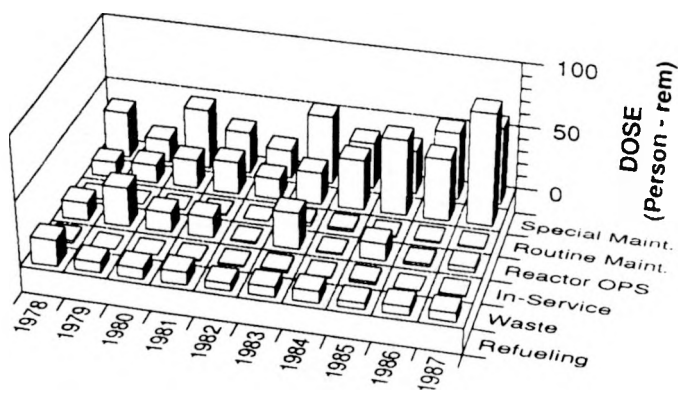


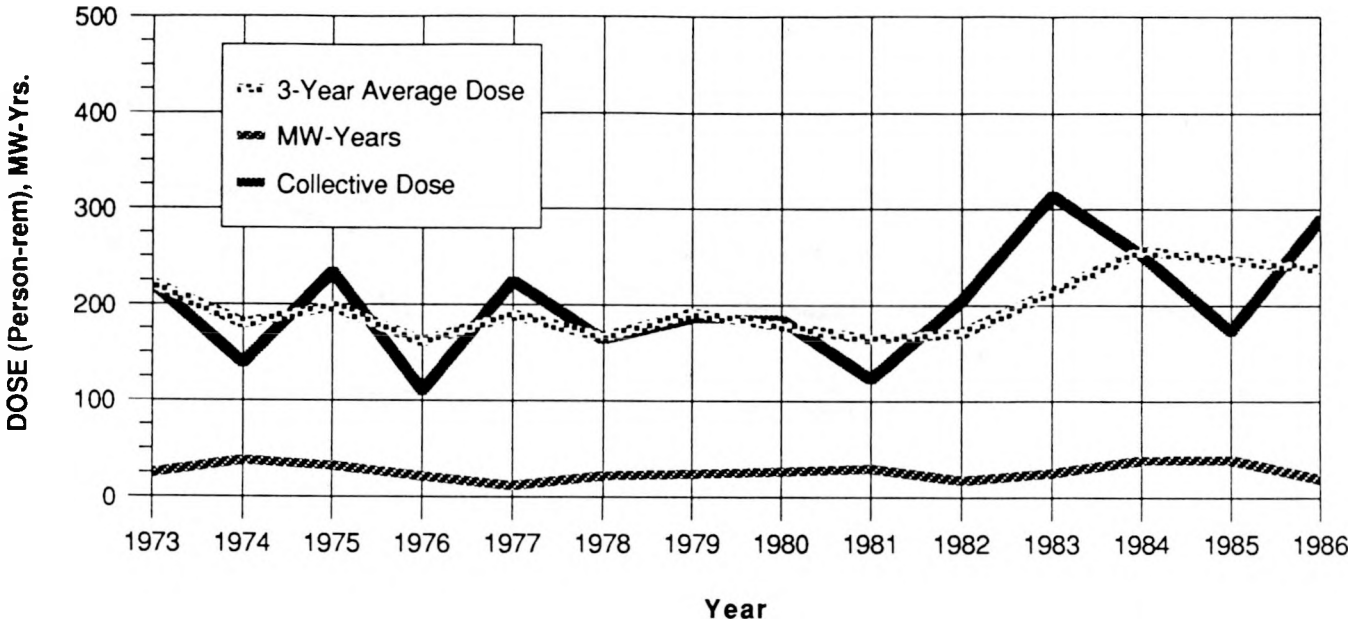
Contract

APPENDIX E (continued)

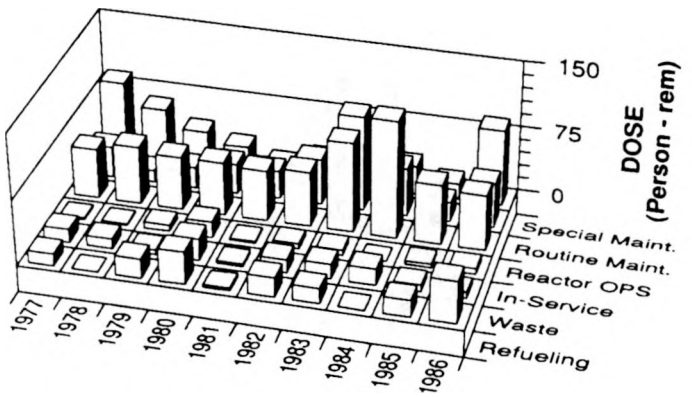
LACROSSE

BWR

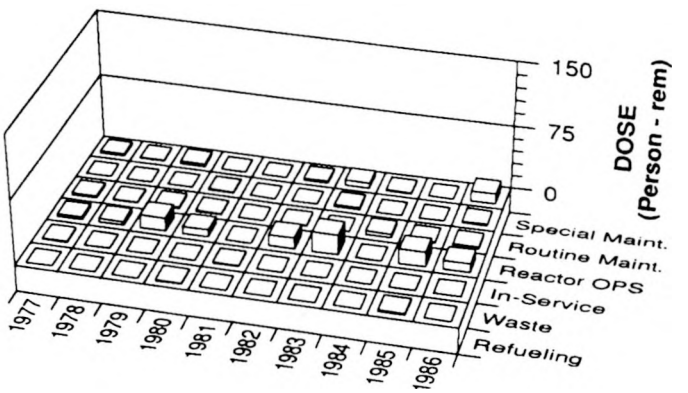
Dose-Performance Indicators



Breakdown By Job Function



Plant



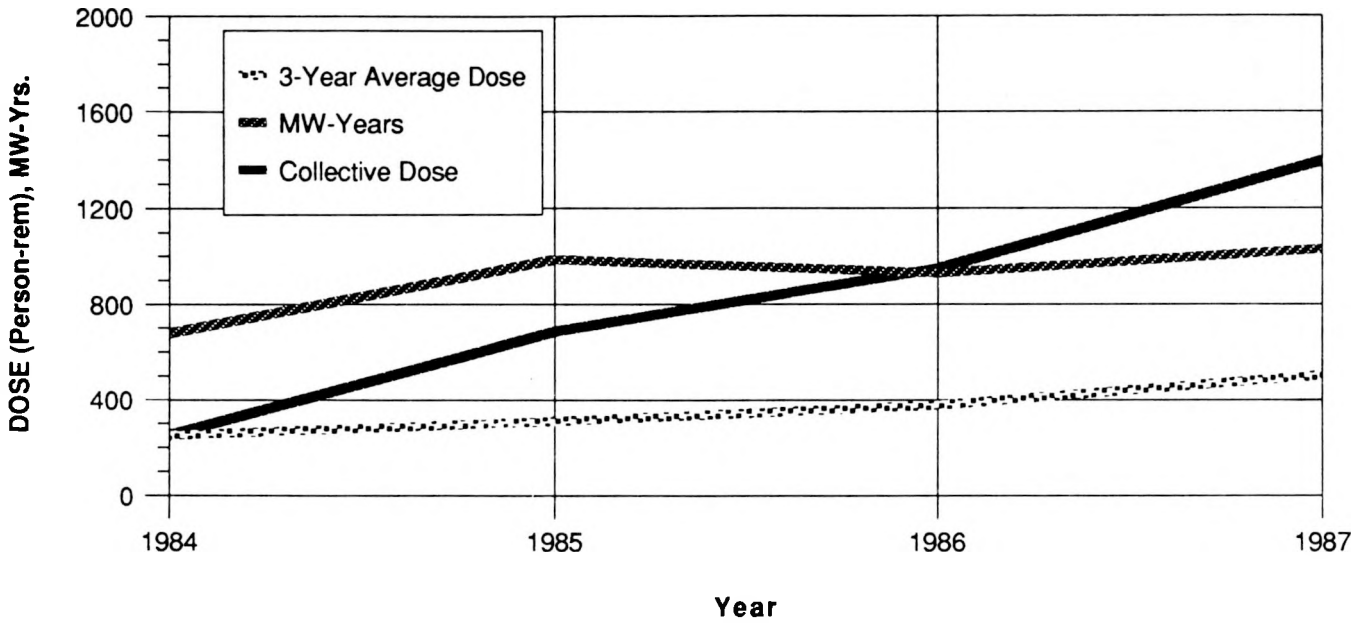
Contract

APPENDIX E (continued)

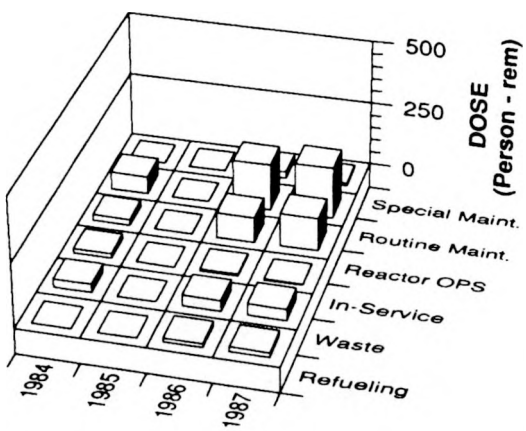
LASALLE 1,2

BWR

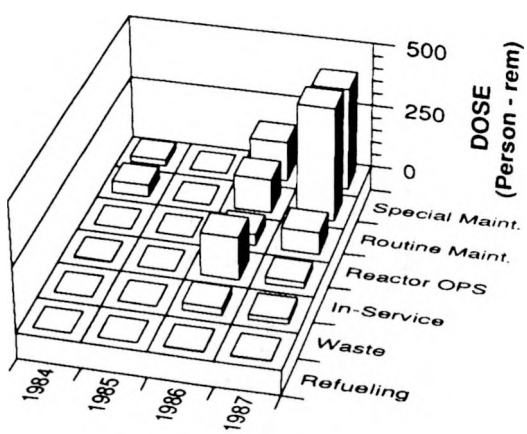
Dose-Performance Indicators



Breakdown By Job Function



Plant



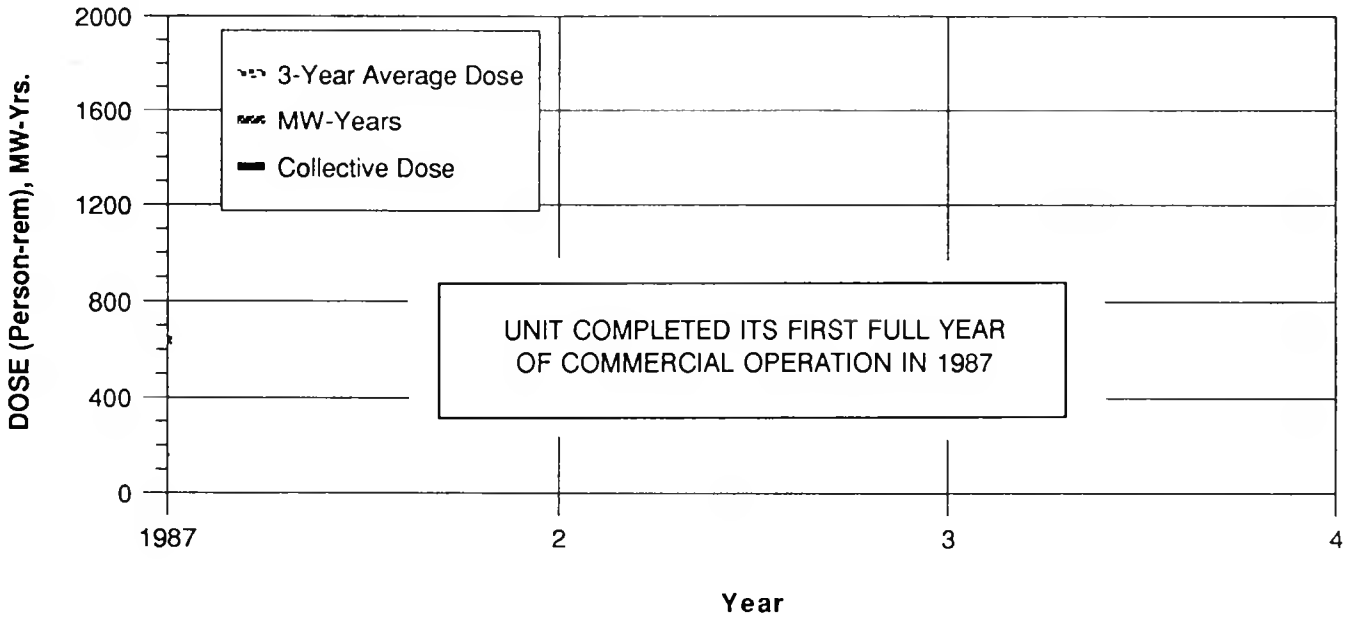
Contract

APPENDIX E (continued)

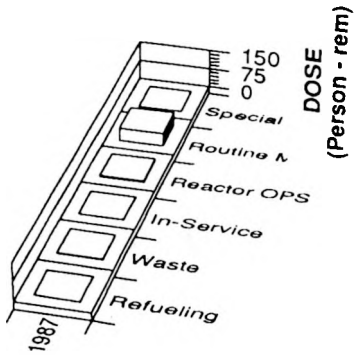
LIMERICK

BWR

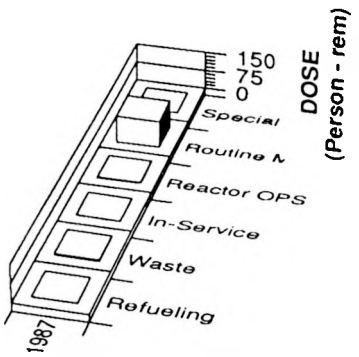
Dose-Performance Indicators



Breakdown By Job Function



Plant



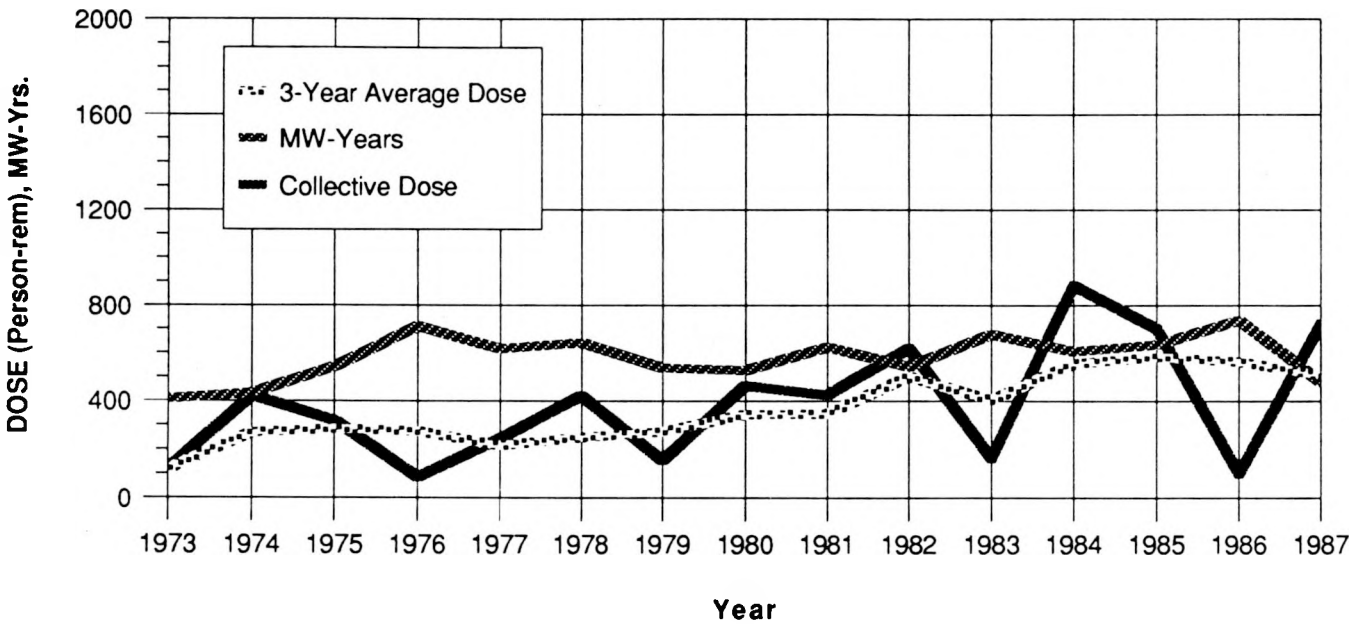
Contract

APPENDIX E (continued)

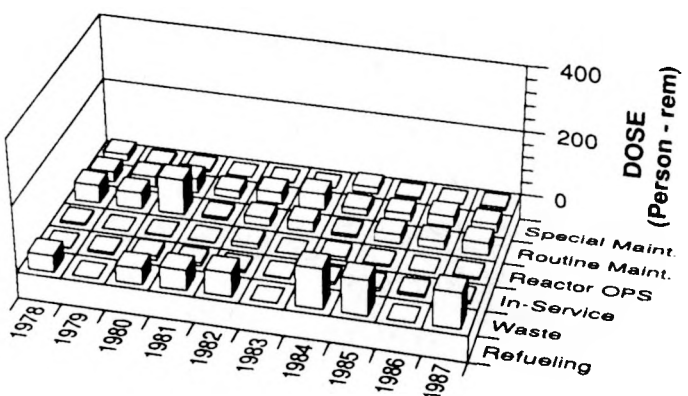
MAINE YANKEE

PWR

Dose-Performance Indicators



Breakdown By Job Function



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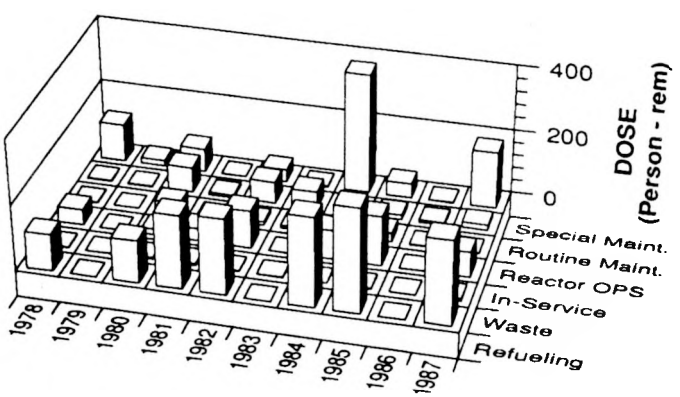


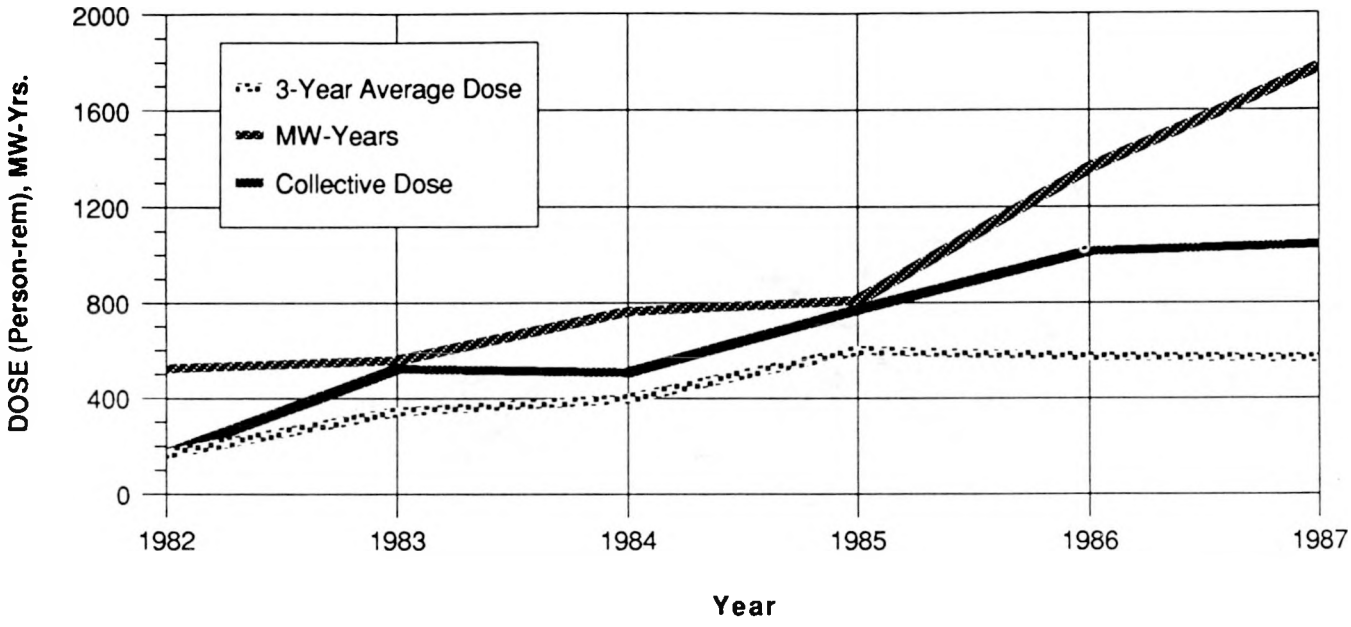
Contract

APPENDIX E (continued)

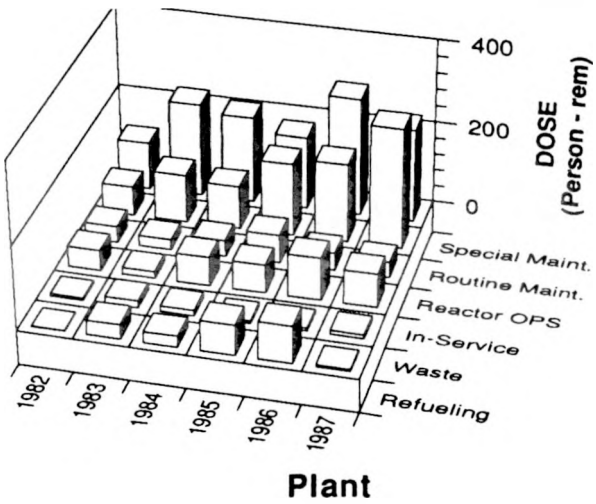
MCGUIRE 1,2

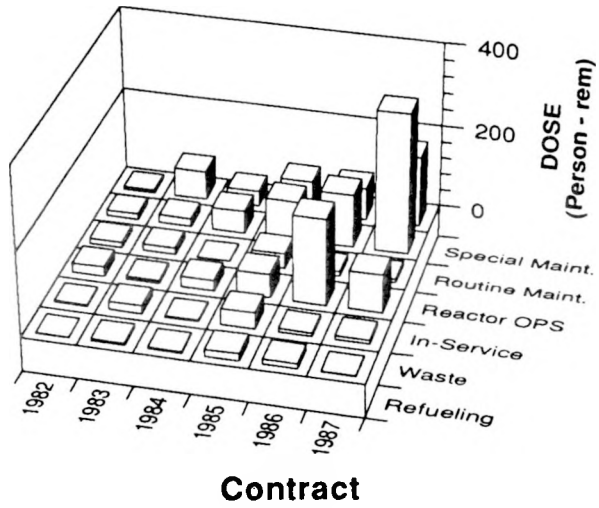
PWR

Dose-Performance Indicators



Breakdown By Job Function



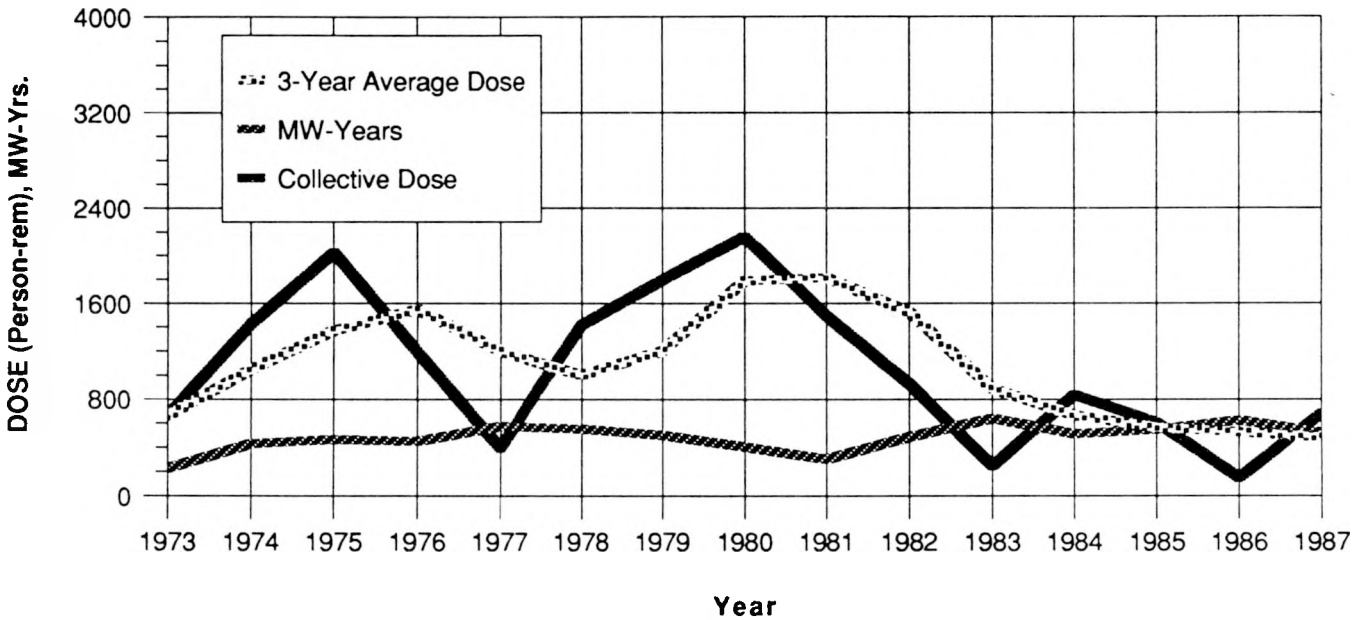


APPENDIX E (continued)

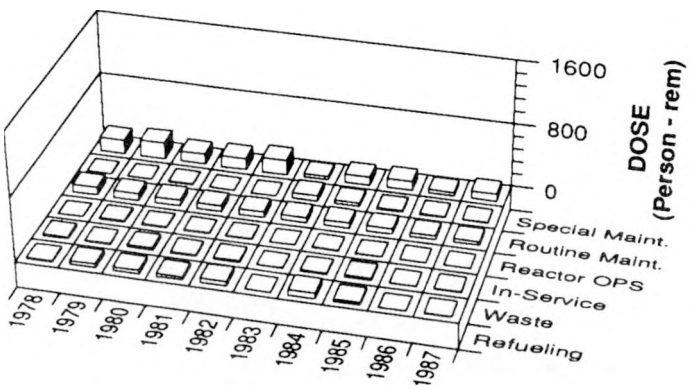
MILLSTONE POINT 1

BWR

Dose-Performance Indicators



Breakdown By Job Function



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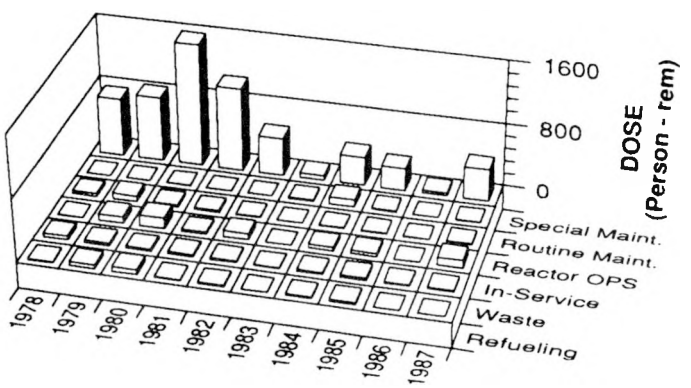


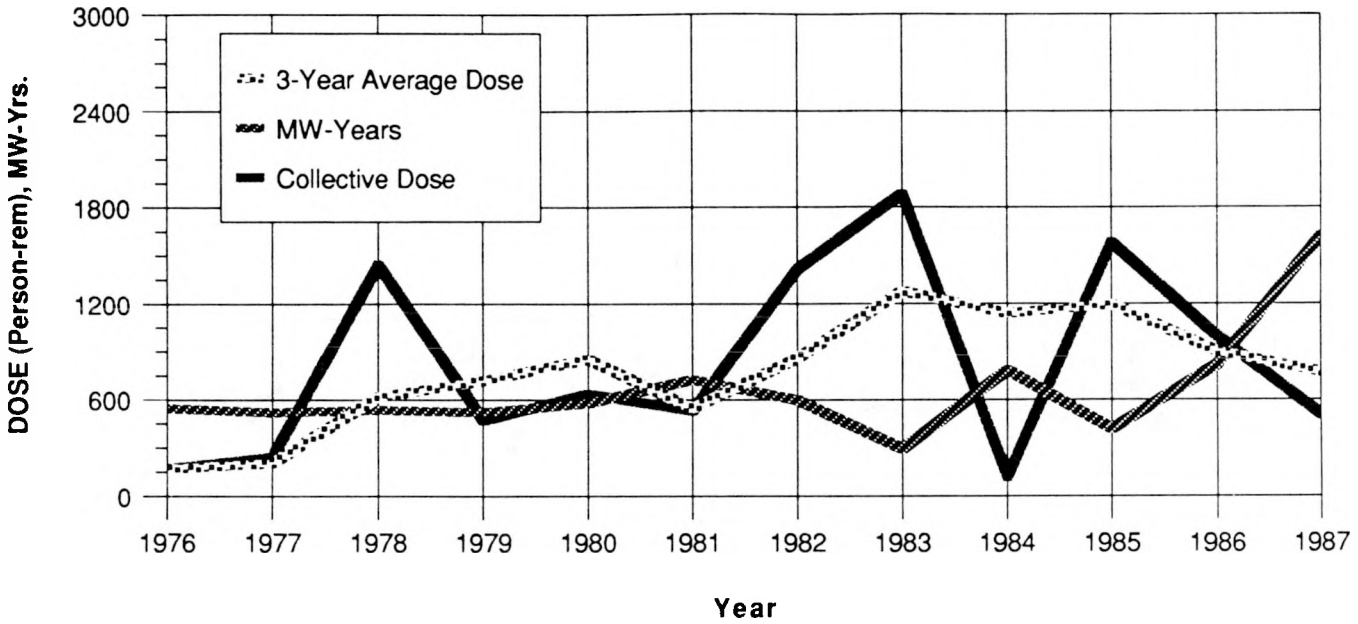
Contract

APPENDIX E (continued)

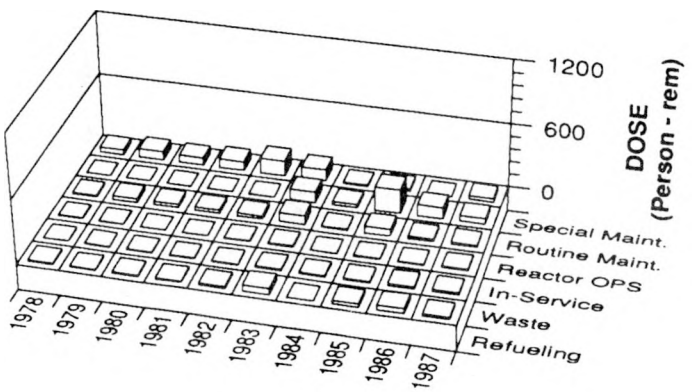
MILLSTONE POINT 2,3

PWR

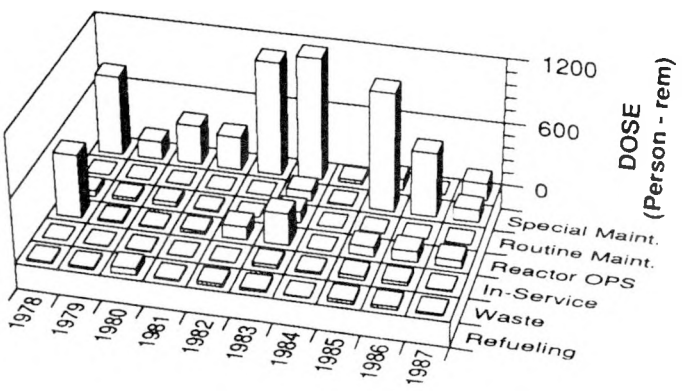
Dose-Performance Indicators



Breakdown By Job Function



Plant



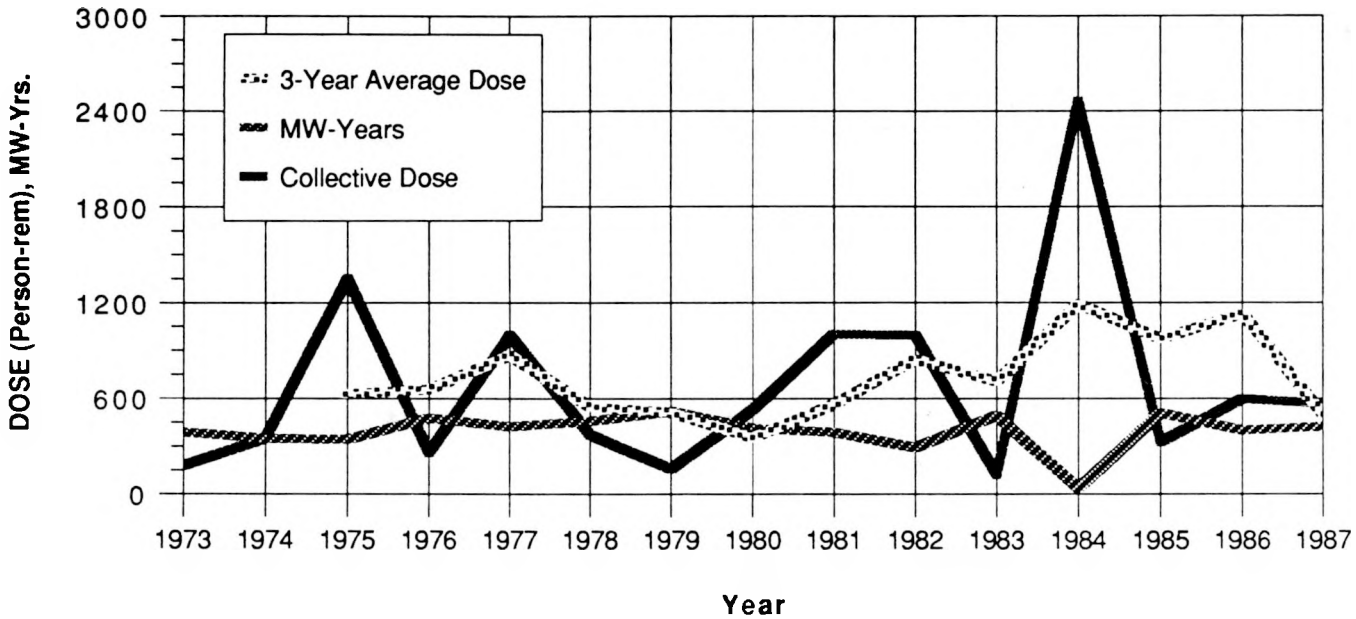
Contract

APPENDIX E (continued)

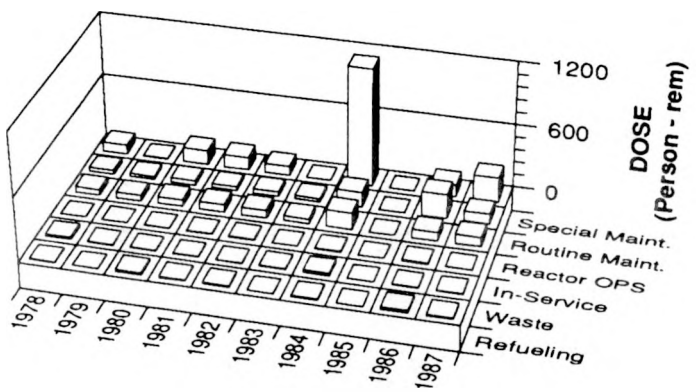
MONTICELLO

BWR

Dose-Performance Indicators



Breakdown By Job Function



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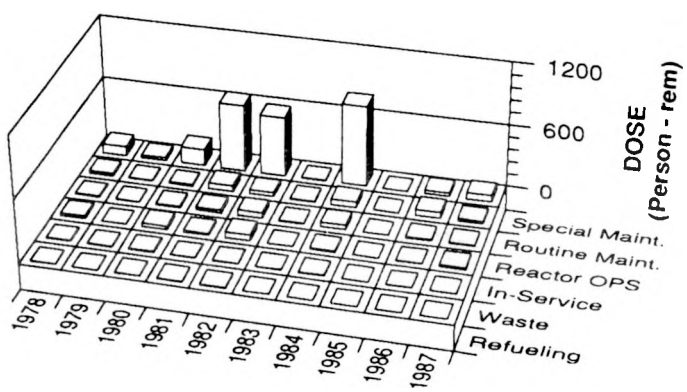


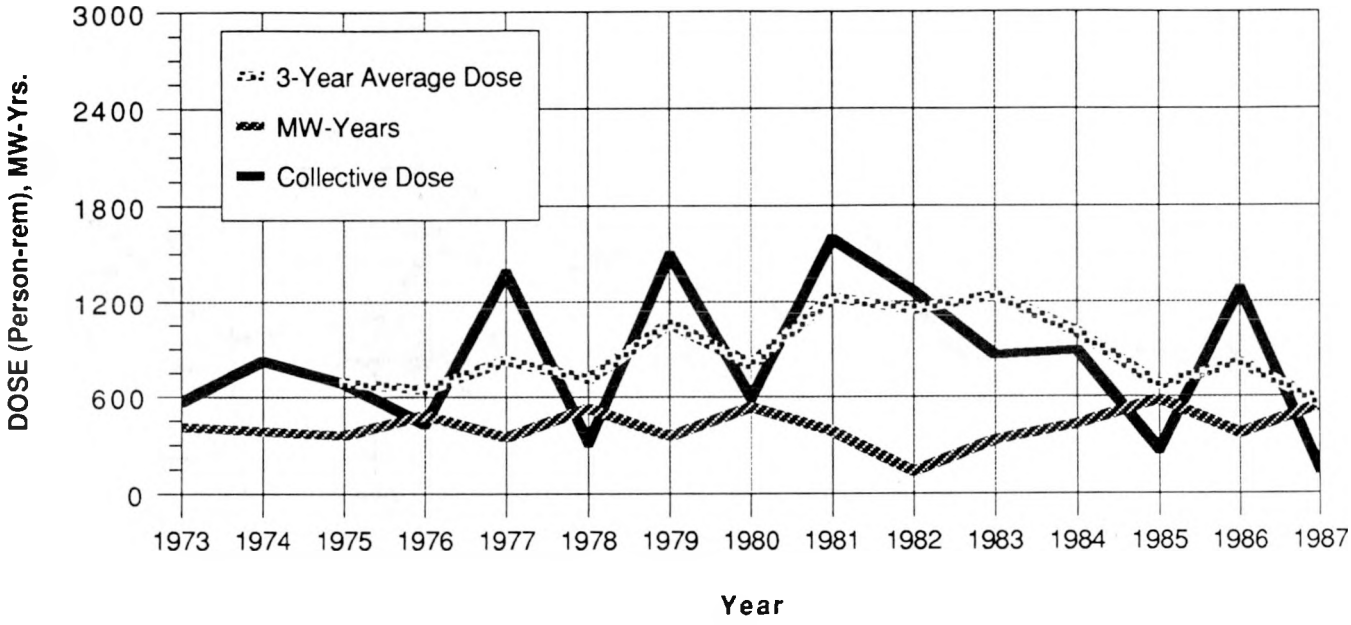
Contract

APPENDIX E (continued)

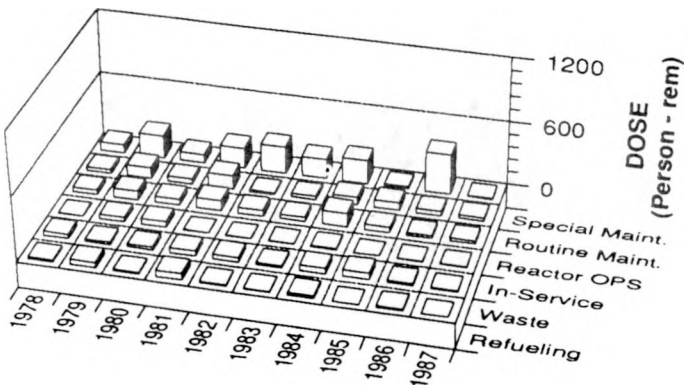
NINE MILE POINT 1

BWR

Dose-Performance Indicators



Breakdown By Job Function



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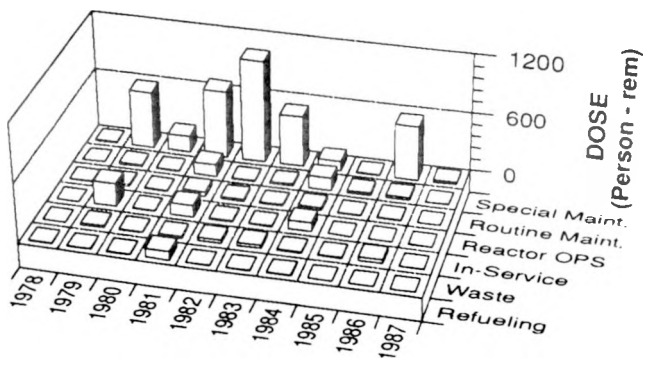


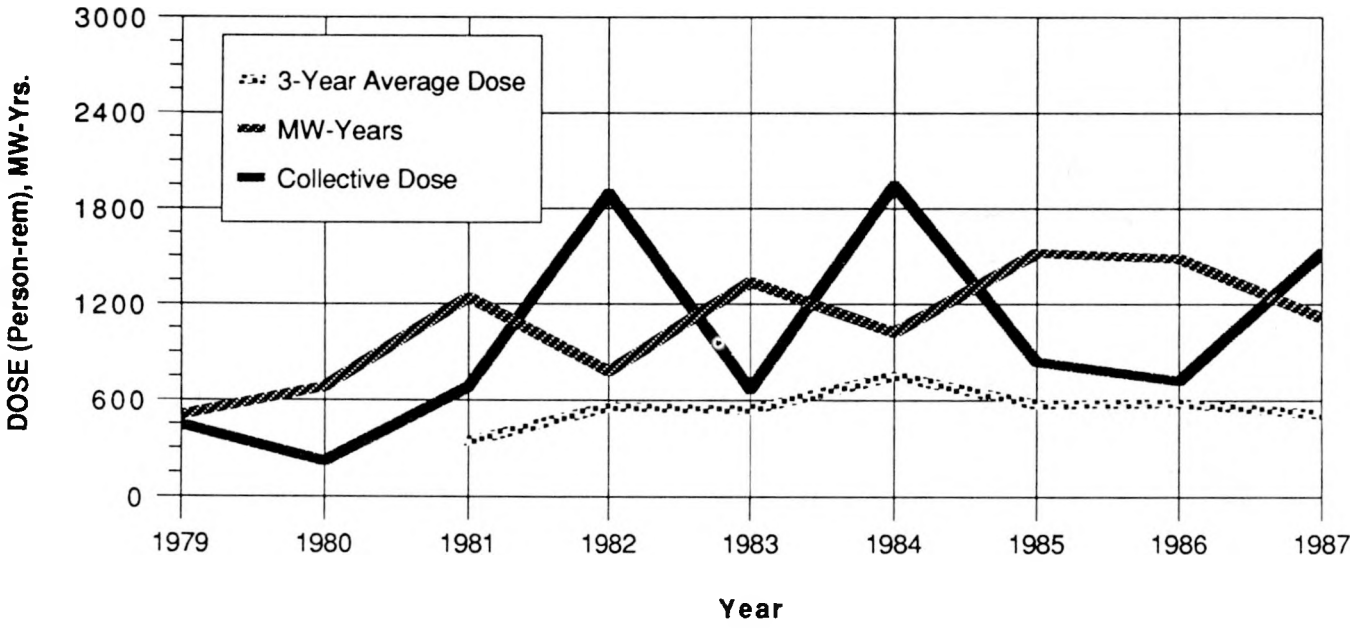
Contract

APPENDIX E (continued)

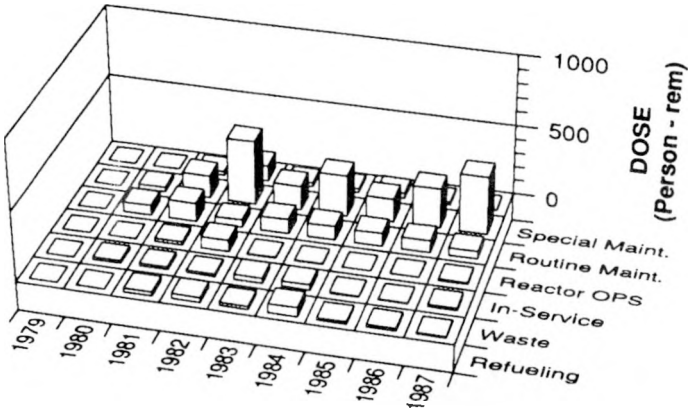
NORTH ANNA 1,2

PWR

Dose-Performance Indicators



Breakdown By Job Function



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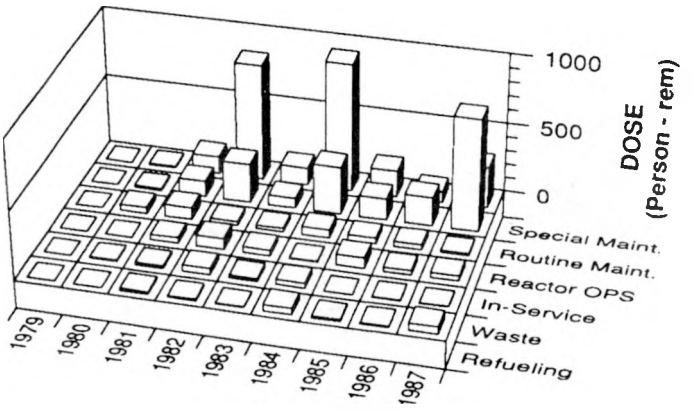


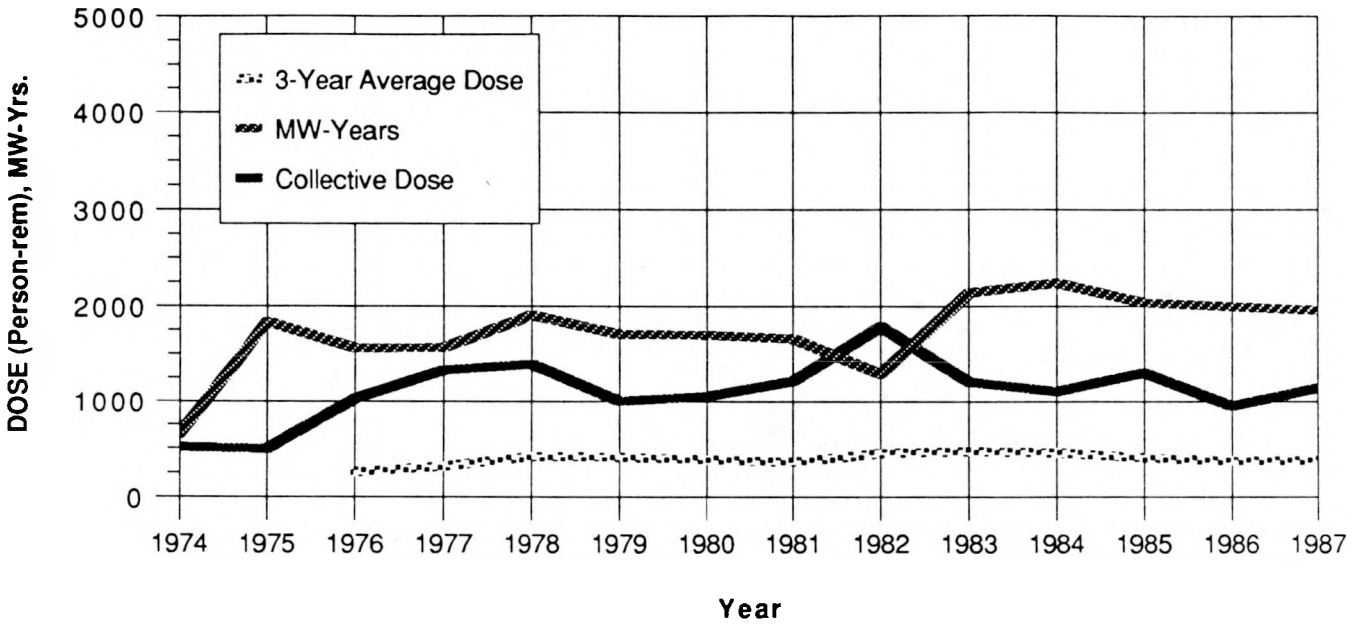
Contract

APPENDIX E (continued)

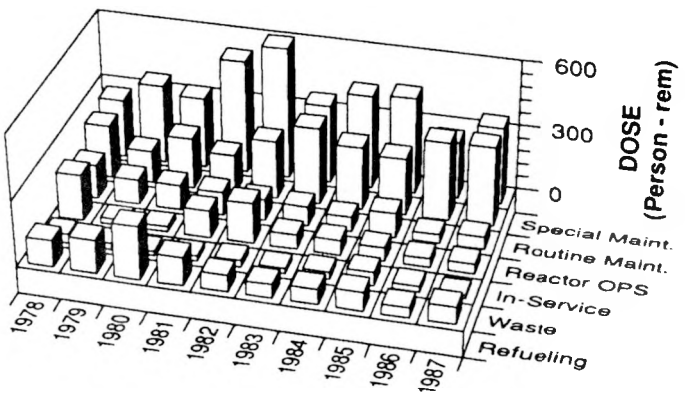
OCONEE 1,2,3

PWR

Dose-Performance Indicators



Breakdown By Job Function



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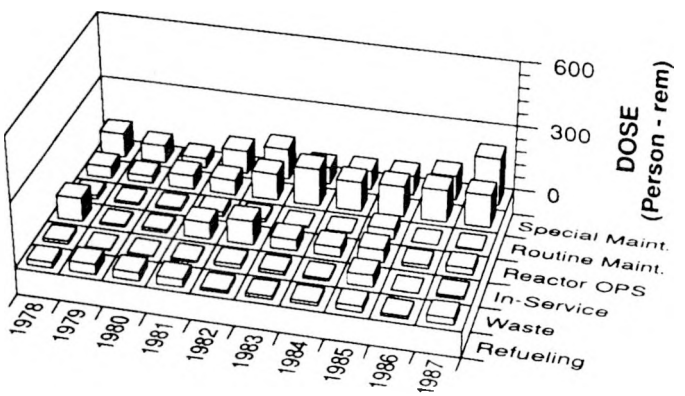


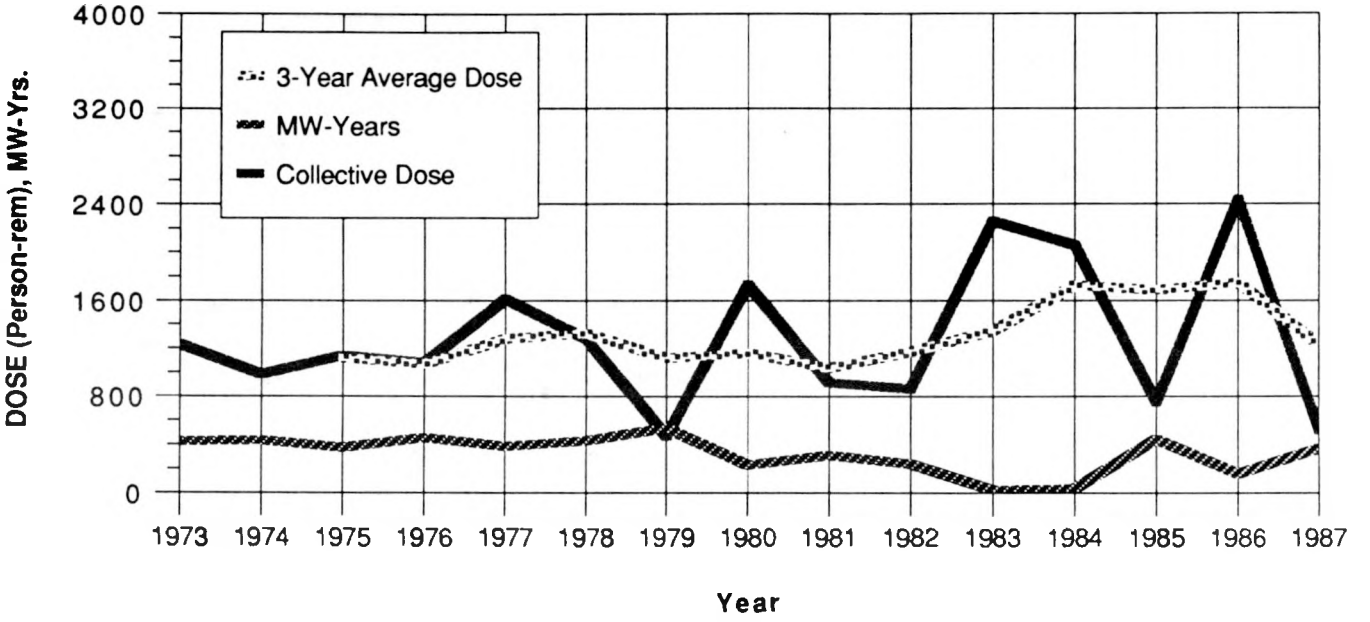
Contract

APPENDIX E (continued)

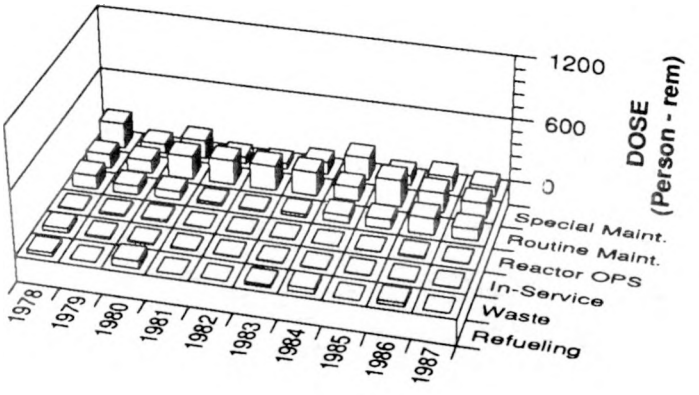
OYSTER CREEK

BWR

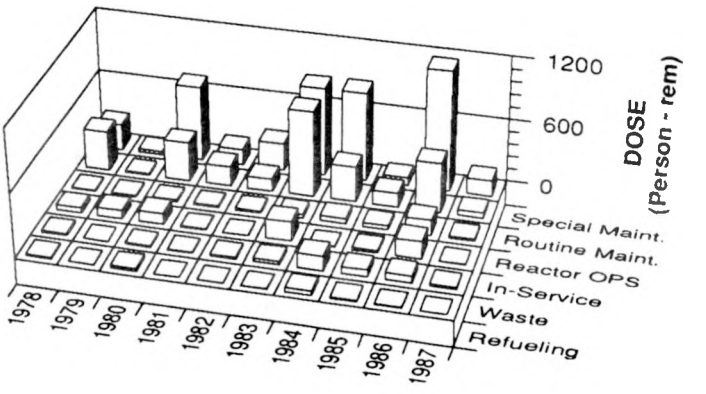
Dose-Performance Indicators



Breakdown By Job Function



Plant



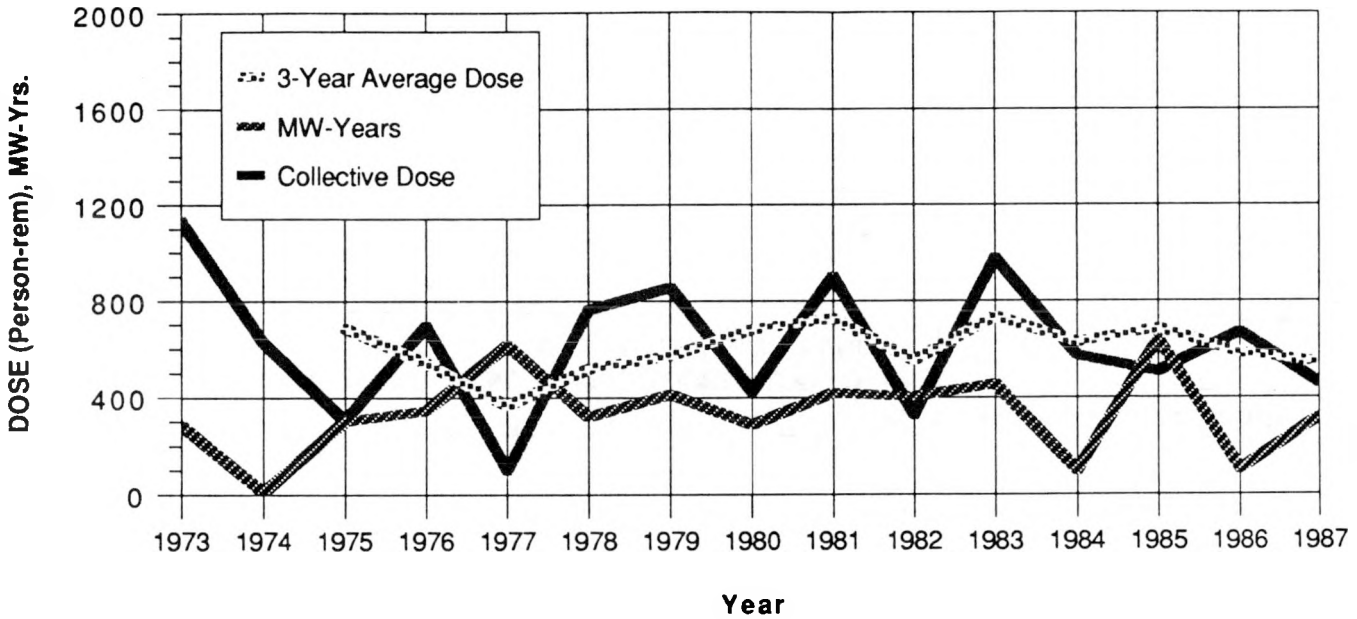
Contract

APPENDIX E (continued)

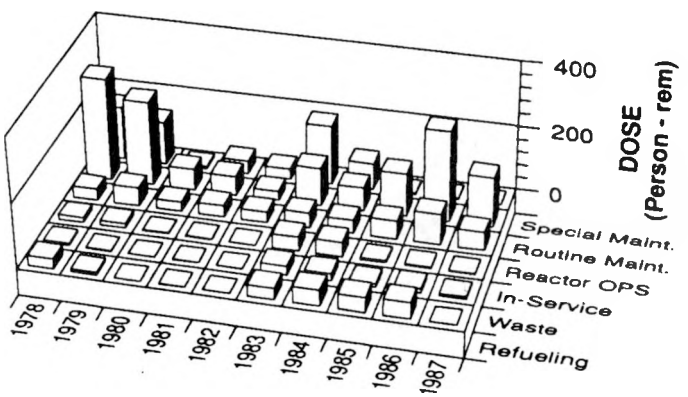
PALISADES

PWR

Dose-Performance Indicators



Breakdown By Job Function



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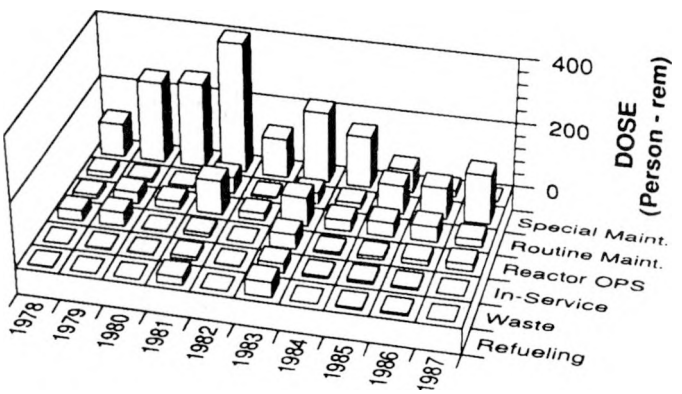


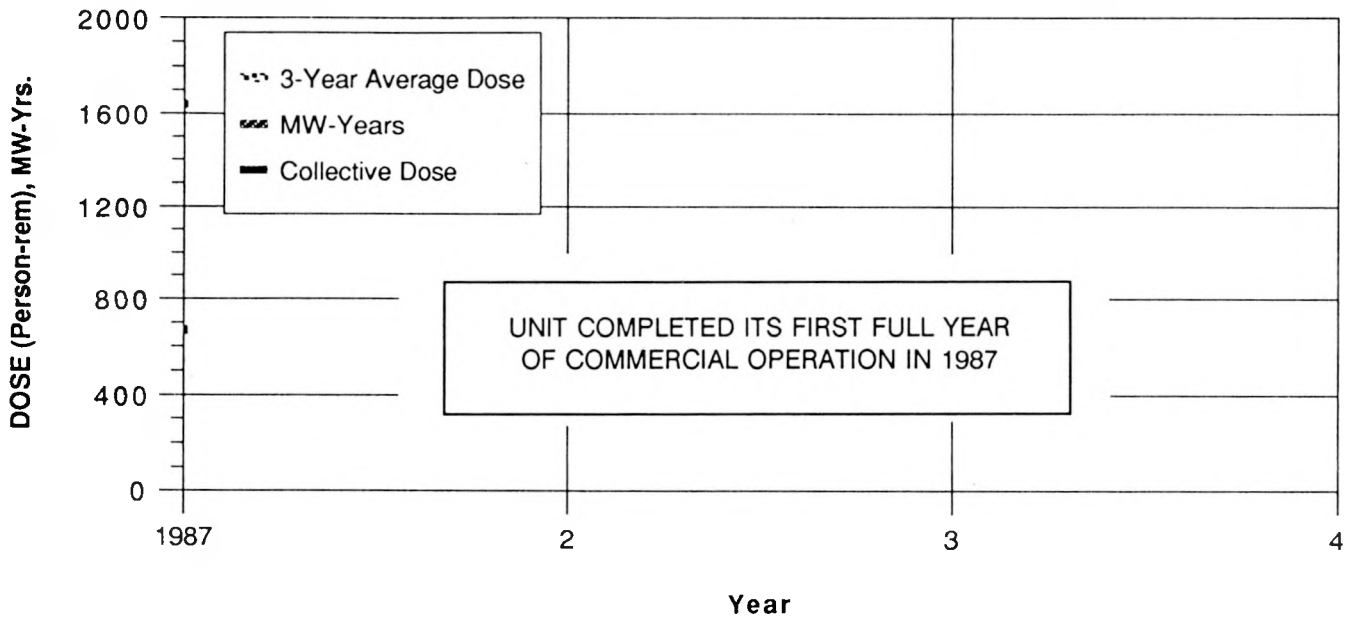
Contract

APPENDIX E (continued)

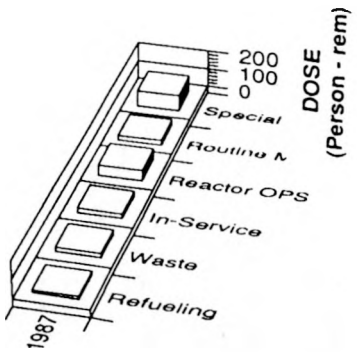
PALO VERDE 1,2

PWR

Dose-Performance Indicators



Breakdown By Job Function



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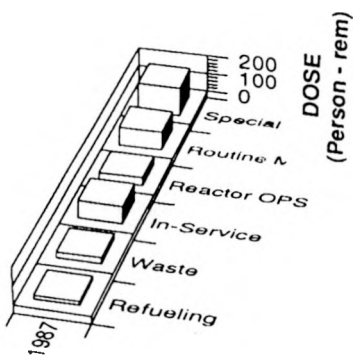


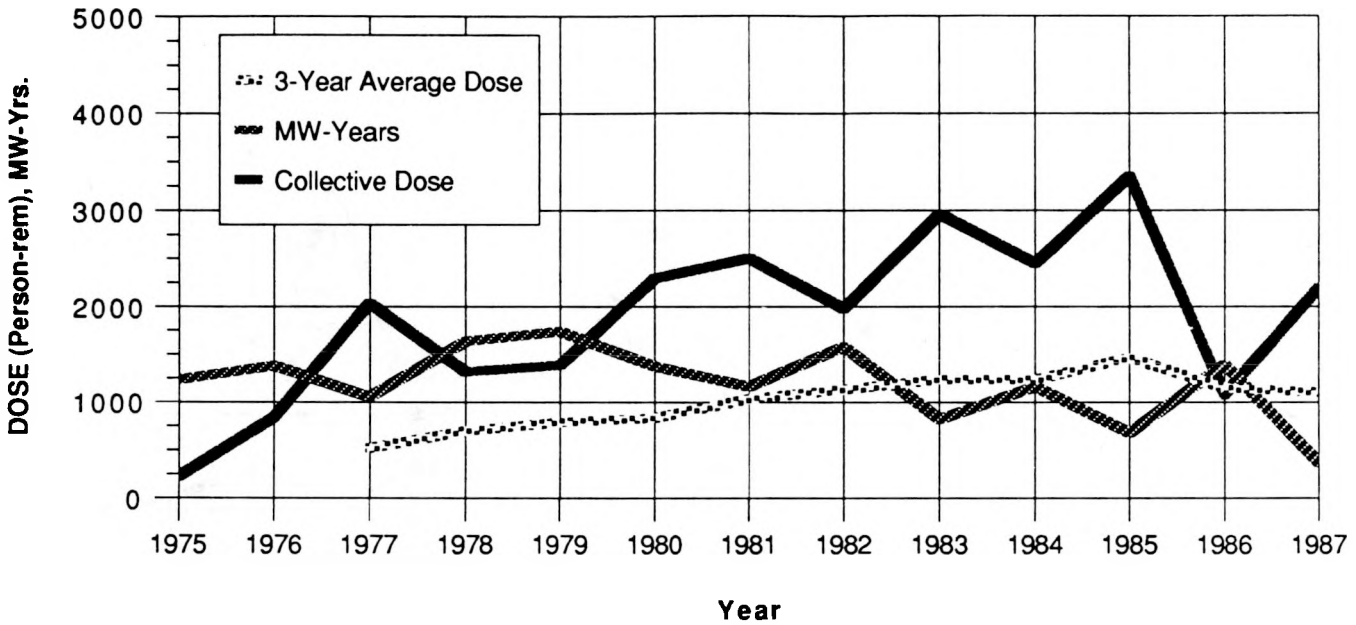
Contract

APPENDIX E (continued)

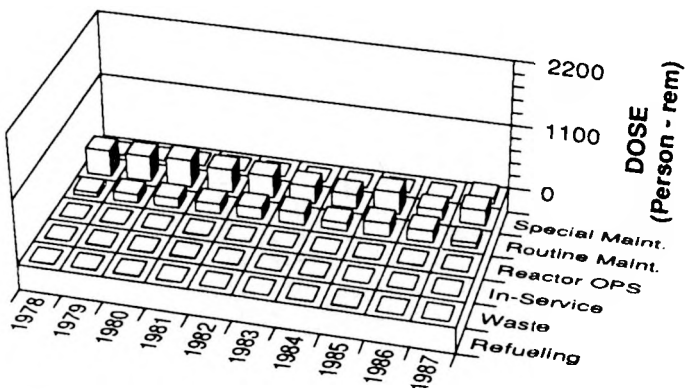
PEACH BOTTOM 2,3

BWR

Dose-Performance Indicators



Breakdown By Job Function



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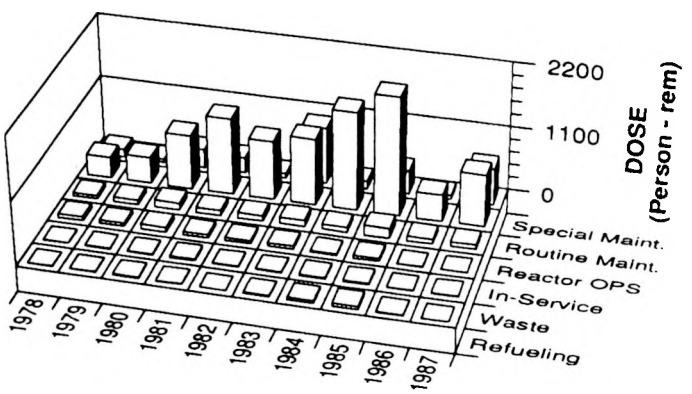


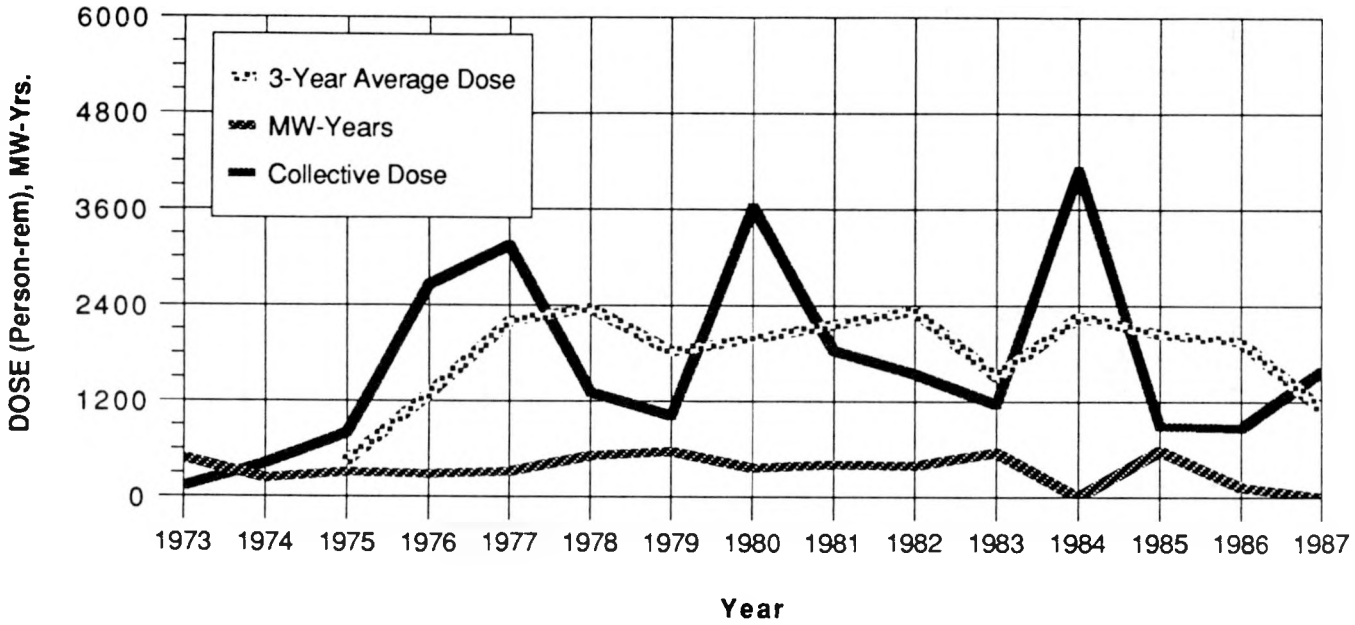
Contract

APPENDIX E (continued)

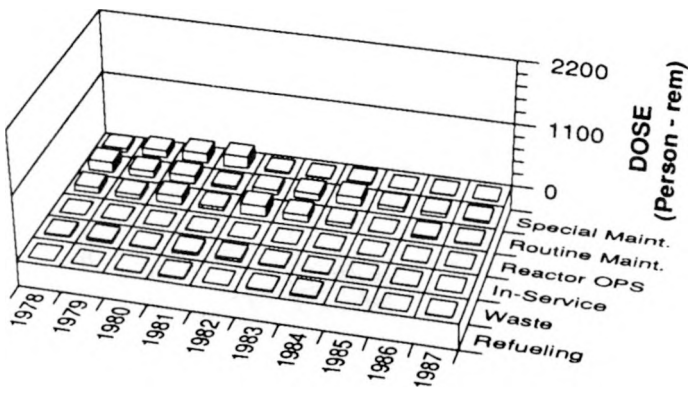
PILGRIM

BWR

Dose-Performance Indicators



Breakdown By Job Function



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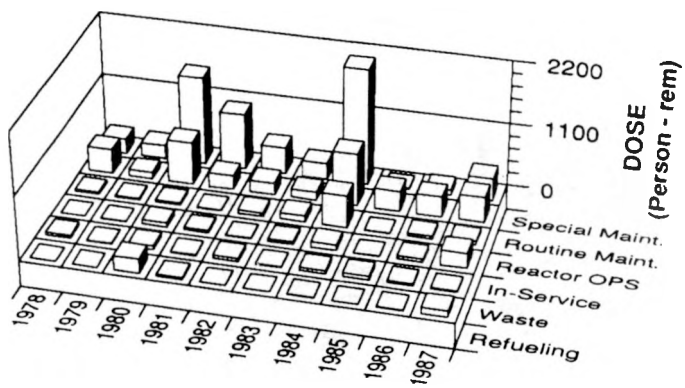


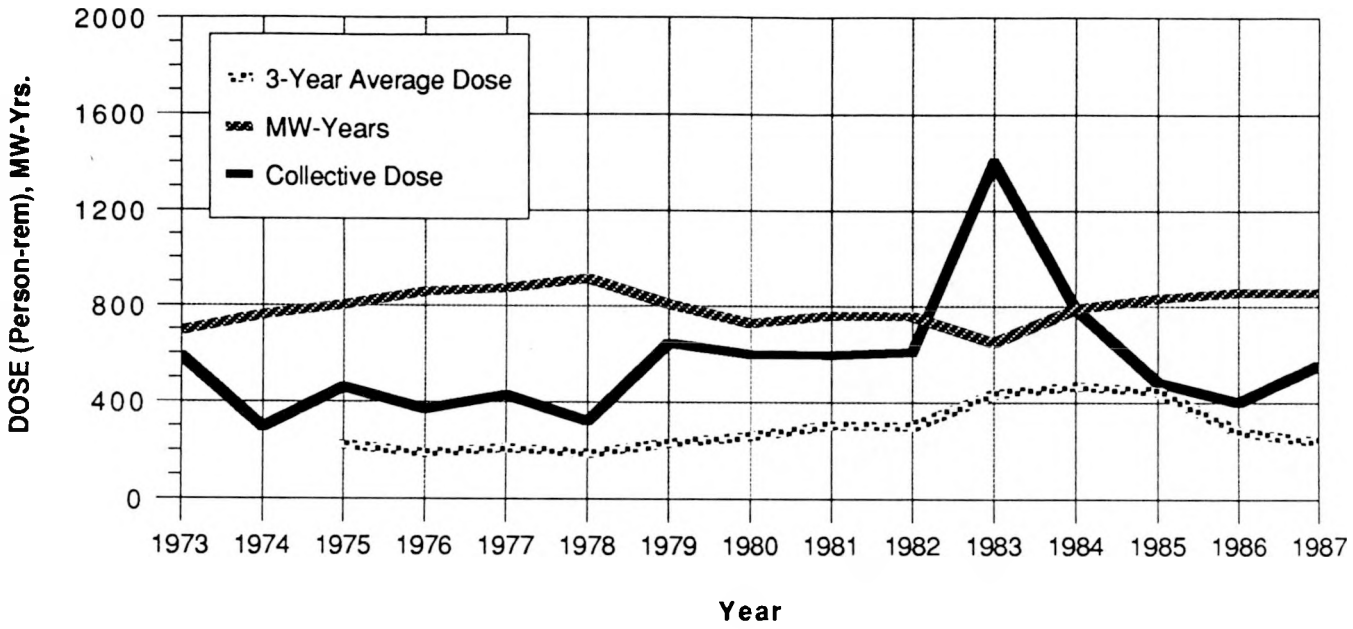
Contract

APPENDIX E (continued)

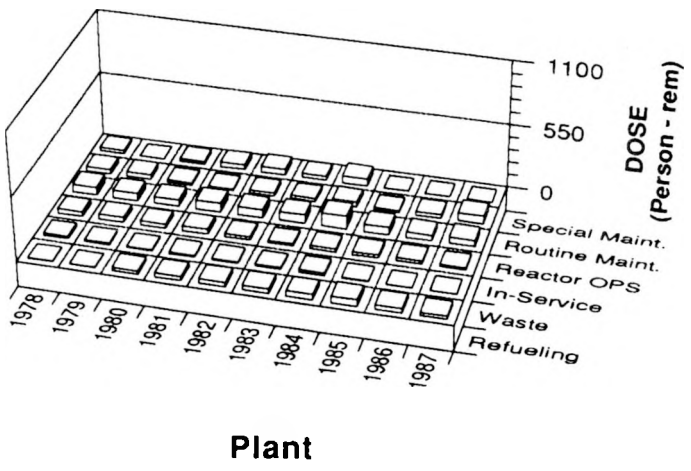
POINT BEACH 1,2

PWR

Dose-Performance Indicators



Breakdown By Job Function



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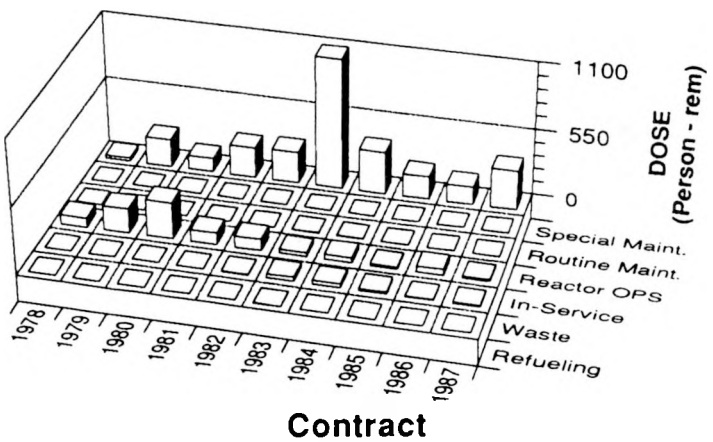


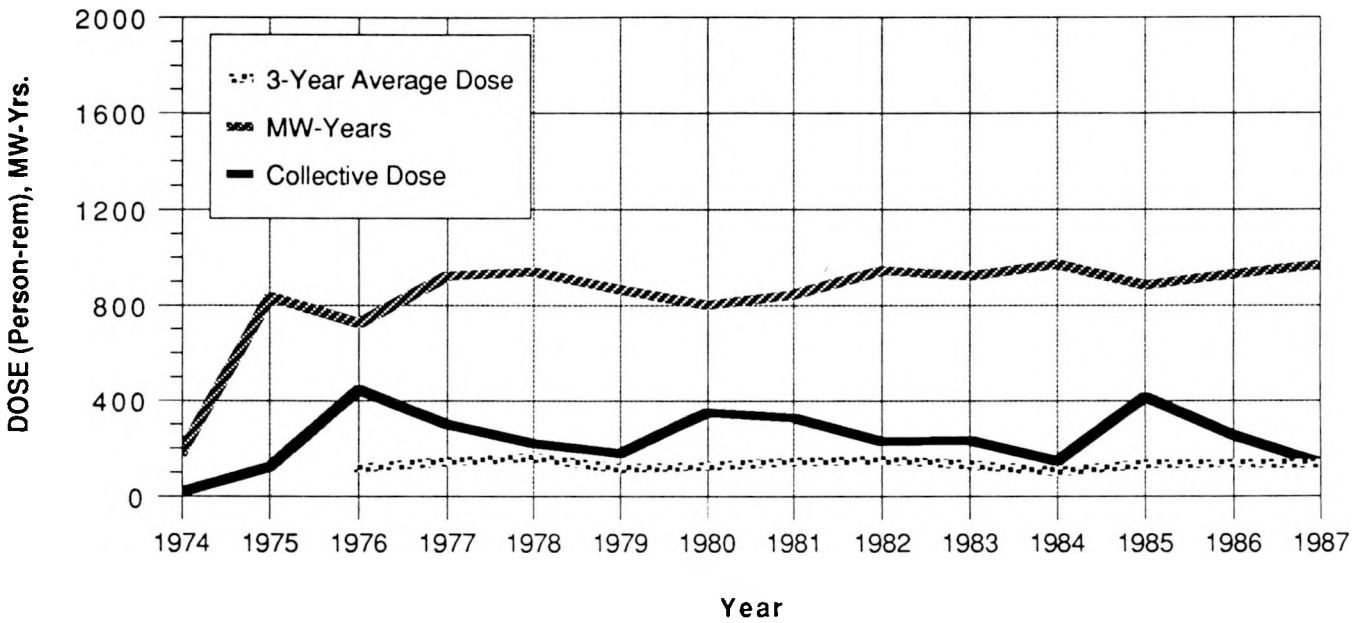
Contract

APPENDIX E (continued)

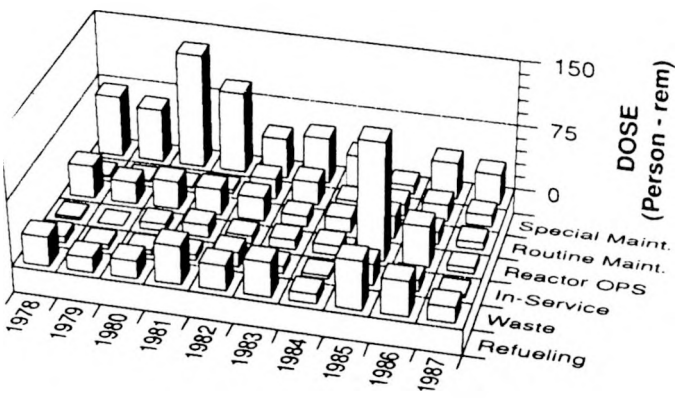
PRAIRIE ISLAND 1,2

PWR

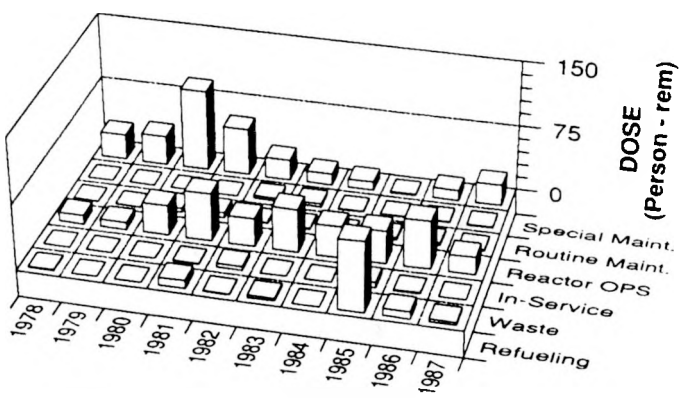
Dose-Performance Indicators



Breakdown By Job Function



Plant



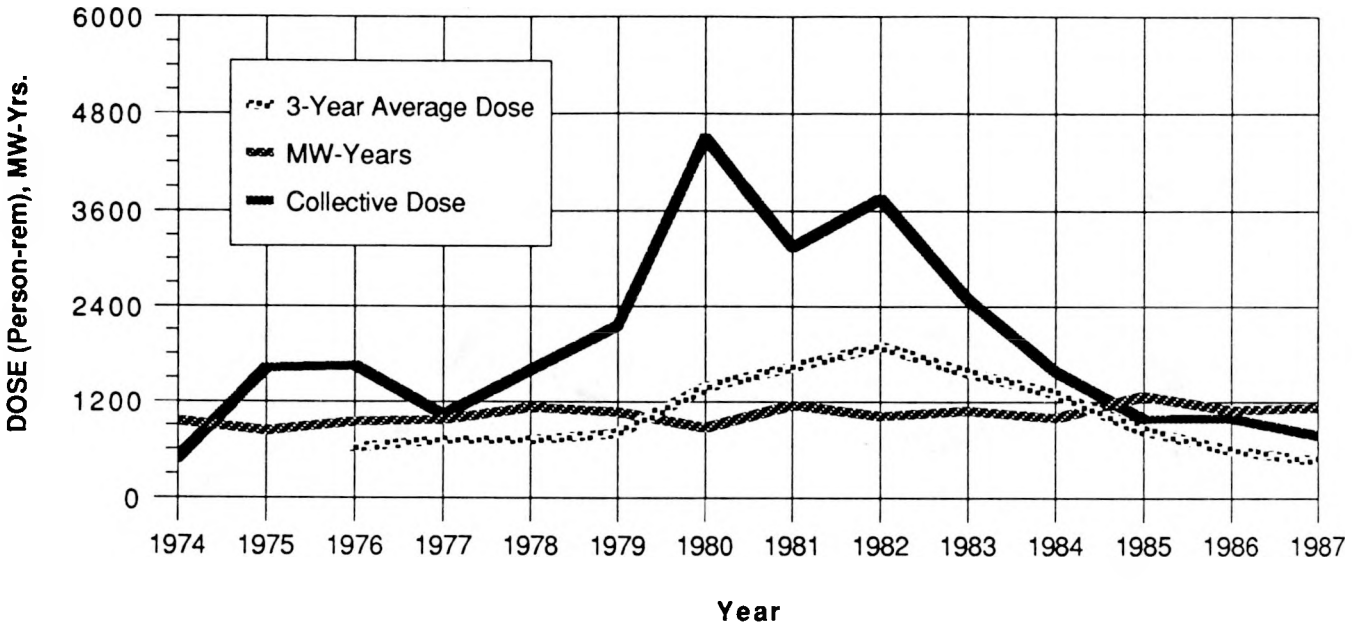
Contract

APPENDIX E (continued)

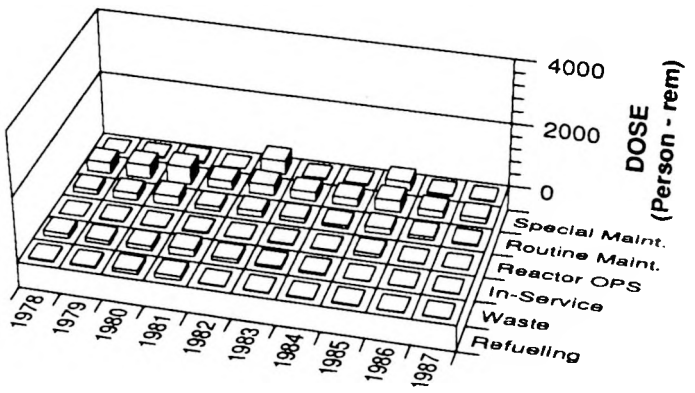
QUAD CITIES 1,2

BWR

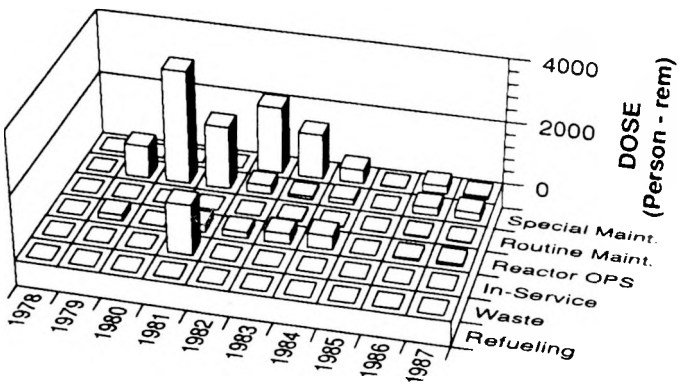
Dose-Performance Indicators



Breakdown By Job Function



Plant



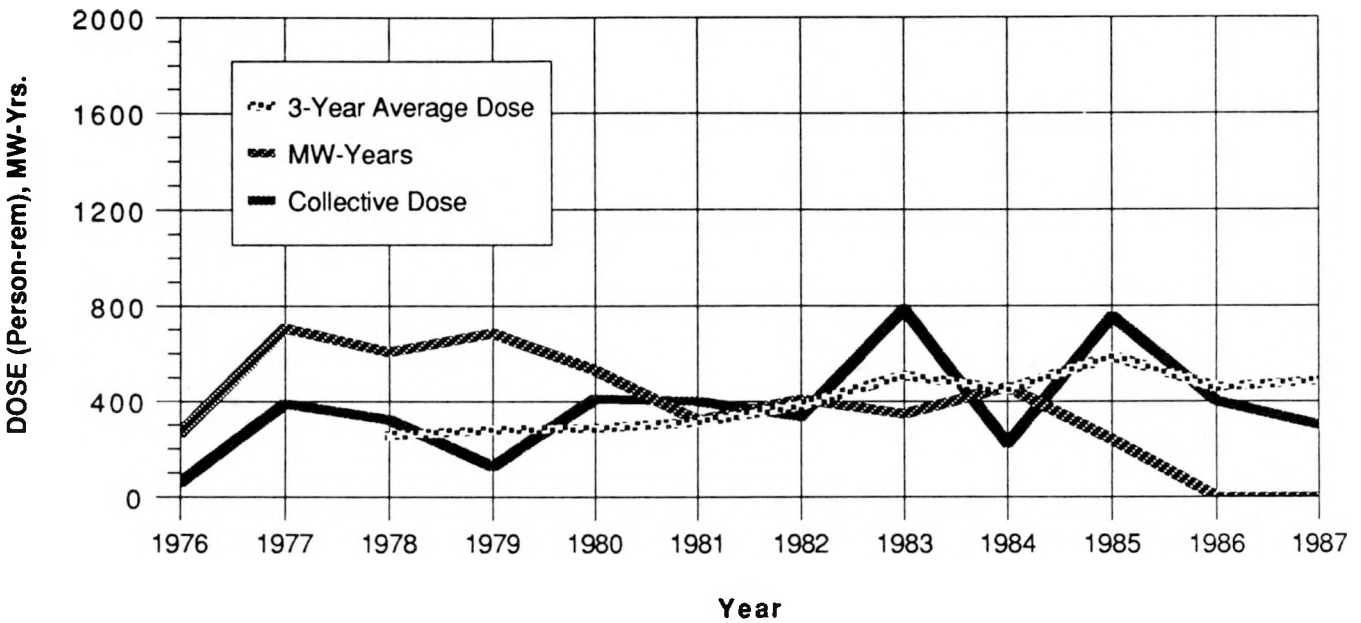
Contract

APPENDIX E (continued)

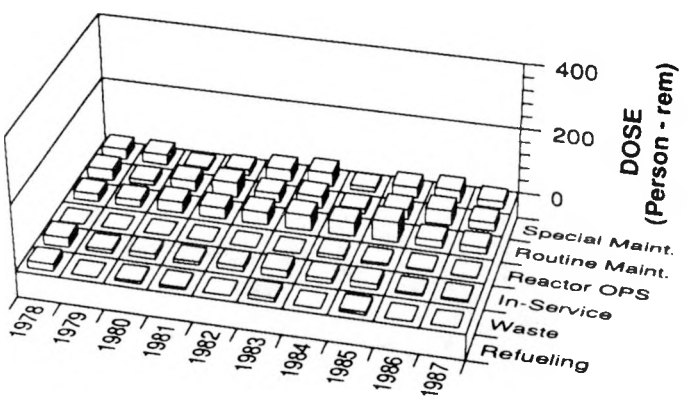
RANCHO SECO

PWR

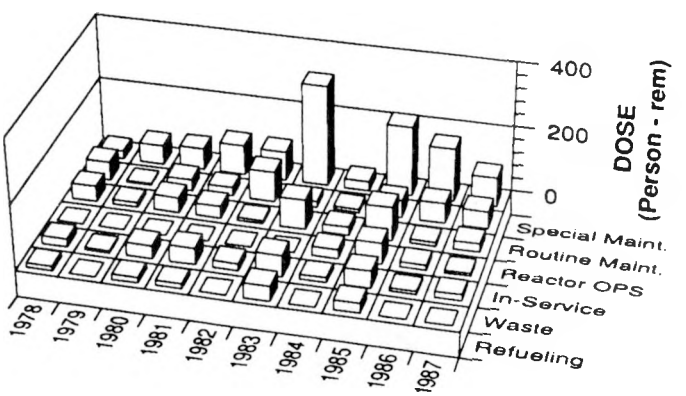
Dose-Performance Indicators



Breakdown By Job Function



Plant



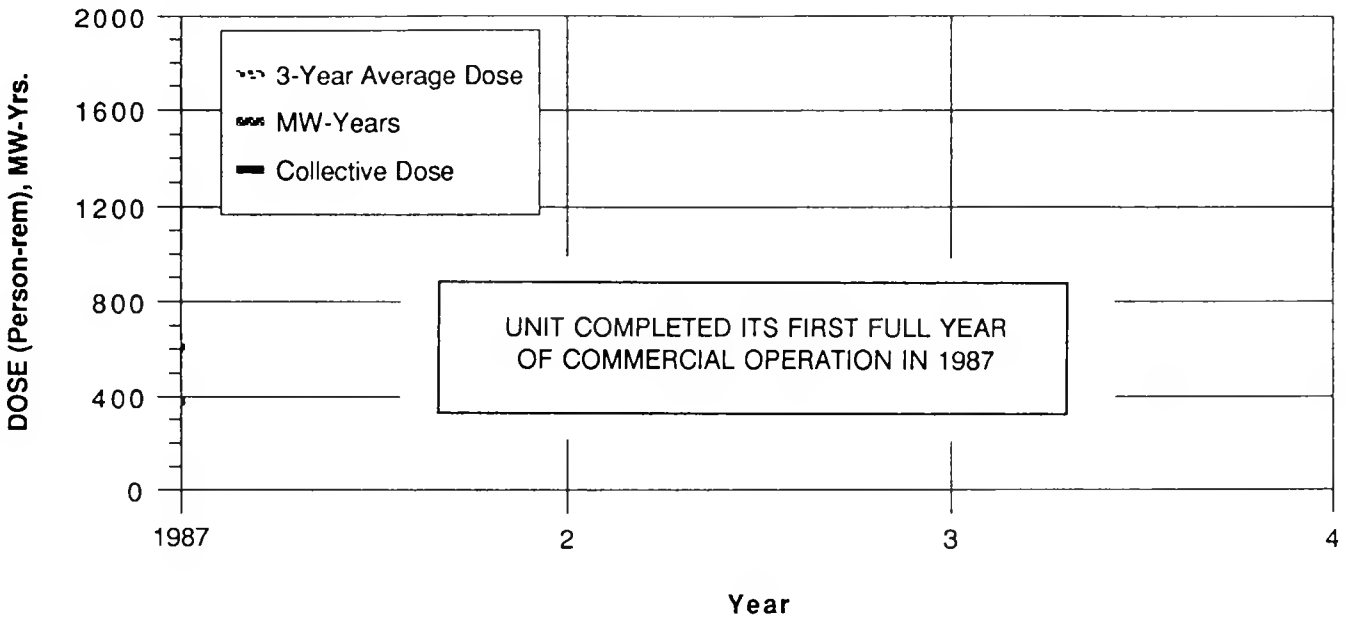
Contract

APPENDIX E (continued)

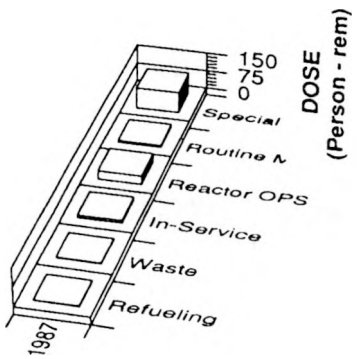
RIVER BEND

BWR

Dose-Performance Indicators



Breakdown By Job Function



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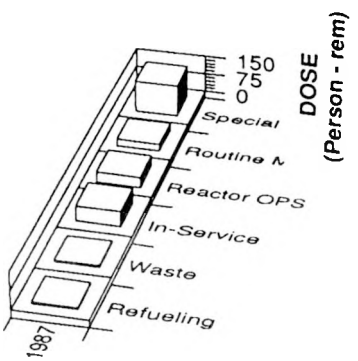


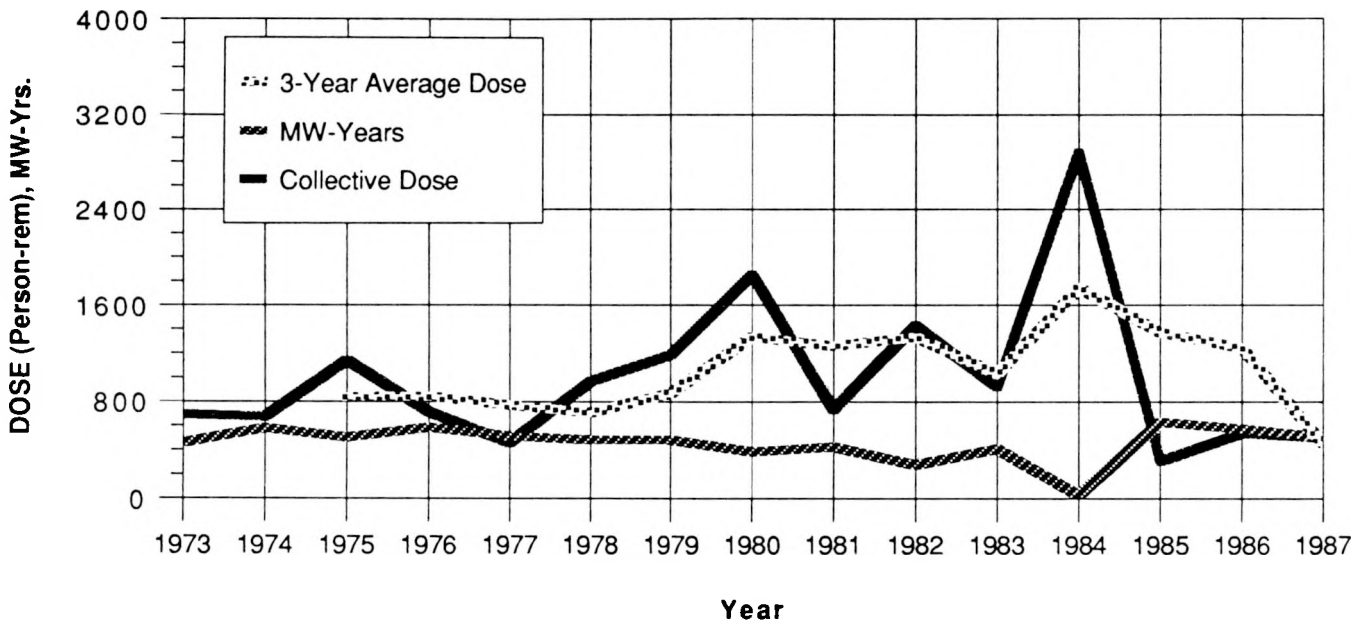
Contract

APPENDIX E (continued)

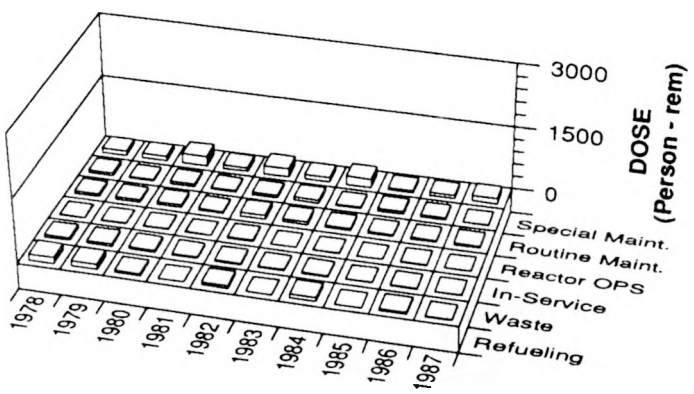
ROBINSON 2

PWR

Dose-Performance Indicators



Breakdown By Job Function



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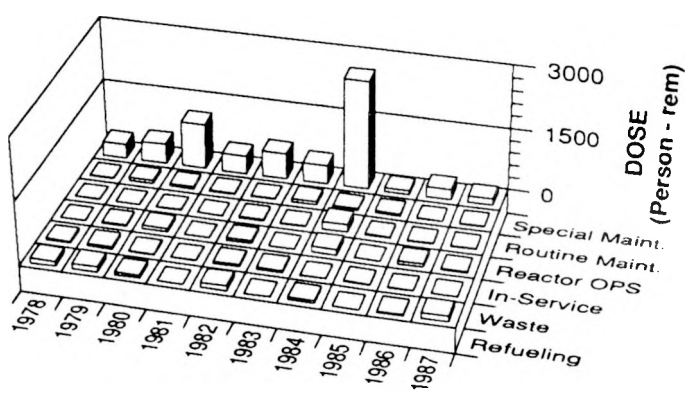


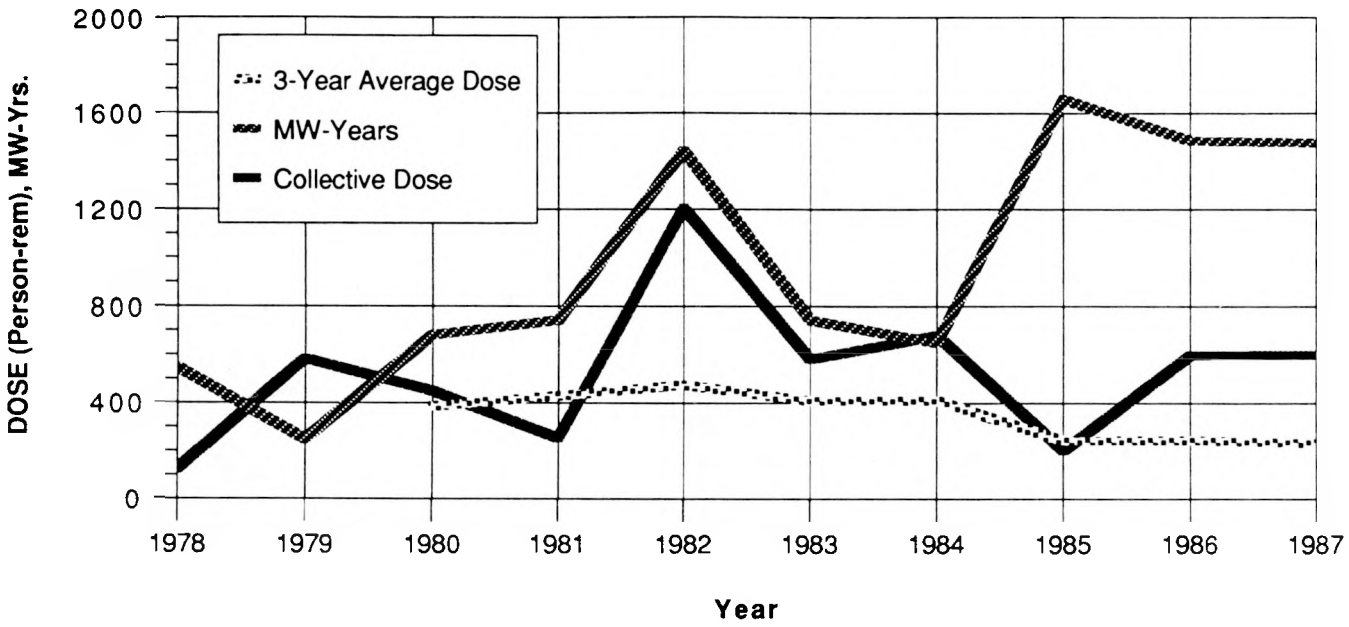
Contract

APPENDIX E (continued)

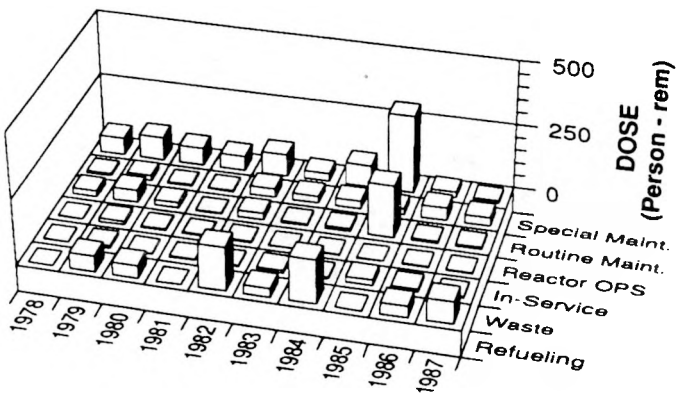
SALEM 1,2

PWR

Dose-Performance Indicators



Breakdown By Job Function



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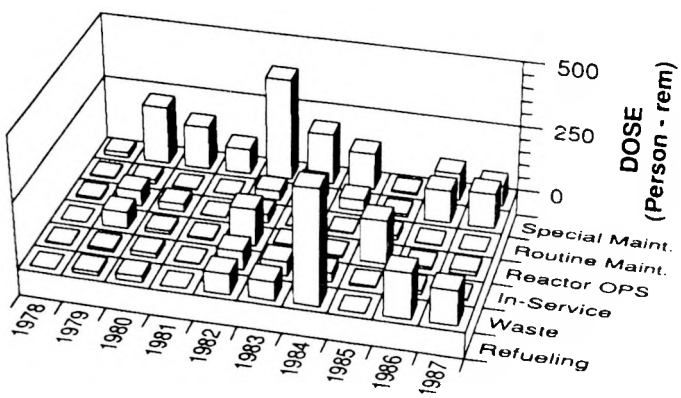


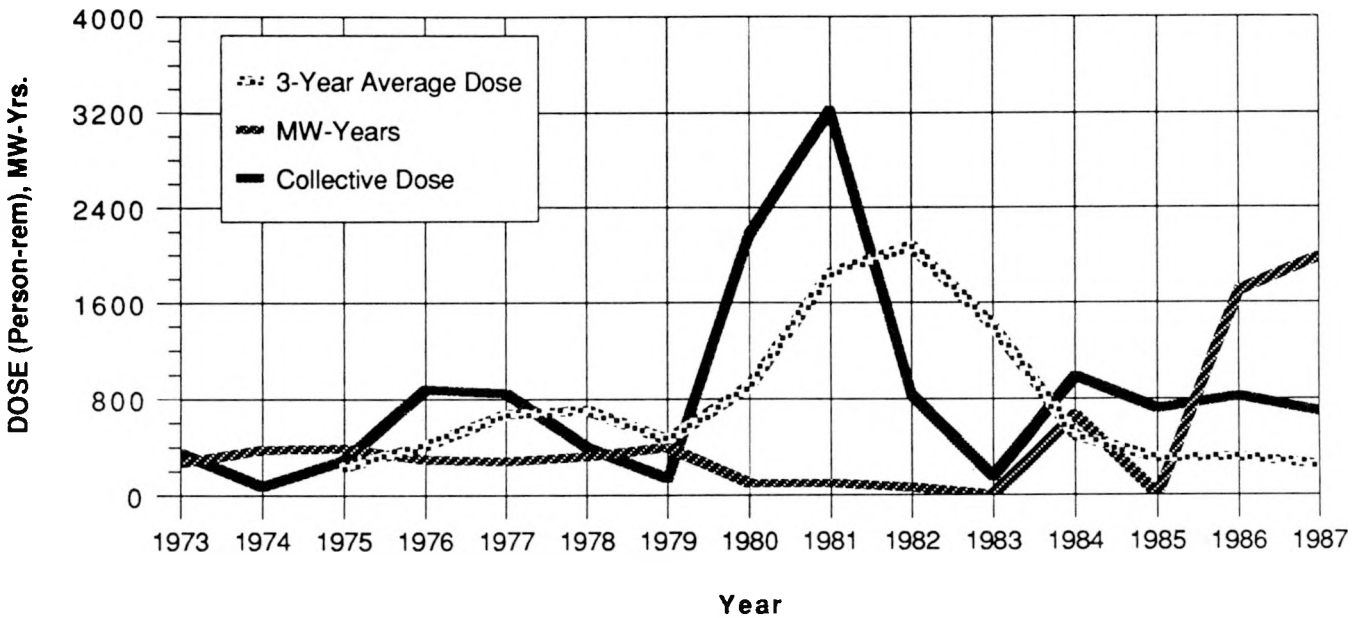
Contract

APPENDIX E (continued)

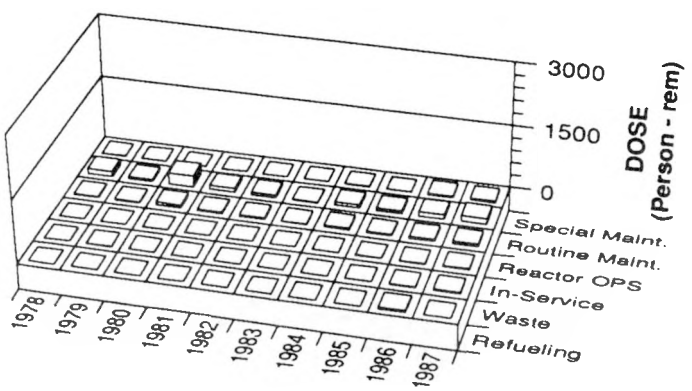
SAN ONOFRE 1,2,3

PWR

Dose-Performance Indicators



Breakdown By Job Function



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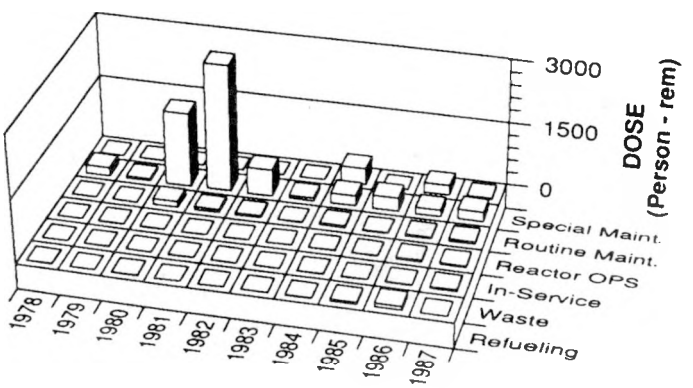


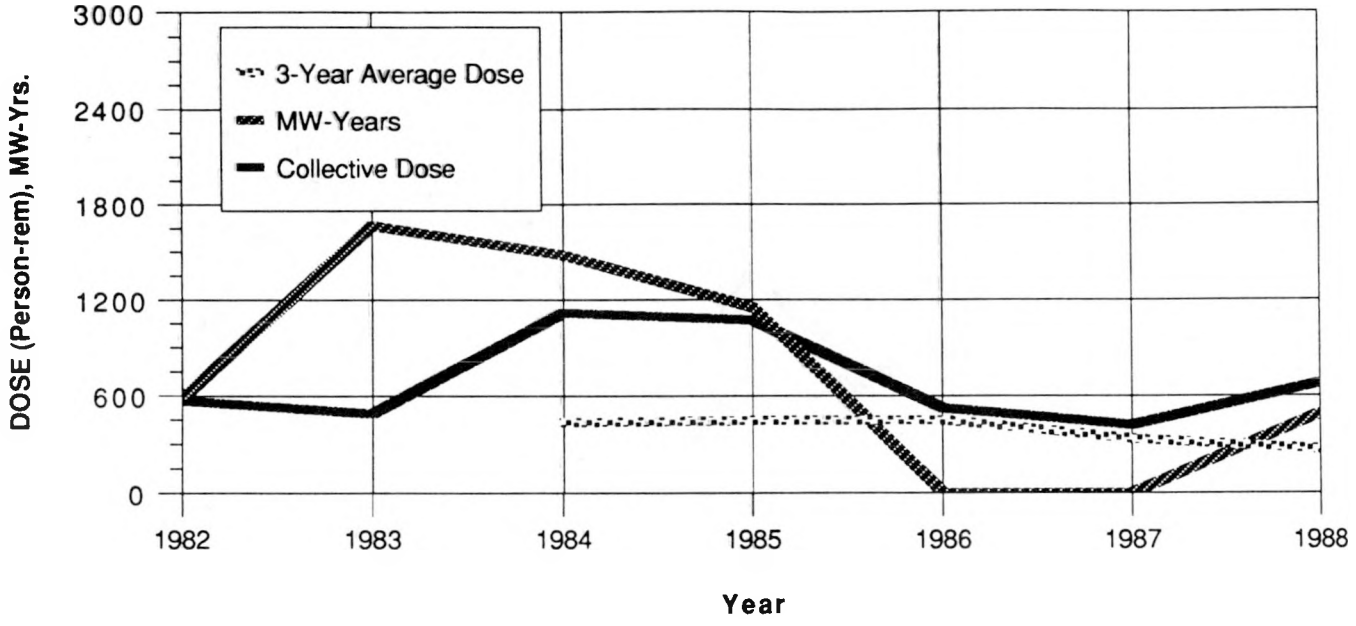
Contract

APPENDIX E (continued)

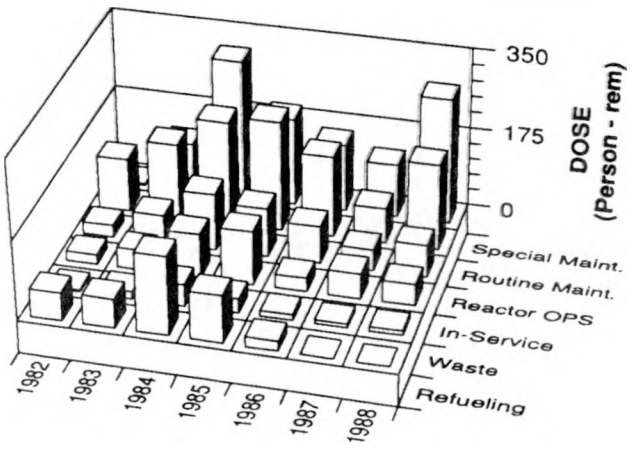
SEQUOYAH 1,2

PWR

Dose-Performance Indicators



Breakdown By Job Function



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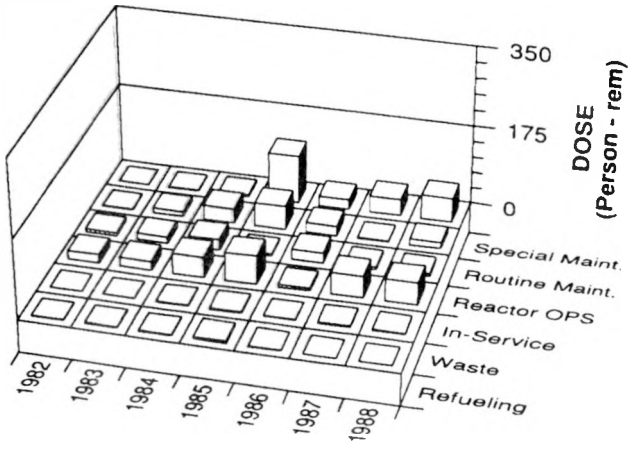


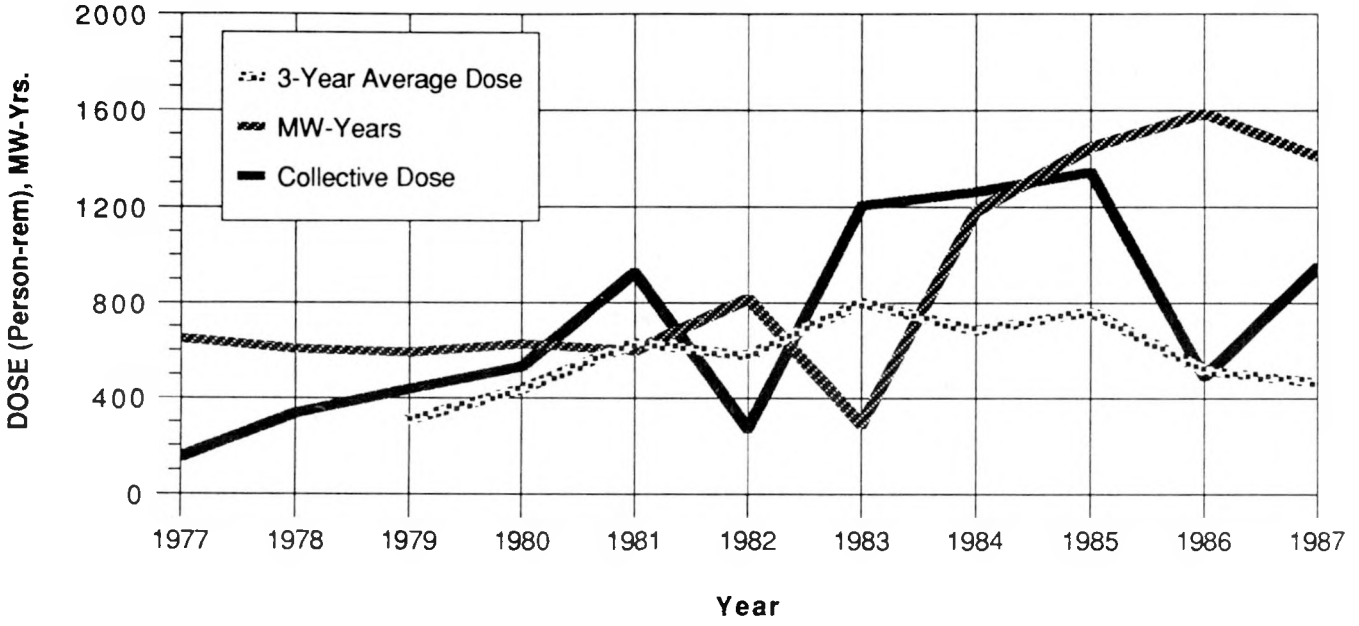
Contract

APPENDIX E (continued)

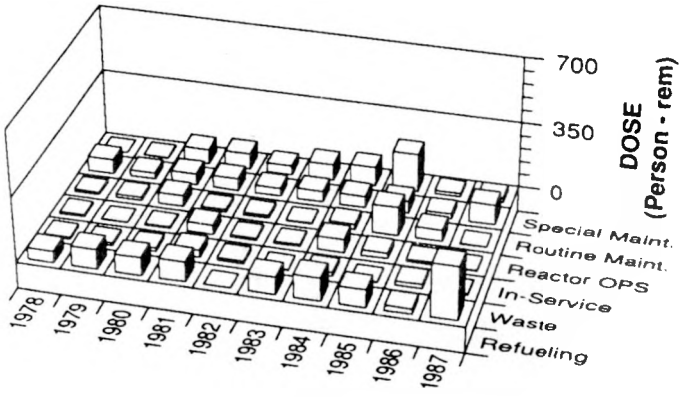
ST. LUCIE 1,2

PWR

Dose-Performance Indicators



Breakdown By Job Function



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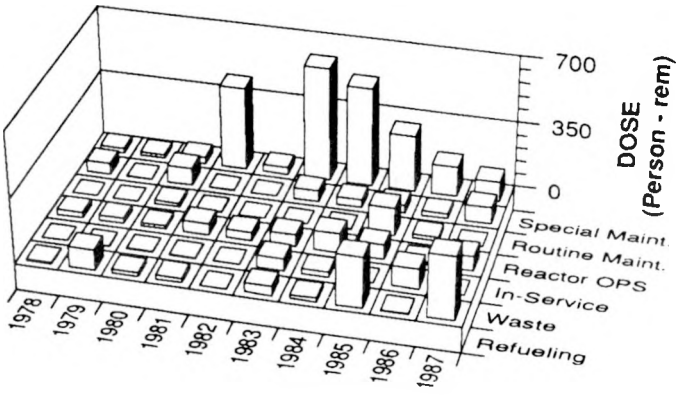


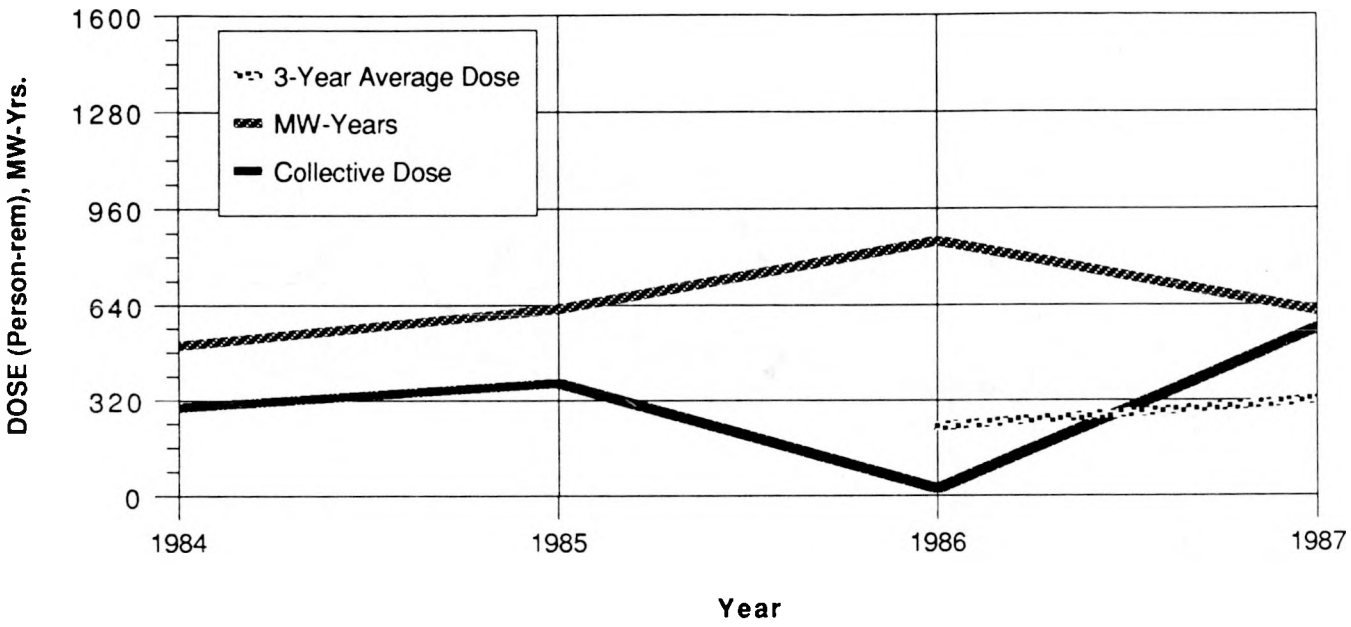
Contract

APPENDIX E (continued)

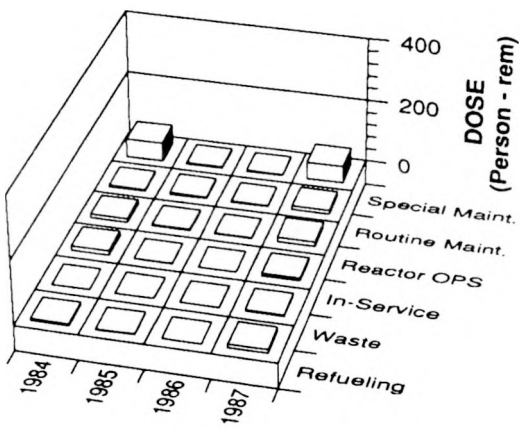
SUMMER

PWR

Dose-Performance Indicators



Breakdown By Job Function



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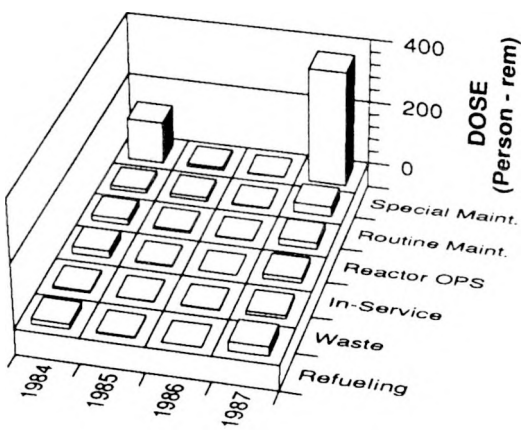


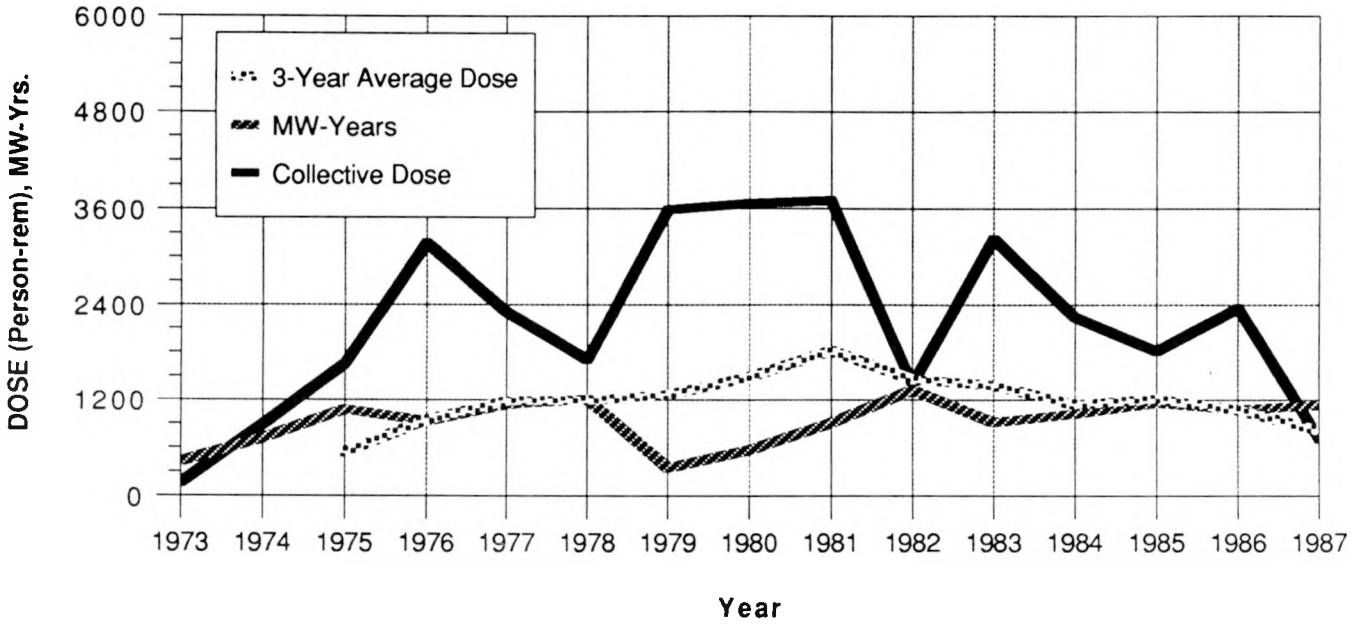
Contract

APPENDIX E (continued)

SURRY 1,2

PWR

Dose-Performance Indicators



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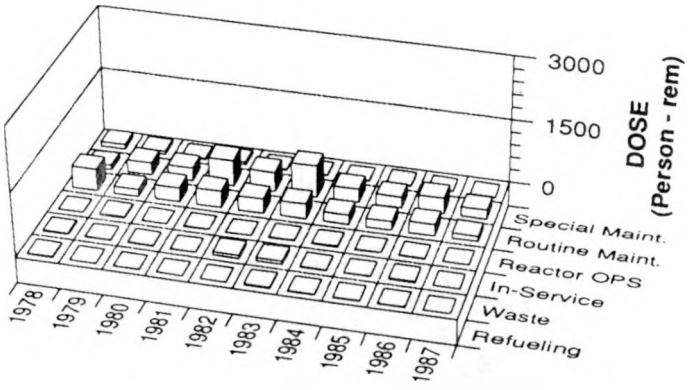

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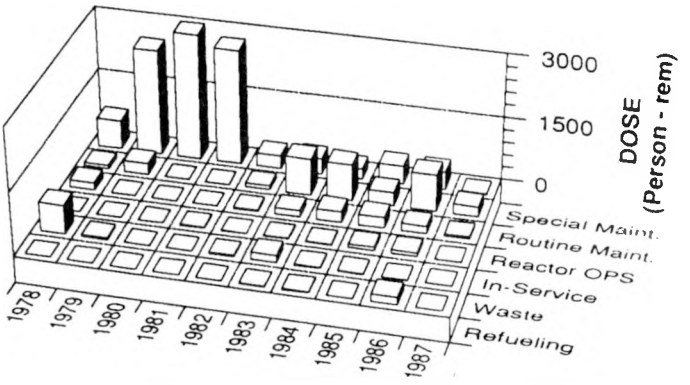


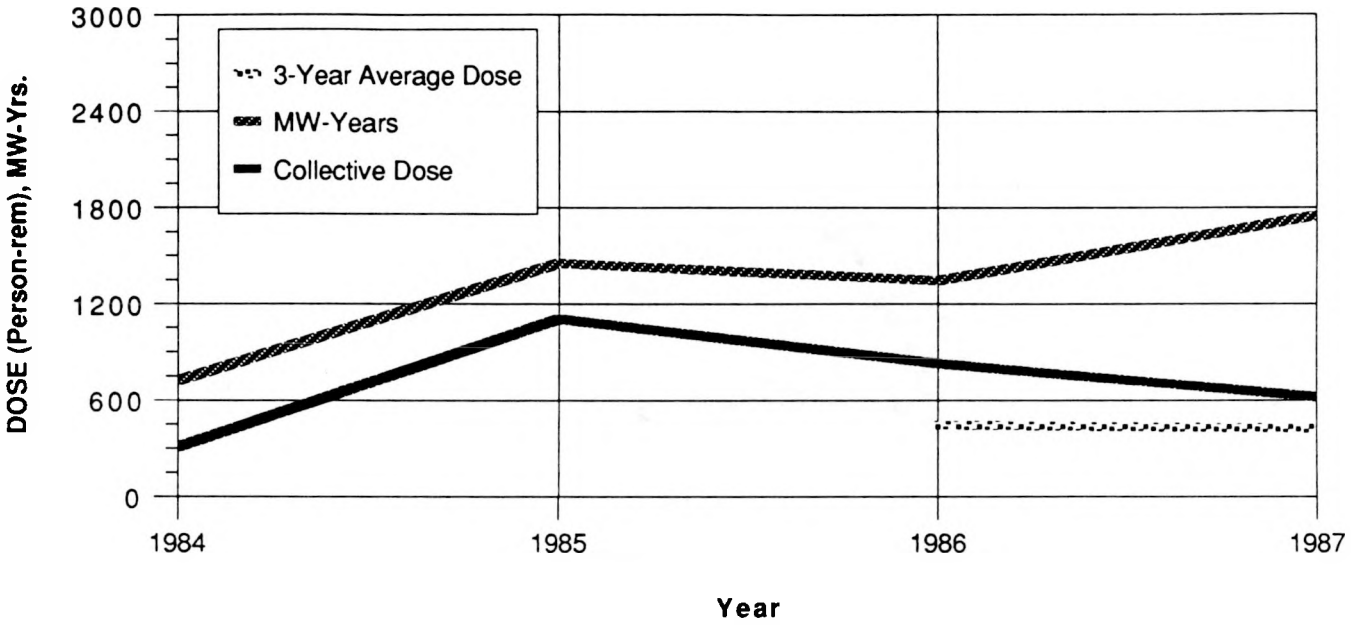
Contract

APPENDIX E (continued)

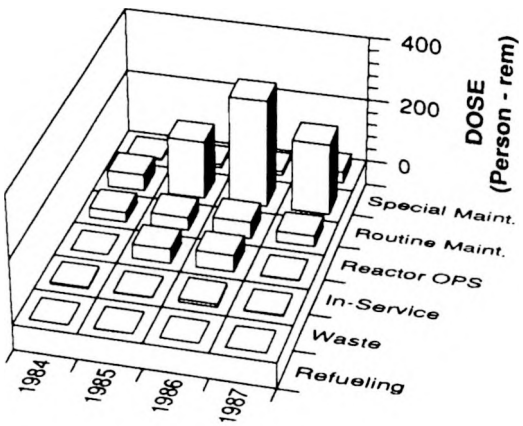
SUSQUEHANNA 1,2

BWR

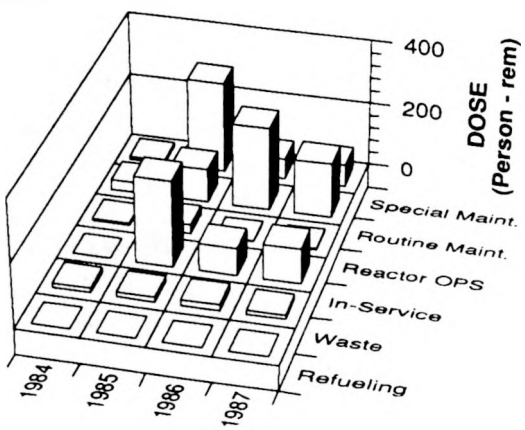
Dose-Performance Indicators



Breakdown By Job Function



Plant



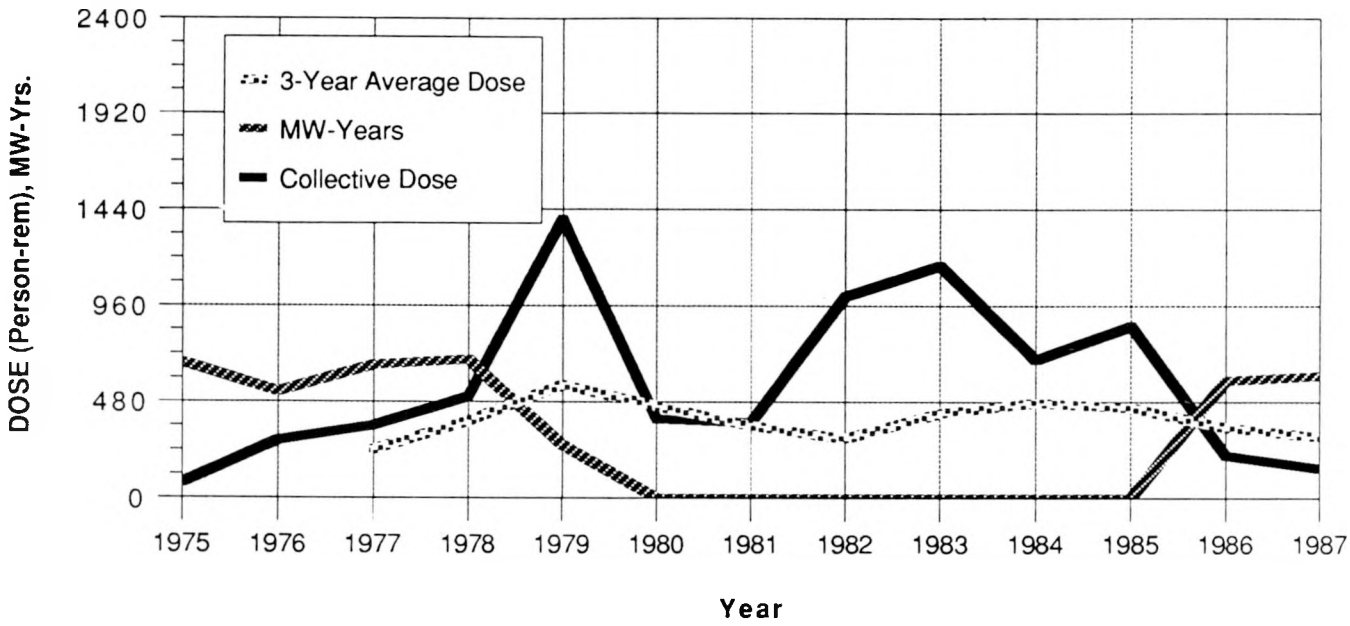
Contract

APPENDIX E (continued)

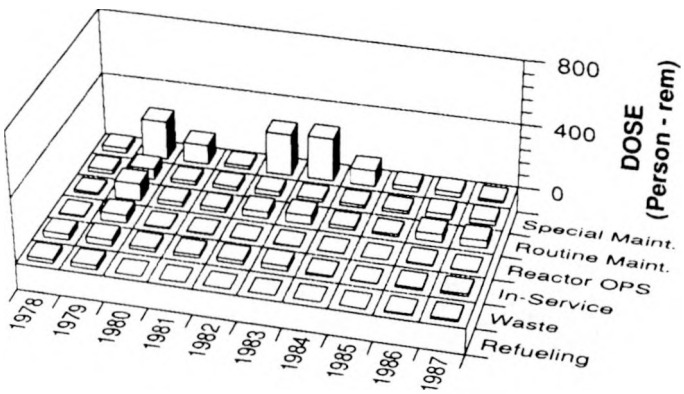
THREE MILE ISLAND 1

PWR

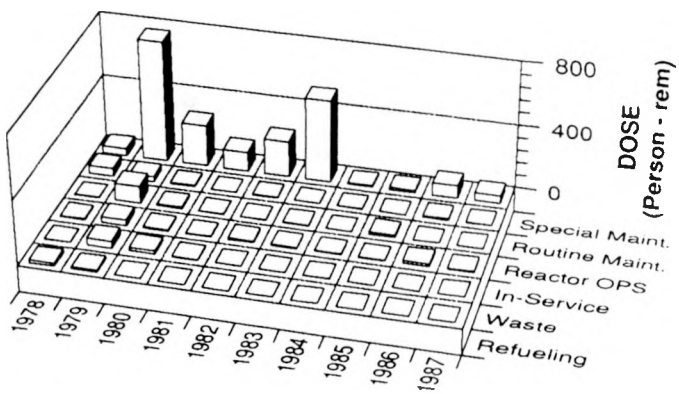
Dose-Performance Indicators



Breakdown By Job Function



Plant



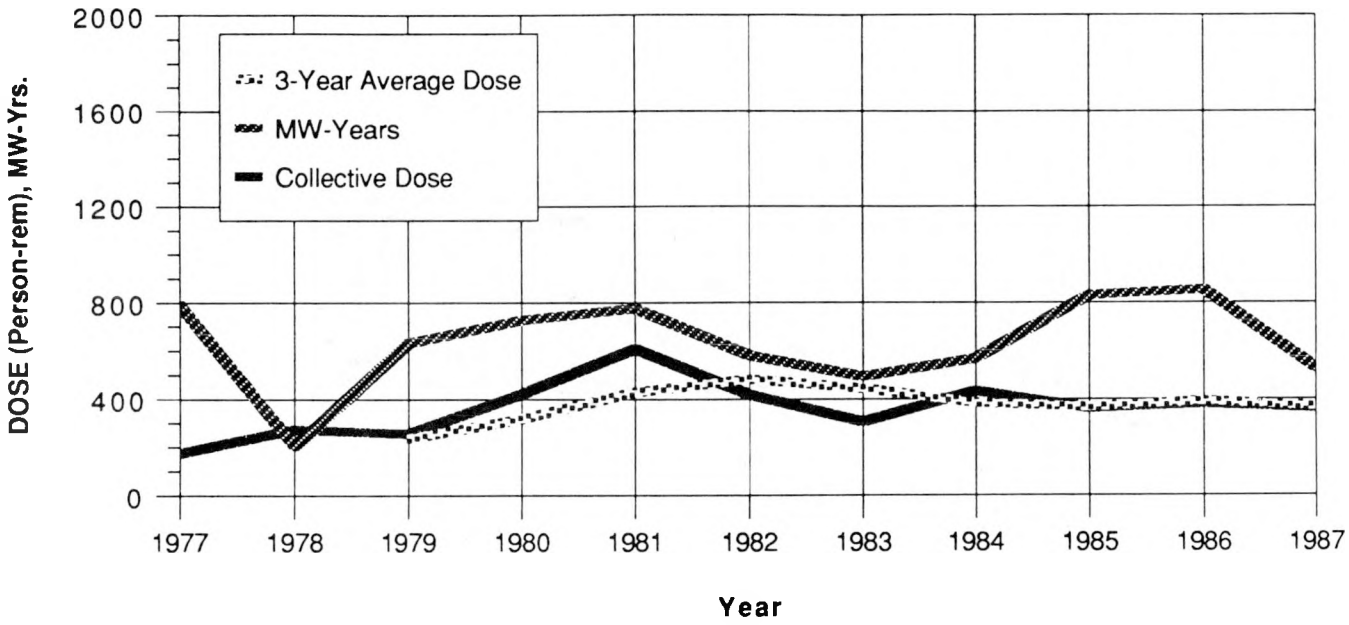
Contract

APPENDIX E (continued)

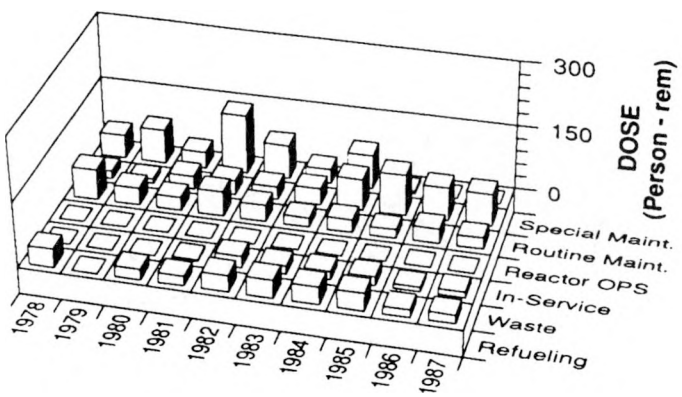
TROJAN

PWR

Dose-Performance Indicators



Breakdown By Job Function



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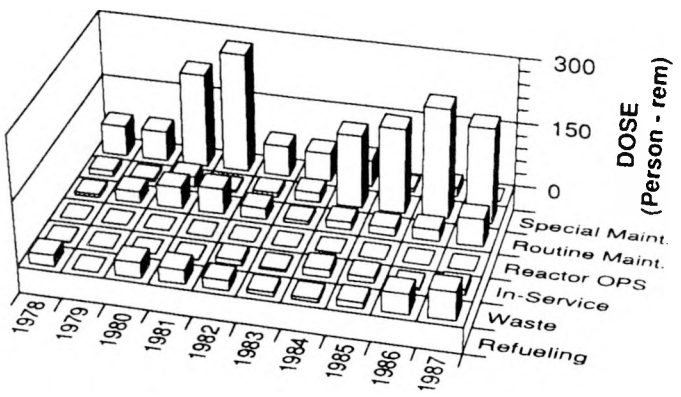


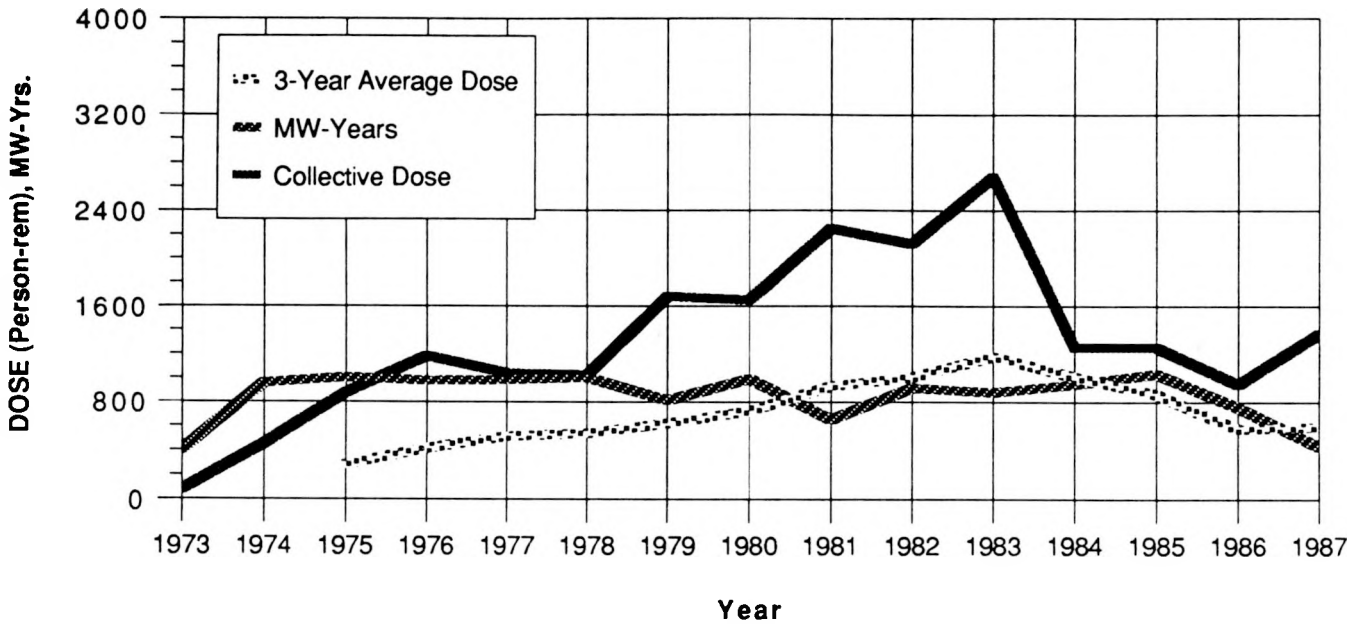
Contract

APPENDIX E (continued)

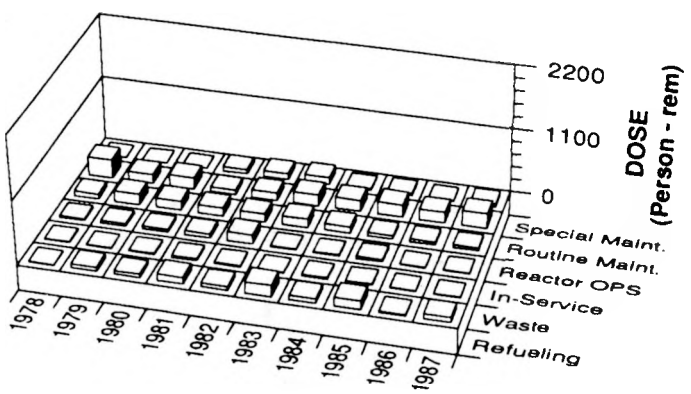
TURKEY POINT 3,4

PWR

Dose-Performance Indicators



Breakdown By Job Function



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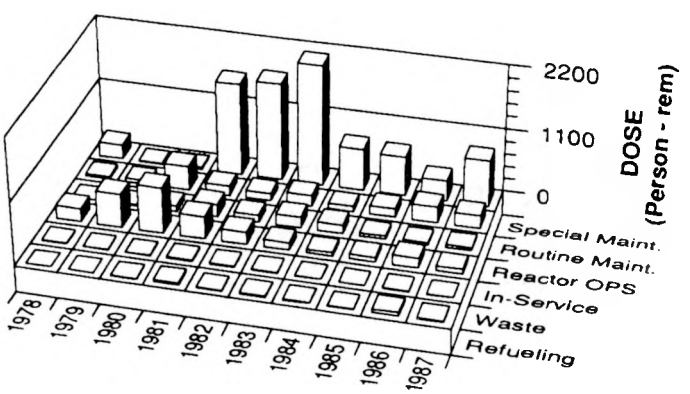


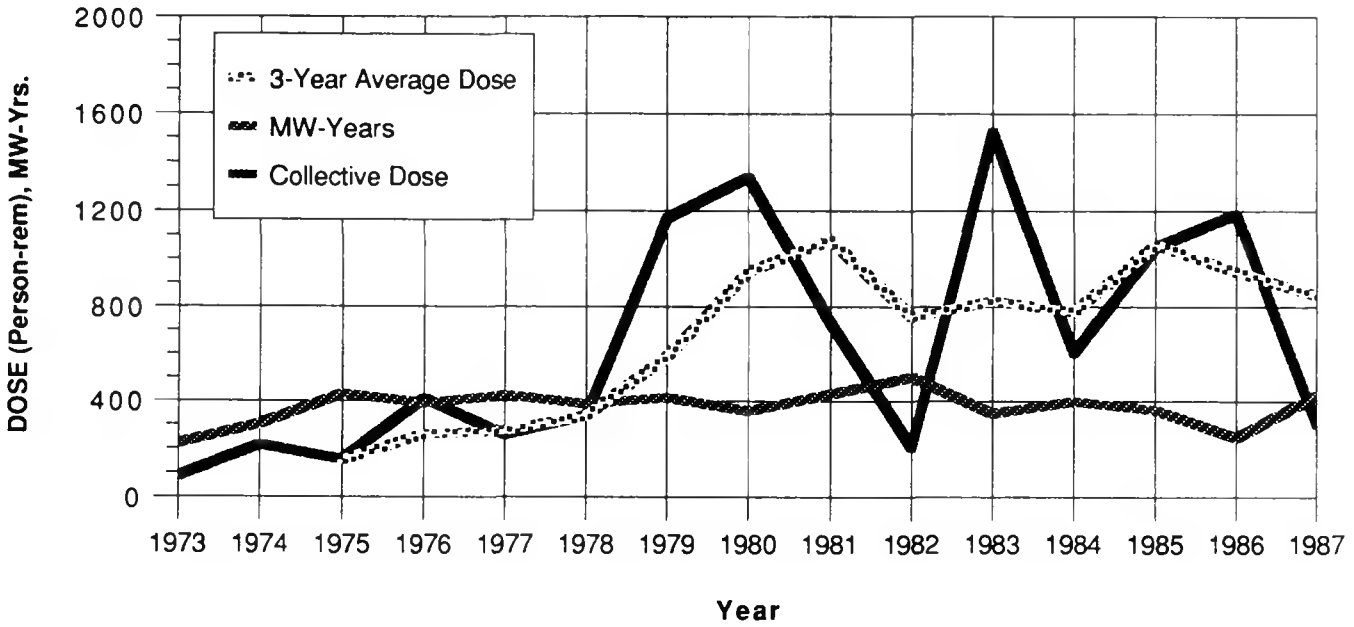
Contract

APPENDIX E (continued)

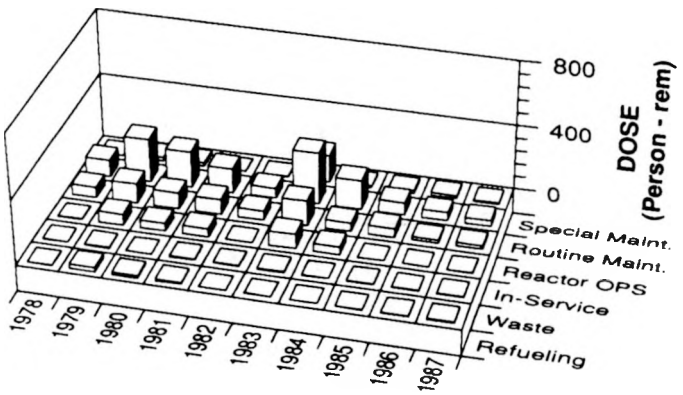
VERMONT YANKEE

BWR

Dose-Performance Indicators



Breakdown By Job Function



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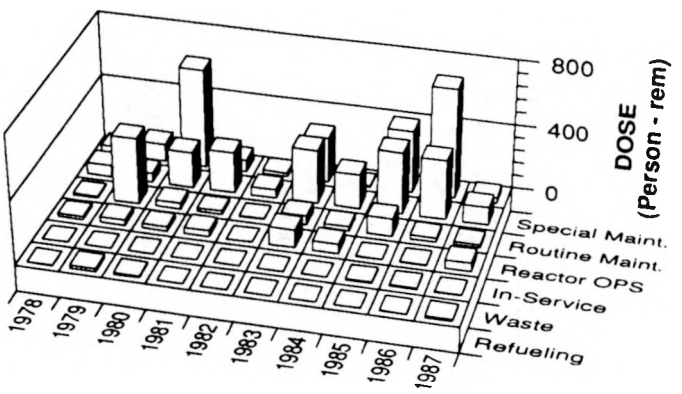


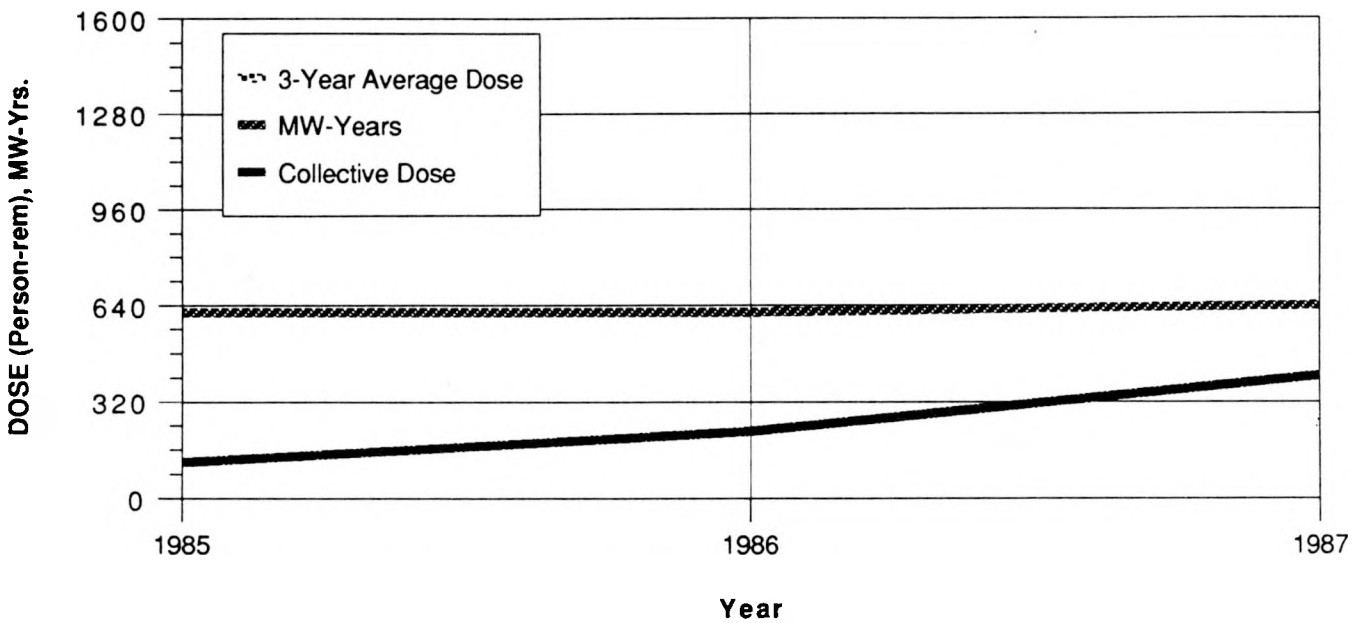
Contract

APPENDIX E (continued)

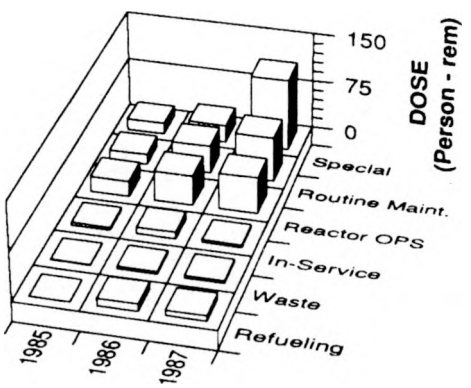
WASHINGTON NUCLEAR 2

BWR

Dose-Performance Indicators



Breakdown By Job Function



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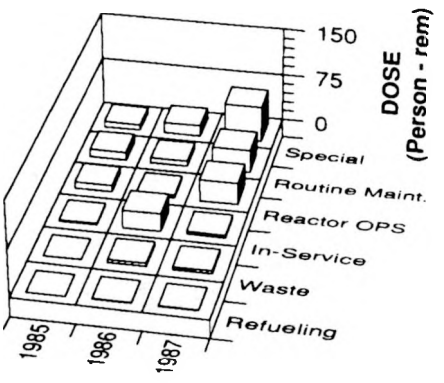


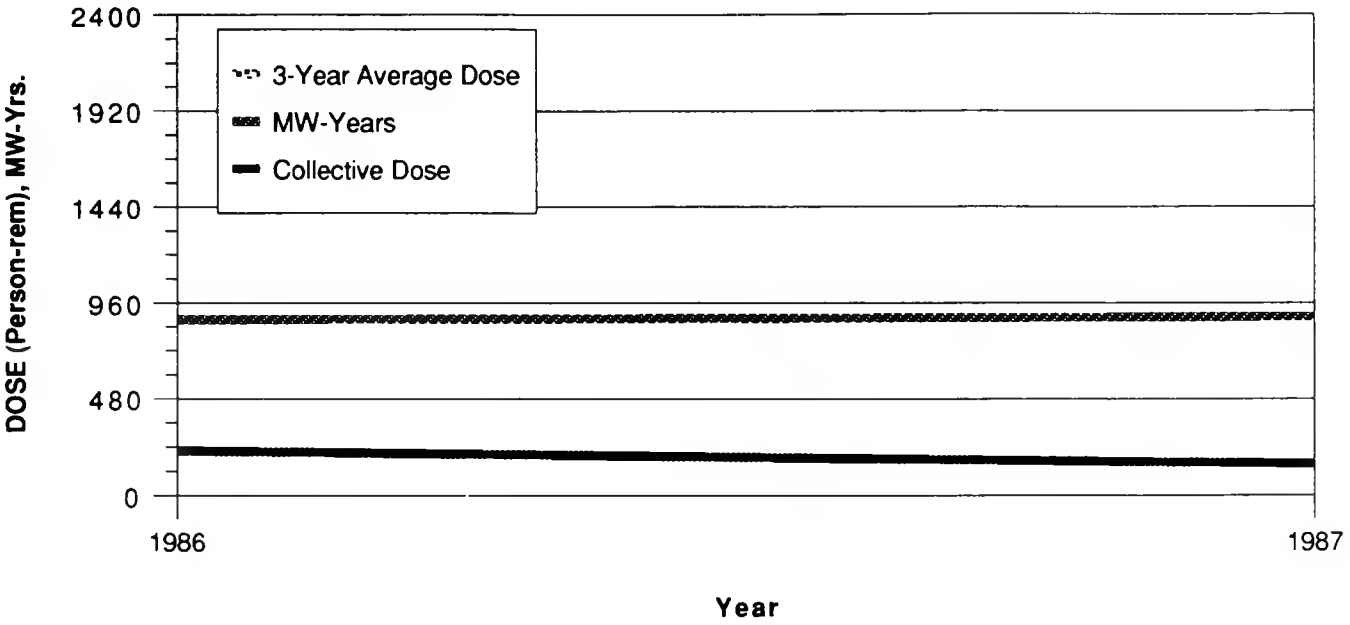
Contract

APPENDIX E (continued)

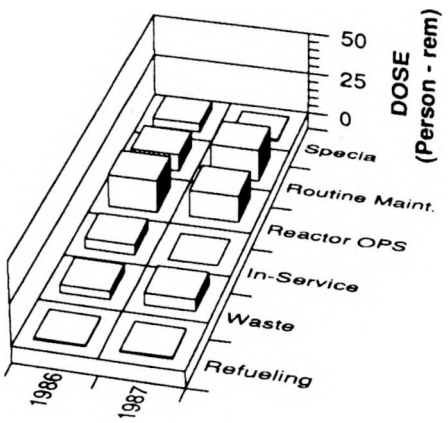
WATERFORD 3

PWR

Dose-Performance Indicators



Breakdown By Job Function



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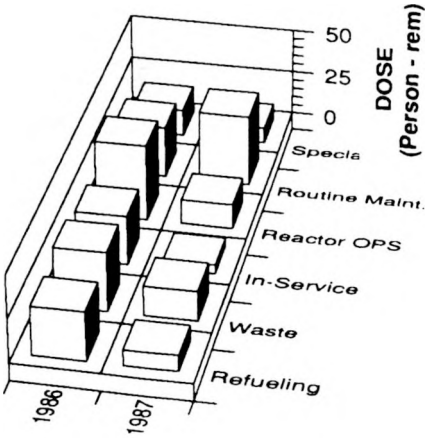


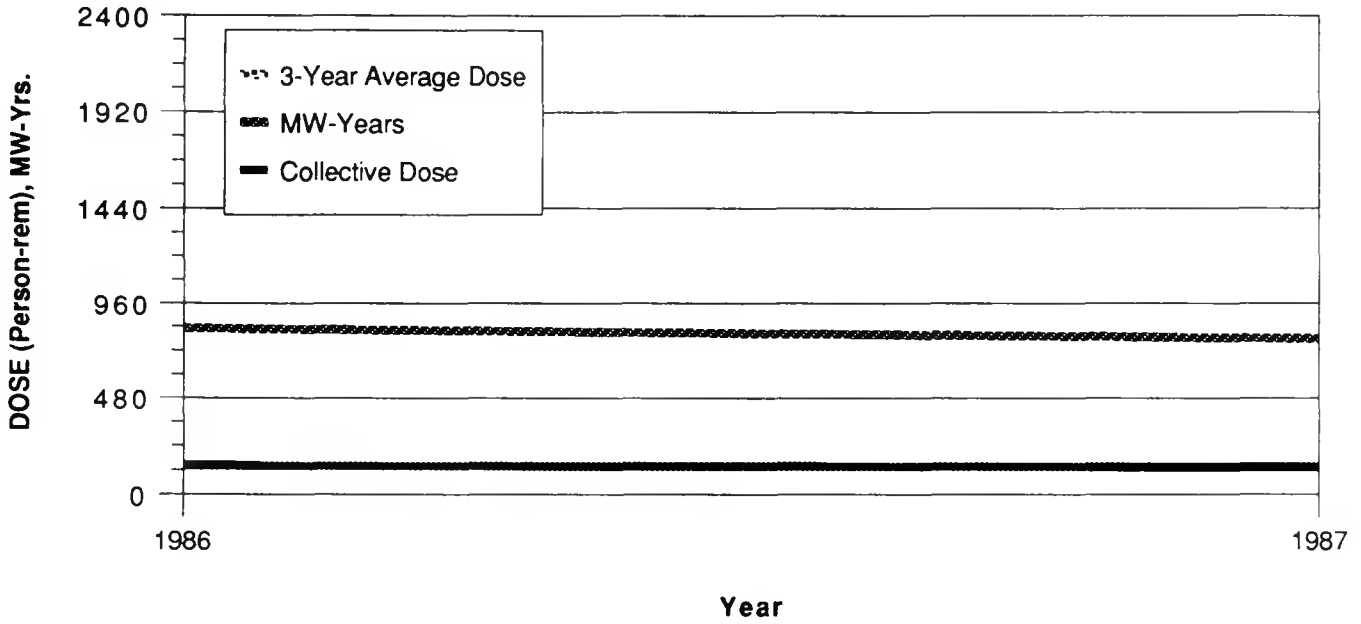
Contract

APPENDIX E (continued)

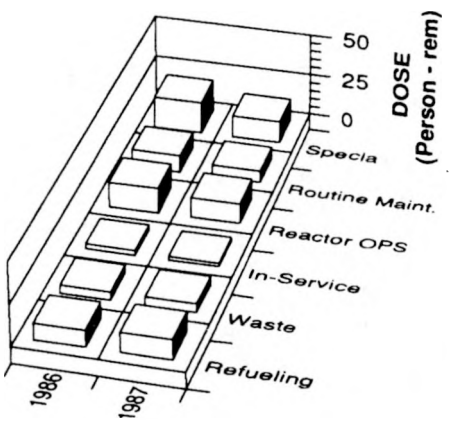
WOLF CREEK

PWR

Dose-Performance Indicators



Breakdown By Job Function



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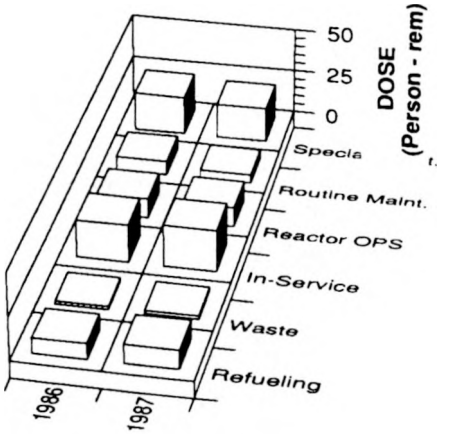


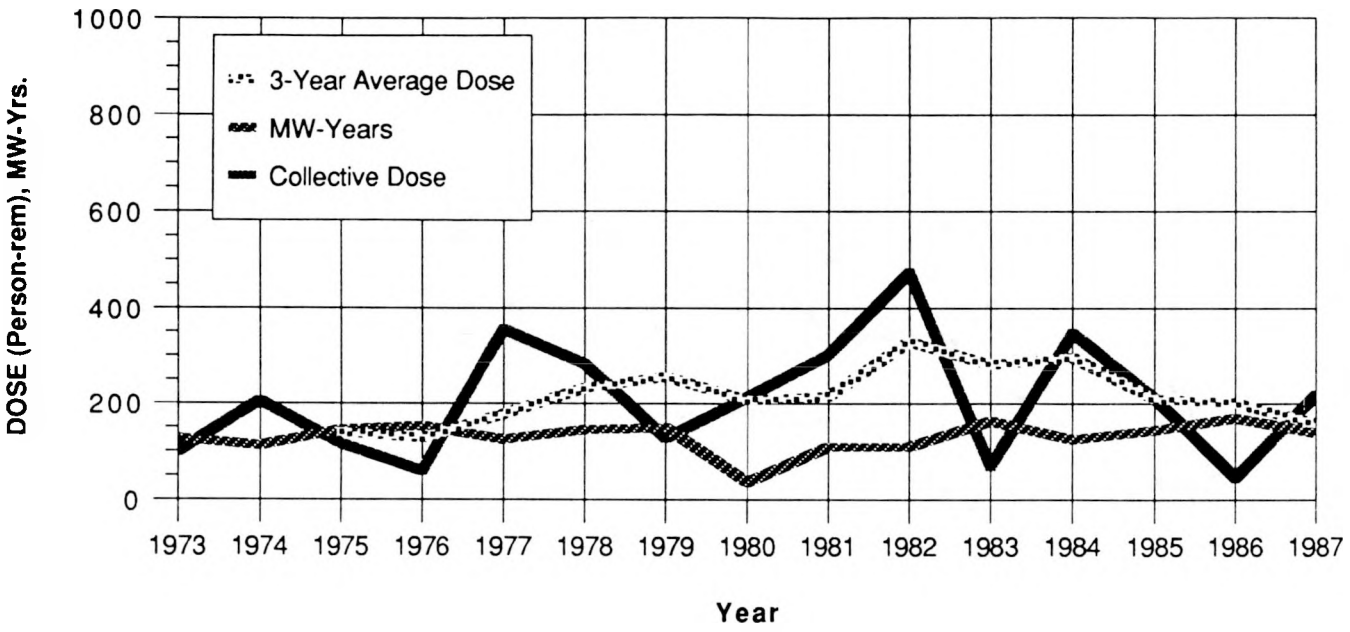
Contract

APPENDIX E (continued)

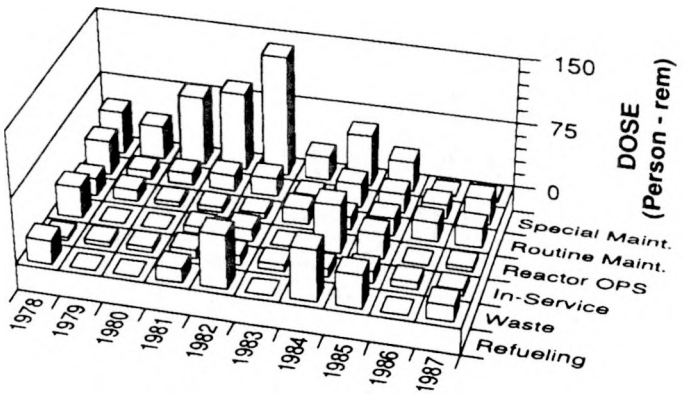
YANKEE-ROWE

PWR

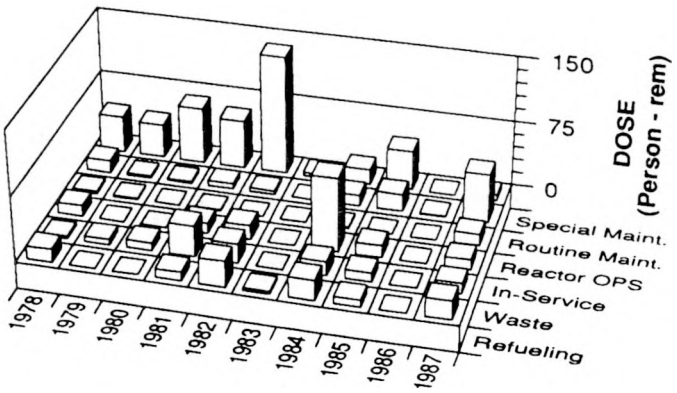
Dose-Performance Indicators



Breakdown By Job Function



Plant



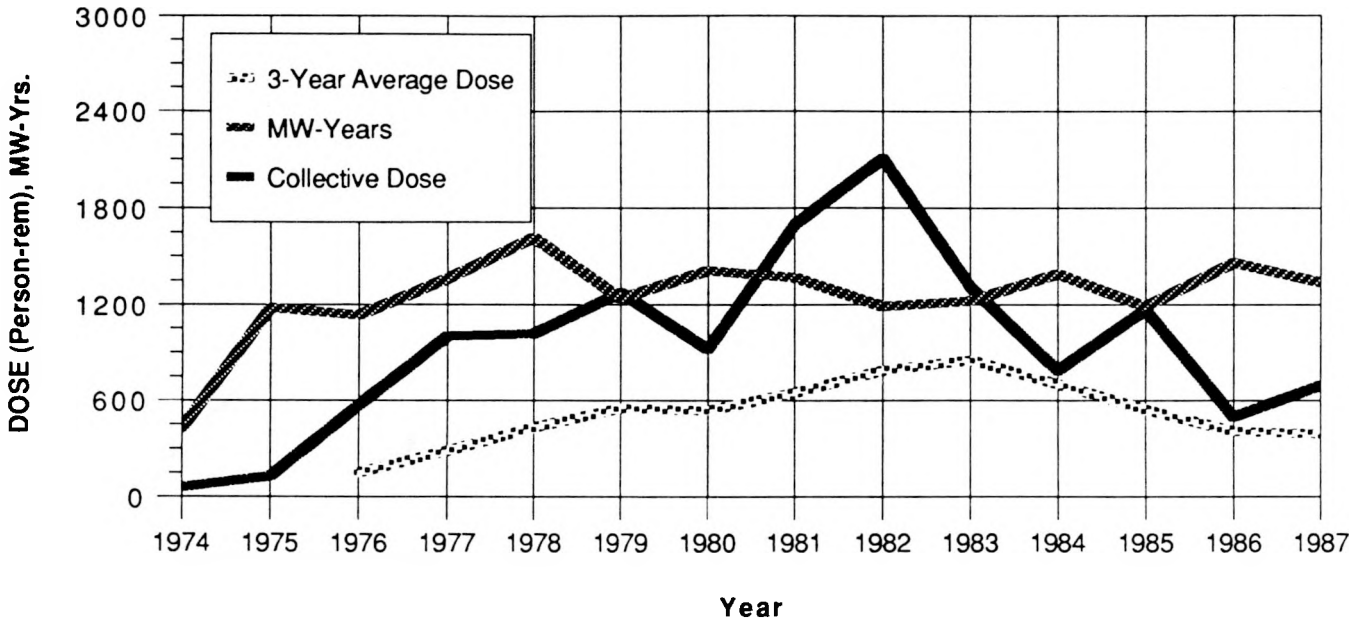
Contract

APPENDIX E (continued)

ZION 1,2

PWR

Dose-Performance Indicators



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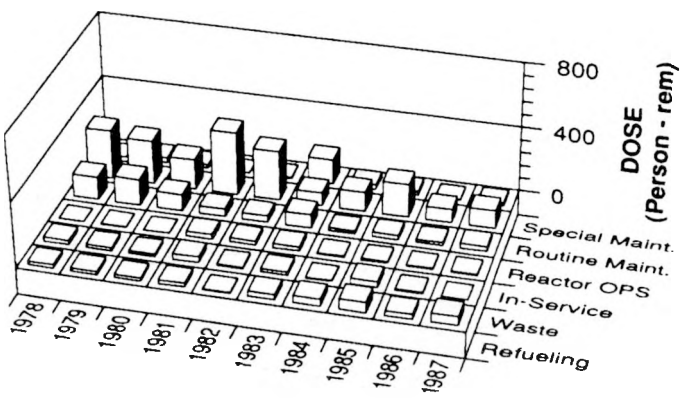

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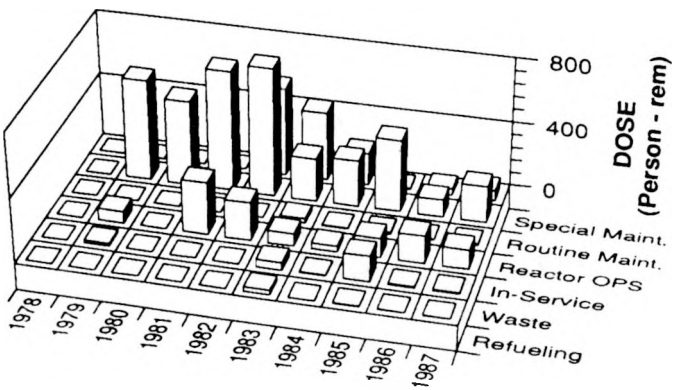

Contract

APPENDIX F

Summary of Annual Whole Body Dose by Year and Reactor Type

APPENDIX F*
SUMMARY OF ANNUAL WHOLE BODY DOSE DISTRIBUTIONS BY YEAR AND REACTOR TYPE
1981-1987

YEAR AND REACTOR TYPE	Number of Individuals with Whole Body Doses in the Ranges (rems or cSv)																	TOTAL NUMBER MONI-	NUMBER WITH MEAS.	TOTAL COLLEC-
	No Meas- urable	Meas. <0.10	0.10- 0.25	0.25- 0.50	0.50- 0.75	0.75- 1.00	1.00- 2.00	2.00- 3.00	3.00- 4.00	4.0- 5.0	5- 6.0	6- 7.0	7- 8.0	8- 9.0	9- 10	10- 12	>12	TORED	EXPOSURE	TIVE DOSE
1987 - BWRs	43,688	17,711	7,027	5,739	3,447	2,383	4,578	723	117	12								85,425	41,737	16,871
1987 - PWRs	49,648	27,070	10,795	8,827	5,152	3,441	6,187	987	124	10								112,241	62,593	23,721
1987 - LWRs	93,336	44,781	17,822	14,566	8,599	5,824	10,765	1,710	241	22								197,666	104,330	40,592
1986 - BWRs	29,232	15,075	5,865	4,962	2,996	2,121	5,084	1,426	354	45								67,160	37,928	19,515
1986 - PWRs	44,365	29,754	10,131	8,160	4,784	3,058	5,594	1,244	239	30								107,359	62,994	23,008
1986 - LWRs	73,597	44,829	15,996	13,122	7,780	5,179	10,678	2,670	593	75								174,519	100,922	42,523
1985 - BWRs	22,061	14,446	5,957	5,218	3,107	2,295	4,973	1,731	468	42								60,298	38,237	20,572
1985 - PWRs	42,409	25,545	8,158	6,761	4,107	2,602	5,584	1,586	248	42								97,042	54,633	22,470
1985 - LWRs	64,470	39,991	14,115	11,979	7,214	4,897	10,557	3,317	716	84								157,340	92,870	43,042
1984 - 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
1984 - 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
1984 - LWRs	59,616	39,884	14,764	11,492	7,166	5,396	12,453	4,967	1,675	295								157,708	98,092	55,214
1983 - BWRs	17,721	10,475	4,317	4,036	2,607	1,925	5,659	2,890	1,252	299	63	16	4					51,264	33,543	27,455
1983 - PWRs	33,350	21,425	7,894	6,260	3,863	2,783	6,512	2,421	698	315	2							85,523	52,173	29,016
1983 - LWRs	51,071	31,900	12,211	10,296	6,470	4,708	12,171	5,311	1,950	544	65	16	4					136,717	85,646	56,471
1982 - BWRs	15,661	9,944	4,431	4,403	2,839	2,046	4,794	2,358	1,183	230	7							47,896	32,235	24,437
1982 - PWRs	29,232	21,536	8,262	6,411	3,900	2,749	6,061	2,328	631	202	49	13	4	0	1			81,379	52,147	27,753
1982 - LWRs	44,893	31,480	12,693	10,814	6,739	4,795	10,855	4,686	1,814	432	56	13	4	0	1			129,275	84,382	52,190
1981 - BWRs	15,345	11,130	4,869	4,536	2,939	2,326	5,373	2,485	911	224	32	4	2	0	0	0	1	50,177	34,832	25,471
1981 - PWRs	26,978	18,202	7,348	5,790	3,686	2,577	6,393	2,061	882	262	61	77	9	2	1			74,329	47,351	28,671
1981 - LWRs	42,323	29,332	12,217	10,326	6,625	4,903	11,766	4,546	1,793	486	93	81	11	2	1	0	1	124,506	82,183	54,142

* Figures contained herein are uncorrected for multiple reporting of transient individuals, and include only those reactors that have completed a full year of commercial operation in each of the years indicated.