
Occupational Radiation Exposure at Commercial Nuclear Power Reactors 1983

Annual Report

**U.S. Nuclear Regulatory
Commission**

Office of Nuclear Regulatory Research

B. G. Brooks



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B. G. Brooks

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PREVIOUS REPORTS IN SERIES

1. T. D. Murphy, "A Compilation of Occupational Radiation Exposure from Light Water Cooled Nuclear Power Plants, 1969-1973," USAEC Report
2. T. D. Murphy, C. S. Hinson, "Occupational Radiation Exposure at Light Water Cooled Power Reactors, 1969-1974," USNRC Report NUREG-75/032, June 1975.
3. T. D. Murphy, et al, "Occupational Radiation Exposure at Light Water Cooled Power Reactors, 1969-1975," USNRC Report NUREG-0109, August 1976.
4. L. A. Johnson, "Occupational Radiation Exposure at Light Water Cooled Power Reactors, 1969-1976," USNRC Report NUREG-0323, March 1978.
5. L. A. Johnson, "Occupational Radiation Exposure at Light Water Cooled Power Reactors, 1977," USNRC Report NUREG-0482, May 1979.
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7. B. G. Brooks, "Occupational Radiation Exposure at Commercial Nuclear Power Reactors, 1979," USNRC Report NUREG-0713, Vol. 1, March 1981.
8. B. G. Brooks, "Occupational Radiation Exposure at Commercial Nuclear Power Reactors, 1980," USNRC Report NUREG-0713, Vol. 2, December 1981.
9. B. G. Brooks, "Occupational Radiation Exposure at Commercial Nuclear Power Reactors, 1981," USNRC Report NUREG-0713, Vol. 3, November 1982.
10. B. G. Brooks, "Occupational Radiation Exposure at Commercial Nuclear Power Reactors, 1982," USNRC Report NUREG-0713, Vol. 4, December 1983.

ABSTRACT

This report presents an updated compilation of occupational radiation exposures at commercial nuclear power reactors for the years 1969 through 1983. The summary of the data for calendar year 1983 is based on information received from the 75 light-water-cooled reactors (LWRs) and one high temperature gas-cooled reactor (HTGR) that had been declared to be in commercial operation for at least one full year as of December 31, 1983. This represents an increase of one reactor over the number contained in last year's report. The total number of personnel monitored at LWRs in 1983 was 136,700, a slight increase from that found in 1982 (129,300). The number of workers that received measurable doses during 1983 was 85,600 which is about 1,000 more than that found in 1982. The total collective dose at LWRs for 1983 is estimated to be 56,500 man-rem (man-cSv*), which is about 4,000 more man-rem (man-cSv) than that reported in 1982. This resulted in the average annual dose for each worker who received a measurable dose increasing slightly to 0.66 rem (cSv), and the average collective dose per reactor increasing by about 50 man-rem (man-cSv) to a value of 753 man-rem (man-cSv). The collective dose per megawatt-year of electricity generated by each reactor also increased slightly to an average value of 1.7 man-rem (man-cSv) per megawatt-year. A brief discussion about the health implications of these annual occupational doses is also provided.

The report also presents a summary and some analyses of the exposure data contained in the "termination reports" that have been submitted to the Commission by nuclear power licensees pursuant to 10 CFR §20.408. As of December 31, 1983, personal identification and exposure information had been collected and computerized for a total of 280,000 terminating reactor personnel. Analyses of these data indicate that, in 1982, some 56,500 individuals completed their employment with one or more reactor licensees. About 2,000 of these individuals were quarterly transient** workers who incurred an average dose of 0.40 rem (cSv), and some 4,500 individuals were yearly transient** workers who incurred an average dose of 1.11 rem (cSv). The collective dose (about 5,000 man-rem (man-cSv)) incurred by the yearly transients constituted ten percent of the total collective dose calculated for 1982. The termination data reported in 1983 have not yet been completely computerized; therefore, such analyses for transient workers in 1983 were not available for presentation in this report.

*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 man-rem become man-cSv.

**Transient workers are those workers who begin and end their employment or work assignment at two or more different licensed facilities within one calendar quarter (quarterly transients) or one calendar year (yearly transients).

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PREFACE

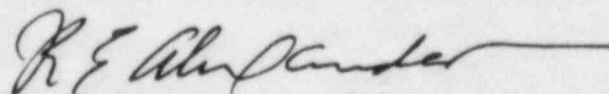
A number of nuclear power plant personnel have inquired as to how occupational radiation exposure data (from reports required by the NRC) are used by the NRC staff. This is a very appropriate inquiry that may be of importance to many affected licensees. In combination with other sources of information, the principal uses of the data by the staff are listed in this preface. In general, the data provide facts regarding routine occupational exposures to radiation and radioactive material that occur in connection with NRC-licensed activities, including individual and collective radiation doses from external sources as well as pertinent information on the inhalation of radioactive material (nuclides involved, bioassay results, exposure magnitude, etc.). These facts are used by the NRC staff as indicated below:

1. The external-dose data permit evaluation, of the radiological risk associated with NRC-licensed activities, including the size of the workforce and the collective dose.
2. The data permit evaluation, from the viewpoint of trends, of the effectiveness of the overall NRC/licensee radiation protection and ALARA efforts. They also provide for the identification (and subsequent correction) of unfavorable trends.
3. The data provide for governmental monitoring of the potential transient-worker problem.
4. The data are used in the establishment of priorities for the utilization of NRC health physics resources: research, standards, development, regulatory program development.
5. The data are considered in reviews of inspection frequencies that are programmed for various categories of licensees.
6. Licensing action decisions are often influenced by the data.
7. The data are used for comparative analyses of radiation protection performance: US/foreign, BWR's/PWR's, civilian/military, plant by plant, nuclear industry with other industries, etc.
8. The data permit analysis of annual dose distribution changes which can trigger investigations as to the cause.
9. The data are used for purposes of justification in the annual budget process.
10. The data provide facts for evaluating the adequacy of the current risk-limitation system (e.g., are individual lifetime dose limits, worker population collective dose limits, requirements for optimization, etc., needed).

11. The effectiveness of dose-reduction measures is evaluated using the data (e.g., methods for reducing individual doses that may increase the collective dose).
12. The data provide facts for answering Congressional and Administration inquiries and for responding to questions raised by public interest groups, special interest groups, labor unions, etc.
13. The data permit comparisons of occupational radiation risks with potential public risks when action for additional protection of the public involves workers exposures.
14. The data provide information which can be used in the planning of epidemiological studies.

With regard to routine work-place conditions, the annual statistical summary reports required by § 20.407, the termination reports required by § 20.408, and the annual dose data reported by work function in accordance with Subsection 6.9.1.5 of the standard technical specifications provide the only centralized data based available to assist the staff in the performance of its duties as listed above. It is to everyone's advantage if these duties are performed by a well-informed staff in the light of factual information.

Beginning with the next report in this series (1984 data), we plan to expand the data analysis sections in an effort to provide for additional practical applications. Suggestions for advanced analysis of this type are invited.



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Without the benefit of her patience and expertise during the past 10 years, the annual reports (NUREG-0713 and NUREG-0714) that summarize and analyze the exposure data contained in REIRS would not have progressed to be the comprehensive reports that they are today. Mrs. Feezell died August 23, 1984. Her vitality and talents will be sorely missed by the author and her associates at the NRC.

OCCUPATIONAL RADIATION EXPOSURE AT
COMMERCIAL NUCLEAR POWER REACTORS
1983

1. INTRODUCTION

In 1974, the NRC staff began changing the technical specifications of operating nuclear power reactors to require the submittal of an annual report that indicated the number of individuals exposed and their cumulative annual doses, categorized by type of personnel, work function, and occupation. (The format for reporting is contained in each plant's technical specifications and is similar to that shown in Appendix C of this report.) To obtain data for previous years, reactor licensees were requested to provide similar information for each year since 1969 in which they had a unit in commercial operation. In every instance, an estimate of the total collective dose incurred by all individuals monitored during the year was provided; however, the number of workers who received measurable doses could not always be determined. The information given in Appendix A is therefore not complete for all plants for the years 1969 through 1972.

On February 4, 1974, 10 CFR § 20.407 was amended to require licensed nuclear power utilities, among other licensees, to submit an annual statistical report indicating the distribution of the whole body doses of all individuals monitored at each facility. These reports (see Appendix B) allow an estimate to be made of the total collective dose and indicate the number of workers receiving measurable doses. The collective dose and number of workers obtained from these reports were used throughout this report (except for Tables 8, 9, 10 and Appendix C) for the years 1973 through 1983.

Plant operating data, such as plant capacity and megawatt-years of electricity generated, were obtained or derived from data included in various issues of the "Operating Units Status Report," (Ref. 1), and from the report "U. S. Central Station Nuclear Power Plants, 1976" (Ref. 2).

This report and each of its predecessors summarizes information reported during previous years. However, more plant-specific data, such as the annual reports submitted by each plant 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 of the years from 1973 through 1981 may be found in a series of reports, "Nuclear Power Plant Operating Experience" (Refs. 3-10). 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. SUMMARY OF OCCUPATIONAL MONITORING DATA AND POWER GENERATION

2.1 Definitions of Terms and Sources of Data

2.1.1 Number of Reactors

Tables 1 through 3 provide summaries of the plant data given in Appendix A for boiling water reactors (BWRs), pressurized water reactors (PWRs), and all light-water-cooled reactors (LWRs), respectively. The number of reactors included each year (those without parentheses) are those reactors that had been in commercial operation for at least one full year as of December 31 of each of the indicated years. The figure shown in parentheses (for the years 1969-1972) is the number of reactors that provided both the number of individuals that received measurable doses (referred to as "workers") while visiting or working at the facility and the summation of the annual whole body doses (collective dose) of all of these workers. The annual collective doses shown in parentheses and the other information marked with an asterisk are based on the data submitted by the number of reactors shown in parentheses.

2.1.2 Collective Dose

The collective doses shown for 1969 through 1972 were obtained by special requests made to the licensee or from monthly and semi-annual operating reports that had previously been submitted pursuant to plant technical specifications. When possible, the number of workers receiving measurable doses was obtained in the same manner. Beginning with 1973, the collective dose and the number of workers receiving measurable doses were obtained from the annual reports submitted pursuant to 10 CFR §20.407. For the years 1973 through 1980, the annual collective dose was calculated for each facility by summing the products obtained by multiplying the number of individuals reported in each of the dose ranges (shown in Table 7 and Appendix B) by the midpoint of the corresponding 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 facilities began reporting the actual collective dose (as determined from official personnel dosimetry results) on their 20.407 annual reports, and the NRC staff used these doses, when provided, instead of the above-described calculations. The staff would prefer to use the actual collective dose and encourages more licensees to make it available.

2.1.3 Collective Dose by Work Function and Employee Type

In Appendix A, the collective dose that was calculated from or provided with the § 20.407-type annual reports is collated by work function (operations and maintenance) and by personnel type (contractor and station and utility combined) for each plant site. The proportion of the collective dose shown for each type is the same as that reported in the plant's annual report required by its technical specifications (see Appendix C). This was done in the following way:

TABLE 1
SUMMARY OF ANNUAL INFORMATION REPORTED BY
COMMERCIAL BOILING WATER REACTORS

1969 - 1983

Year	Number Of Reactors Included	Annual Collective Doses (Man-rem)	No. of Workers With Measurable Doses	Gross Electricity Generated (MW-yr)	Average Dose Per Worker (Rem)	Average Collective Dose Per Reactor (Man-rem)	Average No. Personnel With Measurable Doses Per Reactor	Average Collective Dose (man-rem) per MW-yr	Average Electricity Generated Per Reactor (MW-yr)	Average Rated Capacity Net (MWe)
1969	3 (2)	586 (300)	290*	192	1.03*	195	145*	3.1	64	112
1970	6 (4)	764 (510)	1,321*	912	0.39*	127	330*	0.8	152	267
1971	7 (5)	1,784 (1,069)	1,873*	1,308	0.57*	255	375*	1.4	187	339
1972	10 (7)	2,858 (2,130)	2,258*	3,058	0.94*	286	323*	0.9	306	434
1973	12	4,564	5,340	3,394	0.85	380	445	1.3	283	459
1974	14	7,095	8,769	4,059	0.81	507	626	1.7	290	513
1975	18	12,611	14,607	5,786	0.86	701	812	2.2	321	611
1976	23	12,626	17,859	8,586	0.71	549	776	1.5	373	647
1977	23**	19,042	21,388	9,098	0.89	828	930	2.1	396	645
1978	25**	15,096	20,278	11,774	0.74	604	811	1.3	471	668
1979	25**	18,322	25,245	11,671	0.73	733	1,010	1.6	467	669
1980	26**	29,530	34,094	10,868	0.87	1,136	1,311	2.7	418	664
1981	26**	25,471	34,832	10,899	0.73	980	1,340	2.3	419	674
1982	26**	24,437	32,235	10,655	0.76	940	1,240	2.3	410	674
1983	26**	27,455	33,473	9,730	0.82	1,056	1,287	2.8	374	675

*During the years 1969 through 1972, all plants reported collective doses but a few did not submit the number of personnel that received measurable doses. The number of reactors that did report doses and number of workers is given in parentheses in the second column. The collective doses shown in parentheses in the third column, as well as the asterisked numbers in the remaining columns, are all based on the data submitted by the number of reactors shown in parentheses.

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

TABLE 2
SUMMARY OF ANNUAL INFORMATION REPORTED BY
COMMERCIAL PRESSURIZED WATER REACTORS

1969 - 1983

Year	Number Of Reactors Included	Annual Collective Doses (Man-rem)	No. of Workers With Measurable Doses	Gross Electricity Generated (MW-yr)	Average Dose Per Worker (Rems)	Average Collective Dose Per Reactor (Man-rem)	Average No. Personnel With Measurable Doses Per Reactor	Average Collective Dose (man-rem per MW-yr)	Average Electricity Generated Per Reactor (MW-yr)	Average Rated Capacity Net (MWe)
1969	4 (3)	661 (363)	454*	1,097	0.80*	165	151*	0.6	274	349
1970	4 (3)	2,738 (1,099)	1,340*	979	0.82*	684	447*	2.8	245	349
1971	6 (4)	1,844 (912)	905*	1,912	1.01*	307	226*	1.0	319	399
1972	8 (5)	3,708 (2,083)	1,885*	2,544	1.11*	464	377*	1.5	318	446
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

*During the years 1969 through 1972, all plants reported collective doses but a few did not submit the number of personnel that received measurable doses. The number of reactors that did report doses and number of workers is given in parentheses in the second column. The collective doses shown in parentheses in the third column, as well as the asterisked numbers in the remaining columns, are all based on the data submitted by the number of reactors shown in parentheses.

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

TABLE 3
SUMMARY OF ANNUAL INFORMATION REPORTED
BY COMMERCIAL LIGHT WATER COOLED REACTORS

1969 - 1983

Year	Number Of Reactors Included	Annual Collective Doses (Man-rems)	No. of Workers With Measurable Doses	Gross Electricity Generated (MW-yr)	Average Dose Per Worker (Rems)	Average Collective Dose Per Reactor (Man-rems)	Average No. Personnel With Measurable Doses Per Reactor	Average Collective Dose (man-rems per MW-yr)	Average MW-Yrs Electricity Per Reactor (MW-yr)	Average Rated Capacity Net (MWe)
1969	7 (5)	1,247 (663)	744*	1,289	0.89*	178	149*	1.0	184	247
1970	10 (7)	3,502 (1,609)	2,661*	1,892	0.60*	350	380*	1.9	189	300
1971	13 (9)	3,628 (1,981)	2,778*	3,220	0.71*	280	309*	1.1	248	367
1972	18 (12)	6,566 (4,213)	4,143*	5,602	1.02*	365	345*	1.2	311	408
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	25,491	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

*During the years 1969 through 1972, all plants reported collective doses but a few did not submit the number of personnel that received measurable doses. The number of reactors that did report doses and number of workers is given in parentheses in the second column. The collective doses shown in parentheses in the third column, as well as the asterisked numbers in the remaining columns, are all based on the data submitted by the number of reactors shown in parentheses.

** Five plants have been shut down continuously for a number of years but have been included in the count of reactors used to compute various averages per reactor in this report. One may wish to calculate these averages without counting these reactors each year: Dresden 1 - shut down since 10/78; Humboldt Bay - shut down since 7/76; Indian Point 1 - shut down since 10/78; Three Mile Island 1 and 2 - shut down since 3/79. (See Appendix A.)

(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 columns in Appendix C) was determined. (2) The ratio of this dose to the total collective dose (the last number in the last columns in Appendix C) was calculated and multiplied by the total collective dose that had been estimated or obtained from the § 20.407 annual report. This product is the collective dose shown in the column headed "Operations" in Appendix A. (3) The collective dose shown in the column headed "Maintenance and Others" in Appendix A was determined by first summing the collective doses incurred by workers in the five remaining functions given in Appendix C and then calculating the fraction that this dose is of the total collective dose. This fraction was multiplied by the total collective dose estimated from the § 20.407 annual reports to yield the collective dose shown in this column of Appendix A. (4) A similar procedure was followed in determining the collective dose for the columns headed "Contractor" and "Station & Utility" in Appendix A.

2.1.4 Workers With Measurable Whole Body Doses

The number of workers with measurable doses, rather than the total number of individuals monitored, is shown in Tables 1 through 3 and Appendix A. These values were used to calculate the average annual dose per worker and the average number of personnel per reactor. This was done to delete those individuals, many of whom probably did not routinely work in radiation areas (and were monitored for convenience or for identification purposes), who may have received exposures too small to be detected by personnel monitoring devices.

2.1.5 Electric Energy Generated

The electric energy generated in gross megawatt-years (MW-yr) each year by each facility is shown in Appendix A. 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. The gross megawatt-years of generated electricity that are presented in Tables 1 through 3 are the sums of that produced by all of the reactors included each year. This sum is divided by the number of those reactors included each year to yield the average amount of electric energy generated (MW-Yr) per reactor, which is also shown in Tables 1 through 3.

2.1.6 Collective Dose per Megawatt-year

The number of megawatt-years generated was used to determine average values of the annual collective dose per megawatt-year generated. This was calculated by dividing the total collective dose by the total gross megawatt-years generated to yield a quotient that is used as a measure of the dose incurred by workers at power reactors in relation to the gross electric energy produced. This value was also calculated for each reactor site and is presented in Tables 4 through 6 and Appendix A.

2.1.7 Average Rated Capacity

The average rated capacity, shown in Tables 1 through 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 is the "capacity" shown for each plant in Appendix A.

2.2 Average Annual Occupational Doses

Some of the data presented in Tables 1 and 2 are graphically displayed in Figure 1, where it can be seen that the average collective dose and average number of workers per BWR has been higher than that for PWRs for the last ten years and that the values of both parameters have, in general, continued to rise at both types of facilities. However, looking at the number of workers per reactor reported each year since 1980, it appears that the number of workers per BWR has levelled off at about 1300 workers, while at PWRs the number has levelled off at around 1100 workers. From Table 1, it can be seen that the average collective dose per reactor, dose per worker, and collective dose per megawatt-year at BWRs showed increases over those found for 1982. At PWRs (Table 2), the values of these three parameters remained nearly the same as the 1982 values.

Figures 2 and 3 are plots of much of the information that is given in Table 3 for all light water reactors. One can see that all of the parameters plotted showed increases over last year's values. In looking at these figures and the fluctuations in the parameters for the years following the incident at the Three Mile Island Plant in 1979, one might wonder if they reflect some of the impact that this incident had on the nuclear power industry.

To further assist in the identification of any trends that might exist, Figure 4 displays the average and the median* values of the collective dose per reactor for BWRs and for PWRs for the years 1973 through 1983. 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 are not as greatly affected by the extreme values of the collective doses, one can see that they do not usually fluctuate as much from year to year as do the average values. The median collective dose for PWRs appears to have levelled off at about 500 man-rems (man-cSv),** while for BWRs it has increased to about 1100 man-rems (man-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).

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

**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 man-rems becomes man-cSv.

FIGURE 1
COMMERCIAL LIGHT WATER COOLED REACTORS
1969 - 1983

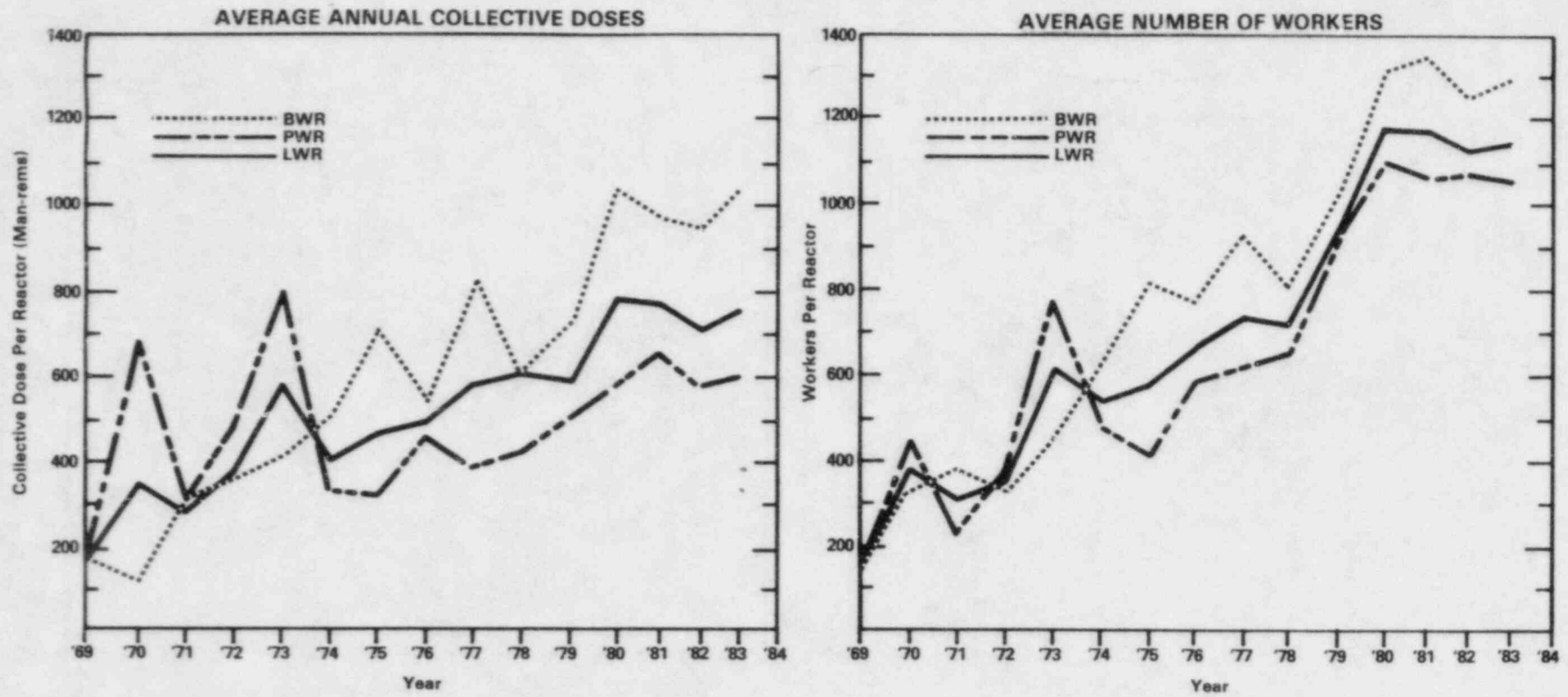


FIGURE 2
TOTAL ANNUAL VALUES
AT LIGHT WATER COOLED REACTORS
1969 - 1983

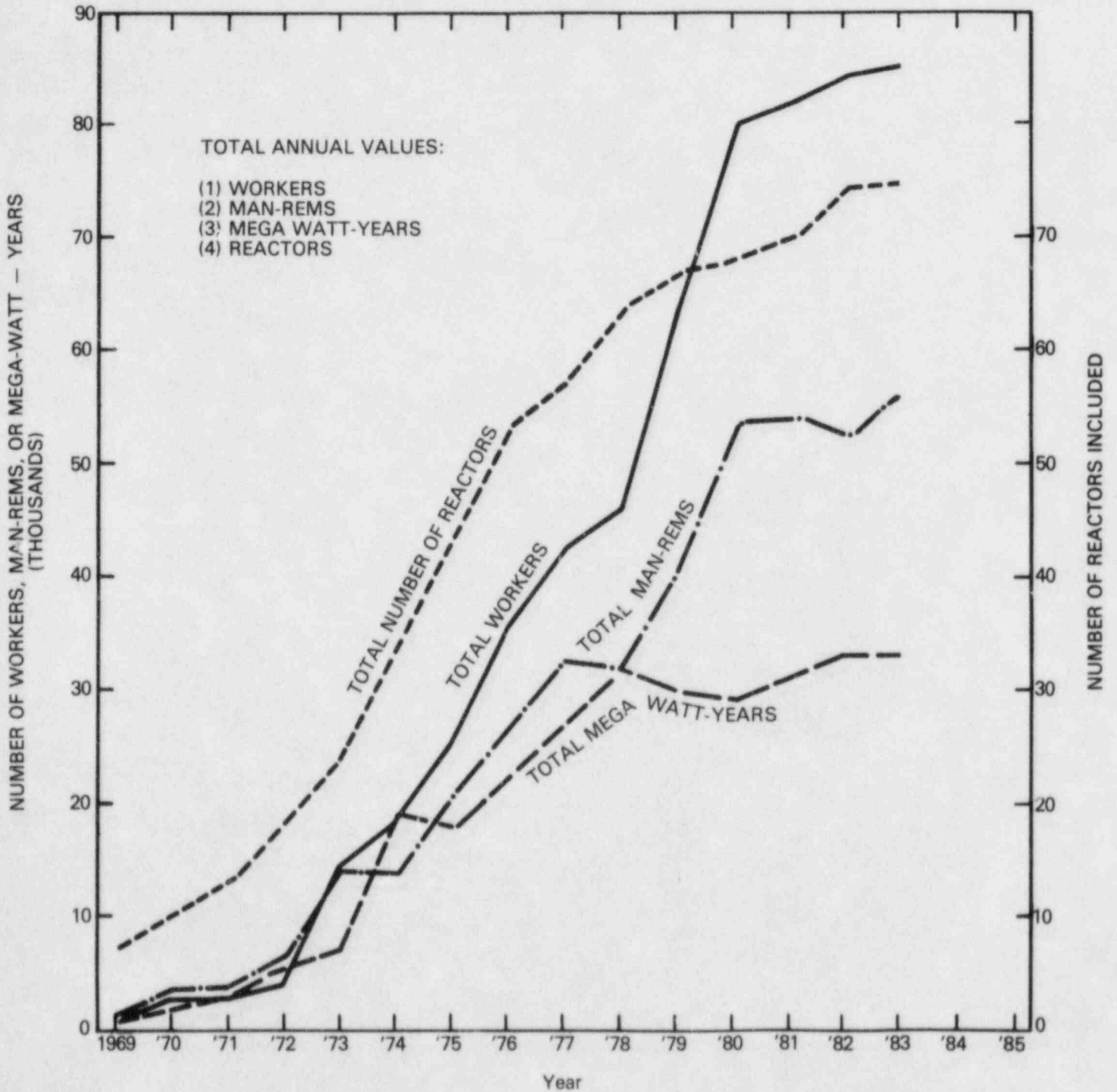


FIGURE 3
AVERAGE ANNUAL VALUES
AT LIGHT WATER COOLED REACTORS
1969 - 1983

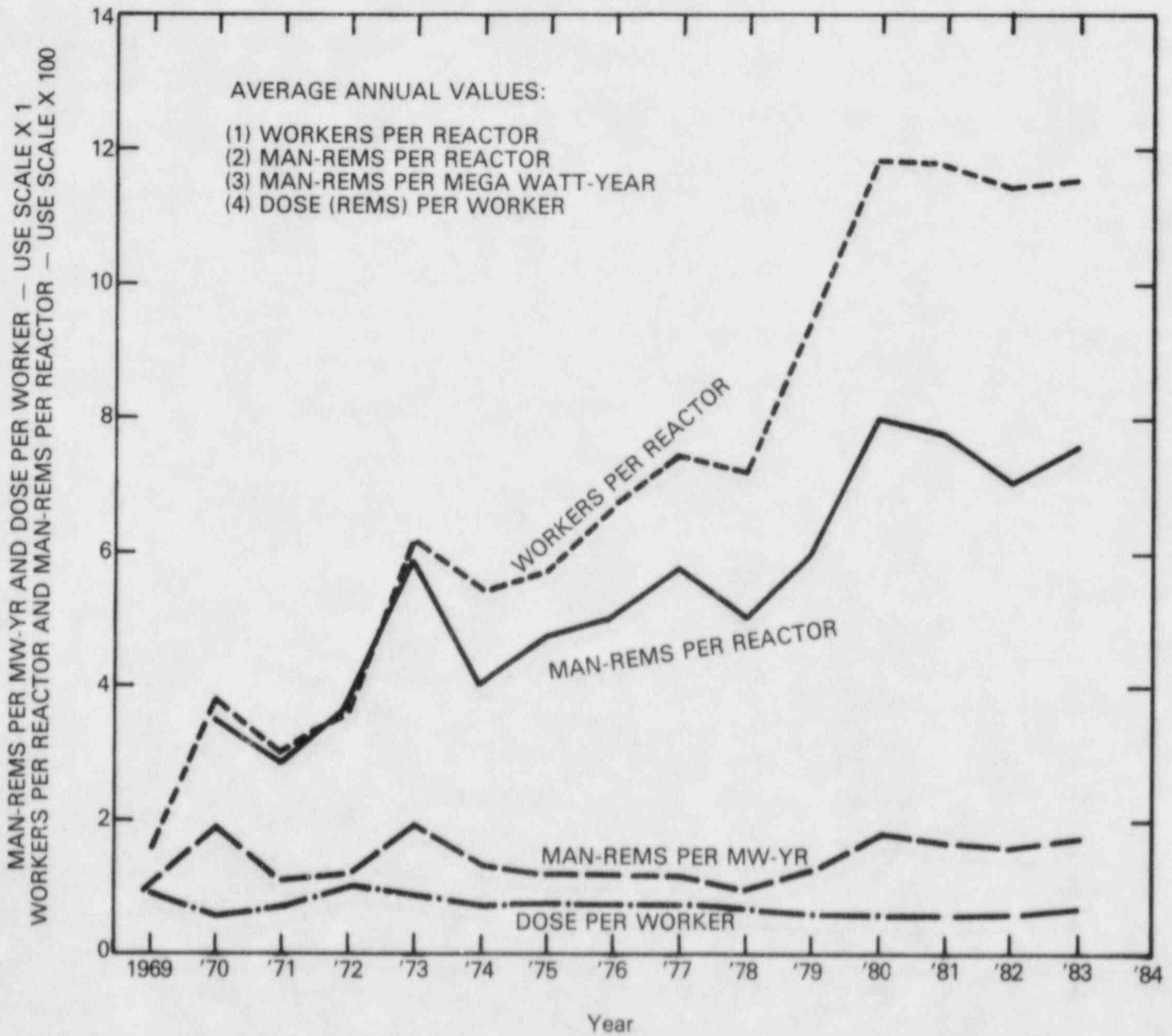
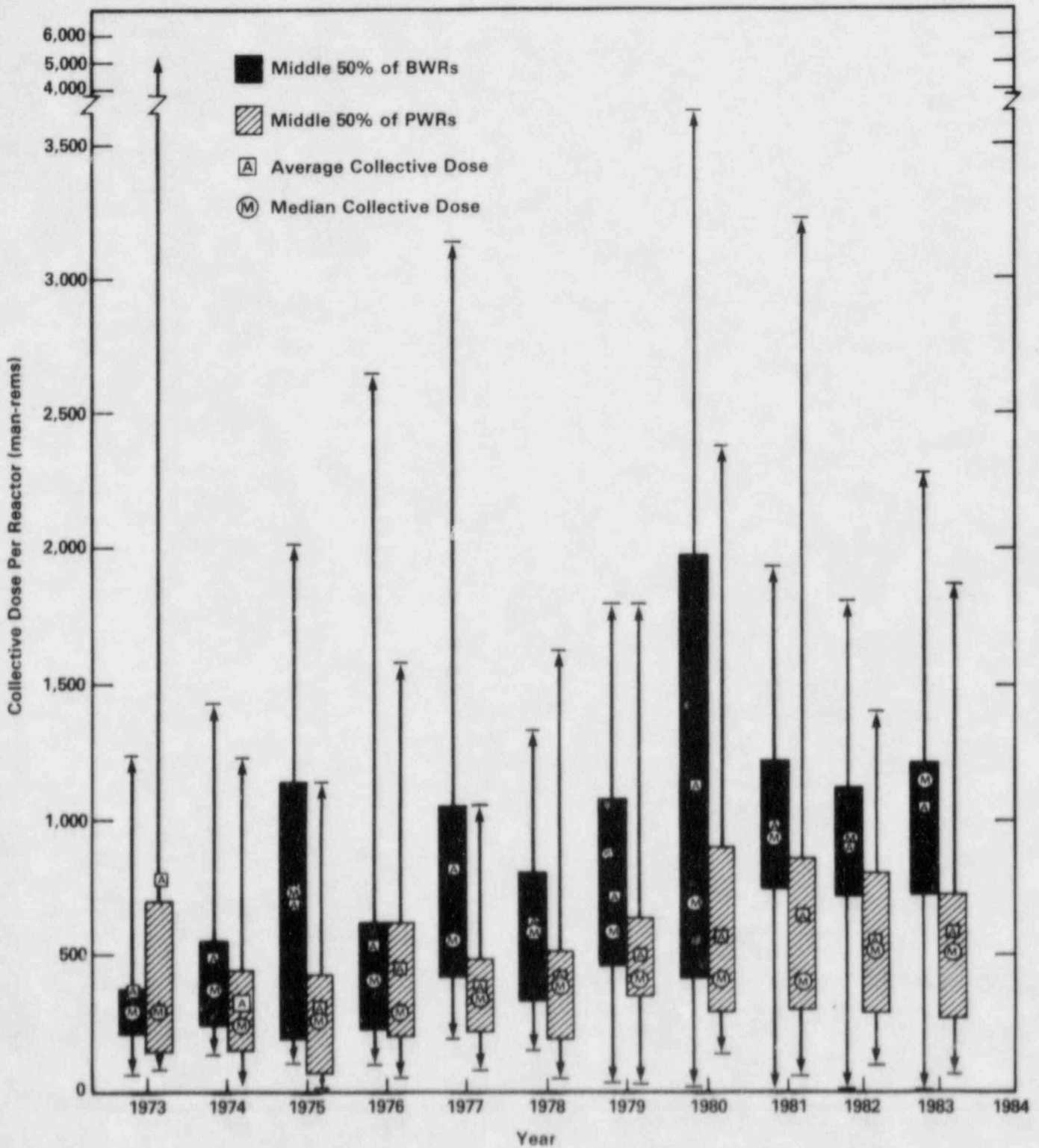


FIGURE 4
AVERAGE, MEDIAN AND EXTREME VALUES OF
THE COLLECTIVE DOSE PER REACTOR
1973 - 1983



2.3 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 and 5 list the BWRs and PWRs in ascending order of man-rems per reactor for each of the years 1978 through 1983. Two other parameters, dose per worker and collective dose per megawatt-year, are also given for each plant and could have been used in listing the plants as well. Also shown is a parameter "CR" which is defined to be the ratio of the annual collective dose delivered at individual doses exceeding 1.5 rems (cSv) to the total annual collective dose. This indicates the proportion of the total collective dose at the plant that was received by individuals who incurred higher annual doses, viz., of 1.5 rems (cSv) or greater. CR is one of the parameters that the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) recommended be used in the analysis and comparison of exposure data. The latest UNSCEAR report (Ref. 11) states that, under normal conditions, the values of CR lie between 0.05 and 0.50, and one can see that CR for about half of the U.S. plants fell within this range in 1983.

Table 6 gives the grand totals of the collective dose and megawatt-years of electricity generated for each commercial BWR and PWR based on data reported since 1969. For all but those few plants that began commercial operation before 1969, these totals would be the "lifetime" totals for each site. Dividing the total collective dose by the total megawatt-years generated, the average collective dose per megawatt-year was obtained for each site, and, by dividing the collective dose by the total number of reactor-years for which data were reported, the "lifetime" average collective dose per reactor-year was obtained. The upper half of the table lists the sites in ascending order of man-rems (man-cSv) per reactor-year based on data submitted through 1983, and the lower half lists them similarly based on data submitted through 1982. One can quickly see that the average collective dose per megawatt-year has risen to 2.0 at BWRs and remained at 1.1 at PWRs. The average collective dose per reactor-year also appears to increase at a faster rate at BWRs than at PWRs, and based on data accumulated through 1983, the collective dose per reactor-year was calculated to be 510 and 749 man-rems (man-cSv) per reactor-year for PWRs and BWRs, respectively.

In general, one can see from the listings in Tables 4 through 6 that 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 generated will be higher because of their limited power generation capacity. Usually, when a plant reports a large annual collective dose, and a large collective dose to megawatt-year ratio as well, it indicates that extensive maintenance or modifications were undertaken during the year. For example, the PWR facilities reporting high values for these two parameters during the last few years generally have been involved in extensive tube-sleeving jobs related to the repair of steam generators. Other major sources of exposures at PWRs in 1983 were maintenance of reactor vessel internals and

TABLE 4
BOILING WATER REACTORS
LISTED IN ASCENDING ORDER OF MAN-REMS PER REACTOR
1979 - 1983

Site Name	1979			Site Name	1980			Site Name	1981				Site Name	1982				Site Name	1983			
	Man-Rems per Site	Dose per Worker (Rems)	Man-Rems per Mw-Yr.		Man-Rems per Site	Dose per Worker (Rems)	Man-Rems per Mw-Yr.		Man-Rems per Site	Dose per Worker (Rems)	Man-Rems per Mw-Yr.	² CR		Man-Rems per Site	Dose per Worker (Rems)	Man-Rems per Mw-Yr.	² CR		Man-Rems per Site	Dose per Worker (Rems)	Man-Rems per Mw-Yr.	² CR
Humboldt Bay	31	0.23	-	Humboldt Bay	22	0.15	-	Humboldt Bay	9	0.12	-	0.00	Humboldt Bay	19	0.27	-	0.08	Humboldt Bay	17	0.20	-	0.09
Monticello	157	0.42	0.3	La Crosse	218	1.76	8.3	La Crosse	123	0.66	4.2	0.68	La Crosse	205	1.39	11.9	0.81	Monticello	121	0.29	0.2	0.16
La Crosse	186	1.22	7.7	Hatch 1,2	449	0.23	0.4	Big Rock Point	160	0.33	2.8	0.47	Vermont Yankee	205	0.43	0.4	0.24	Millstone Point 1	244	0.79	0.4	0.66
Cooper	221	0.52	0.4	Big Rock Point	354	0.59	7.2	Cooper Station	579	0.62	1.3	0.45	Duane Arnold	227	0.44	0.3	0.48	Big Rock Point	263	0.53	6.0	0.46
Duane Arnold	275	0.36	0.8	Monticello	531	0.48	1.3	Hatch 1,2	1,337	0.46	1.5	0.35	Big Rock Point	328	0.63	7.5	0.58	La Crosse	313	1.96	12.6	0.90
Big Rock Point	455	0.73	35.0	Nine Mile Point	591	0.50	1.1	Vermont Yankee	731	0.58	1.7	0.45	Cooper Station	542	0.73	0.9	0.52	Hatch 1,2	1,299	0.38	1.4	0.29
Oyster Creek	467	0.55	0.9	Browns Ferry 1,2,3	1,825	0.67	0.8	Duane Arnold	790	0.61	2.8	0.50	Hatch 1,2	1,460	0.43	1.9	0.33	Nine Mile Point	860	0.61	2.6	0.45
Browns Ferry 1,2,3	1,667	0.62	0.7	Duane Arnold	671	0.61	2.0	Browns Ferry 1,2,3	2,380	0.70	1.1	0.49	Browns Ferry 1,2,3	2,220	0.68	1.1	0.51	Fitzpatrick	1,090	0.64	2.0	0.58
Hatch	982	0.27	1.4	Dresden 1,2,3	2,105	0.77	2.0	Oyster Creek	917	0.54	2.9	0.40	Oyster Creek	865	0.68	3.6	0.51	Browns Ferry 1,2,3	3,363	1.02	2.0	0.68
Dresden 1,2,3	1,800	0.75	1.8	Cooper Station	859	1.09	1.9	Dresden 1,2,3	2,820	1.16	2.7	0.76	Millstone Point 1	929	0.68	1.9	0.48	Duane Arnold	1,135	0.77	4.0	0.53
Peach Bottom 2,3	1,388	0.61	0.8	Peach Bottom 2,3	2,352	0.83	1.7	Monticello	1,004	0.69	2.6	0.52	Dresden 1,2,3	2,923	1.14	2.7	0.73	Pilgrim	1,162	0.50	2.1	0.47
Fitzpatrick	859	1.01	2.4	Vermont Yankee	1,338	0.93	3.7	Peach Bottom 2,3	2,506	0.88	2.2	0.56	Peach Bottom 2,3	1,977	0.72	1.2	0.48	Dresden 1,2,3	3,582	1.26	3.9	0.75
Pilgrim	1,035	0.41	1.8	Oyster Creek	1,733	0.88	7.4	Brunswick 1,2	2,638	0.68	1.9-	0.66	Monticello	993	0.76	3.4	0.57	Quad Cities 1,2	2,491	1.38	2.3	0.77
Quad Cities 1,2	2,158	1.28	2.0	Brunswick 1,2	3,870	1.02	5.6	Fitzpatrick	1,425	0.57	2.5	0.44	Fitzpatrick	1,190	0.51	2.0	0.37	Cooper Station	1,293	0.93	3.3	0.68
Vermont Yankee	1,170	0.96	2.9	Fitzpatrick	2,040	0.99	4.0	Millstone 1	1,496	0.60	4.9	0.44	Nine Mile Point	1,264	0.93	9.5	0.66	Peach Bottom 2,3	2,963	0.95	3.6	0.67
Brunswick 1,2	2,603	0.90	3.2	Millstone Point 1	2,158	0.71	5.3	Quad Cities 1,2	3,146	1.40	2.7	0.81	Pilgrim	1,539	0.54	3.9	0.42	Vermont Yankee	1,527	1.16	4.4	0.61
Nine Mile Point	3,497	1.13	4.2	Quad Cities 1,2	4,838	1.57	5.6	Nine Mile Point	1,592	0.78	4.1	0.59	Quad Cities 1,2	3,757	1.62	3.7	0.79	Brunswick 1,2	3,475	0.62	5.5	0.63
Millstone Point 1	1,793	1.01	3.6	Pilgrim	3,625	1.02	10.1	Pilgrim	1,836	0.66	4.5	0.44	Brunswick 1,2	3,792	0.76	6.5	0.70	Oyster Creek	2,257	0.98	80.9	0.63
Averages per Reactor	733	0.73	1.6	Averages per Reactor	1,136	0.87	2.7	Averages per Reactor	980	0.73	2.3	0.57	Averages per Reactor	940	0.76	2.3	0.59	Averages per Reactor	1,056	0.82	2.8	0.56

¹For sites with more than one operating reactor, the number of man-rems per reactor is obtained by dividing the number of man-rems for the site by the number of reactors.

²CR is the ratio of the annual collective dose delivered at individual doses exceeding 1.5 rems to the total collective dose.

TABLE 5
PRESSURIZED WATER REACTORS
 LISTED IN ASCENDING ORDER OF MAN-REMS PER REACTOR
 1979 - 1983

1979				1980				1981				1982				1983						
Site Name	¹ Man-Rems per Site	Dose per Worker (Rems)	Man-Rems per Mw-Yr	Site Name	¹ Man-Rems per Site	Dose per Worker (Rems)	Man-Rems per Mw-Yr	Site Name	¹ Man-Rems per Site	Dose per Worker (Rems)	Man-Rems per Mw-Yr	FCR	Site Name	¹ Man-Rems per Site	Dose per Worker (Rems)	Man-Rems per Mw-Yr	FCR					
Davis Besse	30	0.10	0.1	Davis Besse	154	0.12	0.1	Davis Besse	58	0.10	0.1	0.04	Kewaunee	101	0.29	0.2	0.11	Yankee Rowe	68	0.17	0.4	0.20
Prairie Island 1,2	180	0.30	0.2	Kewaunee	165	0.41	0.4	Kewaunee	141	0.37	0.3	0.18	Prairie Island 1,2	229	0.36	0.2	0.16	Davis Besse	90	0.11	0.1	0.04
Fort Calhoun	126	0.28	0.3	Prairie Island 1,2	363	0.36	0.4	Prairie Island 1,2	329	0.39	0.4	0.30	Haddam Neck	126	0.23	0.2	0.27	Prairie Island 1,2	233	0.36	0.3	0.24
Rancho Seco	126	0.44	0.2	Three Mile Island 1,2	394	0.17	-	Three Mile Island 1,2	376	0.18	-	0.06	Davis Besse	184	0.12	0.4	0.06	San Onofre 1	155	0.09	-	0.13
Kewaunee	127	0.37	0.3	Yankee Rowe	213	0.42	6.0	Beaver Valley	229	0.19	0.4	0.13	McGuire	169	0.11	0.3	0.03	Maine Yankee	164	0.28	0.2	0.14
Yankee Rowe	127	0.29	0.8	North Anna 1	219	0.10	0.3	Salem 1	254	0.15	0.3	0.09	Crystal River	177	0.23	0.3	0.13	Kewaunee	165	0.37	0.4	0.24
Beaver Valley	132	0.25	0.6	Cook 1,2	493	0.37	0.3	Point Beach 1,2	596	0.77	0.8	0.46	Fort Calhoun	217	0.30	0.5	0.42	Indian Point 1,2	406	0.46	0.7	0.46
San Onofre	139	0.27	0.4	Point Beach 1,2	598	1.07	0.8	Yankee Rowe	302	0.59	2.8	0.43	Farley 1,2	484	0.33	0.4	0.18	Sequoyah 1,2	491	0.28	0.3	0.14
Maine Yankee	154	0.39	0.3	Indian Point 3	308	0.32	0.8	Calvert Cliffs 1,2	607	0.39	0.4	0.19	St. Lucie	272	0.26	0.3	0.18	Salem 1,2	581	0.24	0.8	0.16
Trojan	257	0.35	0.4	Calvert Cliffs 1,2	677	0.45	0.5	Cook 1,2	655	0.49	0.4	0.25	Point Beach 1,2	609	0.79	0.8	0.50	Trojan	307	0.32	0.6	0.25
Point Beach 1,2	644	1.06	0.8	Arkansas 1	342	0.28	0.8	North Anna 1,2	680	0.28	0.5	0.37	Palisades	330	0.21	0.8	0.20	Cook 1,2	658	0.46	0.5	0.33
Oconee, 1,2,3	1,051	0.48	0.6	Oconee 1,2,3	1,055	0.50	0.6	Indian Point 3	384	0.54	1.0	0.36	Rancho Seco	337	0.44	0.8	0.36	North Anna 1,2	665	0.30	0.5	0.38
Cook 1,2	718	0.50	0.5	Rancho Seco	412	0.44	0.8	Rancho Seco	402	0.52	1.3	0.28	Cook 1,2	699	0.46	0.5	0.27	Calvert Cliffs 1,2	668	0.35	0.5	0.32
Arkansas	369	0.26	0.9	Trojan	421	0.36	0.6	Oconee 1,2,3	1,211	0.50	0.7	0.45	Arkansas 1,2	803	0.50	0.9	0.43	Oconee 1,2,3	1,207	0.62	0.6	0.46
Calvert Cliffs 1,2	805	0.56	0.7	Palisades	424	0.32	1.5	Crystal River 3	408	0.36	0.8	0.23	Trojan	419	0.42	0.7	0.35	Fort Calhoun	433	0.50	1.3	0.39
St. Lucie	438	0.48	0.7	Farley	435	0.33	0.8	Maine Yankee	424	0.49	0.7	0.29	Yankee Rowe	474	0.58	4.4	0.54	Farley 1,2	1,021	0.53	0.8	0.41
North Anna	449	0.22	0.9	Salem 1	449	0.26	0.7	Fort Calhoun	458	0.56	1.8	0.50	Three Mile Island 1,2	1,004	0.47	-	0.44	McGuire 1	521	0.30	0.9	0.32
Willstone Point 2	472	0.62	0.9	Zion 1,2	920	0.68	0.6	Farley	511	0.38	1.6	0.28	Calvert Cliffs 1,2	1,057	0.59	0.8	0.40	Crystal River	552	0.32	1.2	0.38
Crystal River	495	0.43	1.1	Maine Yankee	462	0.61	0.9	Willstone Point 2	531	0.90	0.7	0.44	Sequoyah	570	0.29	1.0	0.18	Three Mile Island 1,2	1,159	0.73	-	0.57
Salem	584	0.39	2.3	Indian Point 1*,2	971	0.62	1.9	Arkansas 1,2	1,102	0.50	1.0	0.39	Oconee 1,2,3	1,792	0.73	1.4	0.58	Indian Point 3	607	0.65	77.8	0.52
Three Mile Island 1,2	1,170	0.29	4.4	St. Lucie	532	0.50	0.9	Trojan	609	0.46	0.8	0.33	Salem 1,2	1,203	0.37	0.8	0.29	Zion 1,2	1,311	1.02	1.1	0.62
Ginna	592	0.67	1.7	Beaver Valley	553	0.30	13.9	Ginna	655	0.71	1.6	0.45	Maine Yankee	619	0.48	1.1	0.32	Arkansas 1,2	1,397	0.66	1.5	0.65
Indian Point 3	636	0.79	1.1	Crystal River	625	0.59	1.6	Robinson 2	733	0.50	1.7	0.51	Beaver Valley	599	0.34	1.8	0.26	Point Beach 1,2	1,403	0.82	2.2	0.53
Zion 1,2	1,274	0.87	1.0	Willstone Point 2	636	0.71	1.1	Zion 1,2	1,720	0.98	1.3	0.69	Surry 1,2	1,490	0.79	1.1	0.71	Beaver Valley	772	0.52	1.4	0.42
Indian Point 1*,2	1,279	0.95	2.2	Fort Calhoun	668	0.75	2.8	Palisades	902	0.42	2.2	0.41	Indian Point 1*,2	1,635	0.76	3.1	0.52	Rancho Seco	787	0.59	2.3	0.39
Farley	634	0.52	3.0	Ginna	708	0.66	1.9	Ginna	929	0.63	1.6	0.43	San Onofre	832	0.27	13.5	0.35	Ginna	855	0.88	2.2	0.55
Turkey Point 3,4	1,680	0.84	2.1	Turkey Point 3,4	1,651	0.92	1.7	Haddam Neck	1,036	0.67	2.1	0.52	North Anna 1,2	1,915	0.87	7.5	0.67	Robinson	923	0.41	2.3	0.44
Palisades	654	0.53	2.1	Haddam Neck	1,353	0.73	3.2	Turkey Point 3,4	2,251	0.77	3.4	0.51	Zion 1,2	2,103	1.34	1.8	0.76	Palisades	977	0.45	2.2	0.54
Haddam Neck	1,161	0.95	2.4	Robinson 2	1,852	0.92	4.8	Indian Point 1*,2	2,731	1.05	7.4	0.65	Turkey Point 3,4	2,119	0.72	2.3	0.48	St. Lucie	1,204	0.54	4.2	0.47
Robinson 2	1,188	0.82	2.5	Surry 1,2	3,838	0.72	5.8	Surry 1,2	4,244	1.13	4.7	0.77	Ginna	1,140	1.02	3.9	0.65	Turkey Point 1,2	2,681	0.92	3.1	0.60
Surry 1,2	3,584	0.71	10.4	San Onofre 1	2,387	0.78	24.5	San Onofre	3,223	1.11	33.6	0.72	Indian Point 3	1,226	0.83	7.1	0.59	Haddam Neck	1,384	0.84	1.1	0.57
Averages per Reactor	520	0.55	1.2	Averages per Reactor	578	0.50	1.3	Averages per Reactor	652	0.61	1.4	0.52	Willstone Point 2	1,413	0.68	2.4	0.48	Surry 1,2	3,220	1.17	3.5	0.78
													Robinson 2	1,426	0.71	5.1	0.65	Willstone Point 2	1,881	0.79	6.4	0.67
													Averages per Reactor	578	0.53	1.3	0.49	Averages per reactor	592	0.56	1.3	0.40

*Indian Point 1 was defueled in 1974.

¹For sites with more than one operating reactor, the number of man-rems per reactor is obtained by dividing the number of man-rems for the site by the number of reactors.

²FCR is the ratio of the annual collective dose delivered at individual doses exceeding 1.5 rems to the total collective dose.

TABLE 6

GRAND TOTALS AND AVERAGES

a Light Water Reactors Listed in Ascending Order of Man-remS per Reactor-year (Rx-yr)
1969 - 1983

BWRs	Collective dose (man-remS)	Megawatt- years generated	Man-remS per Mw-yr	Rx-years reported	Man-remS per Rx-yr	PWRs	Collective dose (man-remS)	Megawatt- years generated	Man-remS per Mw-yr	Rx-years reported	Man-remS per Rx-yr
La Crosse	2,579	347	7.4	14	184	Davis Besse	534	2,478	0.2	6	89
Big Rock Point	3,794	633	6.0	15	253	Prairie Island 1,2	2,433	7,984	0.3	19	128
Humboldt Bay	4,861	339	14.3	15	324	Kewaunee	1,290	3,900	0.3	9	143
Cooper Station	4,316	4,519	1.0	9	480	Yankee Rowe	3,116	1,908	1.6	15	208
Hatch 1,2	5,974	5,439	1.1	12	498	Point Beach 1,2	7,055	9,371	0.7	24	294
Monticello	6,383	4,978	1.3	12	532	Cook 1,2	3,974	9,526	0.4	13	306
Duane Arnold	4,478	2,338	1.9	8	560	Maine Yankee	3,429	6,265	0.6	11	312
Vermont Yankee	6,433	4,203	1.5	11	585	Fort Calhoun	3,287	3,197	1.0	10	329
Browns Ferry 1,2,3	14,669	14,193	1.0	23	638	McGuire	690	1,083	0.6	2	345
Dresden 1,2,3	26,010	13,179	2.0	40	650	Calvert Cliffs 1,2	4,935	9,011	0.5	14	352
Nine Mile Point	10,525	5,207	2.0	14	752	Rancho Seco	2,835	3,879	0.7	8	354
Peach Bottom 2,3	15,557	11,986	1.3	18	864	Sequoyah 1,2	1,061	2,247	0.5	3	354
Oyster Creek	14,455	5,244	2.8	14	1,032	Trojan	2,506	4,205	0.6	7	358
Fitzpatrick	8,795	3,998	2.2	8	1,099	Beaver Valley	2,562	2,382	1.1	7	366
Quad Cities 1,2	22,790	10,044	2.3	20	1,140	Oconee 1,2,3	11,027	16,034	0.7	28	394
Millstone Point 1	14,156	5,426	2.6	12	1,180	Three Mile Island 1,2	5,547	2,827	2.0	14	396
Brunswick 1,2	18,826	5,361	3.5	14	1,345	Arkansas 1,2	4,768	6,065	0.8	12	397
Pilgrim	17,634	4,443	4.0	11	1,603	Salem 1,2	3,193	4,402	0.7	8	399
Totals and Averages	202,235	101,877	2.0	270	749	Farley 1,2	3,202	4,420	0.7	8	400
						Crystal River	2,578	2,699	1.0	6	430
						North Anna 1,2,	3,927	4,547	0.9	8	491
						Palisades	7,191	4,080	1.8	14	514
						Zion 1,2	10,102	12,138	0.8	19	532
						St. Lucie	3,864	4,181	0.9	7	552
						Haddam Neck	9,330	7,123	1.3	15	622
						Indian Point 3*	3,141	1,481	2.1	5	628
						San Onofre 1	10,083	3,979	2.5	15	672
						Ginna	8,886	4,430	2.0	13	684
						Indian Point 1,2*	7,102	2,688	2.6	10	710
						Turkey Point 3,4	15,042	9,563	1.6	**	716
						Millstone Point 2	6,964	4,013	1.7	**	871
						Robinson	10,979	5,676	1.9	12	915
						Indian Point 1,2,3*	15,575	4,410	3.5	17	916
						Surry 1,2	26,368	9,556	2.8	21	1,256
						Totals and Averages	208,576	181,748	1.1	409	510

*Indian Point 3 began reporting separately in 1979.

b Light Water Reactors Listed in Ascending Order of Man-remS per Reactor-year (Rx-yr)
1969 - 1982

BWRs	Collective dose (Man-remS)	Megawatt- years generated	Man-remS per Mw-yr	Rx-years reported	Man-remS per Rx-yr	PWRs	Collective dose (man-remS)	Megawatt- years generated	Man-remS per Mw-yr	Rx-years reported	Man-remS per Rx-yr
LaCrosse	2,266	322	7.0	13	174	Davis Besse	454	1,886	0.2	5	91
Big Rock Point	3,531	590	6.0	14	252	Prairie Island 1,2	2,200	7,063	0.3	17	129
Humboldt Bay	4,844	339	14.3	14	346	Kewaunee	1,125	3,456	0.3	8	141
Cooper Station	3,023	4,122	0.7	8	378	McGuire	169	525	0.3	1	169
Hatch 1,2	4,675	4,505	1.0	10	467	Yankee Rowe	3,048	1,744	1.7	14	218
Duane Arnold	3,343	2,055	1.6	7	478	Point Beach 1,2	5,652	8,723	0.7	22	257
Vermont Yankee	4,906	3,857	1.3	10	491	Rancho Seco	2,048	3,531	0.6	7	292
Browns Ferry 1,2,3	11,306	12,552	0.9	20	565	Cook 1,2	3,316	8,069	0.4	11	301
Monticello	6,262	4,483	1.4	11	569	Beaver Valley	1,790	1,821	1.0	6	303
Dresden 1,2,3	22,427	12,266	1.8	37	606	Fort Calhoun	2,854	2,867	1.0	9	317
Nine Mile Point	9,665	4,878	2.0	13	743	Maine Yankee	3,265	5,588	0.6	10	326
Peach Bottom 2,3	12,594	11,161	1.1	16	787	Arkansas 1,2	3,371	5,150	0.6	10	337
Oyster Creek	12,198	5,217	2.3	13	938	Calvert Cliffs 1,2	4,267	7,614	0.6	12	356
Fitzpatrick	7,705	3,452	2.2	7	1,101	Farley 1,2	2,181	3,063	0.7	6	364
Quad Cities 1,2	20,299	8,955	2.3	18	1,128	Three Mile Island 1,2	4,388	2,827	1.6	12	366
Millstone Point 1	13,932	4,786	2.9	11	1,265	Trojan	2,199	3,711	0.6	6	366
Brunswick 1,2	15,351	4,724	3.2	12	1,279	Oconee 1,2,3	9,820	13,892	0.7	25	393
Pilgrim	16,472	3,883	4.2	10	1,647	Crystal River	2,026	2,247	0.9	5	405
Totals and Averages	174,779	92,147	1.9	244	716	Salem 1,2	2,612	3,660	0.7	6	435
						St. Lucie	2,660	3,891	0.7	6	443
						Palisades	6,214	3,626	1.7	13	478
						Zion 1,2	8,791	10,916	0.8	17	517
						North Anna 1,2	3,262	3,209	1.0	6	544
						Haddam Neck	7,946	6,669	1.2	14	568
						Sequoyah	570	584	1.0	1	570
						Indian Point 3*	2,534	1,472	1.7	4	633
						Turkey Point 3,4	12,361	8,685	1.4	19	650
						Ginna	8,031	4,065	2.0	12	669
						San Onofre	9,928	3,979	2.5	14	709
						Millstone Point 2	5,083	4,019	1.3	7	726
						Indian Point 1,2*	6,616	1,985	3.3	8	827
						Robinson 2	10,056	5,266	1.9	11	914
						Indian Point 1,2,3*	15,575	4,410	3.5	17	916
						Surry 1,2	23,148	8,642	2.7	19	1,218
						Totals and Averages	179,560	158,270	1.1	360	499

*Indian Point 3 began reporting separately in 1979.

feedwater nozzle replacement. At BWRs, inspections and repairs of primary piping and pipe welds and Mark I torus modifications have contributed to increased doses. It should be noted that the differences in nuclear plant designs and the ages of plants (Ref. 12) even between plants of a given type affect the nature of these parameters as well, and one should be careful when attempting to draw conclusions from these data.

3. ANNUAL DOSE DISTRIBUTIONS

3.1 Annual Whole Body Dose Distributions

Table 7 summarizes the distribution of the annual whole body doses received by workers at commercial LWRs during each of the years 1969 through 1983. This distribution is the sum of the annual dose distributions reported by each licensed LWR each year. The distribution reported by each LWR for 1983 is shown in Appendix B. From Table 7, one can see that, prior to 1973, the reports had a different format such that, for doses less than two rems (cSv), there were only two dose ranges, 0.0 to 1.25 rems (cSv) and 1.25 to 2.0 rems (cSv). This did not allow an estimate of the collective dose, as previously described, to be made for these years. For the years after 1972, the table indicates that the annual collective dose increased nearly every year, as did the number of monitored individuals. However, the values of CR show that the portion of the collective dose due to individual doses greater than 1.5 rems (cSv) has decreased from a high of 0.72 in 1973 and has levelled off at about 0.55 for the last few years.

Since personnel monitoring data have frequently been found to have log-normal distributions (Ref 13), trends in the data may be observed from logprobability plots of the data. If the data are log normally distributed, 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 a logarithmic scale on the horizontal axis. Figure 5 displays such plots of the dose distributions of workers at BWRs and PWRs for 1982 and 1983. The positions of the plots for the PWRs above those of the BWRs indicates that a larger portion of workers at PWRs received lower doses, which resulted in lower median doses (point at which the 50 percentile line crosses each plot) and smaller values of CR.

Further examination of the plots reveals that they form fairly straight lines only to about 1.5 rems (cSv) where they start to curve upward. This curve is typical of distributions when there are several workers in the higher dose ranges, (Ref. 11) and indicates that the entire distribution is not a log-normal one. A new theoretical analysis of occupational dose distributions (Ref. 14) has found that these data are far better fitted by a hybrid log-normal distribution. At low doses, this distribution is log-normal, but at higher doses, where radiation control programs require that each worker's total dose be closely monitored so that the frequency of doses approaching the dose limits is reduced, the distribution is normal. This method of analyzing occupational doses may prove to have several valuable applications (Ref. 15) for individuals involved in radiation protection programs.

TABLE 7*
SUMMARY DISTRIBUTION OF ANNUAL WHOLE BODY DOSES
AT COMMERCIAL LIGHT-WATER-COOLED REACTORS

1969 - 1983

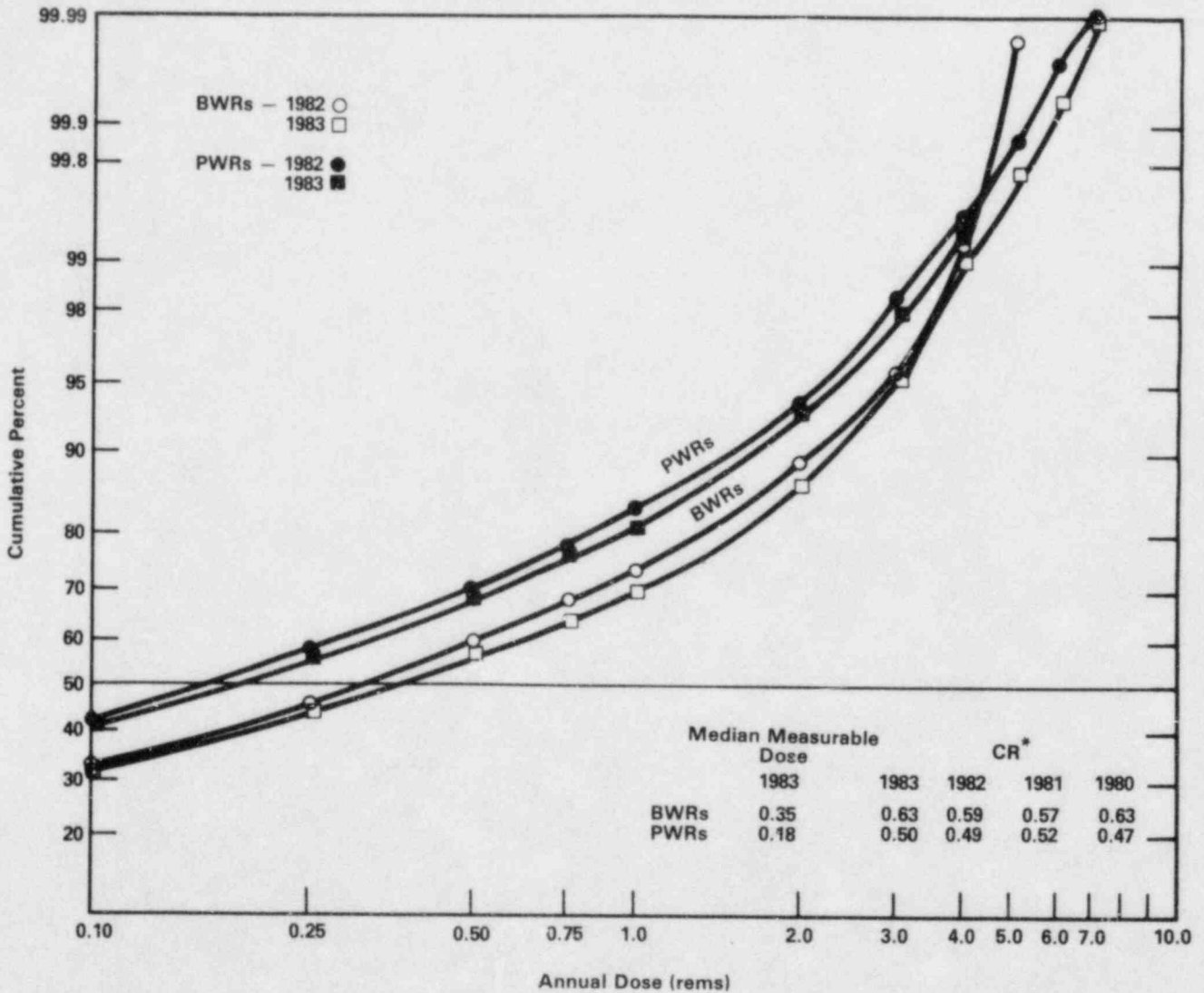
Year	Number of Individuals with Whole Body Exposures in the Indicated Ranges (Rems)															Total Number Monitored	** Annual Collective Dose (Man-rem)	*** CR			
	No Measurable Exposure	Measurable, <0.10	0.10-0.25	0.25-0.50	0.50-0.75	0.75-1.0	1.0-2.0	2.0-3.0	3.0-4.0	4.0-5.0	5.0-6.0	6.0-7.0	7.0-8.0	8.0-9.0	9.0-10.0				10.0-11.0		
	0.0-1.25			1.25-2.0																	
1969	2,479			128			134	85	25	5	2								2,838		
1970	6,839			146			166	163	89	98	8	1							7,509		
1971	8,586			410			315	137	105	17	11								9,581		
1972	14,095			688			532	199	111	46	21	9	6	6					15,713		
1973	19,043	5,494	1,698	1,214	740	652	2,468	1,584	422	251	125	71	38	16	7				33,823	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	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		1			44,343	20,879	0.65
1976	25,704	12,821	5,130	4,135	2,520	2,030	4,890	2,354	789	487	188	70	26	11	5	1			61,151	26,433	0.62
1977	24,868	13,970	6,534	5,050	3,258	2,486	6,162	2,837	1,130	569	141	66	36	21	6				67,134	32,511	0.61
1978	30,143	16,639	6,943	5,504	3,399	2,498	6,405	2,989	1,080	418	67	26	8			(>12) 2			76,121	31,804	0.50
1979	41,191	24,512	9,881	8,090	5,147	3,426	7,898	3,306	1,255	477	86	28	13	2		(11-12) 1			105,313	39,961	0.54
1980	47,377	29,638	11,750	9,820	6,082	4,518	11,474	4,515	1,537	686	192	98	18	3					127,708	53,796	0.56
1981	42,323	29,332	12,217	10,326	6,625	4,903	11,766	4,546	1,793	486	93	81	11	2	1	(-12) 1			124,506	54,142	0.55
1982	44,893	31,480	12,693	10,814	6,739	4,795	10,955	4,686	1,814	432	56	13	4	0	1				129,275	52,190	0.54
1983	51,071	31,900	12,211	10,296	6,470	4,708	12,171	5,311	1,950	544	65	16	4						136,717	56,471	0.56

* 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.

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

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

FIGURE 5
CUMULATIVE PERCENT OF ANNUAL INDIVIDUAL DOSES
1982 & 1983



NOTE: Each point on the curves represent the cumulative percentage of workers with measurable dose who received doses less then the indicated annual dose. The median measurable dose is the dose at the which the curve crosses the fifth percentile.

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

The compilation of the distribution data submitted by each facility into one report, however, introduces an additional source of error. Since individuals are not identified in the annual distribution reports, an individual who was monitored by five different reactor facilities would have been counted once on each facility's report. Therefore, when the data were summed to determine the total number of individuals monitored by all facilities, this person would have been counted as five individuals rather than as one. This affects the distribution of doses as well as the number of individuals and the average dose, because the individual could have been counted five times in the lower dose ranges rather than one time in a higher range in which his actual accumulated dose (the sum of his doses incurred at each facility) would have placed him. Further discussion of this is provided in Section 4.4.

3.2 Dose Distribution by Work and Job Function

Tables 8, 9, and 10 summarize the annual data submitted in accordance with plant technical specifications in a format similar to that shown in Appendix C. The licensees are requested to record the collective doses received by station employees, utility employees, and contract workers among various prescribed work functions and occupations. The report submitted by each station for 1983 is contained in Appendix C. One may note that in some cases, the licensee data had to be modified slightly in order to fit into the prescribed categories.

Table 8 provides a detailed summary of the distribution of collective dose by work function and personnel types for BWRs, PWRs, and all LWRs. It shows that contract workers performing special maintenance at LWRs incur the largest portion of the collective dose. Table 9 presents a more general summary of these data for the last nine years, and one can see that workers involved in routine and special maintenance activities continue to incur most of the total collective dose. At BWRs (Table 8), workers involved in these activities received 76.7% of the collective dose for BWRs; at PWRs, these workers received 70.8% of the collective dose, each being one percent less than that found for 1982. The portions of the collective dose received by workers during inservice inspection and refueling at BWRs are 7.9% and 4.3%, respectively; at PWRs, such workers received 7.2% and 4.9%, respectively, of the collective dose. Overall, contractor personnel received 63.4% of the collective dose (1.5% more than last year), and the station and utility employees received the remaining 36.6% at LWRs.

Table 10 presents the distribution of the collective dose at all LWRs among five occupations. As expected, maintenance personnel incurred the majority (72.1%) of the collective dose with contractor maintenance personnel receiving about twice as much as the station and utility maintenance employees combined. Supervisory personnel received only 2.7% of the dose, while workers in the remaining three occupations - operations, health physics, and engineering - received 7.9%, 9.8%, and 7.4%, respectively, of the collective dose. All of these values are about the same as those found for 1982. The collective doses shown in Tables 8 and 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 C rather than the collective dose that was obtained or calculated from the \$20.407 annual reports.

TABLE 8
ANNUAL COLLECTIVE DOSE
BY WORK FUNCTION AND PERSONNEL TYPE

1983

WORK FUNCTION	STATION EMPLOYEES		UTILITY EMPLOYEES		CONTRACT WORKERS & OTHERS		TOTAL PER FUNCTION	
	MAN-REMS	% OF TOTAL	MAN-REMS	% OF TOTAL	MAN-REMS	% OF TOTAL	MAN-REMS	% OF TOTAL
BOILING WATER REACTORS								
REACTOR OPERATIONS & SURVEILLANCE	1497.612	5.7 %	163.202	0.6 %	633.138	2.4 %	2293.952	8.8 %
ROUTINE MAINTENANCE	2371.138	9.1 %	1813.572	6.9 %	5593.209	21.4 %	9777.919	37.5 %
INSERVICE INSPECTION	179.127	0.7 %	272.852	1.0 %	1622.308	6.2 %	2074.287	7.9 %
SPECIAL MAINTENANCE	957.859	3.7 %	751.254	2.9 %	8510.735	32.6 %	10219.848	39.2 %
WASTE PROCESSING	575.554	2.2 %	40.200	0.2 %	518.469	2.0 %	1134.223	4.3 %
REFUELING	367.117	1.4 %	44.355	0.2 %	191.871	0.7 %	603.343	2.3 %
TOTALS	5948.407	22.8 %	3085.435	11.8 %	17069.730	65.4 %	26103.572	100.0 %
*PRESSURIZED WATER REACTORS								
REACTOR OPERATIONS & SURVEILLANCE	1813.572	6.6 %	113.060	0.4 %	1186.264	4.3 %	3112.896	11.3 %
ROUTINE MAINTENANCE	2474.250	9.0 %	676.988	2.5 %	3017.435	11.0 %	6168.673	22.4 %
INSERVICE INSPECTION	241.567	0.9 %	179.508	0.7 %	1568.947	5.7 %	1990.022	7.2 %
SPECIAL MAINTENANCE	1994.813	7.3 %	1603.549	5.8 %	9712.349	35.3 %	13310.711	48.4 %
WASTE PROCESSING	508.421	1.8 %	30.853	0.1 %	807.444	2.9 %	1346.718	4.9 %
REFUELING	706.578	2.6 %	228.758	0.8 %	642.109	2.3 %	1577.445	5.7 %
TOTALS	7739.201	28.1 %	2832.716	10.3 %	16934.548	61.6 %	27506.465	100.0 %
*ALL LIGHT WATER REACTORS								
REACTOR OPERATIONS & SURVEILLANCE	3311.184	6.2 %	276.262	0.5 %	1819.402	3.4 %	5406.848	10.1 %
ROUTINE MAINTENANCE	4845.388	9.0 %	2490.560	4.6 %	8610.644	16.1 %	15946.592	29.7 %
INSERVICE INSPECTION	420.694	0.8 %	452.360	0.8 %	3191.255	6.0 %	4064.309	7.6 %
SPECIAL MAINTENANCE	2952.672	5.5 %	2354.803	4.4 %	18223.084	34.0 %	23530.559	43.9 %
WASTE PROCESSING	1083.975	2.0 %	71.053	0.1 %	1325.913	2.5 %	2480.941	4.6 %
REFUELING	1073.695	2.0 %	273.113	0.5 %	833.980	1.6 %	2180.788	4.1 %
TOTALS	13687.608	25.5 %	5918.151	11.0 %	34004.278	63.4 %	53610.037	100.0 %

*Table does not include results from the PWRs at Point Beach 1,2 (1360 man-rems) because of formatting problems.

TABLE 9

PERCENTAGES OF ANNUAL COLLECTIVE DOSE
AT LWRS BY WORK FUNCTION

Work Function	Percent of Dose Each Year								
	1975	1976	1977	1978	1979	1980	1981	1982	1983
Reactor Operations and Surveillance	10.8%	10.2%	10.5%	13.3%	12.2%	9.5%	8.9%	9.4%	10.1%
Routine Maintenance	52.6%	31.0%	28.1%	31.5%	29.2%	35.5%	36.1%	27.9%	29.7%
Inservice Inspection	3.0%	6.0%	6.4%	7.7%	9.0%	5.5%	5.3%	6.5%	7.6%
Special Maintenance	19.0%	40.0%	42.5%	35.9%	39.4%	40.6%	40.5%	46.8%	43.9%
Waste Processing	6.9%	5.0%	5.8%	5.0%	3.6%	3.0%	4.2%	5.0%	4.6%
Refueling	7.7%	7.9%	6.7%	6.6%	6.6%	6.1%	5.0%	4.4%	4.1%

TABLE 10
ANNUAL COLLECTIVE DOSE
BY OCCUPATION AND PERSONNEL TYPE

1983

OCCUPATION	STATION EMPLOYEES		UTILITY EMPLOYEES		CONTRACT WORKERS & OTHERS		TOTAL PER FUNCTION	
	MAN-REMS	% OF TOTAL	MAN-REMS	% OF TOTAL	MAN-REMS	% OF TOTAL	MAN-REMS	% OF TOTAL
<u>BOILING WATER REACTORS</u>								
MAINTENANCE	2957.978	11.3 %	2835.918	10.9 %	15172.087	58.1 %	20965.983	80.3 %
OPERATIONS	1407.712	5.4 %	14.381	0.1 %	230.856	0.9 %	1652.949	6.3 %
HEALTH PHYSICS	846.823	3.2 %	15.048	0.1 %	885.286	3.4 %	1747.157	6.7 %
SUPERVISORY	400.670	1.5 %	39.381	0.2 %	123.539	0.5 %	563.590	2.2 %
ENGINEERING	335.224	1.3 %	180.707	0.7 %	657.962	2.5 %	1173.893	4.5 %
TOTALS	5948.407	22.8 %	3085.435	11.8 %	17069.730	65.4 %	26103.572	100.0 %
<u>* PRESSURIZED WATER REACTORS</u>								
MAINTENANCE	3976.465	14.5 %	1832.525	6.7 %	11885.746	43.2 %	17694.736	64.3 %
OPERATIONS	1600.568	5.8 %	692.102	2.5 %	311.409	1.1 %	2604.079	9.5 %
HEALTH PHYSICS	1164.826	4.2 %	29.248	0.1 %	2335.980	8.5 %	3530.054	12.8 %
SUPERVISORY	484.471	1.8 %	39.060	0.1 %	343.546	1.2 %	867.077	3.2 %
ENGINEERING	512.871	1.9 %	239.781	0.9 %	2057.867	7.5 %	2810.519	10.2 %
TOTALS	7739.201	28.1 %	2832.716	10.3 %	16934.548	61.6 %	27506.465	100.0 %
<u>* ALL LIGHT WATER REACTORS</u>								
MAINTENANCE	6934.443	12.9 %	4668.443	8.7 %	27057.833	50.5 %	38660.719	72.1 %
OPERATIONS	3008.280	5.6 %	706.483	1.3 %	542.265	1.0 %	4257.028	7.9 %
HEALTH PHYSICS	2011.649	3.8 %	44.296	0.1 %	3221.266	6.0 %	5277.211	9.8 %
SUPERVISORY	885.141	1.7 %	78.441	0.1 %	467.085	0.9 %	1430.667	2.7 %
ENGINEERING	848.095	1.6 %	420.488	0.8 %	2715.829	5.1 %	3984.412	7.4 %
TOTALS	13687.608	25.5 %	5918.151	11.0 %	34004.278	63.4 %	53610.037	100.0 %

* Table does not include results from the PWRs at Point Beach 1,2 (1360 man-rems) because of formatting problems.

3.3 Health Implications of Average Annual Doses

If any damage to health is caused by exposure to radiation in the work place, it would likely manifest itself as certain types of cancer in the exposed worker or, less likely, as inherited genetic damage in the first few generations of the workers' offspring. However, the likelihood of cancer or genetic damage occurring as a result of radiation exposure experienced by workers in nuclear power plants is small. A vast amount of scientific information is available from which estimates of these risks can be made. Much of this information, however, has been obtained from epidemiologic studies of human populations at levels of exposure considerably higher than those normally experienced in the work place. 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 work place introduces uncertainties, these uncertainties can be dealt with in such a manner that the risk is not likely to be underestimated. Thus, the discussion below is likely to overstate the health implications rather than understate them.

Cancer induction as a result of radiation exposure has been examined by many organizations having scientific and medical expertise in the subject. One of these, the National Academy of Sciences (NAS), published a comprehensive review of the biological effects of ionizing radiation in 1980 (Ref. 16). Based on this report, a large working population receiving one million man-rem (man-cSv) might suffer an estimated 100 to 200 additional cancer deaths over the remaining years of their lives. This risk estimate can be applied to the 56,471 man-rem (man-cSv) (Table 3) and the 85,646 workers who received measurable exposures. The result is that, for the total work force exposed at commercial LWRs in 1983, the expected number of additional cancer deaths that might result from radiation dose received that year would be about ten. These deaths would occur many years following the exposure and would be in addition to the approximately 15,000 cancer deaths that occur normally in a population of 85,000 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 0.66 rem (cSv) or the maximum dose of eight or nine rem (cSv) during 1983. The estimated increased cancer death risk is about one chance in 10,000 for the average dose and about one chance in 1,000 for the maximum dose. Should a worker receive 0.66 rem (cSv) per year continuously during his entire working career (working from age 20 until age 65) his risk of dying from cancer could increase by approximately 2% over the normal risk of dying of cancer.† These risks can be compared to the American Cancer Society's estimates of one chance in four of developing cancer and one chance in six of dying of cancer.

The potential genetic effects from a worker population receiving about 60,000 man-rem (man-Sv) is very small compared to genetic damages that occur spontaneously in this population. Based again on the 1980 NAS report,

†The use of the linear quadratic dose-response model in making this risk estimate would estimate an increase in the risk of dying of cancer of less than 1%.

less than four serious genetic diseases could be induced in first generation children of the 85,000 exposed* workers and less than 60 in all future generations. This number can be compared to the approximately 100,000 serious genetic defects that occur normally in one million live births, i.e., an average of about one serious defect in every ten live births. Thus, the total genetic damage in the first generation children of 85,000 workers would be an increase of less than four cases (less than 0.05%) to the expected 8,500 cases that occur normally.

3.4 High Temperature Gas Cooled Reactor (HTGR)

The only HTGR operating in the United States is the Fort St. Vrain plant near Denver, Colorado. It is owned by the Public Service Company of Colorado which was licensed to operate the plant on December 21, 1973. The 330 MWe (net) rated plant began generating electricity in December 1976. However, the plant did not declare commercial operability until July 1, 1979 and during 1983 the utility restricted the plant to a 70% power level.

As shown in Table 11, annual whole body doses incurred by workers at the plant have, in general, been minimal. For the last three years, everyone monitored has received a whole body dose that was less than 0.10 rem (cSv), and no one has ever exceeded an annual dose of 0.25 rems (cSv). The average dose per worker has remained at about 0.03 rem (cSv) or less for the last several years. For the 10 years ending on December 31, 1983, the total collective dose for workers at the site was about 21 man-rems (man-cSv), and a total of 481 megawatt-years of electricity had been generated. This yields a ten-year average of about 0.04 man-rem (man-cSv) per megawatt-year. The average value of this parameter for PWRs is twenty-six times as much (Table 6).

TABLE 11
ANNUAL WHOLE BODY DOSES AT FORT ST. VRAIN
1974 - 1983

Year	No. of Individuals with Annual Doses in Ranges (Rems)			Total No. of Individuals Monitored	Annual Collective Dose (man-rems)	Gross Electricity (MW-yrs) Generated	Average Measurable Dose Per Worker (rems)
	No Measurable Dose	Measurable, but <0.10	0.10-0.25				
1974	1597	63	1	1,661	3.3	0.0	0.05
1975	1263	0	0	1,263	0.0	0.0	0.00
1976	1362	25	0	1,387	1.3	2.8	0.05
1977	946	55	1	1,002	2.9	29.8	0.05
1978	896	34	0	930	1.7	75.7	0.05
1979	1149	120	2	1,271	6.4	28.6	0.01
1980	902	57	1	960	3.0	83.2	0.05
1981	1096	31	0	1,127	1.0	93.6	0.03
1982	978	22	0	1,000	0.4	72.6	0.02
1983	955	48	0	1,013	1.0	94.4	0.02

*Assuming that, on the average, each exposed person will have one child in the future, i.e., 85,000 children born to this worker population.

4. TERMINATION DATA SUBMITTED PURSUANT TO 10 CFR §20.408

4.1 Termination Reports, 1969-1983

In 1969, the Atomic Energy Commission (predecessor of the NRC) began requiring operating nuclear power facilities and three other types of licensees* to submit personal identification and exposure information upon the termination of each monitored person's employment or work assignment in the licensee's facility. The appropriate information on each report is manually coded and entered into the Commission's computerized Radiation

Exposure Information and Reporting System (REIRS) at Oak Ridge, Tennessee. The data are retrievable by several criteria - social security number, name, facility, etc. - which allows statistical analyses of the data as well as the tracing of individual dose histories. During the years that this information has been collected, some 1,040,000 termination records have been received for approximately 280,000 individuals who have been reported as having terminated their employment at nuclear power plants. The figures given for the number of reports and the number of individuals are different because numerous individuals have been terminated more than once over the years and because some individuals may have had external doses reported for more than one part of the body as well as estimates of internal depositions of radioactive material, each of which is counted as one record. Table 12 provides a breakdown of this information for individuals terminating during each of the fourteen years and shows that the number of such records has continued to increase each year for which all of the data have been entered into REIRS. Part of this is due to the fact that each annual transient worker (see Section 4.4) has terminated an average of 2.6 times each year since 1978.

4.2 Limitations of the Termination Data

When examining or using the statistics in this report that are based on the termination data, one should keep in mind that these data have various limitations: (1) Some licensees submit a termination report for each monitored non-utility employee at the end of each monitoring period rather than waiting until the individual actually completes his work assignment at the facility. (2) The period(s) of exposure that are reported for terminating individuals may indicate the monitoring period during which he may have been exposed to radiation rather than the actual dates of exposure. (3) Some licensees report cumulative periods of exposure and doses rather than the actual periods and dose incurred during each period. (4) Licensees having more than one licensed facility sometimes include in the termination report submitted when the individual leaves the second facility the dose that he incurred at the first facility

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

which had already been reported. Although attempts have been made to correct for some of these problems, they are still an additional source of error in any statistics developed from the termination data.

TABLE 12
TERMINATION REPORTS SUBMITTED FOR REACTOR PERSONNEL
1969 - 1983

Year	Number of Termination Records	Number of Terminating Individuals
1969	790	730
1970	2,130	1,910
1971	2,350	2,200
1972	4,500	3,890
1973	11,530	9,070
1974	16,950	11,600
1975	38,380	22,630
1976	63,590	35,290
1977	81,704	36,864
1978	85,308	37,359
1979	118,218	48,305
1980	162,515	65,092
1981*	177,832*	66,902*
1982**	153,390**	56,491**
1983**	86,223**	34,563**

*Data were updated based on more recent compilations.

**Not all of the termination data for individuals terminating during 1982 and 1983 have been entered into the REIRS.

4.3 Transient Workers per Calendar Quarter

One use that is being made of the information contained in the termination reports is the examination of the doses being received by short-term workers. Since nearly half of the termination reports indicated periods of exposure that were less than 90 days, it is possible that several thousand individuals could have been employed by two or more licensees during the same calendar quarter. Thus, a "transient" worker is defined here as an individual who began and terminated employment at two or more different licensed facilities within one calendar quarter. This allows

one to examine the doses of those workers most likely to approach the quarterly limits without the licensee's knowledge since they move so rapidly among facilities.

Table 13 displays some of the information gathered from these termination reports that were submitted by the licensed nuclear power facilities. The number of these workers has increased more than twentyfold during the five years 1972 through 1976, but now appears to be increasing at a much smaller rate. The top part of Table 13 shows that the average individual dose (which is close to being a quarterly dose for most of these workers) showed a decreasing trend in the earlier years and has remained at about 0.42 rems (cSv) for the last two years.

The bottom half of the table separates the information shown in the top part and presents the doses of the workers employed by two, three, and four or more different reactor licensees. The majority of these workers each year were reported by two different licensees during a quarter. The smaller number of workers terminated by three or more licensees received higher average doses than those terminated by two employers every year except for 1982. Examinations of these records have revealed that some individuals have worked for as many as six different NRC licensees during one calendar quarter. However, on the average, less than two instances per year have been found in which a worker exceeded his quarterly limit of 3 rems (cSv) as a result of his working at two or more different licensed facilities within one calendar quarter. In a few of these instances, the doses that the workers had received while employed by the first utility were revised upward later in the year. The under estimates resulted in quarterly doses that slightly exceeded 3 rems (cSv). A very few quarterly exposure exceeding 3 rems (cSv) may have gone undetected because a worker's dose was received over a period spanning more than one quarter and was reported for the entire period. When this happens, it is not possible to determine the portion of the dose received during each quarter.

4.4 Transient Workers per Calendar Year

Since the number of transient workers per calendar quarter comprise only a small percentage of the total number of individuals terminating each year, it was decided to change the criteria so that the records of more workers would be examined. This was done by selecting the records of all individuals who began and terminated two or more periods of employment with at least two different reactor facilities within one calendar year and summing each worker's whole body doses. An examination of these data would allow one to determine the number and average dose for the "annual transients." Table 14 presents the number and doses of the transients found among the individuals terminating during the six years 1977 through 1982. A similar collation has not been done for the 1983 data because not all of them have yet been computerized. One can see that the number of these workers increased from about 3,200 workers in 1977 to about 5,400 in 1980 and 1981. The 4,481 workers shown for 1982 may indicate a decreasing trend or may be due to the fact that all of the 1982 termination data have not yet been computerized. The average dose, however, remains at about 1 rem (cSv).

TABLE 13

TRANSIENT WORKERS PER CALENDAR QUARTER
AT NUCLEAR POWER FACILITIES

1972 - 1982

Year	No. of Commercial Reactors	No. of Workers Terminated by Two or More Licensees	Collective Dose (Man-rems)	Average Dose (Rems)
1972	18	57	57	1.00
1973	24	146	123	0.84
1974	34	285	157	0.56
1975	44	684	493	0.72
1976	53	1,257	889	0.71
1977	57	1,435	851	0.59
1978	64	1,500	680	0.45
1979	68	1,754	802	0.46
1980	69	2,218	1,033	0.47
1981*	71	2,335	952	0.41
1982**	75	1,922	771	0.40

Year	No. of Workers Terminated by Two Licensees	Collective Dose (Man-rems)	Average Dose (Rems)	No. of Workers Terminated by Three Licensees	Collective Dose (Man-rems)	Average Dose (Rems)	No. of Workers Terminated by >Three Licensees	Collective Dose (Man-rems)	Average Dose (Rems)
1972	54	52	0.96	2	3	1.50	1	2	2.00
1973	133	108	0.81	11	13	1.18	2	2	1.00
1974	255	132	0.52	28	24	0.86	2	1	0.50
1975	609	427	0.70	70	62	0.89	5	4	0.80
1976	1,095	720	0.66	145	146	1.01	17	23	1.35
1977	1,271	718	0.56	147	115	0.78	17	18	1.06
1978	1,303	590	0.45	165	75	0.45	32	15	0.47
1979	1,527	647	0.43	178	130	0.73	49	25	0.51
1980	1,896	856	0.45	259	140	0.54	63	36	0.57
1981*	1,967	780	0.40	308	145	0.47	60	27	0.45
1982**	1,659	678	0.41	216	84	0.39	47	9	0.19

*Revised according to latest compilations.

**Figures for 1982 may be incomplete because all of the 1982 termination data may not have been computerized at this time.

TABLE 14

TRANSIENT WORKERS PER CALENDAR YEAR
AT NUCLEAR POWER FACILITIES

1977 - 1982

Year	No. of Commercial Reactors	No. of Workers Terminated by Two or More Licensees	Collective Dose (Man-rem)	Average Dose (Rem)
1977	57	3,161	3,776	1.19
1978	64	3,202	3,231	1.01
1979	68	3,938	3,891	0.99
1980	69	5,463	6,028	1.10
1981*	71	5,425	5,381	0.99
1982**	75	4,481	4,954	1.11

Year	No. of Workers Terminated by Two Licensees	Collective Dose (Man-rem)	Average Dose (Rem)	No. of Workers Terminated by Three Licensees	Collective Dose (Man-rem)	Average Dose (Rem)	No. of Workers Terminated by Four or More Licensees	Collective Dose (Man-rem)	Average Dose (Rem)
1977	2,166	1,987	0.92	572	842	1.47	423	947	2.24
1978	2,119	1,490	0.70	621	792	1.28	462	949	2.05
1979	2,761	2,097	0.76	688	805	1.17	489	989	2.02
1980	3,772	3,444	0.91	959	1,245	1.30	732	1,339	1.83
1981*	3,745	3,033	0.81	924	1,172	1.27	756	1,176	1.56
1982**	3,059	3,025	0.99	829	1,055	1.27	596	874	1.47

*Revised according to latest compilations.

**Figures for 1982 may be incomplete because all of the 1982 termination data may not have been computerized at this time.

The lower portion of the table shows the number and doses of workers that were terminated by two, three and four or more different reactor licensees during the year. The average dose of workers employed by two licensees increased to 0.99 rem (cSv) in 1982, while the average dose of those employed by three licensees remained at 1.27 rems (cSv). The average dose of workers employed by four or more licensees has continued to decline from a value of 2.24 rems (cSv) in 1977 to a value of 1.47 rems (cSv) in 1982.

In order to determine the impact that the inclusion of these individuals in each of two or more licensee's annual reports had on the annual summary (Table 7) for all nuclear power facilities (one of the problems mentioned in Section 3.1), Tables 15a and 15b are presented. Table 15a shows the actual distribution of these transient workers' doses as determined from the above-described termination reports and compares it with the distribution of the whole body doses as they would have appeared in a compilation of the annual statistical reports submitted by each of the nuclear power facilities. During each of the years shown, each of the transient workers was counted an average of 2.6 times. This was not surprising because some individuals were reported by as many as nine different facilities.

Table 15b illustrates the impact that the multiple reporting of these transient workers had on the staff's compilations of the annual statistical reports for the years 1978 through 1982. 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 about 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 1982 the compiled annual reports indicated that 84,404 workers received a measurable dose, 74 of whom received doses greater than 5 rems (cSv). After accounting for those individuals that were reported more than once, the adjusted distribution indicated that there were only 79,697 workers that received a measurable dose and that 125 of them received doses greater than five rems (cSv). This resulted in an average measurable dose of 0.71 rem (cSv) rather than the 0.66 rem (cSv) obtained from the compiled reports.

Since the number of transient workers receiving measurable doses is only about five percent of the total number of workers receiving measurable doses during the year, their impact on most of the statistics derived from compilations of the annual summary reports is not very great. However, when examining the distribution of doses over five rems, one finds that the adjusted statistical distribution indicates that the number of workers who received doses over five rems (cSv) each year was between 50 and 80 more than the number found in the compiled statistical distribution. This is

TABLE 15a
ACTUAL AND COMPILED DOSE DISTRIBUTIONS OF
TRANSIENT WORKERS PER CALENDAR YEAR AT POWER REACTORS

Type of Distribution and Year	Number of Individuals with Whole Body Doses in the Ranges (Rems)																Total Individuals	Total Man-Rems	Avg. Dose (Rems)	Avg. Meas. Dose (Rems)
	Less than Measurable	Meas'ble <0.10	0.10-0.25	0.25-0.50	0.50-0.75	0.75-1.00	1.00-2.00	2.00-3.00	3.00-4.00	4.00-5.00	5.00-6.00	6.00-7.00	7.00-8.00	8.00-9.00	9.00-10.00	>10				
Actual Distribution of Transients - 1978	308	985	317	282	177	131	463	307	168	104	42	13	1	0	1		3,202	^b 3,231	1.01	1.12
Compiled Distribution of Transients - 1978	2,079	2,423	918	788	488	382	873	262	51	11	0	2					8,277	^b 3,231	0.39	0.52
Actual Distribution of Transients - 1979	373	883	398	358	281	240	678	410	195	71	32	14	4	1			3,938	^b 3,888	0.99	1.09
Compiled Distribution of Transients - 1979	2,130	2,676	1,259	1,048	673	460	1,040	313	46	3	1						9,649	^b 3,888	0.40	0.52
Actual Distribution of Transients - 1980	533	1,175	565	482	388	277	829	595	353	174	47	25	15	4	1		5,463	^b 6,028	1.10	1.22
Compiled Distribution of Transients - 1980	3,207	3,910	1,639	1,398	900	661	1,632	503	74	29	4	4	4				13,956	^b 6,028	0.43	0.56
Actual Distribution of Transients - 1981	562	1,271	482	422	380	310	954	614	275	107	30	17	0	1			5,425	^b 5,381	0.99	1.08
Compiled Distribution of Transients - 1981	3,640	3,767	1,473	1,418	963	716	1,550	349	69	8	1	1					13,955	^b 5,381	0.39	0.52
Actual Distribution of Transients - 1982	494	1,048	359	337	263	240	731	485	307	164	34	18	0	0	0	1	4,481	^b 4,954	1.11	1.24
Compiled Distribution of Transients - 1982	3,030	2,964	1,469	1,079	708	578	1,328	472	78	17	1						11,724	^b 4,954	0.42	0.57

TABLE 15b
EFFECTS OF TRANSIENT WORKERS ON ANNUAL STATISTICAL COMPILATIONS

^a Compiled Statistical Distribution - 1978	31,039	16,673	6,943	5,504	3,399	2,498	6,405	2,989	1,080	418	67	26	8	0	0	2	77,051	31,806	0.41	0.69
^c Adjusted Statistical Distribution - 1978	29,268	15,135	6,342	4,998	3,088	2,247	5,995	3,034	1,197	514	109	37	9	0	1	2	71,976	31,668	0.45	0.74
^a Compiled Statistical Distribution - 1979	42,340	24,632	9,883	8,090	5,147	3,426	7,898	3,306	1,255	477	86	28	13	2	0	1	106,584	39,987	0.38	0.62
^c Adjusted Statistical Distribution - 1979	40,583	22,831	9,022	7,400	4,755	3,206	7,536	3,403	1,404	545	117	42	17	3	0	1	100,873	39,525	0.39	0.66
^a Compiled Statistical Distribution - 1980	47,377	29,695	11,751	9,820	6,082	4,518	11,474	4,615	1,537	686	192	98	18	3			128,668	53,799	0.42	0.67
^c Adjusted Statistical Distribution - 1980	44,703	26,960	10,677	8,904	5,570	4,134	10,671	4,607	1,816	831	235	119	29	7	1		120,166	53,626	0.45	0.72
^a Compiled Statistical Distribution - 1981	42,323	29,332	12,217	10,326	6,625	4,903	11,766	4,546	1,763	486	93	81	11	2	1	1	124,506	54,142	0.43	0.66
^c Adjusted Statistical Distribution - 1981	39,245	26,836	11,226	9,330	6,042	4,497	11,170	4,811	1,969	585	122	91	11	3	1	1	115,946	54,142	0.47	0.71
^a Compiled Statistical Distribution - 1982	45,871	31,502	12,693	10,814	6,739	4,795	10,855	4,686	1,814	432	56	13	4	0	1		130,275	52,191	0.40	0.62
^c Adjusted Statistical Distribution - 1982	43,335	29,586	11,585	10,072	6,294	4,457	10,258	4,699	2,043	579	89	30	4	0	1	1	123,032	52,191	0.42	0.65

^aIncludes data from Fort St. Vrain.

^bCollective dose found by summing the actual doses reported for those workers on their termination reports.

^cDistribution found by subtracting the actual from the compiled distribution shown in Table 15a and then subtracting this difference from the compiled statistical distribution shown in Table 15b.

more clearly shown in Table 16, where it can also be seen that in 1982 the number of workers receiving doses greater than five rems (cSv) fell to 125, 0.2% of the work force. Similar corrections and tables for the 1983 annual data will be presented in a subsequent report.

TABLE 16
ANNUAL WHOLE BODY DOSES EXCEEDING FIVE REMS (cSv)

Year	Compiled Number >5 Rems	Adjusted Number >5 Rems	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	125	0.2

4.5 Temporary Workers Per Calendar Year

To complete the examination of the doses received by the short-term workers employed at nuclear power facilities, Table 17 summarizes the data compiled on "temporary workers". For purpose of this report, temporary workers were defined to be those individuals who began and ended their employment at only one nuclear power facility during the calendar year. Table 17 shows that the number of these individuals has grown each year except for 1982 when the number receiving measurable doses decreased by about 4,000 to around 24,000 workers. Comparison of these figures with those in Table 15b reveals that these workers comprised 31% of the total number of workers (76,701) receiving a measurable dose in 1982, while their collective dose was only 25% of the total collective dose. Their average measurable dose of 0.57 rem (cSv) was also less than the overall average of 0.65 rem (cSv).

TABLE 17
TEMPORARY WORKERS PER CALENDAR YEAR
(Individuals terminated by only one employer)

YEAR	No. of Reactors	Total No. Monitored	No. with Meas'ble Dose	Collective Dose (man-rems)	Avg. Dose (rems)	Avg. Meas'ble Dose (rems)
1977	57	29,090	19,094	11,373	0.39	0.60
1978	64	28,864	17,110	9,821	0.34	0.57
1979	68	38,347	21,491	9,488	0.25	0.44
1980	69	48,383	28,305	16,168	0.33	0.57
1981	71	48,265	28,675	16,755	0.35	0.58
1982*	75	40,264	24,049	13,723	0.34	0.57

*Figures for 1982 may be incomplete because all of the 1982 termination data have not yet been computerized.

5. OVEREXPOSURES TO RADIATION

The term "overexposure" as used in this report refers to exposures to radiation or radioactive material that exceeded quarterly control limits established by NRC regulations. When these limits are exceeded for any reason, licensees are required to report the occurrence to the NRC, thus providing for investigations and corrective action as necessary. The term "overexposure" is not necessarily intended to indicate that a worker has been subjected to an unacceptable biological risk. The "overexposures" reported in 1983 are cases in point.

In 1983 there were seven individuals reported as being overexposed; the largest dose being 3.9 rems (cSv). Doses of five individuals exceeded the 1.25-rem (cSv) quarterly limit; the doses of the two others exceeded the 3-rem (cSv) quarterly limit.* All seven cases occurred because of dose-tracking errors. Five "overexposures" occurred during the second quarter of 1983 at the Surry nuclear plant when five contract workers received whole body doses between 1.6 and 2.4 rems (cSv). These were reportable exposures because forms indicating their previous radiation exposures because forms indicating their previous radiation exposure histories had not yet been completed, and the 3-rem (cSv) per quarter limit therefore could not be used. Similar dose-tracking errors at the Browns Ferry and the H. B. Robinson nuclear plants resulted in workers receiving quarterly. Table 18 presents the number and types of exposures exceeding NRC limits that have been reported by power reactors pursuant to 10 CFR § 20.403 and § 20.405 since 1971.

*Three rems (cSv) per quarter are allowed if the workers occupational dose history has been obtained and his accumulated dose indicates an annual average of 5 rems (cSv) or less.

TABLE 18
OVEREXPOSURES AT POWER REACTORS
1971 - 1983

Year	Number of Workers Overexposed to External Radiation	Sum of Whole Body Doses (man-rems)	Maximum Whole Body Dose (Rems)	Number of Workers Exposed to Excessive Concentrations of Radioactive Material	Maximum Exposure
1971	2	4.5	3.1	21	6.1 rems (thyroid)
1972	16	49.7	5.1	2	2000 MPC-hrs
1973	19	61.2	4.0	0	---
1974	43	155.9	6.1	12	433 MPC-hrs
1975	14	44.2	3.8	7	13.5 rems (lung)
1976	20	74.3	10.1	1	248 MPC-hrs
1977	27	52.9	3.6	0	---
1978	9	71.1	27.3	0	---
1979	23	43.4	10.1	0	---
1980	73	266.2	4.9	0	---
1981	7	35.4	21	0	---
1982	2	14.4	9.4	0	---
1983	7	17.2	3.9	0	---

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APPENDIX A*

Personnel, Dose and Power Generation Summary

1969 - 1983

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

Appendix A
Personnel, Dose and Power Generation Summary

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rem	Man-rem per Work Function		Man-rem per Personnel Type		Average Dose per Worker (Rems)	Man-rem per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
ARKANSAS 1, 2 Docket 50-313; DPR-51, NPF-6 1st commercial operation 12/74,- Type - PWR 3/80 Capacity - 836, 858 MWe	1975	588.0	76.5	147	21					0.14	0.0
	1976	464.6	56.6	476	289	27	262	100	189	0.61	0.6
	1977	610.3	76.8	601	256	28	228	111	145	0.43	0.4
	1978	627.2	77.5	722	189	32	157	109	80	0.26	0.3
	1979	397.0	55.3	1321	369	54	315	252	117	0.28	0.9
	1980	452.8	63.7	1233	342	81	261	213	129	0.28	0.8
	1981	1104.7	68.3	2225	1102	130	972	843	259	0.50	1.0
	1982	905.4	58.6	1608	803	97	706	505	298	0.50	0.9
	1983	915.0	54.6	2109	1397	97	1300	1145	252	0.66	1.5
BEAVER VALLEY I Docket 50-334; DPR-66 1st commercial operation 10/76 Type - PWR Capacity - 810 MWe	1977	355.6	57.0	331	87	8	79	58	29	0.26	0.2
	1978	304.2	40.8	646	190	11	179	152	38	0.29	0.6
	1979	221.0	40.0	704	132	22	110	67	65	0.19	0.6
	1980	39.8	6.8	1817	553	76	477	477	76	0.30	13.9
	1981	573.4	73.6	1237	229	38	191	142	87	0.19	.4
	1982	326.7	41.6	1755	599	126	473	481	118	0.34	1.8
	1983	561.2	68.2	1485	772	158	614	615	157	0.52	1.4
BIG ROCK POINT Docket 50-155, DPR-6 1st commercial operation 3/63 Type - BWR Capacity - 64 MWe	1969	48.1		165	136					0.82	2.8
	1970	43.5		290	194					0.67	4.5
	1971	44.4		260	184					0.71	4.1
	1972	43.5		195	181					0.93	4.2
	1973	50.9		241	285			119	166	1.18	5.6
	1974	40.7	70.3	281	276	54	222	42	234	0.98	6.8
	1975	35.1	59.8	300	180	58	122	20	160	0.60	5.1
	1976	29.5	50.1	488	289	82	207	105	184	0.59	9.8
	1977	43.6	73.4	465	334	94	240	60	274	0.72	7.7
	1978	48.5	77.9	285	175	93	82	9	166	0.61	3.6
	1979	13.0	23.5	623	455	89	366	102	353	0.73	35.0

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

Reporting Organization	Year	Mega- watt Year (MW-Yr)	Unit Availa- bility Factor	Total Personnel With Measur- able Doses	Total Man- rems	Man-rems per Work Function		Man-rems per Personnel Type		Average Dose per Worker (Rems)	Man- rems per MW-Yr
						Opera- tions	Maint. & Others	Contractor	Station & Utility		
BIG ROCK POINT (Continued)											
	1980	48.9	79.0	599	354	16	338	91	263	0.59	7.2
	1981	56.9	90.6	479	160	58	102	38	122	0.33	2.8
	1982	43.6	70.8	521	328	129	199	68	260	0.63	7.5
	1983	42.3	71.0	493	263	32	231	55	208	0.53	6.9
BRUNSWICK FERRY 1, 2, 3 Docket 50-259, 50-260, 50-296; DPR-33, -52, -68 1st commercial operation 8/74, 3/75, 3/77 Type - BWR Capacity - 1065, 1065, 1065 MWe											
	1975	161.7	17.8	2380	325					0.14	2.0
	1976	337.6	26.9	2207	234					0.11	0.7
	1977	1327.5	73.0	1858	863	60	803	249	614	0.46	0.6
	1978	1992.1	73.5	2376	1792	4	1788	259	1533	0.75	0.9
	1979	2393.0	79.1	2689	1667	0	1667	289	1378	0.62	0.7
	1980	2182.1	73.6	2712	1825	4	1821	49	1776	0.67	0.8
	1981	2132.9	69.5	3379	2380	100	2280	404	1976	0.70	1.1
	1982	2025.4	67.6	3277	2220	181	2039	317	1903	0.68	1.1
	1983	1641.0	54.3	3302	3363	276	3087	908	2454	1.02	2.0
BRUNSWICK 2, 1 Docket 50-324, 50-325; DPR-62, -71 1st commercial operation 11/75, 3/77 Type - BWR Capacity - 790, 790 MWe											
	1976	297.2	56.0	1265	326	15	311	222	104	0.26	1.1
	1977	291.1	55.7	1512	1119	48	1071	782	337	0.74	3.8
	1978	1173.1	83.7	1458	1004	99	905	695	309	0.69	0.8
	1979	810.0	60.1	2891	2602	97	2505	2074	528	0.90	3.2
	1980	687.2	52.2	3788	3870	111	3759	3098	772	1.02	5.6
	1981	925.2	56.9	3854	2638	159	2479	1890	748	0.68	2.9
	1982	540.3	50.3	4957	3792	162	3630	2841	951	0.76	6.5
	1983	636.7	40.6	5602	3475	152	3323	2428	1047	0.62	5.5
CALVERT CLIFFS 1, 2 Docket 50-317, 50-318; DPR-53, -69											
	1976	753.4	95.2	507	74	28	46	8	66	0.15	0.1
	1977	583.0	72.1	2265	547	36	511	224	323	0.24	0.9
	1978	1188.5	75.8	1391	500	13	487	143	357	0.36	0.4

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rem	Man-rem per Work Function		Man-rem per Personnel Type		Average Dose per Worker (Rems)	Man-rem per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
CALVERT CLIFFS 1, 2 (Continued) 1st commercial operation 5/75, 4/77 Type - PWR Capacity 825, 825 MWe	1979	1161.0	74.0	1428	805	33	772	423	382	0.56	0.7
	1980	1309.9	84.1	1496	677	15	662	402	275	0.45	0.5
	1981	1379.7	83.1	1555	607	29	578	378	229	0.39	0.4
	1982	1238.3	73.7	1805	1057	84	973	402	655	0.59	0.8
	1983	1397.2	81.6	1915	668	5	663	143	525	0.35	0.5
COOK 1, 2 Docket 50-315; DPR-58, -74 1st commercial operation 8/75, 7/78 Type - PWR Capacity - 1020 MWe, 1060 MWe	1976	807.4	83.1	395	116	13	103	71	45	0.29	0.1
	1977	573.0	76.1	802	299	21	278	138	161	0.37	0.5
	1978	744.8	73.6	778	336	49	287	139	197	0.43	0.4
	1979	1373.0	65.3	1445	718	45	673	454	264	0.50	0.5
	1980	1552.4	74.1	1345	493	46	447	323	170	0.37	0.3
	1981	1557.3	73.4	1341	655	48	607	442	213	0.49	0.4
	1982	1461.6	69.8	1527	699	67	632	472	227	0.46	0.5
1983	1456.5	71.2	1418	658	50	608	467	191	0.46	0.5	
COOPER STATION Docket 50-298; DPR-46 1st commercial operation 7/74 Type - BWR Capacity - 764 MWe	1975	456.4	83.6	579	117	30	87	19	98	0.20	0.2
	1976	433.3	75.5	763	350	39	311	210	140	0.46	0.8
	1977	538.2	86.2	815	197	50	147	66	131	0.63	0.4
	1978	576.0	91.0	297	158	40	118	58	100	0.53	0.3
	1979	591.0	87.6	426	221	50	171	89	132	0.52	0.4
	1980	448.3	71.2	735	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	1333	1293	57	1236	1081	212	0.93	3.3

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rems	Man-rems per Work Function		Man-rems per Personnel Type		Average Dose per Worker (Rems)	Man-rems per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
CRYSTAL RIVER 3 Docket 50-302; DPR-72 1st commercial operation 3/77 Type - PWR Capacity - 811 MWe	1978	311.5	41.4	643	321	8	313	244	77	0.50	1.0
	1979	453.0	58.9	1150	495	29	466	346	149	0.43	1.1
	1980	402.1	53.2	1053	625	24	601	382	243	0.59	1.6
	1981	490.4	62.2	1120	408	18	340	236	172	0.36	0.8
	1982	589.8	76.0	780	177	9	168	116	61	0.23	0.3
	1983	452.1	58.8	1720	552	71	481	353	199	0.32	1.2
DAVIS-BESSE 1 Docket 50-346; NPF-3 1st commercial operation 11/77 Type - PWR Capacity - 874 MWe	1978	326.4	48.7	421	48	13	35	14	34	0.11	0.1
	1979	381.0	67.0	304	30	8	22	5	25	0.10	0.1
	1980	256.4	36.2	1283	154	4	150	121	33	0.12	0.6
	1981	531.4	67.4	578	58	1	57	32	26	0.10	0.1
	1982	390.8	51.5	1350	164	12	152	139	25	0.12	0.4
	1983	592.1	73.0	718	80	6	74	46	34	0.11	0.1
DRESDEN 1,* 2, 3 Docket 50-010, 50-237, 50-249; DPR-2, -19, -25 1st commercial operation 7/60, 7/70, 11/71 Type - BWR Capacity - 197, 772, 773 MWe	1969	99.7			286						2.9
	1970	163.1			143						0.9
	1971	394.5			715						1.8
	1972	1243.7			728						0.6
	1973	1112.2		1341	939	143	796	344	595	0.70	0.8
	1974	942.5	54.9	1594	1662			57	1605	1.04	2.0
	1975	708.1	54.6	2310	3423	271	3152	2252	1171	1.48	4.8
	1976	1127.2	80.8	1746	1680	228	1452	749	931	0.96	1.5
	1977	1132.9	77.0	1862	1693	316	1377	693	1000	0.91	1.5
	1978	1242.2	79.5	1946	1529	204	1325	619	910	0.79	1.2
	1979	1013.0	74.7	2407	1800	191	1609	641	1159	0.75	1.8
	1980	1074.4	55.0	2717	2105	236	1869	1093	1012	0.77	2.0
	1981	1035.7	51.5	2408	2802	120	2682	1850	952	1.16	2.7
	1982	1085.3	77.9	2572	2923	136	2787	1731	1192	1.14	2.7
1983	913.6	65.6	2854	3582	176	3406	2127	1455	1.26	3.9	

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

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rems	Man-rems per Work Function		Man-rems per Personnel Type		Average Dose per Worker (rms)	Man-rems per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
DUANE ARNOLD Docket 50-331; DPR-49 1st commercial operation 2/75 Type - BWR Capacity - 515 MWe	1976	305.2	78.0	350	105	14	91	62	43	0.30	0.3
	1977	353.6	78.9	538	299	36	263	220	79	0.56	0.8
	1978	149.2	33.2	1112	974	59	915	932	42	0.88	6.5
	1979	352.0	78.0	757	275	35	240	219	56	0.36	0.8
	1980	339.1	73.3	1108	671	32	639	570	101	0.61	2.0
	1981	277.7	69.8	1286	790	56	734	598	192	0.61	2.8
	1982	278.5	74.7	524	229	18	211	175	54	0.44	0.8
	1983	283.0	62.9	1468	1135	42	1093	1016	119	0.77	4.0
42 FARLEY 1, 2 Docket 50-348, 50-364; NPF-2, -8 1st commercial operation 12/77, 7/81 Type - PWR Capacity - 804, 814 MWe	1978	713.8	86.5	527	108	39	69	34	74	0.20	0.1
	1979	211.0	28.6	1227	643	108	535	460	183	0.52	3.0
	1980	557.3	69.3	1330	435	106	329	185	250	0.33	0.8
	1981	310.2	41.4	1331	511	96	415	270	241	0.38	1.6
	1982	1271.5	79.2	1453	484	155	329	196	288	0.33	0.4
	1983	1356.5	82.9	1938	1021	241	780	479	542	0.53	0.8
FITZPATRICK Docket 50-333; DPR-59 1st commercial operation 7/75 Type - BWR Capacity - 810 MWe	1976	489.0	71.6	600	202					0.34	0.4
	1977	460.5	68.4	1380	1080	14	1066	937	143	0.78	2.3
	1978	497.0	72.1	904	909	166	743	597	312	1.00	1.8
	1979	349.0	50.8	850	859	169	690	538	321	1.01	2.5
	1980	509.5	70.3	2056	2040	118	1922	1008	232	0.99	4.0
	1981	562.9	74.7	2490	1425	187	1238	1072	353	0.57	2.5
	1982	583.6	75.0	2322	1190	136	1054	862	328	0.51	2.0
	1983	546.2	70.6	1715	1090	158	932	667	423	0.64	2.0

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rems	Man-rems per Work Function		Man-rems per Personnel Type		Average Dose per Worker (Rems)	Man-rems per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
FORT CALHOUN Docket 50-285; DPR-40 1st commercial operation 9/73 Type - PWR Capacity - 438 MWe	1974	294.0	83.5	327	71			24	47	0.22	0.2
	1975	252.3	67.4	469	294			92	202	0.63	1.2
	1976	265.9	69.5	516	313	28	285	38	275	0.61	1.2
	1977	351.8	79.4	535	297	33	264	72	225	0.56	0.8
	1978	342.3	75.1	596	410	59	351	151	259	0.69	1.2
	1979	440.0	95.7	451	126	19	107	47	79	0.28	0.3
	1980	242.3	60.4	491	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
GINNA Docket 50-244; DPR-18 1st commercial operation 7/70 Type - PWR Capacity - 470 MWe	1971	327.8		340	430	69	361	108	322	1.26	1.3
	1972	293.6		677	1022	71	961	278	754	1.52	3.5
	1973	409.5		319	224	55	169	84	140	0.70	0.5
	1974	253.7	62.4	884	1225					1.39	4.8
	1975	365.2	76.7	685	538					0.78	1.5
	1976	248.8	58.2	758	636	29	607	210	426	0.84	2.5
	1977	365.6	85.5	530	401	15	386	120	281	0.76	1.1
	1978	386.5	80.6	657	450	20	430	98	352	0.68	1.2
	1979	355.0	72.8	878	592	68	524	207	385	0.67	1.7
	1980	370.5	76.0	1073	708	64	644	302	406	0.66	1.9
	1981	399.0	82.1	925	655	49	606	251	404	0.71	1.6
	1982	289.0	58.8	1117	1140	80	1060	546	594	1.02	3.9
	1983	365.0	74.6	969	855	42	813	378	477	0.88	2.3

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rems	Man-rems per Work Function		Man-rems per Personnel Type		Average Dose per Worker (Rems)	Man-rems per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
HADDAM NECK (CONN. YANKEE) Docket 50-213; DPR-61 1st commercial operation 1/68 Type - PWR Capacity - 569 MWe	1969	438.5		138	106			27	79	0.77	0.2
	1970	424.7		734	689			463	226	0.94	1.6
	1971	502.2		209	342			166	176	1.18	0.7
	1972	515.6		355	325			181	144	0.91	0.6
	1973	293.1		951	697			544	153	0.73	2.4
	1974	521.4	91.2	550	201					0.36	0.4
	1975	494.3	89.9	795	703	20	683			0.88	1.4
	1976	482.9	82.5	644	449	5	444	253	196	0.70	0.9
	1977	480.7	83.9	894	641	59	582	440	201	0.72	1.3
	1978	563.4	98.6	216	117	25	92	18	99	0.54	0.2
	1979	493.0	87.5	1226	1161	73	1088	783	378	0.95	2.4
	1980	426.8	75.0	1860	1353	175	1178	1076	277	0.73	3.2
	1981	487.5	84.3	1554	1036	174	862	809	227	0.67	2.1
	1982	543.9	93.4	559	126	46	80	22	104	0.23	0.2
	1983	453.7	77.8	1645	1384	106	1278	1017	367	0.84	3.1
HATCH 1, 2 Docket 50-321, 50-366; DPR-57; NPF-05 1st commercial operation 12/75, 9/79 Type - BWR Capacity - 764, 771 MWe	1976	496.3	83.8	630	134	79	55	4	130	0.21	0.3
	1977	446.8	66.3	1303	465	96	369	220	245	0.36	1.0
	1978	513.0	72.8	1304	248	88	160	52	196	0.19	0.5
	1979	401.0	54.6	2131	582	85	497	382	200	0.27	1.5
	1980	1008.7	70.9	1930	449	143	306	163	286	0.23	0.4
	1981	870.9	64.3	2899	1337	200	1137	792	545	0.46	1.5
	1982	768.0	56.6	3418	1460	218	1242	1064	396	0.43	1.9
	1983	934.7	68.6	3428	1299	253	1046	851	448	0.38	1.4
HUMBOLDT BAY ^a Docket 50-133; DPR-7	1969	44.6		125	164	69	95	12	152	1.31	3.7
	1970	49.3		115	209	130	79	37	172	1.82	4.2

^aHumboldt Bay is shutdown indefinitely. It is still included in the count of commercial reactors.

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rems	Man-rems per Work Function		Man-rems per Personnel Type		Average Dose per Worker (Rems)	Man-rems per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
HUMBOLDT BAY (Continued) 1st commercial operation 8/63 Type - BWR Capacity - 63 MWe	1971	39.6		140	292	114	178	65	227	2.09	7.4
	1972	43.1		127	253	81	172	57	196	1.99	5.9
	1973	50.1		210	266	60	206			1.27	5.3
	1974	43.4	83.8	296	318	103	215			1.07	7.3
	1975	45.3	83.9	265	339	131	208	112	227	1.28	7.5
	1976	23.5	46.4	523	683	37	646	50	633	1.31	29.1
	1977	0	0	1063	1904	24	1880	973	931	1.79	-
	1978	0	0	320	335	13	322	145	190	1.05	-
	1979	0	0	135	31	11	20	2	29	0.23	-
	1980	0	0	142	22	10	12	3	19	0.15	-
	1981	0	0	75	9					0.12	-
	1982	0	0	71	19	5	14	0	19	0.27	-
	1983	0	0	84	17	4	13	0	17	0.20	-
	INDIAN POINT 1,* 2, 3** Docket 50-3, 50-247, 50-286; DPR-5, -26, -64 1st commercial operation 10/62, 8/73, 8/76 Type - PWR	1969	206.2			298					
1970		43.3			1639						37.8
1971		154.0			768						5.0
1972		142.3			967						6.8
1973		0		2998	5262	709	4553	2847	2415	1.75	-
1974		556.1	59.4	1019	910					0.89	1.6
1975		584.4	74.8	891	705	166	539	47	658	0.79	1.2
1976		273.9	34.8	1590	1950	154	1796	172	1778	1.23	7.1
1977		1278.3	75.3	1391	1070	189	881	383	687	0.77	0.8
1978		1172.3	67.8	1909	2006	260	1746	759	1247	1.05	1.7

*Indian Point 1 was defueled in 1975. It had a capacity of 265 MWe. It is still included in the count of commercial reactors.

**Indian Point 3 was purchased by a different utility and now reports separately.

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rem	Man-rem per Work Function		Man-rem per Personnel Type		Average Dose per Worker (Rems)	Man-rem per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
INDIAN POINT 1,* 2 Docket 50-3, 50-247, DPR-5, -26 1st commercial operation 10/62, 8/73 Type - PWR Capacity - 1,864 MWe	1979	574.0	71.4	1349	1279	209	1070	612	667	0.95	2.2
	1980	510.8	64.8	1577	971	181	790	398	573	0.62	1.9
	1981	367.5	46.0	2595	2731	237	2494	1595	1137	1.05	7.4
	1982	532.4	65.4	2144	1635	343	1292	883	752	0.76	3.1
	1983	702.6	84.0	1057	486	200	286	217	269	0.46	0.7
INDIAN POINT 3** Docket 50-286; DPR-64 1st commercial operation 8/76 Type - PWR Capacity - 965 MWe	1979	568.0	66.5	808	636	63	573	482	154	0.79	1.1
	1980	367.3	53.2	977	308	47	261	210	98	0.32	0.8
	1981	365.8	59.8	677	364	46	318	255	109	0.54	1.0
	1982	171.5	22.5	1477	1226	42	1184	1094	132	0.83	7.1
	1983	7.8	2.6	941	607	38	569	494	113	0.65	77.8
KEWAUNEE Docket 50-305; DPR-43 1st commercial operation 6/74 Type - PWR Capacity - 503 MWe	1975	401.9	88.2	104	28	1	27	12	16	0.27	0.1
	1976	405.9	78.9	381	270	16	254	193	77	0.71	0.7
	1977	425.0	79.9	312	139	8	131	76	63	0.44	0.3
	1978	466.6	89.5	335	154	11	143	89	65	0.46	0.3
	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

*INDIAN POINT 1 was defueled in 1975. It had a capacity of 265 MWe. It is still included in the count of commercial reactors.

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

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rem	Man-rem per Work Function		Man-rem per Personnel Type		Average Dose per Worker (Rems)	Man-rem per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
LACROSSE Docket 50-409; DPR-45 1st commercial operation 11/69 Type - BWR Capacity - 48 MWe	1970	15.3			111			40	71		7.2
	1971	33.1		218	158					0.72	4.8
	1972	29.2		151	172					1.14	5.9
	1973	24.4		157	221					1.41	9.1
	1974	37.9	81.0	115	139	89	50	6	133	1.21	3.7
	1975	32.0	69.6	165	234					1.42	7.3
	1976	21.2	47.6	118	111	40	71	6	105	0.94	5.2
	1977	11.3	33.7	141	224	60	164	8	216	1.59	19.8
	1978	21.6	62.0	182	164	69	95	6	158	0.90	7.6
	1979	24.0	71.8	153	186	65	121	21	165	1.22	7.7
	1980	26.4	68.5	124	218	63	155	11	207	1.76	8.3
	1981	29.6	76.0	187	123	62	61	3	120	0.66	4.2
	1982	17.2	44.6	148	205	65	140	16	189	1.59	11.9
	1983	24.8	59.7	160	313	103	210	31	282	1.96	12.6
MAINE YANKEE Docket 50-309; DPR-36 1st commercial operation 12/72 Type - PWR Capacity - 810 MWe	1973	408.7		782	117			59	58	0.15	0.3
	1974	432.6	68.7	619	420	64	356	188	232	0.68	1.0
	1975	542.9	79.9	440	319	15	304	181	138	0.72	0.6
	1976	712.2	95.0	244	85	27	58	26	59	0.35	0.1
	1977	617.6	82.2	508	245	46	199	112	133	0.48	0.4
	1978	642.7	84.1	638	420	54	366	262	158	0.66	0.6
	1979	537.0	68.4	393	154	70	84	26	128	0.39	0.3
	1980	527.0	72.2	735	462	117	345	277	185	0.63	0.9
	1981	624.2	78.2	868	424	11	413	308	116	0.49	0.7
	1982	542.5	69.1	1295	619	33	586	462	157	0.48	1.1
	1983	677.1	83.6	592	164	40	124	72	92	0.28	0.2

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rem	Man-rem per Work Function		Man-rem per Personnel Type		Average Dose per Worker (Rems)	Man-rem per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
MCGUIRE 1 Docket 50-369; NPF-9 1st commercial operation 12/81 Type - PWR Capacity - 1180 MWe	1982	524.9	80.4	1560	169	26	143	29	140	0.11	0.3
	1983	558.3	55.4	1751	521	35	486	123	398	0.30	0.9
MILLSTONE POINT 1 Docket 50-245; DPR-21 1st commercial operation 3/71 Type - BWR Capacity - 654 MWe	1972	377.6		612	596	50	546	340	256	0.97	1.6
	1973	225.1		1184	663	125	538	422	241	0.56	2.9
	1974	430.3	79.1	2477	1430					0.58	3.3
	1975	465.4	75.6	2587	2022					0.78	4.3
	1976	449.8	76.1	1377	1194	54	1140	955	239	0.87	2.6
	1977	575.7	89.6	1075	392	118	274	159	233	0.36	0.7
	1978	556.6	87.6	1391	1239	140	1099	907	332	0.89	2.2
	1979	505.0	77.3	1769	1793	198	1595	1326	467	1.01	3.6
	1980	405.8	69.0	3024	2158	100	2058	1864	294	0.71	5.3
	1981	304.3	51.6	2506	1496	96	1400	1201	295	0.60	4.9
	1982	490.2	79.9	1370	929	78	851	587	342	0.68	1.9
	1983	640.1	95.6	309	244	63	181	74	170	0.79	0.4
	MILLSTONE POINT 2 Docket 50-336; DPR-65 1st commercial operation 12/75 Type-PWR Capacity - 860 MWe	1976	545.7	78.7	620	168	26	142	73	95	0.27
1977		518.7	65.7	667	242	38	204	153	89	0.36	0.5
1978		536.6	67.3	1420	1621	72	1549	1534	87	1.14	3.0
1979		520.0	62.8	757	472	81	391	305	167	0.62	0.9
1980		579.3	69.2	892	636	76	560	514	122	0.71	1.1
1981		722.4	82.6	890	531	44	487	393	138	0.60	0.7
1982		595.9	70.6	2083	1413	27	1386	1219	194	0.68	2.4
1983		294.0	34.2	2383	1881	170	1711	1548	333	0.79	6.4

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rems	Man-rems per Work Function		Man-rems per Personnel Type		Average Dose per Worker (Rems)	Man-rems per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
MONTICELLO Docket 50-263; DPR-22 1st commercial operation 6/71 Type - BWR Capacity - 525 MWe	1972	424.4		99	61	40	21	1	60	0.62	0.1
	1973	389.5		401	176	48	128	67	109	0.44	0.4
	1974	349.3	74.9	842	349			91	258	0.41	1.0
	1975	344.8	72.2	1353	1353					1.00	3.9
	1976	476.4	91.5	325	263	59	204	51	212	0.81	0.5
	1977	425.6	79.9	860	1000	135	865	661	339	1.16	2.3
	1978	459.4	87.2	679	375	62	313	165	210	0.55	0.8
	1979	522.0	97.6	372	157	62	95	51	106	0.42	0.3
	1980	411.8	78.2	1114	531	82	449	248	283	0.48	1.3
	1981	389.3	72.6	1446	1004	101	903	756	248	0.69	2.6
	1982	291.1	63.3	1307	993	130	863	760	233	0.76	3.4
	1983	494.6	96.2	416	121	57	64	23	98	0.29	0.2
	NINE MILE POINT 1 Docket 50-220; DPR-63 1st commercial operation 12/69 Type - BWR Capacity - 610 MWe	1970	227.0		821	44	12	32	17	27	0.05
1971		346.5		1006	195	43	152	63	132	0.19	0.6
1972		381.8		735	285	59	226	28	257	0.39	0.7
1973		411.0		550	567	139	428	118	449	1.03	1.4
1974		385.9	70.5	740	824	42	782	279	545	1.11	2.1
1975		359.0	72.1	649	681	68	613	203	478	1.05	1.9
1976		484.6	88.2	392	428	52	376	229	199	1.09	0.9
1977		347.4	59.2	1093	1383	41	1342	883	500	1.26	4.0
1978		527.7	95.1	561	314	59	255	26	288	0.56	0.6
1979		354.0	66.1	1326	1497	106	1391	940	557	1.13	4.2
1980		533.9	92.3	1174	591	75	516	251	340	0.50	1.1
1981		385.2	66.0	2029	1592	144	1448	1064	528	0.78	4.1
1982		133.5	21.4	1352	1264	63	1201	944	320	0.93	9.5
1983	329.8	56.2	1405	860	50	810	576	284	0.61	2.6	

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rem	Man-rem per Work Function		Man-rem per Personnel Type		Average Dose per Worker (Rems)	Man-rem per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
NORTH ANNA 1, 2 Docket 50-338; NPF-04, - 09 1st commercial operation 6/78, 12/80 Type - PWR Capacity - 877, 890 MWe	1979	507.0	61.7	2025	449	78	371	190	259	0.22	0.9
	1980	681.8	86.5	2086	218	128	90	85	133	0.10	0.3
	1981	1241.9	71.5	2416	680	188	492	343	337	0.28	0.5
	1982	777.7	45.8	2872	1915	78	1837	1207	708	0.67	2.5
	1983	1338.4	76.1	2228	665	129	536	296	369	0.30	0.5
OCONEE 1, 2, 3 Docket 50-269, 50-270, 50-287; DPR-38, -47, -55 1st commercial operation 7/73 9/74, 12/74 Type - PWR Capacity - 860, 860, 860 MWe	1974	650.6	60.1	844	517	18	499	144	373	0.61	0.8
	1975	1838.3	75.5	829	497	72	425	90	407	0.60	0.3
	1976	1561.4	63.0	1215	1026	65	961	219	807	0.84	0.6
	1977	1566.4	65.9	1595	1328	244	1084	294	1034	0.83	0.8
	1978	1909.0	75.8	1636	1393	179	1214	340	1053	0.85	0.7
	1979	1708.0	67.7	2100	1001	123	878	181	820	0.48	0.6
	1980	1703.7	70.1	2124	1055	117	938	162	893	0.50	0.6
	1981	1661.5	66.8	2445	1211	113	1098	275	936	0.50	0.7
	1982	1293.1	52.5	2445	1792	97	1695	364	1428	0.73	1.4
	1983	2141.5	82.2	1902	1207	88	1119	316	891	0.63	0.6
OYSTER CREEK Docket 50-219; DPR-16 1st commercial operation 12/69 Type - BWR Capacity - 620 MWe	1970	413.6		95	63	21	42	11	52	0.66	0.1
	1971	448.9		249	240	50	190	92	148	0.96	0.5
	1972	515.0		339	582	150	432	167	415	1.72	1.1
	1973	424.6		782	1236	195	1041	683	553	1.58	2.9
	1974	434.5	70.4	935	984	166	818	162	822	1.05	2.3
	1975	373.6	73.3	1210	1140	169	971	271	869	0.94	3.0
	1976	456.5	79.3	1582	1078	70	1008	587	491	0.68	2.4
	1977	385.7	70.1	1673	1614	76	1538	1048	566	0.96	4.2
	1978	431.8	74.3	1411	1279	134	1145	696	583	0.91	3.0
	1979	541.0	85.9	842	467	95	372	135	332	0.55	0.9
	1980	232.9	41.4	1966	1733	97	1636	1182	551	0.88	7.4

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rems	Man-rems per Work Function		Man-rems per Personnel Type		Average Dose per Worker (Rems)	Man-rems per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
OYSTER CREEK (Continued)	1981	314.8	59.8	1689	917	48	869	479	438	0.54	2.9
	1982	242.7	62.5	1270	865	33	832	491	374	0.68	3.6
	1983	27.9	11.5	2303	2257	65	2192	1863	394	0.98	80.9
PALISADES Docket 50-255; DPR-20 1st commercial operation 12/71 Type - PWR Capacity - 635 MWe	1972	216.8			78						0.4
	1973	286.8		975	1133	16	1117	661	472	1.16	3.9
	1974	10.7	5.5	774	627					0.81	58.6
	1975	302.0	64.5	495	306					0.62	1.0
	1976	346.9	55.2	742	696	23	673	109	587	0.94	2.0
	1977	616.6	91.4	332	100	13	87	23	77	0.30	0.2
	1978	320.2	49.7	849	764	52	712	173	591	0.90	2.4
	1979	415.0	59.9	1599	854	99	755	360	494	0.53	2.1
	1980	288.3	42.9	1307	424	191	233	312	112	0.32	1.5
	1981	418.2	57.2	2151	902	167	735	737	165	0.42	2.2
	1982	404.3	54.7	1554	330	73	257	203	127	0.21	0.8
	1983	454.4	60.3	2167	977	145	832	494	483	0.45	2.2
	PEACH BOTTOM 2, 3 Docket 50-277, 50-278; DPR-44, -56 1st commercial operation 7/74, 12/74 Type - BWR Capacity - 1051, 1035 MWe	1975	1234.3	80.9	971	228					0.23
1976		1379.2	73.0	2136	840	180	660	434	406	0.39	0.6
1977		1052.4	58.7	2827	2036	223	1813	1374	662	0.72	1.9
1978		1636.3	84.0	2244	1317	162	1155	709	608	0.59	0.8
1979		1740.0	84.5	2276	1388	245	1143	717	671	0.61	0.8
1980		1374.2	66.3	2774	2302	311	1991	1596	706	0.83	1.7
1981		1161.8	58.0	2857	2506	273	2233	1880	626	0.88	2.2
1982		1583.3	76.9	2734	1977	313	1664	1347	630	0.92	1.2
1983	824.7	40.5	3107	2963	331	2632	2422	541	0.95	3.6	

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rem	Man-rem per Work Function		Man-rem per Personnel Type		Average Dose per Worker (Rems)	Man-rem per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
PILGRIM 1 Docket 50-293; DPR-35 1st commercial operation 12/72 Type - BWR Capacity - 670 MWe	1973	484.0		230	126	49	77			0.55	0.3
	1974	234.1	39.2	454	415					0.91	1.8
	1975	308.1	71.3	473	798	142	656	412	386	1.69	2.6
	1976	287.8	60.7	1317	2648	66	2582	2270	378	2.01	9.2
	1977	316.6	61.4	1875	3142	146	2996	2176	966	1.68	9.9
	1978	519.5	83.1	1667	1327	157	1170	895	432	0.80	2.5
	1979	574.0	89.4	2458	1015	131	884	516	499	0.41	1.8
	1980	360.3	56.2	3549	3626	207	3419	3076	550	1.02	10.1
	1981	408.9	65.9	2803	1836	70	1766	1418	418	0.66	4.5
	1982	389.9	63.9	2854	1539	314	1225	1094	445	0.54	3.9
	1983	559.5	87.2	2326	1162	296	886	776	386	0.50	2.1
POINT BEACH 1, 2 Docket 50-266, 50-301; DPR-24, -27 1st commercial operation 12/70, 10/72 Type - PWR Capacity - 495, 495 MWe	1971	393.4			164						0.4
	1972	378.3			580						1.5
	1973	693.7		501	588	72	516			1.17	0.8
	1974	760.2	81.3	400	295	70	225	81	214	0.74	0.4
	1975	801.2	82.9	339	459					1.35	0.6
	1976	857.3	86.7	313	370	58	312	107	263	1.18	0.4
	1977	873.9	87.3	417	429	63	366	212	217	1.03	0.5
	1978	914.4	90.9	336	320	71	249	111	209	0.95	0.3
	1979	808.0	80.8	610	644	65	579	449	195	1.06	0.8
	1980	727.2	82.5	561	598	60	538	420	178	1.07	0.8
	1981	760.4	83.6	773	596	83	513	364	232	0.77	0.8
	1982	757.2	84.3	767	609	72	537	375	234	0.79	0.8
	1983	648.2	72.7	1702	1403	81	1322	1179	224	0.82	2.2

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rems	Man-rems per Work Function		Man-rems per Personnel Type		Average Dose per Worker (Rems)	Man-rems per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
PRAIRIE ISLAND 1, 2 Docket 50-282, 50-306; DPR-42, -60 1st commercial operation 12/73, 12/74 Type - PWR Capacity - 503, 500 MWe	1974	181.9	43.9	150	18			5	13	0.12	0.1
	1975	836.0	83.3	477	123					0.26	0.1
	1976	725.2	76.6	818	447	68	379	235	212	0.55	0.6
	1977	922.9	87.2	718	300	73	227	60	240	0.42	0.3
	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
QUAD CITIES 1, 2 Docket 50-254, 50-265; DPR-29, -30 1st commercial operation 2/73, 3/73 Type - BWR Capacity - 769, 769 MWe	1974	958.1	72.3	678	482			36	446	0.71	0.5
	1975	833.6	68.4	1083	1618	114	1504	692	926	1.49	1.9
	1976	951.2	73.1	1225	1651	269	1382	648	1003	1.35	1.7
	1977	970.1	84.0	907	1031	108	923	373	658	1.14	1.1
	1978	1124.5	88.6	1207	1618	156	1462	722	896	1.34	1.4
	1979	1075.0	84.6	1688	2158	215	1943	1250	908	1.28	2.0
	1980	866.9	64.4	3089	4838	291	4547	3657	1181	1.57	5.6
	1981	1156.9	81.1	2246	3146	100	3046	2623	523	1.40	2.7
	1982	1018.7	76.0	2314	3757	177	3580	2653	1104	1.62	3.7
	1983	1088.5	79.2	1802	2491	166	2325	1937	554	1.38	2.3
RANCHO SECO Docket 50-312; DPR-54 1st commercial operation 4/75 Type - PWR Capacity - 873 MWe	1976	268.1	30.4	297	58	6	52	17	41	0.19	0.2
	1977	706.4	77.1	515	390	61	329	248	142	0.76	0.5
	1978	607.7	80.5	508	323	76	247	176	147	0.64	0.5
	1979	687.0	91.1	287	126	27	99	64	62	0.44	0.2
	1980	530.9	60.4	890	412	110	302	281	131	0.46	0.8
	1981	321.2	40.2	772	402	83	319	266	137	0.52	1.3
	1982	409.5	53.3	766	337	49	288	217	120	0.44	0.8
	1983	347.9	46.8	1338	787	158	629	604	183	0.59	2.3

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rems	Man-rems per Work Function		Man-rems per Personnel Type		Average Dose per Worker (Rems)	Man-rems per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
ROBINSON 2 Docket 50-261; DPR-23 1st commercial operation 3/71 Type - PWR Capacity - 665 MWe	1972	580.0		245	215					0.88	0.4
	1973	455.1		831	695	42	173	137	78	0.84	1.5
	1974	578.1	83.3	853	672	185	487			0.79	1.2
	1975	501.8	72.7	849	1142					1.34	2.3
	1976	585.5	84.7	597	715	30	685	457	758	1.20	1.2
	1977	511.5	85.2	634	455	52	403	223	232	0.72	0.9
	1978	480.5	72.0	943	963	63	900	529	434	1.02	2.0
	1979	482.0	70.8	1454	1188	60	1128	794	394	0.82	2.5
	1980	387.3	62.2	2009	1852	79	1773	1379	473	0.92	4.8
	1981	426.6	73.0	1462	733	45	688	513	220	0.50	1.7
	1982	277.5	48.9	2011	1426	128	1298	945	481	0.71	5.1
	1983	409.8	75.5	2244	923	96	827	628	295	0.41	2.3
SALEM 1, 2 Docket 50-272,-311; DPR-70,-75 1st commercial operation 6/77, 10/81 Type - PWR Capacity - 1079, 1106, MWe	1978	546.4	55.6	574	122	28	94	32	90	0.21	0.2
	1979	250.0	25.5	1488	584	100	484	359	225	0.39	2.3
	1980	680.6	69.2	1704	449	55	394	281	168	0.26	0.7
	1981	743.0	78.1	1652	254	4	250	152	102	0.15	0.3
	1982	1440.4	72.6	3228	1203	66	1137	846	357	0.37	0.8
	1983	742.0	35.4	2383	581	10	571	463	118	0.24	0.8
SAN ONOFRE 1 Docket 50-206; DPR-13 1st commercial operation 1/68 Type - PWR Capacity - 436 MWe	1969	314.1		123	42	10	32	5	37	0.34	0.1
	1970	365.9		251	155	13	142	59	96	0.62	0.4
	1971	362.1		121	50	12	38	3	47	0.41	0.1
	1972	338.5		326	256	29	227	117	139	0.78	0.8
	1973	273.7		570	353	40	313	168	185	0.62	1.3
	1974	377.8	86.1	219	71					0.32	0.2
	1975	389.0	87.4	424	292					0.69	0.7

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rems	Man-rems per Work Function		Man-rems per Personnel Type		Average Dose per Worker (Rems)	Man-rems per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
SAN ONOFRE 1 (Continued)											
	1976	297.9	70.2	1330	880	147	733	629	251	0.66	2.9
	1977	281.2	63.7	985	847	77	770	451	396	0.86	3.0
	1978	323.2	80.2	764	401	25	376	234	167	0.52	1.2
	1979	401.0	90.2	521	139	23	116	65	74	0.27	0.3
	1980	97.3	22.3	3063	2387	219	2168	2018	369	0.78	24.5
	1981	95.9	26.7	2902	3223	100	3123	3104	119	1.11	33.6
	1982	61.6	15.7	3055	832	81	751	729	102	0.27	13.5
	1983	0.0	0.0	1701	155	31	124	113	42	0.09	-
SEQUOYAH 1, 2											
	1982	583.5	52.8	1965	570	67	503	57	513	0.29	1.0
	1983	1663.7	75.0	1772	491	74	417	46	445	0.28	0.3
1st commercial operation 7/81, 6/82 Type - PWR Capacity - 1148, 1148 MWe											
ST. LUCIE 1											
	1977	649.1	84.7	445	152	26	126	92	60	0.34	0.2
	1978	606.4	76.5	797	337	15	322	140	197	0.42	0.6
	1979	592.0	74.0	907	438	25	413	209	229	0.48	0.7
	1980	627.9	77.5	1074	532	82	450	195	337	0.50	0.8
	1981	599.1	72.7	1473	929	20	909	556	373	0.63	1.6
	1982	816.8	94.0	1045	272	17	255	105	167	0.26	0.3
	1983	290.3	15.4	2211	1204	5	1199	924	280	0.54	4.2

*Sequoyah was counted for the first time in 1983.

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rem	Man-rem per Work Function		Man-rem per Personnel Type		Average Dose per Worker (Rems)	Man-rem per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
SURRY 1, 2 Docket 50-280, 50-281; DPR-32, -37 1st commercial operation 12/72, 5/73 Type - PWR Capacity - 775, 775 MWe	1973	420.6		936	152					0.16	0.4
	1974	717.4	49.8	1715	884	72	812			0.51	1.2
	1975	1079.0	70.8	1948	1649	27	1622	1065	584	0.85	1.5
	1976	930.7	60.4	2753	3165	444	2721	1873	1292	1.15	3.4
	1977	1139.0	72.2	1860	2307	348	1959	1380	927	1.24	2.0
	1978	1210.6	77.2	2203	1837	726	1111	1029	808	0.83	1.5
	1979	343.0	42.3	5065	3584	173	3411	2975	609	0.71	10.4
	1980	568.2	40.3	5317	3836	353	3483	3117	719	0.72	6.6
	1981	907.6	59.3	3753	4244	428	3816	3040	1204	1.13	4.7
	1982	1323.3	88.5	1878	1490	399	1091	506	984	0.79	1.1
	1983	916.2	61.3	2754	3220	571	2649	1786	1434	1.17	3.5
*THREE MILE ISLAND 1, 2 Docket 50-289; DPR-50, -73 1st commercial operation-9/74, 12/78 Type - PWR Capacity - 776, 880 MWe	1975	675.9	82.2	131	73			18	55	0.56	0.1
	1976	530.0	65.4	819	286	23	263	69	217	0.35	0.5
	1977	664.5	80.9	1122	359	15	344	128	231	0.32	0.5
	1978	690.0	85.1	1929	504	23	481	235	269	0.26	0.7
	1979	266.0	21.9	4024	1392	197	1195	907	485	0.35	5.2
	1980	0.0	0.0	2328	394	29	365	234	160	0.17	-
	1981	0.0	0.0	2103	376	50	326	190	186	0.18	-
	1982	0.0	0.0	2123	1004	62	942	433	571	0.47	-
	1983	0.0	0.0	1592	1159	79	1080	637	522	0.73	-
TROJAN Docket 50-344; NPF-1 1st commercial operation 5/76 Type - PWR Capacity - 1080 MWe	1977	792.0	92.6	591	174	30	144	105	69	0.29	0.2
	1978	205.5	20.6	711	319	81	238	124	195	0.45	1.5
	1979	631.0	58.1	736	257	74	183	113	144	0.35	0.4
	1980	727.5	72.5	1159	421	77	344	305	116	0.36	0.6
	1981	775.6	74.1	1311	609	113	496	363	246	0.46	0.8
	1982	579.5	60.8	977	419	76	343	168	251	0.42	0.7
	1983	494.2	62.4	969	307	35	272	129	178	0.32	0.6

*Three Mile Island 1 and 2 are shutdown. They are still included in the count of commercial reactors.

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rems	Man-rems per Work Function		Man-rems per Personnel Type		Average Dose per Worker (Rems)	Man-rems per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
TURKEY POINT 3, 4 Docket 50-250, 50-251; DPR-31, -41 1st commercial operation 12/72, 9/73 Type - PWR Capacity - 666, 666 MWe	1973	401.9		444	78					0.18	0.2
	1974	953.6		794	454	88	366	202	252	0.57	0.5
	1975	1003.7	74.9	1176	876	270	606	559	317	0.74	0.9
	1976	974.2	71.2	1647	1184	89	1095	868	316	0.72	1.2
	1977	979.5	72.1	1319	1036	94	942	522	514	0.78	1.1
	1978	1000.2	78.8	1336	1032	90	942	546	486	0.77	1.0
	1979	811.0	62.4	2002	1680	299	1381	997	683	0.84	2.1
	1980	990.6	73.6	1803	1651	232	1419	1218	433	0.92	1.7
	1981	654.0	46.8	2932	2251	274	1977	1854	397	0.77	3.4
	1982	915.7	65.2	2956	2119	197	1922	1656	463	0.72	2.3
	1983	878.4	62.8	2930	2681	272	2409	2119	562	0.92	3.1
VERMONT YANKEE Docket 50-271; DPR-28 1st commercial operation 11/72 Type - BWR Capacity - 504 MWe	1973	222.1		244	85					0.35	0.4
	1974	303.5		357	216	24	192	103	113	0.60	0.7
	1975	429.0	87.8	282	153	70	83	63	90	0.54	0.4
	1976	389.6	77.1	815	411	36	375	246	165	0.50	1.0
	1977	423.5	85.1	641	258	83	175	90	168	0.40	0.6
	1978	387.5	75.9	934	339	78	261	158	181	0.36	0.9
	1979	414.0	82.1	1220	1170	546	624	642	528	0.96	2.8
	1980	357.8	71.5	1443	1338	141	1197	926	412	0.93	3.7
	1981	429.1	84.6	1264	731	121	610	408	323	0.58	1.7
	1982	501.0	96.0	781	205	60	145	80	125	0.43	0.4
	1983	346.1	69.3	1316	1527	215	1312	787	740	1.16	4.4
YANKEE ROWE Docket 50-29; DPR-3 1st commercial operation 7/61 Type - PWR Capacity - 169 MWe	1969	138.3		193	215	83	132	78	133	1.11	1.5
	1970	146.1		355	255	90	165	158	97	0.72	1.7
	1971	173.5		155	90	46	44	19	71	0.58	0.5
	1972	78.7		282	255	63	192	146	109	0.90	3.2
	1973	127.1		133	99			47	52	0.74	0.8

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

Reporting Organization	Year	Mega-watt-Year (MW-Yr)	Unit Availability Factor	Total Personnel With Measurable Doses	Total Man-rem	Man-rem per Work Function		Man-rem per Personnel Type		Average Dose per Worker (Rems)	Man-rem per MW-Yr
						Operations	Maint. & Others	Contractor	Station & Utility		
YANKEE ROWE (Continued)											
	1974	111.3		243	205			99	106	0.84	1.8
	1975	145.1	82.4	249	116	52	64	66	50	0.47	0.8
	1976	152.2	89.8	152	59	17	42	4	55	0.39	0.4
	1977	124.6	73.9	725	356	28	328	174	182	0.49	2.9
	1978	145.0	81.0	565	282	26	256	95	187	0.50	1.9
	1979	149.0	81.6	441	127	16	111	52	75	0.29	0.9
	1980	35.6	22.0	502	213	6	207	90	123	0.42	6.0
	1981	109.0	74.4	515	302	8	294	136	166	0.59	2.8
	1982	108.6	73.4	814	474	6	468	215	259	0.54	4.4
	1983	163.5	91.4	395	68	19	49	4	64	0.17	0.4
ZION 1, 2											
	1974	425.3	71.1	306	56			13	43	0.18	0.1
	1975	1181.5	74.9	436	127	17	110	49	78	0.29	0.1
	1976	1134.9	61.9	774	571	64	507	257	314	0.74	0.5
	1977	1358.6	75.0	784	1003	43	960	561	442	1.28	0.7
	1978	1613.5	80.2	1104	1017	150	867	418	599	0.92	0.6
	1979	1238.0	67.6	1472	1274	168	1106	747	527	0.87	1.0
	1980	1411.2	74.1	1363	920	97	823	560	360	0.67	0.7
	1981	1366.9	72.3	1754	1720	50	1670	1155	564	0.98	1.3
	1982	1186.4	64.3	1575	2103	42	2061	1688	415	1.34	1.8
	1983	1222.3	66.8	1285	1311	118	1193	905	406	1.02	1.1

APPENDIX B

Annual Whole Body Doses at Licensed Nuclear Power Facilities

1983

APPENDIX B
ANNUAL WHOLE BODY DOSES AT LICENSED NUCLEAR POWER FACILITIES
 1983

PLANT NAME AND TYPE	Number of Individuals with Whole Body Doses in the Following Range (Rems)																Total Number Monitored	Number with Measurable Exposure	Total Man-Rems
	No Measurable Exposure	Measurable < 0.10	0.10 - 0.25	0.25 - 0.50	0.50 - 0.75	0.75 - 1.0	1.0 - 2.0	2.0 - 3.0	3.0 - 4.0	4.0 - 5.0	5.0 - 6.0	6.0 - 7.0	7.0 - 8.0	8.0 - 9.0	9.0 - 16.0	10.0 - 12.0			
Arkansas 1,2 PWR	869	788	292	238	146	118	314	196	15	2							2978	2109	1397
Beaver Valley PWR	1008	582	238	183	114	86	220	61	1								2493	1485	772
Big Rock Point BWR	86	232	44	52	36	33	71	21	4								579	493	263
Browns Ferry 1,2,3 BWR	3699	580	390	471	310	270	681	419	141	29	9	2					7001	3302	3363*
Brunswick 1,2 BWR	1418	2730	515	354	302	282	853	417	149								7020	5602	3475*
Calvert Cliffs 1,2 PWR	160	1109	230	156	105	66	232	17									2075	1915	668
Cook 1,2 PWR	1543	473	289	241	143	87	145	32	6	2							2961	1418	658
Cooper Station BWR	2239	548	67	75	57	48	355	201	31	1							3622	1383	1293
Crystal River PWR	776	587	443	312	172	99	98	8	1								2496	1720	552*
Davis-Besse PWR	986	468	169	58	18	1	4										1704	718	80*
Dresden 1,2,3 BWR	648	561	269	286	232	157	634	380	294	39	1	1					3502	2854	3582
Duane Arnold BWR	1267	419	165	195	144	111	292	113	26	3							2735	1468	1135
Farley 1,2 PWR	192	576	430	328	180	114	214	76	19	1							2100	1938	1021
Fitzpatrick BWR	725	644	243	215	128	87	237	107	52	2							2440	1715	1090*
Fort Calhoun PWR	128	352	115	112	80	64	105	25	4	3							988	860	433
Ginna PWR	407	239	97	106	96	82	251	71	21	* 6							1376	969	855

*These plants provided their actual collective dose in their 20.407 reports. The collective dose shown for the other plants is calculated by NRC staff.

APPENDIX B
ANNUAL WHOLE BODY DOSES AT LICENSED NUCLEAR POWER FACILITIES
1983

PLANT NAME AND TYPE	Number of Individuals with Whole Body Doses in the Following Range (Rems)																	Total Number Monitored	Number with Measurable Exposure	Total Man-Rems
	No Measurable Exposure	Measurable < 0.10	0.10-0.25	0.25-0.50	0.50-0.75	0.75-1.0	1.0-2.0	2.0-3.0	3.0-4.0	4.0-5.0	5.0-6.0	6.0-7.0	7.0-8.0	8.0-9.0	9.0-10.0	10.0-12.0	> 12.0			
Haddam Neck PWR	482	379	184	166	170	199	349	168	23	7								2127	1645	1384*
Hatch 1,2 BWR	950	1310	771	584	286	162	245	56	11	3								4378	3428	1299
Humboldt Bay BWR	68	38	25	16	3	0	2											152	84	17
Indian Point 1,2 PWR	484	424	241	137	65	42	92	41	14	1								1541	1057	486
Indian Point 3 PWR	832	301	166	125	79	54	135	67	14									1773	941	607
Kewaunee PWR	289	174	78	58	45	40	49	0	1									734	445	165*
La Crosse BWR	62	37	10	10	4	3	25	27	14	18	12							222	160	313
Maine Yankee PWR	230	309	89	79	62	23	30											822	592	164
McGuire PWR	1789	955	326	191	89	45	113	32										3540	1751	521
Millstone Point 1 BWR	133	98	39	35	27	16	51	32	7	4								442	309	244*
Millstone Point 2 PWR	1024	756	303	267	205	123	393	249	57	30								3407	2383	1881*
Monticello BWR	1150	196	78	67	35	16	23	1										1566	416	121
Nine Mile Point BWR	765	438	240	185	139	89	236	66	11	1								2170	1405	860
North Anna 1,2 PWR	505	1532	151	154	110	92	136	37	14	2								2733	2228	665
Oconee 1,2,3 PWR	917	594	285	266	185	126	332	95	19									2819	1902	1207
Oyster Creek BWR	943	441	300	365	230	155	446	210	130	26								3246	2303	2257

*These plants provided their actual collective dose in their 20.407 reports. The collective dose shown for the other plants is calculated by NRC staff.

ANNUAL WHOLE BODY DOSES AT LICENSED NUCLEAR POWER FACILITIES

1983

PLANT NAME AND TYPE		Number of Individuals with Whole Body Doses in the Following Range (Rems)															Total Number Monitored	Number with Measurable Exposure	Total Man-Rems		
		No Measurable Exposure	Measurable < 0.10	0.10 - 0.25	0.25 - 0.50	0.50 - 0.75	0.75 - 1.0	1.0 - 2.0	2.0 - 3.0	3.0 - 4.0	4.0 - 5.0	5.0 - 6.0	6.0 - 7.0	7.0 - 8.0	8.0 - 9.0	9.0 - 10.0				10.0 - 12.0	> 12.0
Palisades	PWR	198	1227	256	179	107	79	181	98	29	11								2365	2167	977
Peach Bottom 2,3	BWR	1843	781	494	434	227	211	499	215	124	64	41	13	4					4950	3107	2963
Pilgrim	BWR	0	919	370	393	213	89	200	110	26	6								2326	2326	1162
Point Beach 1,2	PWR	233	470	177	183	145	123	455	124	23	2								1935	1702	1403
Prairie Island 1,2	PWR	331	262	136	122	48	19	64	3										985	654	233
Quad Cities 1,2	BWR	835	369	120	123	103	92	453	344	170	28								2637	1802	2491
Rancho Seco 1	PWR	220	435	200	170	142	107	232	46	6									1558	1338	787
Robinson 2	PWR	1148	1314	221	156	119	99	255	63	17									3392	2244	923
Salem 1,2	PWR	1480	1201	528	363	135	66	76	13	1									3863	2383	581
San Onofre 1	PWR	8001	1397	135	93	32	21	21	2										9702	1701	155*
Sequoyah 1,2**	PWR	1579	684	415	351	178	65	75	3	1									3351	1772	491*
St. Lucie 1	PWR	2089	781	426	319	167	114	271	107	24	2								4300	2211	1204
Surry 1,2	PWR	588	775	404	242	135	138	400	277	202	180	1							3342	2754	3220
Three Mile Island 1,2	PWR	1115	612	156	175	110	103	288	94	33	21								2707	1592	1159
Trojan	PWR	108	479	172	131	72	46	57	9	3									1077	969	307
Turkey Point 3,4	PWR	1478	652	386	400	278	201	617	263	100	33								4408	2930	2681

*These plants provided their actual collective dose in their 20.407 reports. The collective dose shown for the other plants is calculated by NRC staff.
 **Sequoyah Unit 2 was counted for the first time in 1983.

APPENDIX B
ANNUAL WHOLE BODY DOSES AT LICENSED NUCLEAR POWER FACILITIES

1983

PLANT NAME AND TYPE	Number of Individuals with Whole Body Doses in the Following Range (Rems)																	Total Number Monitored	Number with Measurable Exposure	Total Man Rems	
	No Measurable Exposure	Measurable < 0.10	0.10 - 0.25	0.25 - 0.50	0.50 - 0.75	0.75 - 1.0	1.0 - 2.0	2.0 - 3.0	3.0 - 4.0	4.0 - 5.0	5.0 - 6.0	6.0 - 7.0	7.0 - 8.0	8.0 - 9.0	9.0 - 10.0	10.0 - 12.0	> 12.0				
Vermont Yankee BWR	890	134	177	176	131	104	356	171	62	5								2206	1316	1527*	
Yankee Rowe PWR	1247	281	32	36	21	9	15	1										1642	395	68*	
Zion 1,2 PWR	914	257	124	163	110	132	293	143	50	12	1							2199	1285	1311	
Totals - BWRs	17721	10475	4317	4036	2607	1925	5659	2890	1252	229	63	16	4					51194	33473	27455	
Totals - PWRs	33350	21425	7894	6260	3863	2783	6512	2421	698	315	2							85523	52173	29016	
Grand Totals - LWRs	51071	31900	12211	10296	6470	4708	12171	5311	1950	544	65	16	4					136717	85646	56471	

*These plants provided their actual collective dose in their 20.407 reports. The collective dose shown for the other plants is calculated by NRC staff.

APPENDIX C

Number of Personnel and Man-remS by Work and Job Function

1983

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

APPENDIX C

PLANT: * ARKANSAS 1,2	NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION							
	(PWR)				1983			
	NUMBER OF PERSONNEL (>100 M-REM)				TOTAL MAN-REMS			
WORK & JOB FUNCTION	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	21	0	39		4.523	0.000	14.333	
OPERATING PERSONNEL	68	0	0		25.345	0.000	0.000	
HEALTH PHYSICS PERSONNEL	32	0	49		14.949	0.000	25.351	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	2		0.000	0.000	0.223	
TOTAL	121	0	90	211	44.817	0.000	39.907	84.724
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	91	3	71		41.296	0.963	34.648	
OPERATING PERSONNEL	2	0	0		0.230	0.000	0.000	
HEALTH PHYSICS PERSONNEL	23	0	4		4.725	0.000	0.515	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.000	0.105	
ENGINEERING PERSONNEL	0	0	4		0.000	0.000	1.043	
TOTAL	116	3	80	199	46.251	0.963	36.311	83.525
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	1	45		0.000	0.130	22.097	
OPERATING PERSONNEL	5	0	0		1.356	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	5		0.665	0.000	1.402	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	1	15		0.000	0.227	4.710	
TOTAL	8	2	65	75	2.021	0.357	28.209	30.587
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	108	8	749		63.476	2.511	784.483	
OPERATING PERSONNEL	7	0	0		1.538	0.000	0.000	
HEALTH PHYSICS PERSONNEL	28	0	35		16.359	0.000	17.564	
SUPERVISORY PERSONNEL	1	0	1		0.115	0.000	0.321	
ENGINEERING PERSONNEL	2	4	45		0.391	1.053	27.841	
TOTAL	146	12	830	988	81.879	3.564	830.209	915.652
WASTE PROCESSING								
MAINTENANCE PERSONNEL	1	0	31		0.592	0.000	28.704	
OPERATING PERSONNEL	2	0	0		1.020	0.000	0.000	
HEALTH PHYSICS PERSONNEL	8	0	5		2.579	0.000	1.111	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	11	0	36	47	4.191	0.000	29.815	34.006
REFUELING								
MAINTENANCE PERSONNEL	54	6	57		30.511	2.395	27.893	
OPERATING PERSONNEL	12	0	0		2.306	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	4		1.123	0.000	1.028	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.000	0.720	
ENGINEERING PERSONNEL	1	0	12		0.221	0.000	5.687	
TOTAL	70	6	74	150	34.161	2.395	35.328	71.884
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	275	18	992	1285	140.398	5.999	912.158	1058.555
OPERATING PERSONNEL	96	0	0	96	31.795	0.000	0.000	31.795
HEALTH PHYSICS PERSONNEL	97	0	102	199	40.400	0.000	46.971	87.371
SUPERVISORY PERSONNEL	1	0	3	4	0.115	0.000	1.146	1.261
ENGINEERING PERSONNEL	3	5	78	86	0.612	1.280	39.504	41.396
GRAND TOTAL	472	23	1175	1670	213.320	7.279	999.779	1220.378

*Workers may be counted in more than one category.

APPENDIX C

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

PLANT: BEAVER VALLEY (PWR)

1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	15	0	65		0.730	0.000	4.705	
OPERATING PERSONNEL	47	0	0		11.825	0.000	0.000	
HEALTH PHYSICS PERSONNEL	31	0	97		17.575	0.000	76.378	
SUPERVISORY PERSONNEL	24	0	7		5.186	0.000	2.405	
ENGINEERING PERSONNEL	44	0	38		8.410	0.000	11.225	
TOTAL	161	0	207	368	43.726	0.000	94.713	138.439
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	89	0	324		52.738	0.000	215.742	
OPERATING PERSONNEL	22	0	0		3.273	0.000	0.000	
HEALTH PHYSICS PERSONNEL	23	0	45		0.999	0.000	6.309	
SUPERVISORY PERSONNEL	15	0	4		3.655	0.000	0.415	
ENGINEERING PERSONNEL	30	0	31		5.729	0.000	4.495	
TOTAL	179	0	404	583	66.394	0.000	226.961	293.355
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	16	0	96		1.465	0.000	25.085	
OPERATING PERSONNEL	9	0	0		0.590	0.000	0.000	
HEALTH PHYSICS PERSONNEL	8	0	15		1.395	0.000	6.550	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	12	0	60		1.355	0.000	61.665	
TOTAL	45	0	171	216	4.805	0.000	93.300	98.105
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	30	0	145		3.800	0.000	51.210	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	11		0.425	0.000	0.515	
SUPERVISORY PERSONNEL	0	0	5		0.000	0.000	2.075	
ENGINEERING PERSONNEL	10	0	37		1.430	0.000	23.995	
TOTAL	42	0	198	240	5.655	0.000	77.795	83.450
WASTE PROCESSING								
MAINTENANCE PERSONNEL	31	0	38		1.685	0.000	4.330	
OPERATING PERSONNEL	4	0	0		0.870	0.000	0.000	
HEALTH PHYSICS PERSONNEL	9	0	17		0.195	0.000	0.565	
SUPERVISORY PERSONNEL	1	0	0		0.460	0.000	0.000	
ENGINEERING PERSONNEL	3	0	0		0.575	0.000	0.000	
TOTAL	48	0	55	103	3.785	0.000	4.895	8.680
REFUELING								
MAINTENANCE PERSONNEL	48	0	93		10.175	0.000	29.140	
OPERATING PERSONNEL	1	0	0		0.020	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	4		0.000	0.000	0.250	
SUPERVISORY PERSONNEL	10	0	3		0.650	0.000	1.280	
ENGINEERING PERSONNEL	8	0	14		2.145	0.000	10.980	
TOTAL	67	0	114	181	12.990	0.000	41.650	54.640
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	229	0	761	990	70.593	0.000	330.212	400.805
OPERATING PERSONNEL	83	0	0	83	16.578	0.000	0.000	16.578
HEALTH PHYSICS PERSONNEL	73	0	189	262	20.589	0.000	90.567	111.156
SUPERVISORY PERSONNEL	50	0	19	69	9.951	0.000	6.175	16.126
ENGINEERING PERSONNEL	107	0	180	287	19.644	0.000	112.360	132.004
GRAND TOTAL	542	0	1149	1691	137.355	0.000	539.314	676.669

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*Workers may be counted in more than one category.

APPENDIX C

PLANT: [*] BIG ROCK POINT	NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION							
	1983				1983			
	NUMBER OF PERSONNEL (>100 M-REM)				TOTAL MAN-REMS			
WORK & JOB FUNCTION	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	0	0	0		0.309	0.121	0.021	
OPERATING PERSONNEL	32	1	5		20.614	0.174	2.820	
HEALTH PHYSICS PERSONNEL	11	0	0		3.599	0.406	0.047	
SUPERVISORY PERSONNEL	3	0	1		0.848	0.022	0.589	
ENGINEERING PERSONNEL	0	0	0		0.516	0.028	0.000	
TOTAL	46	1	6	53	25.886	0.751	3.477	30.114
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	24	40	3		13.139	18.590	1.676	
OPERATING PERSONNEL	1	1	0		0.543	0.721	0.000	
HEALTH PHYSICS PERSONNEL	12	5	3		5.071	1.681	1.389	
SUPERVISORY PERSONNEL	9	0	0		3.248	0.153	0.045	
ENGINEERING PERSONNEL	2	1	0		0.457	0.862	0.000	
TOTAL	48	47	6	101	22.458	22.007	3.110	47.575
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	38	46		0.080	43.606	27.131	
OPERATING PERSONNEL	1	0	3		0.254	1.700	0.540	
HEALTH PHYSICS PERSONNEL	13	5	9		5.459	1.943	3.912	
SUPERVISORY PERSONNEL	0	1	1		0.217	0.690	0.323	
ENGINEERING PERSONNEL	1	5	16		0.167	2.011	6.061	
TOTAL	15	49	75	139	6.177	49.950	37.967	94.094
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	17	36	12		14.083	18.202	4.008	
OPERATING PERSONNEL	1	0	0		1.848	0.147	0.000	
HEALTH PHYSICS PERSONNEL	12	4	3		6.364	1.383	0.652	
SUPERVISORY PERSONNEL	7	2	0		1.826	0.917	0.000	
ENGINEERING PERSONNEL	1	2	1		0.217	0.721	0.291	
TOTAL	38	44	16	98	24.338	21.370	4.951	50.659
WASTE PROCESSING								
MAINTENANCE PERSONNEL	4	0	0		1.390	0.175	0.149	
OPERATING PERSONNEL	25	0	2		7.598	0.002	0.308	
HEALTH PHYSICS PERSONNEL	2	0	0		0.814	0.121	0.026	
SUPERVISORY PERSONNEL	0	0	0		0.002	0.007	0.000	
ENGINEERING PERSONNEL	0	0	0		0.023	0.000	0.000	
TOTAL	31	0	2	33	9.827	0.305	0.483	10.615
REFUELING								
MAINTENANCE PERSONNEL	10	0	5		3.756	0.258	1.572	
OPERATING PERSONNEL	22	0	0		8.261	0.106	0.096	
HEALTH PHYSICS PERSONNEL	2	0	0		0.566	0.032	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.066	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.006	0.000	0.027	
TOTAL	34	0	5	39	12.655	0.396	1.695	14.746
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	55	114	66	235	32.757	80.952	34.557	148.266
OPERATING PERSONNEL	82	2	10	94	39.118	2.850	3.764	45.732
HEALTH PHYSICS PERSONNEL	52	14	15	81	21.873	5.566	6.026	33.465
SUPERVISORY PERSONNEL	19	3	2	24	6.207	1.789	0.957	8.953
ENGINEERING PERSONNEL	4	8	17	29	1.386	3.622	6.379	11.387
GRAND TOTAL	212	141	110	463	101.341	94.779	51.683	247.803

* Workers may be counted in more than one category.

APPENDIX C

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

PLANT: BROWNS FERRY 1.2.3 (BWR)	NUMBER OF PERSONNEL (>100 M-REM) 1983			TOTAL MAN-REMS				
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
WORK & JOB FUNCTION								
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	80	169	29		17,400	41,500	14,900	
OPERATING PERSONNEL	148	0	0		42,600	0.000	0.000	
HEALTH PHYSICS PERSONNEL	34	0	103		15,300	0.000	54,300	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	73	0		0.000	24,600	0.000	
TOTAL	262	242	132	636	75,300	66,100	69,200	210,600
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	290	1090	254		154,900	940,300	167,100	
OPERATING PERSONNEL	148	0	0		57,000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	33	0	109		14,500	0.000	57,900	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	79	0		0.000	38,400	0.000	
TOTAL	471	1169	363	2003	226,400	978,700	225,000	1430,100
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	11	95	40		5,600	46,400	51,200	
OPERATING PERSONNEL	2	0	0		0.400	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	10		0.000	0.000	2,600	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	2	0		0.000	0.200	0.000	
TOTAL	13	97	50	160	6,000	46,600	53,800	106,400
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	35	753	261		12,600	406,500	319,900	
OPERATING PERSONNEL	11	0	0		2,200	0.000	0.000	
HEALTH PHYSICS PERSONNEL	10	0	48		2,700	0.000	23,300	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	29	0		0.000	8,200	0.000	
TOTAL	56	782	309	1147	17,500	414,700	343,200	775,400
WASTE PROCESSING								
MAINTENANCE PERSONNEL	25	6	0		9,100	1,700	0.000	
OPERATING PERSONNEL	10	0	0		6,800	0.000	0.000	
HEALTH PHYSICS PERSONNEL	5	0	2		1,700	0.000	1,200	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	40	6	2	48	17,600	1,700	1,200	20,500
REFUELING								
MAINTENANCE PERSONNEL	3	71	2		0.400	13,100	0.800	
OPERATING PERSONNEL	25	0	0		9,600	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	7		0.000	0.000	1,200	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	6	0		0.000	1,200	0.000	
TOTAL	28	77	9	114	10,000	14,300	2,000	25,300
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	444	2184	586	3214	200,000	1449,500	553,900	2203,400
OPERATING PERSONNEL	344	0	0	344	118,600	0.000	0.000	118,600
HEALTH PHYSICS PERSONNEL	82	0	279	361	34,200	0.000	140,500	174,700
SUPERVISORY PERSONNEL	0	0	0	0	0.000	0.000	0.000	0.000
ENGINEERING PERSONNEL	0	189	0	189	0.000	72,600	0.000	72,600
GRAND TOTAL	870	2373	865	4108	352,800	1522,100	694,400	2569,300

* Workers may be counted in more than one category.

APPENDIX C

PLANT: BRUNSWICK 1,2		NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION						
		NUMBER OF PERSONNEL (>100 M-REM)			TOTAL MAN-REMS			
		1983						
WORK & JOB FUNCTION	STATION	UTILITY	CONTRACT	TOTAL	STATION	UTILITY	CONTRACT	TOTAL
	EMPLOYEES	EMPLOYEES	& OTHERS	PERSONS	EMPLOYEES	EMPLOYEES	& OTHERS	MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	42	2	7		28.760	7.650	7.470	
OPERATING PERSONNEL	54	0	26		53.740	0.000	9.520	
HEALTH PHYSICS PERSONNEL	18	0	12		17.960	0.000	15.050	
SUPERVISORY PERSONNEL	4	5	5		2.290	1.420	2.970	
ENGINEERING PERSONNEL	5	5	3		1.580	2.560	1.690	
TOTAL	123	12	53	188	104.330	11.630	36.700	152.660
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	85	15	174		92.120	28.920	262.840	
OPERATING PERSONNEL	15	0	0		13.780	0.000	0.000	
HEALTH PHYSICS PERSONNEL	12	0	11		15.780	0.000	14.590	
SUPERVISORY PERSONNEL	1	0	0		0.020	0.060	0.000	
ENGINEERING PERSONNEL	7	4	9		4.670	0.580	8.830	
TOTAL	120	19	194	333	126.370	29.560	286.260	442.190
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	10	0	135		0.000	0.000	158.940	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	5	0	6		14.560	0.000	6.860	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	6	0	8		3.200	0.600	32.520	
TOTAL	21	0	149	170	17.760	0.600	198.320	216.680
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	183	94	1225		306.020	71.620	1462.250	
OPERATING PERSONNEL	19	0	0		19.320	0.000	0.000	
HEALTH PHYSICS PERSONNEL	44	0	64		69.450	0.000	76.740	
SUPERVISORY PERSONNEL	1	0	0		0.410	7.430	0.000	
ENGINEERING PERSONNEL	26	29	87		30.810	17.440	59.300	
TOTAL	273	123	1376	1772	426.010	96.490	1598.290	2120.790
WASTE PROCESSING								
MAINTENANCE PERSONNEL	41	11	121		64.220	14.460	206.380	
OPERATING PERSONNEL	39	0	5		37.800	0.000	8.040	
HEALTH PHYSICS PERSONNEL	14	0	11		15.710	0.000	14.590	
SUPERVISORY PERSONNEL	0	0	0		0.120	0.490	3.000	
ENGINEERING PERSONNEL	5	4	2		6.550	1.440	1.800	
TOTAL	99	15	139	253	124.400	16.390	230.810	371.600
REFUELING								
MAINTENANCE PERSONNEL	36	12	51		56.550	19.990	71.770	
OPERATING PERSONNEL	6	0	0		5.570	0.000	0.000	
HEALTH PHYSICS PERSONNEL	10	0	12		11.430	0.000	13.680	
SUPERVISORY PERSONNEL	0	0	0		0.300	0.440	0.000	
ENGINEERING PERSONNEL	5	2	4		3.090	1.370	3.810	
TOTAL	57	14	67	138	76.940	21.800	89.260	188.000
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	397	134	1713	2244	547.670	142.640	2169.650	2859.960
OPERATING PERSONNEL	133	0	31	164	130.210	0.000	17.560	147.770
HEALTH PHYSICS PERSONNEL	103	0	116	219	144.890	0.000	141.510	286.400
SUPERVISORY PERSONNEL	6	5	5	16	3.140	9.840	2.970	15.950
ENGINEERING PERSONNEL	54	44	113	211	49.900	23.990	107.950	181.840
GRAND TOTAL	693	183	1978	2854	875.810	176.470	2439.640	3491.920

APPENDIX C

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

PLANT: CALVERT CLIFFS 1,2 (PWR)

1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)				TOTAL MAN-REMS			
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	4	0	0		1.107	0.000	0.000	
OPERATING PERSONNEL	16	0	0		2.390	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	0		0.417	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	2	0	0		0.345	0.000	0.000	
TOTAL	25	0	0	25	4.259	0.000	0.000	4.259
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	9	0	0		1.347	0.000	0.000	
OPERATING PERSONNEL	1	0	0		0.222	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	0		2.376	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		1.328	0.000	0.000	
TOTAL	15	0	0	15	5.273	0.000	0.000	5.273
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	16	33	4		2.996	6.251	0.552	
OPERATING PERSONNEL	0	0	2		0.000	0.000	0.413	
HEALTH PHYSICS PERSONNEL	1	0	0		0.237	0.000	0.000	
SUPERVISORY PERSONNEL	1	0	0		0.165	0.000	0.000	
ENGINEERING PERSONNEL	2	0	2		0.438	0.000	0.472	
TOTAL	20	33	8	61	3.836	6.251	1.437	11.524
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	205	159	127		146.379	138.140	53.942	
OPERATING PERSONNEL	80	3	10		42.179	1.096	3.493	
HEALTH PHYSICS PERSONNEL	59	6	69		43.951	1.887	34.029	
SUPERVISORY PERSONNEL	11	6	6		6.050	6.149	3.673	
ENGINEERING PERSONNEL	23	4	20		14.405	0.796	7.077	
TOTAL	378	178	232	788	252.964	148.068	102.214	503.246
WASTE PROCESSING								
MAINTENANCE PERSONNEL	2	2	7		0.302	0.365	2.241	
OPERATING PERSONNEL	1	0	0		0.112	0.000	0.000	
HEALTH PHYSICS PERSONNEL	24	2	34		13.885	0.254	18.756	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	27	4	41	72	14.299	0.619	20.997	35.915
REFUELING								
MAINTENANCE PERSONNEL	46	16	2		21.721	3.832	0.554	
OPERATING PERSONNEL	6	1	0		1.003	0.247	0.000	
HEALTH PHYSICS PERSONNEL	2	0	7		0.453	0.000	1.169	
SUPERVISORY PERSONNEL	1	0	0		0.345	0.000	0.000	
ENGINEERING PERSONNEL	0	0	2		0.000	0.000	0.236	
TOTAL	55	17	11	83	23.522	4.079	1.959	29.560
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	282 (209)	210 (171)	140 (137)	632 (517)	173.852	148.588	57.289	379.729
OPERATING PERSONNEL	104 (93)	4 (3)	12 (10)	120 (106)	45.906	1.343	3.906	51.155
HEALTH PHYSICS PERSONNEL	93 (66)	8 (8)	110 (95)	211 (169)	61.319	2.141	53.954	117.414
SUPERVISORY PERSONNEL	13 (13)	6 (6)	6 (6)	25 (25)	6.560	6.149	3.673	16.382
ENGINEERING PERSONNEL	28 (27)	4 (4)	24 (23)	56 (54)	16.516	0.796	7.785	25.097
GRAND TOTAL	520 (408)	232 (192)	292 (271)	1044 (871)	304.153	159.017	126.607	589.777

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

APPENDIX C

PLANT: * COOK 1,2	NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION							
	NUMBER OF PERSONNEL (>100 M-REM)				TOTAL MAN-REMS			
	STATION	UTILITY	CONTRACT	TOTAL	STATION	UTILITY	CONTRACT	TOTAL
WORK & JOB FUNCTION	EMPLOYEES	EMPLOYEES	& OTHERS	PERSONS	EMPLOYEES	EMPLOYEES	& OTHERS	MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	2	0	0		0.868	0.000	0.000	
OPERATING PERSONNEL	76	0	0		22.901	0.000	0.000	
HEALTH PHYSICS PERSONNEL	20	0	48		3.595	0.000	14.832	
SUPERVISORY PERSONNEL	3	0	0		0.584	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	101	0	48	149	27.948	0.000	14.832	42.780
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	100	4	124		76.467	1.199	44.952	
OPERATING PERSONNEL	17	0	6		6.936	0.000	1.055	
HEALTH PHYSICS PERSONNEL	8	0	14		1.052	0.000	3.102	
SUPERVISORY PERSONNEL	5	0	3		2.623	0.000	0.607	
ENGINEERING PERSONNEL	7	2	9		2.054	0.342	6.542	
TOTAL	137	6	156	299	89.132	1.541	56.258	146.931
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	29	3	126		7.324	2.575	72.819	
OPERATING PERSONNEL	7	0	7		1.532	0.000	7.255	
HEALTH PHYSICS PERSONNEL	19	0	36		4.048	0.000	10.620	
SUPERVISORY PERSONNEL	1	0	3		0.141	0.000	1.010	
ENGINEERING PERSONNEL	5	4	5		1.354	0.939	0.760	
TOTAL	61	7	177	245	14.399	3.514	92.464	110.377
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	19	2	236		6.191	2.826	146.601	
OPERATING PERSONNEL	1	0	21		0.203	0.000	11.374	
HEALTH PHYSICS PERSONNEL	0	0	13		0.000	0.000	2.899	
SUPERVISORY PERSONNEL	1	1	7		0.111	0.518	5.913	
ENGINEERING PERSONNEL	5	4	5		0.854	0.690	1.647	
TOTAL	26	7	282	315	7.359	4.034	168.434	179.827
WASTE PROCESSING								
MAINTENANCE PERSONNEL	21	1	60		4.660	0.151	34.128	
OPERATING PERSONNEL	1	0	0		0.142	0.000	0.000	
HEALTH PHYSICS PERSONNEL	7	0	18		1.973	0.000	9.817	
SUPERVISORY PERSONNEL	3	0	0		3.248	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.508	0.000	0.000	
TOTAL	33	1	78	112	10.531	0.151	43.945	54.627
REFUELING								
MAINTENANCE PERSONNEL	6	2	37		2.644	1.174	20.950	
OPERATING PERSONNEL	4	0	8		1.212	0.000	4.182	
HEALTH PHYSICS PERSONNEL	0	0	3		0.000	0.000	0.536	
SUPERVISORY PERSONNEL	2	0	1		0.678	0.000	0.147	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	12	2	49	63	4.534	1.174	25.815	31.523
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	177 (141)	12 (6)	583 (439)	772 (586)	98.154	7.925	319.450	425.529
OPERATING PERSONNEL	106 (94)	0	42 (34)	148 (128)	32.926	0.000	23.866	56.792
HEALTH PHYSICS PERSONNEL	54 (26)	0	132 (74)	186 (100)	10.668	0.000	41.806	52.474
SUPERVISORY PERSONNEL	15 (12)	1 (1)	14 (7)	30 (20)	7.385	0.518	7.677	15.580
ENGINEERING PERSONNEL	18 (12)	10 (7)	19 (19)	47 (38)	4.770	1.971	8.949	15.690
GRAND TOTAL	370 (285)	23 (14)	790 (573)	1183 (872)	153.903	10.414	401.748	566.065

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

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APPENDIX C

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

1983

PLANT: COOPER

(BWR)

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	5	0	3		2.095	0.000	1.001	
OPERATING PERSONNEL	49	0	0		25.744	0.000	0.000	
HEALTH PHYSICS PERSONNEL	18	0	0		6.950	0.000	0.000	
SUPERVISORY PERSONNEL	14	2	3		4.623	0.107	0.763	
ENGINEERING PERSONNEL	19	1	3		13.984	0.127	0.339	
TOTAL	105	3	9	117	53.396	0.234	2.103	55.733
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	60	17	168		80.261	17.226	251.626	
OPERATING PERSONNEL	6	0	0		2.120	0.000	0.000	
HEALTH PHYSICS PERSONNEL	14	0	0		6.569	0.000	0.000	
SUPERVISORY PERSONNEL	11	4	5		4.047	0.827	8.016	
ENGINEERING PERSONNEL	13	16	3		5.434	15.537	0.272	
TOTAL	104	37	176	317	98.431	33.590	259.914	391.935
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	50		0.000	0.000	70.885	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	0		0.044	0.000	0.000	
SUPERVISORY PERSONNEL	1	0	5		0.096	0.000	4.371	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	2	0	55	57	0.140	0.000	75.256	75.396
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	0	0	404		0.000	0.000	717.356	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	14	0	2		4.559	0.000	0.193	
SUPERVISORY PERSONNEL	4	2	9		1.326	0.088	3.719	
ENGINEERING PERSONNEL	1	17	9		0.080	3.449	6.732	
TOTAL	19	19	424	462	5.965	3.537	728.000	737.502
WASTE PROCESSING								
MAINTENANCE PERSONNEL	2	0	0		0.214	0.000	0.000	
OPERATING PERSONNEL	22	0	0		5.944	0.000	0.000	
HEALTH PHYSICS PERSONNEL	12	0	0		2.009	0.000	0.000	
SUPERVISORY PERSONNEL	4	0	0		0.591	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.063	0.000	0.000	
TOTAL	41	0	0	41	8.821	0.000	0.000	8.821
REFUELING								
MAINTENANCE PERSONNEL	2	0	0		0.062	0.000	0.000	
OPERATING PERSONNEL	28	0	0		3.762	0.000	0.000	
HEALTH PHYSICS PERSONNEL	5	0	0		0.423	0.000	0.000	
SUPERVISORY PERSONNEL	1	1	0		0.092	0.016	0.000	
ENGINEERING PERSONNEL	2	3	0		0.105	0.137	0.000	
TOTAL	38	4	0	42	4.444	0.153	0.000	4.597
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	69 (61)	17 (17)	625 (601)	711 (679)	82.632	17.226	1040.868	1140.726
OPERATING PERSONNEL	105 (50)	0	0	105 (50)	37.570	0.000	0.000	37.570
HEALTH PHYSICS PERSONNEL	64 (18)	0	2 (0)	66 (18)	20.554	0.000	0.193	20.747
SUPERVISORY PERSONNEL	35 (15)	9 (4)	22 (18)	66 (37)	10.775	1.038	16.869	28.682
ENGINEERING PERSONNEL	36 (19)	37 (19)	15 (13)	88 (51)	19.666	19.250	7.343	46.259
GRAND TOTAL	309 (163)	63 (40)	664 (632)	1036 (835)	171.197	37.514	1065.273	1273.984

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

APPENDIX C

PLANT: *CRYSTAL RIVER (PWR)		NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION 1983						
WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	20	34	38		5.301	9.161	10.469	
OPERATING PERSONNEL	39	1	10		11.997	0.404	3.479	
HEALTH PHYSICS PERSONNEL	2	0	0		0.977	0.000	0.171	
SUPERVISORY PERSONNEL	27	7	18		7.329	2.460	5.775	
ENGINEERING PERSONNEL	9	7	28		2.529	1.650	9.669	
TOTAL	97	49	94	240	28.133	13.675	29.563	71.371
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	146	87	452		74.049	54.155	209.919	
OPERATING PERSONNEL	16	0	11		4.585	0.048	3.465	
HEALTH PHYSICS PERSONNEL	18	0	70		6.013	0.000	44.733	
SUPERVISORY PERSONNEL	17	1	17		5.927	0.355	5.489	
ENGINEERING PERSONNEL	6	2	53		1.997	0.519	20.137	
TOTAL	203	90	603	896	92.571	55.077	283.743	431.391
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	2	4	45		1.636	1.556	14.824	
OPERATING PERSONNEL	0	1	2		0.155	0.137	0.257	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.062	0.052	0.074	
ENGINEERING PERSONNEL	2	1	21		0.441	0.134	11.230	
TOTAL	4	6	68	78	2.294	1.879	26.385	30.558
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	6	1	24		2.025	0.264	7.731	
OPERATING PERSONNEL	1	0	3		0.198	0.000	0.970	
HEALTH PHYSICS PERSONNEL	0	0	2		0.009	0.000	0.369	
SUPERVISORY PERSONNEL	2	0	1		0.351	0.000	3.247	
ENGINEERING PERSONNEL	0	0	1		0.021	0.000	0.178	
TOTAL	9	1	31	41	2.604	0.264	12.495	15.363
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.331	0.540	0.244	
OPERATING PERSONNEL	1	0	0		0.880	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	3	0	0		0.993	0.008	0.000	
ENGINEERING PERSONNEL	1	0	0		0.182	0.000	0.121	
TOTAL	5	0	0	5	2.386	0.548	0.365	3.299
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	174 (157)	126 (97)	559 (494)	859 (748)	83.342	65.676	243.187	392.205
OPERATING PERSONNEL	57 (46)	2 (2)	26 (29)	85 (77)	17.815	0.589	8.171	26.575
HEALTH PHYSICS PERSONNEL	20 (20)	0	72 (70)	92 (90)	6.999	0.000	45.273	52.272
SUPERVISORY PERSONNEL	49 (53)	8 (8)	36 (39)	93 (100)	14.662	2.875	14.585	32.122
ENGINEERING PERSONNEL	18 (19)	10 (11)	103 (88)	131 (118)	5.170	2.303	41.335	48.808
GRAND TOTAL	318 (295)	146 (118)	796 (720)	1260 (1133)	127.988	71.443	352.551	551.982

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

APPENDIX C

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

PLANT: *DAVIS-BESSE

(PWR)

1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	9	2	17		0.185	0.020	0.290	
OPERATING PERSONNEL	93	0	25		7.350	0.000	0.795	
HEALTH PHYSICS PERSONNEL	12	0	0		0.790	0.000	0.000	
SUPERVISORY PERSONNEL	20	0	2		0.900	0.000	0.040	
ENGINEERING PERSONNEL	13	0	1		0.325	0.000	0.010	
TOTAL	147	2	45	194	9.550	0.020	1.135	10.705
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	97	46	266		9.110	1.360	16.065	
OPERATING PERSONNEL	16	0	0		0.470	0.000	0.000	
HEALTH PHYSICS PERSONNEL	17	0	42		4.375	0.000	8.530	
SUPERVISORY PERSONNEL	19	0	17		0.775	0.000	0.690	
ENGINEERING PERSONNEL	11	0	4		0.495	0.000	0.185	
TOTAL	160	46	329	535	15.225	1.360	25.470	42.055
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	2	0	23		0.040	0.000	1.395	
OPERATING PERSONNEL	1	0	0		0.020	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	1		0.000	0.000	0.040	
SUPERVISORY PERSONNEL	2	0	2		0.200	0.000	0.225	
ENGINEERING PERSONNEL	0	0	2		0.000	0.000	0.190	
TOTAL	5	0	28	33	0.260	0.000	1.850	2.110
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	98	34	282		13.025	4.995	36.720	
OPERATING PERSONNEL	19	1	0		1.115	0.345	0.000	
HEALTH PHYSICS PERSONNEL	7	0	20		0.490	0.000	3.495	
SUPERVISORY PERSONNEL	14	0	16		0.815	0.000	3.435	
ENGINEERING PERSONNEL	11	0	12		0.775	0.000	0.735	
TOTAL	149	35	330	514	16.220	5.340	44.385	65.945
WASTE PROCESSING								
MAINTENANCE PERSONNEL	3	1	8		0.860	0.005	0.260	
OPERATING PERSONNEL	8	0	1		0.285	0.000	0.220	
HEALTH PHYSICS PERSONNEL	6	0	5		2.225	0.000	0.535	
SUPERVISORY PERSONNEL	3	0	0		0.350	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	20	1	14	35	3.720	0.005	1.015	4.740
REFUELING								
MAINTENANCE PERSONNEL	23	15	42		2.765	3.140	8.655	
OPERATING PERSONNEL	29	1	0		2.230	0.015	0.000	
HEALTH PHYSICS PERSONNEL	2	0	2		0.050	0.000	0.045	
SUPERVISORY PERSONNEL	5	0	3		0.145	0.000	0.590	
ENGINEERING PERSONNEL	7	0	2		1.020	0.000	0.420	
TOTAL	66	16	49	131	6.210	3.155	9.710	19.075
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	232	98	638	968	25.985	9.520	63.385	98.890
OPERATING PERSONNEL	166	2	26	194	11.470	0.360	1.015	12.845
HEALTH PHYSICS PERSONNEL	44	0	70	114	7.930	0.000	12.645	20.575
SUPERVISORY PERSONNEL	63	0	40	103	3.185	0.000	4.980	8.165
ENGINEERING PERSONNEL	42	0	21	63	2.615	0.000	1.540	4.155
GRAND TOTAL	547	100	795	1442	51.185	9.880	83.565	144.630

*Workers may be counted in more than one category.

APPENDIX C

PLANT: DRESDEN 1,2,3 (BWR) NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION 1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	19	2	0		41.950	5.270	0.000	
OPERATING PERSONNEL	53	0	0		92.090	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	0		4.610	0.000	0.000	
SUPERVISORY PERSONNEL	23	0	0		24.910	0.000	0.000	
ENGINEERING PERSONNEL	3	2	0		1.660	0.710	0.000	
TOTAL	100	4	0	104	165.220	5.980	0.000	171.200
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	165	81	604		359.530	171.420	1562.170	
OPERATING PERSONNEL	25	0	0		42.830	0.000	0.000	
HEALTH PHYSICS PERSONNEL	28	0	7		67.990	0.000	6.940	
SUPERVISORY PERSONNEL	79	0	0		84.680	0.000	0.000	
ENGINEERING PERSONNEL	48	37	18		29.070	15.180	27.850	
TOTAL	345	118	629	1092	584.100	186.600	1596.960	2367.660
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	27	35	116		59.920	73.840	300.420	
OPERATING PERSONNEL	6	0	0		10.710	0.000	0.000	
HEALTH PHYSICS PERSONNEL	5	0	11		11.520	0.000	10.400	
SUPERVISORY PERSONNEL	9	0	0		9.960	0.000	0.000	
ENGINEERING PERSONNEL	9	1	15		5.400	0.530	22.780	
TOTAL	56	36	142	234	97.510	74.370	333.600	505.480
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	22	6	54		47.940	13.190	140.190	
OPERATING PERSONNEL	32	0	2		55.680	0.000	2.590	
HEALTH PHYSICS PERSONNEL	10	0	0		25.350	0.000	0.000	
SUPERVISORY PERSONNEL	27	0	0		28.230	0.000	0.000	
ENGINEERING PERSONNEL	4	2	0		2.910	0.880	0.000	
TOTAL	95	8	56	159	160.110	14.070	142.780	316.960
REFUELING								
MAINTENANCE PERSONNEL	41	0	0		89.880	0.000	0.000	
OPERATING PERSONNEL	8	0	0		12.850	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	0		5.760	0.000	0.000	
SUPERVISORY PERSONNEL	17	0	0		18.270	0.000	0.000	
ENGINEERING PERSONNEL	4	1	0		2.490	0.350	0.000	
TOTAL	72	1	0	73	129.250	0.350	0.000	129.600
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	274	124	774	1172	599.220	263.720	2002.780	2865.720
OPERATING PERSONNEL	124	0	2	126	214.160	0.000	2.590	216.750
HEALTH PHYSICS PERSONNEL	47	0	18	65	115.230	0.000	17.340	132.570
SUPERVISORY PERSONNEL	155	0	0	155	166.050	0.000	0.000	166.050
ENGINEERING PERSONNEL	68	43	33	144	41.530	17.650	50.630	109.810
GRAND TOTAL	668	167	827	1662	1136.190	281.370	2073.340	3490.900

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APPENDIX C

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
1983

PLANT: DUANE ARNOLD

(BWR)

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	STATION EMPLOYEES	TOTAL MAN-REMS		TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS			UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	12	12	92		0.354	0.415	0.824	
OPERATING PERSONNEL	54	5	6		39.590	0.732	1.654	
HEALTH PHYSICS PERSONNEL	5	5	47		0.193	0.053	4.198	
SUPERVISORY PERSONNEL	14	0	10		0.688	0.000	0.140	
ENGINEERING PERSONNEL	4	3	32		0.061	0.125	0.322	
TOTAL	89	25	187	301	40.886	1.325	7.138	49.349
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	89	53	226		24.750	18.965	318.115	
OPERATING PERSONNEL	28	9	17		0.905	0.105	0.245	
HEALTH PHYSICS PERSONNEL	26	12	135		6.233	0.640	10.348	
SUPERVISORY PERSONNEL	13	0	152		0.383	0.000	7.692	
ENGINEERING PERSONNEL	20	8	155		0.795	0.257	6.133	
TOTAL	176	82	685	943	33.066	19.967	342.533	595.566
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	22	13	314		0.718	0.640	16.588	
OPERATING PERSONNEL	25	5	3		1.096	0.084	0.085	
HEALTH PHYSICS PERSONNEL	23	8	15		6.456	0.070	18.729	
SUPERVISORY PERSONNEL	14	0	95		0.578	0.000	2.539	
ENGINEERING PERSONNEL	21	29	214		1.605	6.803	42.183	
TOTAL	105	55	641	801	10.453	7.597	79.984	98.034
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	29	31	773		4.570	7.085	579.131	
OPERATING PERSONNEL	4	2	2		0.100	0.028	0.175	
HEALTH PHYSICS PERSONNEL	8	3	86		1.406	0.109	21.513	
SUPERVISORY PERSONNEL	3	0	39		0.350	0.000	44.513	
ENGINEERING PERSONNEL	11	1	44		0.418	1.109	37.429	
TOTAL	55	37	944	1036	6.844	8.331	682.761	697.936
WASTE PROCESSING								
MAINTENANCE PERSONNEL	3	17	28		0.020	0.318	1.367	
OPERATING PERSONNEL	5	15	16		2.707	3.345	8.631	
HEALTH PHYSICS PERSONNEL	9	8	20		0.126	0.302	2.627	
SUPERVISORY PERSONNEL	3	0	2		0.163	0.000	0.035	
ENGINEERING PERSONNEL	0	11	11		0.000	0.030	0.249	
TOTAL	20	51	77	148	3.016	3.995	12.909	19.920
REFUELING								
MAINTENANCE PERSONNEL	11	9	230		0.091	0.480	42.734	
OPERATING PERSONNEL	39	0	0		1.379	0.000	0.000	
HEALTH PHYSICS PERSONNEL	25	0	17		0.522	0.000	4.307	
SUPERVISORY PERSONNEL	15	0	13		0.249	0.000	4.383	
ENGINEERING PERSONNEL	6	0	25		0.085	0.000	4.128	
TOTAL	96	9	285	390	2.326	0.480	55.552	58.358
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	166 (91)	135 (73)	1663 (936)	1964 (1100)	30.503	27.903	958.759	1017.165
OPERATING PERSONNEL	155 (75)	36 (20)	44 (32)	235 (127)	45.777	4.294	10.790	60.861
HEALTH PHYSICS PERSONNEL	96 (40)	36 (15)	320 (171)	452 (226)	14.936	1.174	61.522	77.632
SUPERVISORY PERSONNEL	62 (28)	0	311 (176)	373 (204)	2.411	0.000	59.362	61.773
ENGINEERING PERSONNEL	62 (31)	52 (27)	481 (252)	595 (310)	2.964	8.324	90.444	101.732
GRAND TOTAL	541 (265)	259 (135)	2819 (1567)	3619 (1967)	96.591	41.695	1180.877	1319.163 **

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

**Mark I torus modifications contributed 560 man-rems, and ISI contributed 50 man-rems.

APPENDIX C

WORK & JOB FUNCTION	NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION							
	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL MAN-REMS				
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
PLANT: * FARLEY 1,2 (PWR) 1983								
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	55	3	55		4.553	0.074	2.389	
OPERATING PERSONNEL	143	7	0		57.589	0.957	0.000	
HEALTH PHYSICS PERSONNEL	99	4	103		51.202	0.540	60.268	
SUPERVISORY PERSONNEL	168	11	27		29.918	1.204	1.828	
ENGINEERING PERSONNEL	51	16	102		5.426	0.920	8.516	
TOTAL	516	41	287	844	148.688	3.695	73.001	225.384
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	153	3	78		36.515	1.182	9.426	
OPERATING PERSONNEL	102	2	0		61.841	0.158	0.000	
HEALTH PHYSICS PERSONNEL	34	0	28		10.880	0.000	2.598	
SUPERVISORY PERSONNEL	61	3	5		8.876	0.252	1.955	
ENGINEERING PERSONNEL	21	14	213		2.685	0.496	16.778	
TOTAL	371	22	324	717	120.797	2.088	30.757	153.642
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	3	0	27		0.058	0.000	7.113	
OPERATING PERSONNEL	3	1	0		0.340	0.590	0.000	
HEALTH PHYSICS PERSONNEL	0	0	3		0.000	0.000	0.097	
SUPERVISORY PERSONNEL	2	5	0		0.085	1.883	0.000	
ENGINEERING PERSONNEL	5	2	75		0.723	0.676	22.594	
TOTAL	13	8	105	126	1.206	3.149	29.804	34.159
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	140	3	306		157.641	2.912	93.942	
OPERATING PERSONNEL	93	2	0		23.615	0.045	0.000	
HEALTH PHYSICS PERSONNEL	47	1	45		13.878	0.030	4.651	
SUPERVISORY PERSONNEL	65	3	9		13.687	0.170	1.347	
ENGINEERING PERSONNEL	29	16	495		4.822	1.765	172.933	
TOTAL	374	25	855	1254	213.643	4.922	272.873	491.438
WASTE PROCESSING								
MAINTENANCE PERSONNEL	2	0	9		0.108	0.000	1.539	
OPERATING PERSONNEL	13	0	0		0.886	0.000	0.000	
HEALTH PHYSICS PERSONNEL	12	0	4		2.376	0.000	0.398	
SUPERVISORY PERSONNEL	4	0	1		0.846	0.000	0.115	
ENGINEERING PERSONNEL	1	0	2		0.012	0.000	0.573	
TOTAL	32	0	16	48	4.228	0.000	2.625	6.853
REFUELING								
MAINTENANCE PERSONNEL	11	0	119		0.964	0.000	37.055	
OPERATING PERSONNEL	4	0	0		0.651	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	4		0.155	0.000	0.163	
SUPERVISORY PERSONNEL	7	0	2		0.530	0.000	0.037	
ENGINEERING PERSONNEL	9	4	13		2.453	0.163	2.611	
TOTAL	33	4	138	175	4.753	0.163	39.866	44.782
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	364	9	594	967	199.839	4.168	151.464	355.471
OPERATING PERSONNEL	358	12	0	370	144.922	1.750	0.000	146.672
HEALTH PHYSICS PERSONNEL	194	5	187	386	78.491	0.570	68.175	147.236
SUPERVISORY PERSONNEL	307	22	44	373	53.942	3.509	5.282	62.733
ENGINEERING PERSONNEL	116	52	900	1068	16.121	4.020	224.005	244.146
GRAND TOTAL	1339	100	1725	3164	493.315	14.017	448.926	956.258

* Workers may be counted in more than one category.

APPENDIX C

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
1983

PLANT: † FITZPATRICK

(BWR)

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	STATION EMPLOYEES	TOTAL MAN-REMS		TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS			UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	130	0	114		13.088	0.000	8.770	
OPERATING PERSONNEL	206	0	37		56.420	0.000	3.485	
HEALTH PHYSICS PERSONNEL	35	0	51		17.882	0.000	48.365	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	54	0	67		2.720	0.000	6.800	
TOTAL	425	0	269	694	90.110	0.000	67.420	157.530
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	155	0	476		212.223	0.000	239.670	
OPERATING PERSONNEL	87	0	10		14.738	0.000	14.170	
HEALTH PHYSICS PERSONNEL	18	0	10		1.703	0.000	1.570	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	32	0	109		7.700	0.000	25.280	
TOTAL	292	0	605	897	236.364	0.000	280.690	517.054
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	48	0	103		2.770	0.000	8.616	
OPERATING PERSONNEL	83	0	3		5.764	0.000	0.937	
HEALTH PHYSICS PERSONNEL	7	0	3		0.310	0.000	0.120	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	33	0	84		1.986	0.000	33.530	
TOTAL	171	0	193	364	10.830	0.000	43.203	54.033
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	37	0	424		1.201	0.000	242.170	
OPERATING PERSONNEL	29	0	6		1.571	0.000	1.100	
HEALTH PHYSICS PERSONNEL	5	0	2		0.170	0.000	0.030	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	15	0	71		1.470	0.000	11.770	
TOTAL	86	0	503	589	4.412	0.000	255.070	259.482
WASTE PROCESSING								
MAINTENANCE PERSONNEL	133	0	101		53.678	0.000	12.400	
OPERATING PERSONNEL	80	0	4		26.350	0.000	4.364	
HEALTH PHYSICS PERSONNEL	12	0	18		0.600	0.000	1.096	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	8	0	24		0.215	0.000	3.017	
TOTAL	233	0	147	380	80.843	0.000	20.877	101.720
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	503	0	1218	1721	282.960	0.000	511.626	794.586
OPERATING PERSONNEL	485	0	60	545	104.843	0.000	24.956	128.899
HEALTH PHYSICS PERSONNEL	77	0	84	161	20.665	0.000	51.181	71.846
SUPERVISORY PERSONNEL	0	0	0	0	0.000	0.000	0.000	0.000
ENGINEERING PERSONNEL	142	0	355	497	14.091	0.000	80.397	94.488
GRAND TOTAL	1207	0	1717	2924	422.559	0.000	667.260	1089.819

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* Workers may be counted in more than one category.

APPENDIX C

PLANT: * FORT CALHOUN (PWR) NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION 1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)				TOTAL PERSONS	TOTAL MAN-REMS			
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.									
MAINTENANCE PERSONNEL	7	4	6		1,974	2,382	6,053		
OPERATING PERSONNEL	25	0	0		8,708	0,074	0,000		
HEALTH PHYSICS PERSONNEL	20	3	33		15,774	1,344	17,479		
SUPERVISORY PERSONNEL	5	0	0		1,231	0,170	0,000		
ENGINEERING PERSONNEL	22	6	10		8,425	3,176	2,885		
TOTAL	79	13	49	141	36,112	7,146	26,417		69,675
ROUTINE MAINTENANCE									
MAINTENANCE PERSONNEL	32	41	38		10,329	20,008	23,671		
OPERATING PERSONNEL	0	0	0		0,090	0,000	0,000		
HEALTH PHYSICS PERSONNEL	0	2	0		0,149	0,659	0,040		
SUPERVISORY PERSONNEL	1	0	0		0,198	0,000	0,000		
ENGINEERING PERSONNEL	3	2	0		1,258	0,750	0,172		
TOTAL	36	45	38	119	12,524	21,417	23,883		57,824
IN-SERVICE INSPECTION									
MAINTENANCE PERSONNEL	0	3	21		0,519	1,032	12,975		
OPERATING PERSONNEL	1	0	0		0,212	0,000	0,000		
HEALTH PHYSICS PERSONNEL	0	0	0		0,048	0,065	0,120		
SUPERVISORY PERSONNEL	0	0	0		0,113	0,050	0,000		
ENGINEERING PERSONNEL	5	8	15		1,400	3,909	6,605		
TOTAL	6	11	36	53	2,292	5,056	19,700		27,048
SPECIAL MAINTENANCE									
MAINTENANCE PERSONNEL	40	61	154		39,331	54,469	115,270		
OPERATING PERSONNEL	3	0	0		1,471	0,000	0,000		
HEALTH PHYSICS PERSONNEL	8	1	2		5,139	0,731	0,489		
SUPERVISORY PERSONNEL	3	0	0		1,183	0,016	0,000		
ENGINEERING PERSONNEL	16	14	25		7,488	4,785	14,917		
TOTAL	70	76	181	327	54,612	60,001	130,676		245,289
WASTE PROCESSING									
MAINTENANCE PERSONNEL	8	6	4		2,613	1,936	3,386		
OPERATING PERSONNEL	4	0	0		1,745	0,055	0,000		
HEALTH PHYSICS PERSONNEL	9	1	0		12,336	0,165	0,060		
SUPERVISORY PERSONNEL	1	0	0		0,362	0,000	0,000		
ENGINEERING PERSONNEL	2	0	0		0,802	0,105	0,000		
TOTAL	24	7	4	35	17,858	2,261	3,446		23,565
REFUELING									
MAINTENANCE PERSONNEL	20	20	21		6,473	9,093	10,774		
OPERATING PERSONNEL	14	0	0		3,486	0,044	0,000		
HEALTH PHYSICS PERSONNEL	0	0	0		0,010	0,020	0,025		
SUPERVISORY PERSONNEL	4	0	0		0,871	0,000	0,000		
ENGINEERING PERSONNEL	6	0	8		2,154	0,336	2,477		
TOTAL	44	20	29	93	12,994	9,493	13,276		35,763
TOTAL BY JOB FUNCTION									
MAINTENANCE PERSONNEL	107	135	244	486	61,739	88,920	172,129		322,788
OPERATING PERSONNEL	47	0	0	47	15,712	0,173	0,000		15,885
HEALTH PHYSICS PERSONNEL	37	7	35	79	33,456	2,984	18,213		54,653
SUPERVISORY PERSONNEL	14	0	0	14	3,958	0,236	0,000		4,194
ENGINEERING PERSONNEL	54	30	58	142	21,527	13,061	27,056		61,644
GRAND TOTAL	259	172	337	768	136,392	105,374	217,398		459,164

*Workers may be counted in more than one category.

APPENDIX C

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

PLANT: GINNA

(PWR)

1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	33	138	149		6.590	3.210	8.400	
OPERATING PERSONNEL	30	1	0		13.050	0.850	0.000	
HEALTH PHYSICS PERSONNEL	11	1	40		4.560	0.020	4.750	
SUPERVISORY PERSONNEL	7	4	22		2.580	0.400	1.760	
ENGINEERING PERSONNEL	1	5	14		0.120	0.150	0.750	
TOTAL	82	149	225	456	26.900	4.630	15.660	47.190
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	34	191	146		6.410	8.140	18.170	
OPERATING PERSONNEL	20	0	0		0.270	0.000	0.000	
HEALTH PHYSICS PERSONNEL	11	1	36		1.270	0.070	3.390	
SUPERVISORY PERSONNEL	7	2	16		0.400	0.020	0.660	
ENGINEERING PERSONNEL	1	4	8		0.010	0.160	0.040	
TOTAL	73	198	206	477	8.360	8.390	22.260	39.010
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	17	56	8		1.300	3.340	0.730	
OPERATING PERSONNEL	1	0	0		0.010	0.000	0.000	
HEALTH PHYSICS PERSONNEL	5	0	13		0.090	0.000	0.280	
SUPERVISORY PERSONNEL	5	2	9		0.260	0.120	0.350	
ENGINEERING PERSONNEL	0	1	0		0.000	0.050	0.000	
TOTAL	28	59	30	117	1.660	3.510	1.360	6.530
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	34	263	269		15.890	426.030	282.710	
OPERATING PERSONNEL	29	1	0		6.650	0.020	0.000	
HEALTH PHYSICS PERSONNEL	11	1	42		7.630	1.120	32.610	
SUPERVISORY PERSONNEL	8	5	30		2.460	4.120	22.250	
ENGINEERING PERSONNEL	1	6	31		0.050	3.790	14.060	
TOTAL	83	276	372	731	32.680	435.080	351.630	819.390
WASTE PROCESSING								
MAINTENANCE PERSONNEL	22	29	45		2.070	0.410	8.670	
OPERATING PERSONNEL	6	0	0		0.100	0.000	0.000	
HEALTH PHYSICS PERSONNEL	11	0	28		1.100	0.000	8.070	
SUPERVISORY PERSONNEL	1	1	4		0.000	0.030	1.070	
ENGINEERING PERSONNEL	0	2	2		0.000	0.010	0.310	
TOTAL	40	32	79	151	3.270	0.450	18.120	21.840
REFUELING								
MAINTENANCE PERSONNEL	19	26	23		1.170	6.350	2.910	
OPERATING PERSONNEL	4	0	0		2.710	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	18		0.070	0.000	2.220	
SUPERVISORY PERSONNEL	2	2	3		0.580	0.020	0.430	
ENGINEERING PERSONNEL	0	1	15		0.000	0.110	10.020	
TOTAL	29	29	59	117	4.530	6.480	15.580	26.590
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	159 (34)	703 (264)	640 (273)	1502 (571)	33.430	447.480	321.590	802.500
OPERATING PERSONNEL	90 (30)	2 (1)	0	92 (31)	22.790	0.870	0.000	23.660
HEALTH PHYSICS PERSONNEL	53 (11)	3 (1)	177 (42)	233 (54)	14.720	1.210	51.320	67.250
SUPERVISORY PERSONNEL	30 (8)	16 (5)	84 (30)	130 (43)	6.280	4.710	26.520	37.510
ENGINEERING PERSONNEL	3 (1)	19 (6)	70 (34)	92 (41)	0.180	4.270	25.180	29.630
GRAND TOTAL	335 (84)	743 (277)	971 (379)	2049 (740)	77.400	458.540	424.610	960.550

* Workers may be counted in more than one category. Numbers in parentheses are total numbers of individuals.
 Note: The reports shown in Appendix C for Ginna for the years 1981 and 1982 had the column headings reversed. For each of these years, the figures shown for Utility Employees should be assigned to Station Employees; figures shown for Contractor Employees assigned to Utility Employees; and figures shown for Station Employees assigned to Contractor Employees.

APPENDIX C

PLANT: * HADDAM NECK	NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION							
	NUMBER OF PERSONNEL (>100 M-REM)				TOTAL MAN-REMS			
	STATION	UTILITY	CONTRACT	TOTAL	STATION	UTILITY	CONTRACT	TOTAL
WORK & JOB FUNCTION	EMPLOYEES	EMPLOYEES	& OTHERS	PERSONS	EMPLOYEES	EMPLOYEES	& OTHERS	MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	6	0	1		4.310	0.210	0.760	
OPERATING PERSONNEL	51	0	20		49.280	0.000	6.600	
HEALTH PHYSICS PERSONNEL	29	5	74		11.670	1.540	31.000	
SUPERVISORY PERSONNEL	3	0	0		0.660	0.000	0.000	
ENGINEERING PERSONNEL	5	2	0		1.950	0.850	0.210	
TOTAL	94	7	95	196	67.870	2.600	38.570	109.040
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	60	25	108		82.200	9.010	60.860	
OPERATING PERSONNEL	6	0	2		2.380	0.030	1.090	
HEALTH PHYSICS PERSONNEL	26	1	106		15.250	0.200	65.130	
SUPERVISORY PERSONNEL	0	0	0		0.020	0.070	0.010	
ENGINEERING PERSONNEL	10	14	13		2.660	5.730	7.360	
TOTAL	102	40	229	371	102.510	15.040	134.450	252.000
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	25	4	199		16.340	1.260	286.590	
OPERATING PERSONNEL	1	0	8		1.050	0.000	9.140	
HEALTH PHYSICS PERSONNEL	4	2	63		2.400	1.010	31.590	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	7	12	53		7.330	6.380	53.130	
TOTAL	37	18	323	378	27.120	8.650	380.450	416.220
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	15	61	343		4.370	53.090	269.310	
OPERATING PERSONNEL	0	0	7		0.080	0.140	4.760	
HEALTH PHYSICS PERSONNEL	21	0	71		6.200	0.000	21.760	
SUPERVISORY PERSONNEL	0	1	8		0.120	0.250	5.630	
ENGINEERING PERSONNEL	4	21	43		1.550	14.020	29.770	
TOTAL	40	83	472	595	12.320	67.500	331.230	411.050
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	1		0.160	0.020	0.390	
OPERATING PERSONNEL	1	0	0		0.650	0.000	0.000	
HEALTH PHYSICS PERSONNEL	22	0	62		35.890	0.010	36.450	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	1		0.160	0.000	0.140	
TOTAL	23	0	64	87	36.860	0.030	36.980	73.870
REFUELING								
MAINTENANCE PERSONNEL	43	5	54		29.030	1.600	54.720	
OPERATING PERSONNEL	3	0	27		1.010	0.010	47.290	
HEALTH PHYSICS PERSONNEL	8	0	40		2.580	0.050	15.570	
SUPERVISORY PERSONNEL	0	0	0		0.110	0.000	0.020	
ENGINEERING PERSONNEL	2	1	6		1.380	0.550	6.830	
TOTAL	56	6	127	189	34.110	2.210	124.430	160.750
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	149	95	706	950	136.410	65.190	672.630	874.230
OPERATING PERSONNEL	62	0	64	126	54.450	0.180	68.880	123.510
HEALTH PHYSICS PERSONNEL	110	8	416	534	73.990	2.810	201.500	278.300
SUPERVISORY PERSONNEL	3	1	8	12	0.910	0.320	5.660	6.890
ENGINEERING PERSONNEL	28	50	116	194	15.030	27.530	97.440	140.000
GRAND TOTAL	352	154	1310	1816	280.790	96.030	1046.110	1422.930

*Workers may be counted in more than one category.

APPENDIX C

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
1983

PLANT: HATCH 1,2

(BWR)

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	STATION EMPLOYEES	TOTAL MAN-REMS		TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS			UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	3	0	5		1.000	0.000	1.000	
OPERATING PERSONNEL	122	5	4		73.000	1.000	1.000	
HEALTH PHYSICS PERSONNEL	82	0	135		36.000	0.000	85.000	
SUPERVISORY PERSONNEL	33	5	1		8.000	1.000	0.000	
ENGINEERING PERSONNEL	30	7	3		5.000	1.000	1.000	
TOTAL	270	17	148	435	123.000	3.000	88.000	214.000
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	171	6	153		92.000	2.000	41.000	
OPERATING PERSONNEL	11	0	0		5.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	64	0	2		25.000	0.000	0.000	
SUPERVISORY PERSONNEL	10	1	1		3.000	0.000	0.000	
ENGINEERING PERSONNEL	16	15	26		3.000	5.000	7.000	
TOTAL	272	22	182	476	128.000	7.000	48.000	183.000
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	10		0.000	0.000	4.000	
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	1		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	11	11	0.000	0.000	4.000	4.000
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	133	4	1077		61.000	1.000	519.000	
OPERATING PERSONNEL	15	0	5		3.000	0.000	1.000	
HEALTH PHYSICS PERSONNEL	25	0	24		5.000	0.000	7.000	
SUPERVISORY PERSONNEL	7	2	18		2.000	1.000	7.000	
ENGINEERING PERSONNEL	16	16	93		7.000	5.000	26.000	
TOTAL	196	22	1217	1435	78.000	7.000	560.000	645.000
WASTE PROCESSING								
MAINTENANCE PERSONNEL	1	0	11		0.000	0.000	3.000	
OPERATING PERSONNEL	2	0	1		0.000	0.000	1.000	
HEALTH PHYSICS PERSONNEL	8	0	5		1.000	0.000	2.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	1		0.000	0.000	0.000	
TOTAL	11	0	18	29	1.000	0.000	6.000	7.000
REFUELING								
MAINTENANCE PERSONNEL	50	0	38		24.000	0.000	10.000	
OPERATING PERSONNEL	16	0	1		4.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	13		0.000	0.000	3.000	
SUPERVISORY PERSONNEL	7	0	0		3.000	0.000	0.000	
ENGINEERING PERSONNEL	4	0	7		1.000	0.000	1.000	
TOTAL	77	0	59	136	32.000	0.000	14.000	46.000
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	358 (192)	10 (7)	1294 (1189)	1662 (1388)	178.000	3.000	578.000	759.000
OPERATING PERSONNEL	166 (133)	5 (5)	11 (9)	182 (147)	85.000	1.000	3.000	89.000
HEALTH PHYSICS PERSONNEL	179 (129)	0	179 (150)	358 (279)	67.000	0.000	97.000	164.000
SUPERVISORY PERSONNEL	57 (52)	8 (7)	21 (22)	86 (81)	16.000	2.000	7.000	25.000
ENGINEERING PERSONNEL	66 (53)	38 (33)	130 (137)	234 (223)	16.000	11.000	35.000	62.000
GRAND TOTAL	826 (559)	61 (52)	1635 (1507)	2522 (2118)	362.000	17.000	720.000	1099.000

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

APPENDIX C

PLANT: HUMBOLDT BAY (BWR) NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION 1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)				TOTAL PERSONS	TOTAL MAN-REMS			
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.									
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000		
OPERATING PERSONNEL	15	0	0		1.700	0.000	0.000		
HEALTH PHYSICS PERSONNEL	2	0	0		1.000	0.000	0.000		
SUPERVISORY PERSONNEL	1	0	0		0.200	0.000	0.000		
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000		
TOTAL	18	0	0	18	2.900	0.000	0.000		2.900
ROUTINE MAINTENANCE									
MAINTENANCE PERSONNEL	11	3	0		2.300	0.900	0.000		
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000		
HEALTH PHYSICS PERSONNEL	1	0	0		1.200	0.000	0.000		
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000		
ENGINEERING PERSONNEL	1	0	0		0.300	0.000	0.000		
TOTAL	13	3	0	16	3.800	0.900	0.000		4.700
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	4	0	0		1.000	0.000	0.000		
OPERATING PERSONNEL	6	0	0		3.500	0.000	0.000		
HEALTH PHYSICS PERSONNEL	1	0	0		0.800	0.000	0.000		
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000		
ENGINEERING PERSONNEL	1	0	0		0.400	0.000	0.000		
TOTAL	12	0	0	12	5.700	0.000	0.000		5.700
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	15	3	0	18	3.300	0.900	0.000		4.200
OPERATING PERSONNEL	21	0	0	21	5.200	0.000	0.000		5.200
HEALTH PHYSICS PERSONNEL	4	0	0	4	3.000	0.000	0.000		3.000
SUPERVISORY PERSONNEL	1	0	0	1	0.200	0.000	0.000		0.200
ENGINEERING PERSONNEL	2	0	0	2	0.700	0.000	0.000		0.700
GRAND TOTAL	43	3	0	46	12.400	0.900	0.000		13.300

BA

APPENDIX C

PLANT: *INDIAN POINT 1,2 (PWR) NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION 1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	STATION EMPLOYEES	TOTAL MAN-REMS		TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS			UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	56	37	101		13.548	3.319	23.728	
OPERATING PERSONNEL	59	0	3		51.156	0.000	0.875	
HEALTH PHYSICS PERSONNEL	16	0	39		17.734	0.000	39.975	
SUPERVISORY PERSONNEL	59	15	71		21.692	2.718	9.164	
ENGINEERING PERSONNEL	42	8	13		11.696	0.610	4.768	
TOTAL	232	60	227	519	115.826	6.647	78.510	200.983
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	53	36	55		26.512	3.398	4.524	
OPERATING PERSONNEL	37	0	2		5.087	0.000	0.800	
HEALTH PHYSICS PERSONNEL	10	0	14		0.646	0.000	0.965	
SUPERVISORY PERSONNEL	43	12	56		13.411	0.620	4.119	
ENGINEERING PERSONNEL	26	6	6		1.886	0.239	0.451	
TOTAL	169	54	133	356	47.542	4.257	10.859	62.658
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	45	7	53		3.710	0.441	7.029	
OPERATING PERSONNEL	57	0	2		13.693	0.000	0.140	
HEALTH PHYSICS PERSONNEL	18	0	24		2.252	0.000	4.042	
SUPERVISORY PERSONNEL	47	7	57		5.332	0.965	3.673	
ENGINEERING PERSONNEL	24	4	2		1.164	0.181	0.200	
TOTAL	191	18	138	347	26.151	1.587	15.084	42.822
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	36	54	121		4.795	12.910	43.112	
OPERATING PERSONNEL	17	0	1		1.291	0.000	0.015	
HEALTH PHYSICS PERSONNEL	5	0	1		4.513	0.000	0.020	
SUPERVISORY PERSONNEL	18	18	77		2.305	3.775	13.427	
ENGINEERING PERSONNEL	14	7	6		1.077	0.696	1.447	
TOTAL	90	79	206	375	13.981	17.381	58.021	89.383
WASTE PROCESSING								
MAINTENANCE PERSONNEL	21	11	60		16.215	0.135	41.084	
OPERATING PERSONNEL	13	0	4		0.374	0.000	3.510	
HEALTH PHYSICS PERSONNEL	3	0	8		0.635	0.000	4.215	
SUPERVISORY PERSONNEL	23	4	18		14.153	0.085	5.411	
ENGINEERING PERSONNEL	14	0	5		0.549	0.000	0.917	
TOTAL	74	15	95	184	31.926	0.220	55.137	87.283
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	211 (60)	145 (63)	390 (159)	746 (282)	64.780	20.203	119.477	204.460
OPERATING PERSONNEL	183 (63)	0	12 (4)	195 (67)	71.601	0.000	5.340	76.941
HEALTH PHYSICS PERSONNEL	52 (20)	0	86 (40)	138 (60)	25.780	0.000	49.217	74.997
SUPERVISORY PERSONNEL	190 (61)	56 (20)	279 (88)	525 (169)	56.893	8.163	35.794	100.850
ENGINEERING PERSONNEL	120 (42)	25 (8)	32 (14)	177 (64)	16.372	1.726	7.783	25.881
GRAND TOTAL	756 (246)	226 (91)	799 (305)	1781 (642)	235.426	30.092	217.511	483.129

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

APPENDIX C

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

PLANT: INDIAN POINT 3

(PWR)

1983

NUMBER OF PERSONNEL (>100 M-REM)

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	5	0	1		2.300	0.000	1.300	
OPERATING PERSONNEL	18	0	0		12.500	0.000	0.100	
HEALTH PHYSICS PERSONNEL	14	0	11		10.200	0.100	4.400	
SUPERVISORY PERSONNEL	4	0	0		1.000	0.000	0.100	
ENGINEERING PERSONNEL	2	1	3		2.900	0.500	1.400	
TOTAL	43	1	15	59	28.900	0.600	7.300	36.800
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	12	0	14		6.200	0.000	9.900	
OPERATING PERSONNEL	4	0	0		2.000	0.000	0.100	
HEALTH PHYSICS PERSONNEL	10	0	30		9.000	0.000	25.600	
SUPERVISORY PERSONNEL	1	0	0		0.200	0.000	0.100	
ENGINEERING PERSONNEL	0	0	0		0.200	0.400	0.100	
TOTAL	27	0	44	71	17.600	0.400	35.800	53.800
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	0	24		1.300	0.000	15.600	
OPERATING PERSONNEL	2	0	2		3.100	0.000	0.700	
HEALTH PHYSICS PERSONNEL	4	0	1		1.500	0.000	0.500	
SUPERVISORY PERSONNEL	2	0	0		4.000	0.100	0.200	
ENGINEERING PERSONNEL	7	1	6		8.200	1.500	2.300	
TOTAL	16	1	33	50	18.100	1.600	19.300	39.000
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	43	0	339		22.300	0.000	399.700	
OPERATING PERSONNEL	11	0	5		3.600	0.000	5.600	
HEALTH PHYSICS PERSONNEL	8	0	14		2.700	0.000	4.100	
SUPERVISORY PERSONNEL	8	0	3		3.100	0.000	1.300	
ENGINEERING PERSONNEL	10	0	3		6.100	0.800	2.000	
TOTAL	80	0	364	444	37.800	0.800	412.700	451.300
WASTE PROCESSING								
MAINTENANCE PERSONNEL	3	0	3		1.300	0.000	2.500	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	1		2.600	0.000	0.300	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.100	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	5	0	4	9	3.900	0.000	2.900	6.800
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	64	0	381	445	33.400	0.000	429.000	462.400
OPERATING PERSONNEL	35	0	7	42	21.200	0.000	6.500	27.700
HEALTH PHYSICS PERSONNEL	38	0	57	95	26.000	0.100	34.900	61.000
SUPERVISORY PERSONNEL	15	0	3	18	8.300	0.100	1.800	10.200
ENGINEERING PERSONNEL	19	2	12	33	17.400	3.200	5.800	26.400
GRAND TOTAL	171	2	460	633	106.300	3.400	478.000	587.700

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APPENDIX C

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

PLANT: *KEWAUNEE

(PWR)

1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	6	0	14		2.494	0.000	3.081	
OPERATING PERSONNEL	9	0	1		2.785	0.000	0.147	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	5	0	0		0.808	0.000	0.000	
ENGINEERING PERSONNEL	4	1	1		0.172	0.000	0.080	
TOTAL	24	1	16	41	6.259	0.000	3.308	9.567
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	38	15	58		7.414	4.831	12.073	
OPERATING PERSONNEL	9	0	4		1.728	0.000	1.240	
HEALTH PHYSICS PERSONNEL	20	0	10		9.770	0.000	7.983	
SUPERVISORY PERSONNEL	3	0	12		0.118	0.000	2.047	
ENGINEERING PERSONNEL	3	1	3		0.210	0.000	1.362	
TOTAL	73	16	87	176	19.240	4.831	24.705	48.776
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	2	0	56		0.306	0.000	27.843	
OPERATING PERSONNEL	0	0	7		0.000	0.000	0.496	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	1	0	1		0.222	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.003	0.000	0.000	
TOTAL	4	0	64	68	0.531	0.000	28.339	28.870
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	36	12	103		3.221	0.698	50.280	
OPERATING PERSONNEL	2	0	1		0.001	0.000	0.039	
HEALTH PHYSICS PERSONNEL	5	0	0		0.114	0.000	0.000	
SUPERVISORY PERSONNEL	1	0	4		0.046	0.000	1.678	
ENGINEERING PERSONNEL	3	4	3		0.083	1.527	1.425	
TOTAL	47	16	111	174	3.465	2.225	53.422	59.112
WASTE PROCESSING								
MAINTENANCE PERSONNEL	16	7	7		0.432	0.049	1.368	
OPERATING PERSONNEL	2	0	1		3.152	0.000	0.596	
HEALTH PHYSICS PERSONNEL	5	0	0		0.880	0.000	0.000	
SUPERVISORY PERSONNEL	1	0	0		0.054	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	24	7	8	39	4.518	0.049	1.964	6.531
REFUELING								
MAINTENANCE PERSONNEL	28	11	11		2.289	1.463	6.929	
OPERATING PERSONNEL	3	0	2		0.106	0.000	0.672	
HEALTH PHYSICS PERSONNEL	3	0	0		0.564	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.068	0.000	0.000	
TOTAL	35	11	13	59	3.027	1.463	7.601	12.091
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	126	45	249	420	16.156	7.041	101.574	124.771
OPERATING PERSONNEL	25	0	16	41	7.772	0.000	3.190	10.962
HEALTH PHYSICS PERSONNEL	33	0	10	43	11.328	0.000	7.983	19.311
SUPERVISORY PERSONNEL	11	0	17	28	1.248	0.000	3.725	4.973
ENGINEERING PERSONNEL	12	6	7	25	0.536	1.527	2.867	4.930
GRAND TOTAL	207	51	299	557	37.040	8.568	119.339	164.947

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* Workers may be counted in more than one category.

APPENDIX C

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
1983

PLANT: LACROSSE

(BWR)

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	1	0	0		0.161	0.000	0.247	
OPERATING PERSONNEL	21	0	0		61.608	0.000	0.000	
HEALTH PHYSICS PERSONNEL	8	0	0		20.010	0.000	0.000	
SUPERVISORY PERSONNEL	22	0	0		16.617	0.000	0.000	
ENGINEERING PERSONNEL	6	0	0		4.496	0.000	0.000	
TOTAL	58	0	0	58	102.892	0.000	0.247	103.139
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	20	12	3		57.226	20.182	1.796	
OPERATING PERSONNEL	21	0	0		14.826	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	0		0.841	0.000	0.000	
SUPERVISORY PERSONNEL	9	0	0		7.504	0.000	0.120	
ENGINEERING PERSONNEL	6	0	0		7.043	0.000	0.014	
TOTAL	60	12	3	75	87.440	20.182	1.930	109.552
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	0	7		0.555	0.043	17.810	
OPERATING PERSONNEL	0	0	0		0.089	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	6	0	3		5.079	0.000	4.295	
ENGINEERING PERSONNEL	2	0	2		0.656	0.000	0.429	
TOTAL	9	0	12	21	6.379	0.043	22.534	28.956
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	16	7	6		16.275	6.478	1.520	
OPERATING PERSONNEL	12	0	0		3.467	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	0		0.621	0.000	0.000	
SUPERVISORY PERSONNEL	10	0	2		5.065	0.000	0.688	
ENGINEERING PERSONNEL	2	0	3		0.957	0.000	3.537	
TOTAL	44	7	11	62	26.385	6.478	5.745	38.608
WASTE PROCESSING								
MAINTENANCE PERSONNEL	8	2	0		2.568	0.819	0.000	
OPERATING PERSONNEL	6	0	0		2.997	0.000	0.000	
HEALTH PHYSICS PERSONNEL	7	0	0		4.174	0.000	0.000	
SUPERVISORY PERSONNEL	3	0	0		4.699	0.000	0.000	
ENGINEERING PERSONNEL	3	0	0		1.978	0.000	0.000	
TOTAL	27	2	0	29	16.416	0.819	0.000	17.235
REFUELING								
MAINTENANCE PERSONNEL	7	6	0		1.960	2.489	0.000	
OPERATING PERSONNEL	18	0	0		4.491	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	0		0.944	0.000	0.000	
SUPERVISORY PERSONNEL	9	0	0		5.010	0.000	0.000	
ENGINEERING PERSONNEL	3	0	2		2.225	0.000	0.292	
TOTAL	41	6	2	49	14.630	2.489	0.292	17.411
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	53 (20)	27 (12)	16 (7)	96 (39)	78.745	30.011	21.373	130.129
OPERATING PERSONNEL	78 (21)	0	0	78 (21)	87.478	0.000	0.000	87.478
HEALTH PHYSICS PERSONNEL	27 (8)	0	0	27 (8)	26.590	0.000	0.000	26.590
SUPERVISORY PERSONNEL	59 (22)	0	5 (3)	64 (25)	43.974	0.000	5.103	49.077
ENGINEERING PERSONNEL	22 (6)	0	7 (3)	29 (9)	17.355	0.000	4.272	21.627
GRAND TOTAL	239 (77)	27 (12)	28 (13)	294 (102)	254.142	30.011	30.748	314.901

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

APPENDIX C

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
1983

PLANT: MAINE YANKEE

(PWR)

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	STATION EMPLOYEES	TOTAL MAN-REMS		TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS			UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	3	0	3		1.640	0.000	0.705	
OPERATING PERSONNEL	33	0	0		11.520	0.000	0.010	
HEALTH PHYSICS PERSONNEL	15	0	2		7.420	0.000	0.785	
SUPERVISORY PERSONNEL	11	0	0		4.750	0.010	0.430	
ENGINEERING PERSONNEL	13	0	9		3.740	0.000	5.270	
TOTAL	75	0	14	89	29.070	0.010	7.200	36.280
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	25	0	118		23.012	0.000	50.984	
OPERATING PERSONNEL	15	0	0		4.110	0.000	0.000	
HEALTH PHYSICS PERSONNEL	5	0	0		1.390	0.000	0.000	
SUPERVISORY PERSONNEL	29	0	0		19.550	0.015	0.290	
ENGINEERING PERSONNEL	7	0	7		2.260	0.000	2.160	
TOTAL	81	0	125	206	50.322	0.015	53.434	103.771
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	1		0.000	0.000	0.420	
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		0.005	0.000	0.035	
TOTAL	0	0	1	1	0.005	0.000	0.455	0.460
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	4	0	6		0.940	0.000	2.585	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.020	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.105	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.045	0.000	0.015	
TOTAL	4	0	6	10	1.110	0.000	2.600	3.710
WASTE PROCESSING								
MAINTENANCE PERSONNEL	1	0	2		0.405	0.000	0.495	
OPERATING PERSONNEL	2	0	0		0.750	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	0		0.580	0.000	0.000	
SUPERVISORY PERSONNEL	1	0	0		0.470	0.000	0.020	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.005	
TOTAL	5	0	2	7	2.205	0.000	0.520	2.725
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.075	0.000	0.055	
OPERATING PERSONNEL	0	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		0.025	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.060	0.000	0.000	
TOTAL	0	0	0	0	0.165	0.000	0.055	0.220
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	33	0	130	163	26.072	0.000	55.244	81.316
OPERATING PERSONNEL	50	0	0	50	16.385	0.000	0.010	16.395
HEALTH PHYSICS PERSONNEL	21	0	2	23	9.410	0.000	0.785	10.195
SUPERVISORY PERSONNEL	41	0	0	41	24.900	0.025	0.740	25.665
ENGINEERING PERSONNEL	20	0	16	36	6.110	0.000	7.485	13.595
GRAND TOTAL	165	0	148	313	82.877	0.025	64.264	147.166

PLANT: * MCGUIRE	NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION							
	1983				1983			
	NUMBER OF PERSONNEL (>100 M-REM)				TOTAL MAN-REMS			
WORK & JOB FUNCTION	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	93	11	47		2.550	0.105	1.000	
OPERATING PERSONNEL	74	214	8		5.235	2.615	0.265	
HEALTH PHYSICS PERSONNEL	85	1	63		11.750	0.020	13.090	
SUPERVISORY PERSONNEL	5	0	0		0.330	0.000	0.000	
ENGINEERING PERSONNEL	30	11	9		0.810	0.245	0.215	
TOTAL	287	237	127	651	20.675	2.985	14.570	38.230
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	113	23	55		26.145	2.470	7.572	
OPERATING PERSONNEL	76	352	17		8.105	63.275	2.005	
HEALTH PHYSICS PERSONNEL	75	1	59		5.380	0.055	7.335	
SUPERVISORY PERSONNEL	6	0	0		0.610	0.000	0.000	
ENGINEERING PERSONNEL	47	25	47		6.980	2.205	1.893	
TOTAL	317	401	178	896	47.220	68.005	18.805	134.030
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	29	3	2		1.900	0.200	0.000	
OPERATING PERSONNEL	7	74	2		0.085	9.090	0.110	
HEALTH PHYSICS PERSONNEL	43	1	32		1.660	0.025	2.120	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	30	7	14		1.775	0.340	5.025	
TOTAL	109	85	50	244	5.420	9.655	7.255	22.330
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	74	17	32		14.545	1.040	6.045	
OPERATING PERSONNEL	43	312	11		3.065	177.984	1.235	
HEALTH PHYSICS PERSONNEL	66	1	58		15.765	0.055	20.198	
SUPERVISORY PERSONNEL	2	0	0		0.575	0.000	0.000	
ENGINEERING PERSONNEL	42	15	52		10.350	2.095	41.757	
TOTAL	227	345	153	725	44.300	181.174	69.235	294.709
WASTE PROCESSING								
MAINTENANCE PERSONNEL	49	3	41		1.545	0.040	15.435	
OPERATING PERSONNEL	28	58	6		2.075	0.790	1.375	
HEALTH PHYSICS PERSONNEL	67	0	48		10.400	0.000	1.867	
SUPERVISORY PERSONNEL	3	0	0		1.655	0.000	0.000	
ENGINEERING PERSONNEL	12	0	1		0.100	0.000	0.005	
TOTAL	159	61	96	316	15.775	0.830	18.682	35.287
REFUELING								
MAINTENANCE PERSONNEL	54	1	15		20.095	0.200	0.310	
OPERATING PERSONNEL	25	40	4		1.805	3.795	0.340	
HEALTH PHYSICS PERSONNEL	53	1	29		4.670	0.000	2.725	
SUPERVISORY PERSONNEL	3	0	0		1.545	0.000	0.000	
ENGINEERING PERSONNEL	23	3	6		1.850	0.050	1.265	
TOTAL	158	45	54	257	29.965	4.045	4.640	38.650
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	412 (116)	58 (20)	192 (55)	662 (191)	66.780	4.055	30.362	101.197
OPERATING PERSONNEL	253 (80)	1050 (356)	48 (20)	1351 (456)	20.370	257.549	5.330	283.249
HEALTH PHYSICS PERSONNEL	389 (86)	5 (1)	289 (63)	683 (150)	49.625	0.155	47.335	97.115
SUPERVISORY PERSONNEL	19 (6)	0 (0)	0 (0)	19 (6)	4.715	0.000	0.000	4.715
ENGINEERING PERSONNEL	184 (55)	61 (19)	129 (65)	374 (139)	21.865	4.935	50.160	76.960
GRAND TOTAL	1257 (343)	1174 (396)	658 (203)	3089 (942)	163.355	266.694	133.187	563.236

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

APPENDIX C

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

PLANT: *MILLSTONE 1

(BWR)

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	STATION EMPLOYEES	TOTAL MAN-REMS		TOTAL MAN-REMS
	STATION	UTILITY	CONTRACT			UTILITY	CONTRACT	
	EMPLOYEES	EMPLOYEES	& OTHERS			EMPLOYEES	& OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	19	0	1		7.660	0.120	0.460	
OPERATING PERSONNEL	51	0	0		48.560	0.000	0.130	
HEALTH PHYSICS PERSONNEL	22	0	4		8.690	0.010	1.840	
SUPERVISORY PERSONNEL	1	0	0		0.130	0.000	0.050	
ENGINEERING PERSONNEL	3	0	0		1.040	0.200	0.200	
TOTAL	96	0	5	101	66.080	0.330	2.680	69.090
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	52	1	17		50.610	0.600	6.160	
OPERATING PERSONNEL	16	0	3		4.710	0.000	2.430	
HEALTH PHYSICS PERSONNEL	15	0	9		7.470	0.010	3.660	
SUPERVISORY PERSONNEL	0	0	1		0.010	0.000	0.190	
ENGINEERING PERSONNEL	9	9	2		2.420	3.060	1.170	
TOTAL	92	10	32	134	65.220	3.670	13.610	82.500
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	0		0.100	0.000	0.110	
OPERATING PERSONNEL	0	0	0		0.060	0.000	0.030	
HEALTH PHYSICS PERSONNEL	0	0	0		0.200	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	2	0	2		0.800	0.270	0.380	
TOTAL	2	0	2	4	1.160	0.270	0.520	1.950
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	34	33	134		14.410	17.400	53.120	
OPERATING PERSONNEL	3	0	7		0.970	0.010	2.320	
HEALTH PHYSICS PERSONNEL	14	0	3		5.540	0.010	1.020	
SUPERVISORY PERSONNEL	0	0	2		0.000	0.000	0.740	
ENGINEERING PERSONNEL	4	3	4		1.460	2.030	1.360	
TOTAL	55	36	150	241	22.380	19.450	58.560	100.390
WASTE PROCESSING								
MAINTENANCE PERSONNEL	3	0	8		0.630	0.000	3.920	
OPERATING PERSONNEL	7	0	0		1.840	0.000	0.000	
HEALTH PHYSICS PERSONNEL	6	0	5		2.950	0.000	1.460	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.250	0.000	0.010	
TOTAL	16	0	13	29	5.670	0.000	5.390	11.060
REFUELING								
MAINTENANCE PERSONNEL	2	0	2		0.630	0.000	0.000	
OPERATING PERSONNEL	1	0	1		0.260	0.000	0.040	
HEALTH PHYSICS PERSONNEL	0	0	0		0.270	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	2	0		0.250	0.910	0.060	
TOTAL	3	2	3	8	1.410	0.910	0.100	2.420
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	110	34	162	306	74.040	18.120	63.770	155.930
OPERATING PERSONNEL	78	0	11	89	56.400	0.010	6.950	61.360
HEALTH PHYSICS PERSONNEL	57	0	21	78	25.120	0.030	7.980	33.130
SUPERVISORY PERSONNEL	1	0	3	4	0.140	0.000	0.980	1.120
ENGINEERING PERSONNEL	18	14	8	40	6.220	6.470	3.180	15.870
GRAND TOTAL	264	48	205	517	161.920	24.630	80.860	267.410

*Workers may be counted in more than one category.

APPENDIX C

PLANT: *MILLSTONE 2	NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION							
	(PWR)				1983			
	NUMBER OF PERSONNEL (>100 M-REM)				TOTAL MAN-REMS			
WORK & JOB FUNCTION	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	9	0	11		4.320	0.960	6.720	
OPERATING PERSONNEL	54	0	2		48.730	0.030	0.910	
HEALTH PHYSICS PERSONNEL	24	3	78		18.090	1.060	98.110	
SUPERVISORY PERSONNEL	0	0	0		0.100	0.030	0.030	
ENGINEERING PERSONNEL	11	5	2		5.290	2.030	1.440	
TOTAL	98	8	93	199	76.530	4.110	107.210	187.850
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	70	22	205		75.970	5.800	80.320	
OPERATING PERSONNEL	19	0	1		6.090	0.000	0.650	
HEALTH PHYSICS PERSONNEL	2	1	15		1.040	0.220	5.770	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.020	0.450	
ENGINEERING PERSONNEL	9	11	15		4.390	4.010	7.950	
TOTAL	100	34	237	371	87.490	10.050	95.140	192.680
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	13	0	222		4.770	0.170	233.450	
OPERATING PERSONNEL	1	0	5		0.620	0.000	2.580	
HEALTH PHYSICS PERSONNEL	3	0	10		2.050	0.000	4.070	
SUPERVISORY PERSONNEL	0	0	2		0.000	0.000	1.650	
ENGINEERING PERSONNEL	3	7	47		1.450	3.270	56.730	
TOTAL	20	7	286	313	8.890	3.440	298.480	310.810
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	69	33	574		65.130	12.480	669.610	
OPERATING PERSONNEL	17	0	73		4.630	0.020	79.000	
HEALTH PHYSICS PERSONNEL	7	1	26		2.880	0.220	17.070	
SUPERVISORY PERSONNEL	0	0	12		0.100	0.060	5.730	
ENGINEERING PERSONNEL	17	30	263		7.450	13.950	382.340	
TOTAL	110	64	948	1122	80.190	26.730	1153.750	1260.670
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	29		0.180	0.000	20.040	
OPERATING PERSONNEL	10	0	0		3.190	0.000	0.020	
HEALTH PHYSICS PERSONNEL	6	0	16		7.990	0.020	11.320	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.030	
ENGINEERING PERSONNEL	0	0	2		0.140	0.030	0.530	
TOTAL	16	0	47	63	11.500	0.050	31.940	43.490
REFUELING								
MAINTENANCE PERSONNEL	68	8	22		45.880	5.320	10.260	
OPERATING PERSONNEL	22	0	1		5.590	0.040	0.290	
HEALTH PHYSICS PERSONNEL	0	0	10		0.010	0.000	3.480	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	7	0	29		2.070	0.200	8.270	
TOTAL	97	8	62	167	53.550	5.560	22.300	81.410
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	229	63	1063	1355	196.250	24.730	1020.400	1241.380
OPERATING PERSONNEL	123	0	82	205	68.850	0.090	83.450	152.390
HEALTH PHYSICS PERSONNEL	42	5	155	202	32.060	1.520	139.820	173.400
SUPERVISORY PERSONNEL	0	0	15	15	0.200	0.110	7.890	8.200
ENGINEERING PERSONNEL	47	53	358	458	20.790	23.490	457.260	501.540
GRAND TOTAL	441	121	1673	2235	318.150	49.940	1708.820	2076.910

*Workers may be counted in more than one category.

PLANT: †MONTICELLO (BWR) NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION 1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	39	28	38		9.102	1.546	0.310	
OPERATING PERSONNEL	46	0	0		20.384	0.000	0.000	
HEALTH PHYSICS PERSONNEL	17	17	5		7.283	0.000	0.965	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	16	7	24		3.414	0.828	4.242	
TOTAL	118	52	67	237	40.183	2.374	5.517	48.074
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	39	31	22		15.813	8.720	2.988	
OPERATING PERSONNEL	29	0	0		2.021	0.000	0.000	
HEALTH PHYSICS PERSONNEL	13	13	6		2.201	0.000	1.981	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	14	2	12		1.113	0.335	1.995	
TOTAL	95	46	40	181	21.148	9.125	6.964	37.237
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	0	0		0.004	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	1	0	1		0.016	0.000	0.000	
TOTAL	2	0	1	3	0.020	0.000	0.000	0.020
SPECIAL MAINTENANCE**								
MAINTENANCE PERSONNEL	0	21	23		0.000	0.873	4.045	
OPERATING PERSONNEL	1	0	0		0.005	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	1	0		0.022	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	22	23	47	0.027	0.873	4.045	4.945
WASTE PROCESSING								
MAINTENANCE PERSONNEL	28	18	0		3.939	1.424	0.000	
OPERATING PERSONNEL	41	0	0		2.703	0.000	0.000	
HEALTH PHYSICS PERSONNEL	9	9	3		0.880	0.000	0.152	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	5	0	3		0.359	0.000	2.898	
TOTAL	83	27	6	116	7.881	1.424	3.050	12.355
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	107	98	83	288	28.858	12.633	7.343	48.834
OPERATING PERSONNEL	117	0	0	117	25.113	0.000	0.000	25.113
HEALTH PHYSICS PERSONNEL	40	40	14	94	10.386	0.000	3.098	13.484
SUPERVISORY PERSONNEL	0	0	0	0	0.000	0.000	0.000	0.000
ENGINEERING PERSONNEL	36	9	40	85	4.902	1.163	9.135	15.200
GRAND TOTAL	300	147	137	584	69.259	13.796	19.576	102.631

* Workers may be counted in more than one category.

** Includes torus mods., installation of combustable gas control system, turbine building addition and maintenance performed in primary containment during shutdown.

APPENDIX C

PLANT: † NINE MILE POINT (BWR) NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION 1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	STATION EMPLOYEES	TOTAL MAN-REMS		TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS			UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	137	23	67		11.316	0.634	2.317	
OPERATING PERSONNEL	171	22	135		13.121	0.643	4.202	
HEALTH PHYSICS PERSONNEL	57	2	25		8.268	0.166	3.611	
SUPERVISORY PERSONNEL	34	0	9		3.851	0.000	0.177	
ENGINEERING PERSONNEL	16	16	37		0.705	0.112	1.280	
TOTAL	415	63	273	751	37.261	1.555	11.587	50.403
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	122	11	106		23.096	0.219	6.529	
OPERATING PERSONNEL	75	10	67		2.872	0.177	3.780	
HEALTH PHYSICS PERSONNEL	38	1	17		2.884	0.076	1.552	
SUPERVISORY PERSONNEL	14	0	8		0.690	0.000	1.851	
ENGINEERING PERSONNEL	19	8	23		0.664	0.171	1.720	
TOTAL	268	30	221	519	30.206	0.643	15.432	46.281
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	38	3	20		2.963	1.585	1.842	
OPERATING PERSONNEL	15	0	28		0.302	0.000	3.389	
HEALTH PHYSICS PERSONNEL	11	0	5		0.119	0.000	0.330	
SUPERVISORY PERSONNEL	6	0	5		0.235	0.000	0.285	
ENGINEERING PERSONNEL	4	3	15		0.061	0.030	2.516	
TOTAL	74	6	73	153	3.680	1.615	8.362	13.657
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	752	98	855		114.038	12.838	366.661	
OPERATING PERSONNEL	439	39	450		20.767	0.658	89.748	
HEALTH PHYSICS PERSONNEL	205	2	87		21.685	0.026	12.381	
SUPERVISORY PERSONNEL	99	0	38		6.896	0.000	4.521	
ENGINEERING PERSONNEL	89	42	156		7.622	1.503	43.256	
TOTAL	1584	181	1586	3351	171.008	15.025	516.567	702.600
WASTE PROCESSING								
MAINTENANCE PERSONNEL	88	7	33		8.355	0.490	1.810	
OPERATING PERSONNEL	45	1	46		4.415	0.304	19.084	
HEALTH PHYSICS PERSONNEL	39	0	32		5.260	0.000	8.866	
SUPERVISORY PERSONNEL	6	0	5		0.239	0.000	1.272	
ENGINEERING PERSONNEL	9	2	11		0.050	0.006	1.740	
TOTAL	187	10	127	324	18.319	0.800	32.772	51.891
REFUELING								
MAINTENANCE PERSONNEL	77	4	11		4.684	0.055	0.087	
OPERATING PERSONNEL	50	1	32		2.863	0.001	0.573	
HEALTH PHYSICS PERSONNEL	30	1	5		0.824	0.005	0.116	
SUPERVISORY PERSONNEL	23	0	4		0.765	0.000	0.086	
ENGINEERING PERSONNEL	13	4	9		0.230	0.012	0.137	
TOTAL	193	10	61	264	9.366	0.073	0.999	10.438
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	1214	146	1092	2452	164.452	15.821	379.246	559.519
OPERATING PERSONNEL	795	73	758	1626	44.340	1.783	120.776	166.899
HEALTH PHYSICS PERSONNEL	380	6	171	557	39.040	0.273	26.856	66.169
SUPERVISORY PERSONNEL	182	0	69	251	12.676	0.000	8.192	20.868
ENGINEERING PERSONNEL	150	75	251	476	9.332	1.834	50.649	61.815
GRAND TOTAL	2721	300	2341	5362	269.840	19.711	585.719	875.270

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* Workers may be counted in more than one category.

APPENDIX C

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

PLANT: * NORTH ANNA 1,2 (PWR) 1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	162	15	177		14.607	0.170	15.477	
OPERATING PERSONNEL	224	5	11		42.961	0.032	3.674	
HEALTH PHYSICS PERSONNEL	49	0	73		40.191	0.000	5.468	
SUPERVISORY PERSONNEL	42	1	5		2.453	0.002	0.054	
ENGINEERING PERSONNEL	41	13	42		0.833	0.274	0.543	
TOTAL	518	34	308	860	101.045	0.478	25.216	126.739
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	150	17	227		121.046	3.004	42.880	
OPERATING PERSONNEL	116	0	18		28.881	0.000	2.871	
HEALTH PHYSICS PERSONNEL	41	1	73		15.244	0.010	22.672	
SUPERVISORY PERSONNEL	22	2	1		2.555	0.407	0.125	
ENGINEERING PERSONNEL	19	7	39		0.651	0.065	2.967	
TOTAL	348	27	358	733	168.377	3.486	71.515	243.378
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	31	2	73		2.109	0.085	39.547	
OPERATING PERSONNEL	15	0	3		0.481	0.000	0.038	
HEALTH PHYSICS PERSONNEL	8	0	30		0.255	0.000	3.838	
SUPERVISORY PERSONNEL	1	0	1		0.052	0.000	0.010	
ENGINEERING PERSONNEL	3	2	4		0.171	0.110	0.143	
TOTAL	58	4	111	173	3.068	0.195	43.576	46.839
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	71	9	276		13.327	0.579	104.225	
OPERATING PERSONNEL	30	1	4		4.866	0.010	0.403	
HEALTH PHYSICS PERSONNEL	27	0	36		5.579	0.000	8.038	
SUPERVISORY PERSONNEL	5	0	1		0.426	0.000	9.335	
ENGINEERING PERSONNEL	17	4	15		0.917	0.030	4.288	
TOTAL	150	14	332	496	25.115	0.619	126.289	152.023
WASTE PROCESSING								
MAINTENANCE PERSONNEL	42	1	72		6.230	0.172	14.411	
OPERATING PERSONNEL	55	0	0		14.048	0.000	3.617	
HEALTH PHYSICS PERSONNEL	36	0	35		15.362	0.000	1.295	
SUPERVISORY PERSONNEL	5	1	0		1.416	0.015	0.000	
ENGINEERING PERSONNEL	6	1	0		0.188	0.005	0.000	
TOTAL	144	3	107	254	37.244	0.192	19.323	56.759
REFUELING								
MAINTENANCE PERSONNEL	53	3	17		17.087	1.009	0.683	
OPERATING PERSONNEL	43	1	2		3.135	0.011	0.070	
HEALTH PHYSICS PERSONNEL	14	0	30		0.835	0.000	2.200	
SUPERVISORY PERSONNEL	7	3	0		0.459	0.112	0.000	
ENGINEERING PERSONNEL	4	7	13		0.135	0.274	1.411	
TOTAL	121	14	62	197	21.651	1.406	4.364	27.421
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	509	47	842	1398	174.406	5.019	217.223	396.648
OPERATING PERSONNEL	483	7	38	528	94.372	0.053	10.673	105.098
HEALTH PHYSICS PERSONNEL	175	1	277	453	77.466	0.010	43.511	120.987
SUPERVISORY PERSONNEL	82	7	8	97	7.361	0.536	9.524	17.421
ENGINEERING PERSONNEL	90	34	113	237	2.895	0.758	9.352	13.005
GRAND TOTAL	1339	96	1278	2713	356.500	6.376	290.283	653.159

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* Workers may be counted in more than one category.

APPENDIX C

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
1983

PLANT: OCONEE 1,2,3

(PWR)

NUMBER OF PERSONNEL (>100 M-REM)

TOTAL MAN-REMS

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	74	3	22		1.500	0.045	0.100	
OPERATING PERSONNEL	144	45	6		57.555	1.690	0.680	
HEALTH PHYSICS PERSONNEL	66	1	67		14.985	0.035	3.680	
SUPERVISORY PERSONNEL	6	0	0		0.470	0.000	0.000	
ENGINEERING PERSONNEL	62	9	5		12.225	0.710	0.090	
TOTAL	352	58	100	510	86.735	2.480	4.550	
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	232	8	130		183.965	1.430	102.775	
OPERATING PERSONNEL	130	278	4		27.010	86.990	0.250	
HEALTH PHYSICS PERSONNEL	63	1	73		22.730	0.070	55.080	
SUPERVISORY PERSONNEL	29	0	0		15.025	0.000	0.000	
ENGINEERING PERSONNEL	75	12	29		13.245	1.530	14.025	
TOTAL	529	299	236	1064	261.975	90.020	172.130	
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	55	0	35		3.935	0.000	16.435	
OPERATING PERSONNEL	8	121	1		0.125	43.125	0.055	
HEALTH PHYSICS PERSONNEL	10	0	58		0.410	0.000	7.840	
SUPERVISORY PERSONNEL	1	0	0		0.310	0.000	0.000	
ENGINEERING PERSONNEL	53	6	50		14.060	2.825	27.830	
TOTAL	127	127	144	398	18.840	45.950	52.160	
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	181	9	100		51.805	2.010	43.105	
OPERATING PERSONNEL	48	350	9		3.075	273.325	3.015	
HEALTH PHYSICS PERSONNEL	33	0	65		3.665	0.000	17.640	
SUPERVISORY PERSONNEL	6	0	0		0.740	0.000	0.000	
ENGINEERING PERSONNEL	64	19	33		18.995	4.230	13.100	
TOTAL	332	378	207	917	78.280	279.565	76.860	
WASTE PROCESSING								
MAINTENANCE PERSONNEL	41	0	43		2.570	0.000	7.705	
OPERATING PERSONNEL	23	12	8		6.140	0.890	4.720	
HEALTH PHYSICS PERSONNEL	29	0	22		10.335	0.000	2.775	
SUPERVISORY PERSONNEL	1	0	0		0.070	0.000	0.000	
ENGINEERING PERSONNEL	13	0	0		3.355	0.000	0.000	
TOTAL	107	12	73	192	22.470	0.890	15.200	
REFUELING								
MAINTENANCE PERSONNEL	137	1	37		39.720	0.105	5.945	
OPERATING PERSONNEL	108	37	2		14.635	3.075	0.050	
HEALTH PHYSICS PERSONNEL	17	0	56		0.515	0.000	7.065	
SUPERVISORY PERSONNEL	3	0	0		0.350	0.000	0.000	
ENGINEERING PERSONNEL	27	2	18		3.150	0.255	2.260	
TOTAL	292	40	113	445	58.370	3.435	15.320	
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	720 (234)	21 (9)	367 (175)	1108 (418)	283.495	3.590	176.065	463.150
OPERATING PERSONNEL	461 (150)	843 (397)	30 (21)	1334 (568)	108.540	409.095	8.770	526.405
HEALTH PHYSICS PERSONNEL	218 (66)	2 (1)	341 (77)	561 (144)	52.640	0.105	94.080	146.825
SUPERVISORY PERSONNEL	46 (29)	0	0	46 (29)	16.965	0.000	0.000	16.965
ENGINEERING PERSONNEL	294 (96)	48 (24)	135 (81)	477 (201)	65.030	9.550	57.305	131.885
GRAND TOTAL	1739 (575)	914 (431)	873 (354)	3526 (1360)	526.670	422.340	336.220	1285.230 **

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

** NRC mandated work contributed 57 man-rems.

APPENDIX C

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
1983

PLANT: *OYSTER CREEK	(BWR)	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	STATION EMPLOYEES	TOTAL MAN-REMS		TOTAL MAN-REMS
		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS			UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.									
MAINTENANCE PERSONNEL	104	35	328		10.943	1.232	31.901		
OPERATING PERSONNEL	111	1	5		13.533	0.050	0.510		
HEALTH PHYSICS PERSONNEL	14	0	7		1.010	0.000	0.230		
SUPERVISORY PERSONNEL	29	0	0		1.778	0.000	0.000		
ENGINEERING PERSONNEL	23	0	11		2.177	0.000	2.848		
TOTAL	281	36	351	668	29.441	1.282	35.489		66.212
ROUTINE MAINTENANCE									
MAINTENANCE PERSONNEL	197	46	1091		96.971	3.944	714.446		
OPERATING PERSONNEL	167	1	22		49.246	0.220	3.537		
HEALTH PHYSICS PERSONNEL	58	0	136		59.408	0.000	88.573		
SUPERVISORY PERSONNEL	71	1	0		8.761	0.044	0.000		
ENGINEERING PERSONNEL	60	0	35		4.510	0.000	5.274		
TOTAL	553	48	1284	1885	218.896	4.208	811.830		1034.934
IN-SERVICE INSPECTION									
MAINTENANCE PERSONNEL	29	2	244		1.040	0.000	177.000		
OPERATING PERSONNEL	20	0	1		4.411	0.000	0.090		
HEALTH PHYSICS PERSONNEL	8	0	13		0.475	0.000	0.355		
SUPERVISORY PERSONNEL	2	0	0		0.000	0.000	0.000		
ENGINEERING PERSONNEL	4	0	6		0.375	0.000	0.863		
TOTAL	63	2	264	329	6.301	0.000	178.308		184.609
SPECIAL MAINTENANCE									
MAINTENANCE PERSONNEL	152	51	1321		51.531	17.764	793.379		
OPERATING PERSONNEL	94	1	10		14.124	0.503	2.027		
HEALTH PHYSICS PERSONNEL	40	0	105		23.368	0.000	43.085		
SUPERVISORY PERSONNEL	32	1	0		3.696	0.082	0.000		
ENGINEERING PERSONNEL	29	0	18		2.686	0.000	3.537		
TOTAL	347	53	1454	1854	95.405	18.349	842.028		955.782
WASTE PROCESSING									
MAINTENANCE PERSONNEL	80	1	152		2.512	0.000	27.593		
OPERATING PERSONNEL	15	1	5		1.119	0.005	1.149		
HEALTH PHYSICS PERSONNEL	22	0	29		1.952	0.000	3.008		
SUPERVISORY PERSONNEL	8	0	0		0.482	0.000	0.000		
ENGINEERING PERSONNEL	3	0	2		0.095	0.000	0.155		
TOTAL	128	2	188	318	6.160	0.005	31.905		38.070
REFUELING									
MAINTENANCE PERSONNEL	82	5	50		13.763	0.004	1.598		
OPERATING PERSONNEL	68	0	1		5.222	0.000	0.068		
HEALTH PHYSICS PERSONNEL	18	0	19		0.767	0.000	0.945		
SUPERVISORY PERSONNEL	14	0	0		1.797	0.000	0.000		
ENGINEERING PERSONNEL	12	0	0		0.673	0.000	0.000		
TOTAL	194	5	70	269	22.222	0.004	2.611		24.837
TOTAL BY JOB FUNCTION									
MAINTENANCE PERSONNEL	644 (207)	140 (52)	3186 (1533)	3970 (1792)	176.760	22.944	1745.917		1945.621
OPERATING PERSONNEL	475 (177)	4 (1)	44 (26)	523 (204)	87.655	0.778	7.381		95.814
HEALTH PHYSICS PERSONNEL	160 (60)	0	309 (137)	469 (197)	86.980	0.000	136.196		223.176
SUPERVISORY PERSONNEL	156 (76)	2 (1)	0	158 (77)	16.514	0.126	0.000		16.640
ENGINEERING PERSONNEL	131 (74)	0	72 (39)	203 (113)	10.516	0.000	12.677		23.193
GRAND TOTAL	1566 (594)	146 (54)	3611 (1735)	5323 (2383)	378.425	23.848	1902.171		2304.444

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

APPENDIX C

PLANT: PALISADES (PWR) NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION 1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	4	0	0		2.921	0.000	0.000	
OPERATING PERSONNEL	17	0	0		11.207	0.000	0.000	
HEALTH PHYSICS PERSONNEL	48	7	86		28.749	2.265	88.617	
SUPERVISORY PERSONNEL	0	0	0		0.024	0.421	0.000	
ENGINEERING PERSONNEL	1	0	0		0.868	0.000	0.021	
TOTAL	70	7	86	163	43.769	2.686	88.638	135.093
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	99	27	0		64.345	31.693	0.000	
OPERATING PERSONNEL	21	0	0		13.330	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	4		1.305	0.102	4.021	
SUPERVISORY PERSONNEL	4	0	0		2.842	0.000	0.000	
ENGINEERING PERSONNEL	0	3	39		0.000	3.373	30.354	
TOTAL	126	30	43	199	81.822	35.168	34.375	151.365
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	7	26	56		4.325	30.768	43.303	
OPERATING PERSONNEL	6	0	0		3.652	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	1		0.447	0.035	1.377	
SUPERVISORY PERSONNEL	1	0	0		0.474	0.000	0.000	
ENGINEERING PERSONNEL	0	3	0		0.000	3.301	0.000	
TOTAL	15	29	57	101	8.898	34.104	44.680	87.682
SPECIAL MAINTENANCE**								
MAINTENANCE PERSONNEL	21	80	173		13.378	95.164	133.933	
OPERATING PERSONNEL	16	0	0		10.714	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	1	8		2.558	0.202	7.886	
SUPERVISORY PERSONNEL	0	0	1		0.167	0.000	1.168	
ENGINEERING PERSONNEL	10	46	96		6.737	53.900	74.113	
TOTAL	51	127	278	456	33.554	149.266	217.100	399.920
WASTE PROCESSING								
MAINTENANCE PERSONNEL	3	11	24		1.831	13.027	18.335	
OPERATING PERSONNEL	11	0	0		7.226	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	1	8		2.558	0.202	7.884	
SUPERVISORY PERSONNEL	0	0	0		0.033	0.000	0.000	
ENGINEERING PERSONNEL	3	0	2		1.968	0.000	1.967	
TOTAL	21	12	34	67	13.616	13.229	28.186	55.031
REFUELING								
MAINTENANCE PERSONNEL	6	20	43		3.322	23.634	33.263	
OPERATING PERSONNEL	11	0	0		7.299	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	1		0.299	0.023	0.920	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	17		0.000	0.000	13.173	
TOTAL	18	20	61	99	10.920	23.657	47.356	81.933
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	140	164	296	600	90.122	194.286	228.834	513.242
OPERATING PERSONNEL	82	0	0	82	53.428	0.000	0.000	53.428
HEALTH PHYSICS PERSONNEL	60	9	108	177	35.916	2.829	110.705	149.450
SUPERVISORY PERSONNEL	5	0	1	6	3.540	0.421	1.168	5.129
ENGINEERING PERSONNEL	14	52	154	220	9.573	60.574	119.628	189.775
GRAND TOTAL	301	225	559	1085	192.579	258.110	460.335	911.024

** Includes steam generator tube removal and extensive steam generator tube repair.

APPENDIX C

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
1983

PLANT: *PEACH BOTTOM 2,3

(BWR)

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	STATION EMPLOYEES	TOTAL MAN-REMS		TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS			UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	2	57	110		2.151	28.619	29.098	
OPERATING PERSONNEL	61	7	51		53.701	3.008	12.846	
HEALTH PHYSICS PERSONNEL	78	11	64		71.766	6.433	53.588	
SUPERVISORY PERSONNEL	0	0	3		0.000	0.000	0.643	
ENGINEERING PERSONNEL	50	2	9		42.953	0.305	8.331	
TOTAL	191	77	237	505	170.571	38.365	104.506	313.442
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	6	483	1055		2.560	263.015	1100.594	
OPERATING PERSONNEL	8	4	12		1.427	0.658	5.192	
HEALTH PHYSICS PERSONNEL	30	6	39		13.799	1.189	27.312	
SUPERVISORY PERSONNEL	0	0	2		0.000	0.000	0.591	
ENGINEERING PERSONNEL	13	11	15		5.790	4.764	3.801	
TOTAL	57	504	1123	1624	23.576	269.626	1137.490	1430.692
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	8	97		0.000	2.684	53.375	
OPERATING PERSONNEL	1	0	1		0.116	0.000	0.229	
HEALTH PHYSICS PERSONNEL	0	0	1		0.000	0.000	0.285	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	1	2		0.000	0.130	1.108	
TOTAL	1	9	101	111	0.116	2.814	54.997	57.927
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	0	2	557		0.000	0.683	954.100	
OPERATING PERSONNEL	0	0	6		0.000	0.000	11.158	
HEALTH PHYSICS PERSONNEL	2	0	2		0.439	0.000	0.463	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	1	1		0.000	0.000	0.239	
TOTAL	2	3	566	571	0.439	0.683	965.960	967.082
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	5	53		0.000	0.612	11.600	
OPERATING PERSONNEL	3	0	0		2.125	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	5		0.762	0.000	0.731	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	1		0.000	0.000	0.127	
TOTAL	6	5	59	70	2.887	0.612	12.458	15.957
REFUELING								
MAINTENANCE PERSONNEL	0	10	66		0.000	2.455	17.146	
OPERATING PERSONNEL	2	0	1		0.619	0.000	0.188	
HEALTH PHYSICS PERSONNEL	0	0	3		0.000	0.000	0.992	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	2		0.000	0.000	0.404	
TOTAL	2	10	72	84	0.619	2.455	18.730	21.804
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	8 (7)	565(528)	1938(1376)	2511(1911)	4.711	298.068	2165.913	2468.692
OPERATING PERSONNEL	75 (67)	11 (11)	71 (66)	157 (144)	57.988	3.666	29.613	91.267
HEALTH PHYSICS PERSONNEL	113 (79)	17 (15)	114 (77)	244 (171)	86.766	7.622	83.371	177.759
SUPERVISORY PERSONNEL	0	0	5 (3)	5 (3)	0.000	0.000	1.234	1.234
ENGINEERING PERSONNEL	63 (52)	15 (15)	30 (26)	108 (93)	48.743	5.199	14.010	67.952
GRAND TOTAL	259 (205)	608 (569)	2158 (1548)	3025 (2322)	198.208	314.555	2294.141	2806.904

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

APPENDIX C

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
1983

PLANT: PILGRIM

(BWR)

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	78	13	717		15.070	2.650	85.080	
OPERATING PERSONNEL	70	0	0		24.630	0.000	0.000	
HEALTH PHYSICS PERSONNEL	54	1	70		14.400	0.080	5.790	
SUPERVISORY PERSONNEL	69	85	54		21.595	21.365	5.085	
ENGINEERING PERSONNEL	38	32	164		8.730	5.085	12.905	
TOTAL	309	131	1005	1445	84.425	29.180	108.860	
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	90	6	499		64.430	2.705	108.690	
OPERATING PERSONNEL	46	0	0		9.300	0.000	0.000	
HEALTH PHYSICS PERSONNEL	36	0	85		9.220	0.000	12.485	
SUPERVISORY PERSONNEL	44	17	26		15.795	2.145	3.345	
ENGINEERING PERSONNEL	23	3	76		7.340	0.345	11.670	
TOTAL	239	26	686	951	106.085	5.195	136.190	
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	66		0.000	0.000	27.245	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	12		0.295	0.000	4.740	
SUPERVISORY PERSONNEL	2	0	12		0.240	0.000	5.545	
ENGINEERING PERSONNEL	3	0	16		0.250	0.000	5.670	
TOTAL	6	0	106	112	0.785	0.000	43.200	
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	35	4	336		3.875	0.695	252.755	
OPERATING PERSONNEL	25	0	0		1.775	0.000	0.000	
HEALTH PHYSICS PERSONNEL	27	0	37		5.810	0.000	7.760	
SUPERVISORY PERSONNEL	18	5	15		2.925	0.180	1.880	
ENGINEERING PERSONNEL	8	1	44		1.065	0.070	11.535	
TOTAL	113	10	432	555	15.450	0.945	273.930	
WASTE PROCESSING								
MAINTENANCE PERSONNEL	48	2	35		9.305	0.080	8.060	
OPERATING PERSONNEL	14	0	0		11.545	0.000	0.000	
HEALTH PHYSICS PERSONNEL	24	0	29		5.400	0.000	7.465	
SUPERVISORY PERSONNEL	5	0	1		0.625	0.000	0.500	
ENGINEERING PERSONNEL	2	0	4		0.065	0.000	1.160	
TOTAL	93	2	69	164	26.940	0.080	17.185	
REFUELING								
MAINTENANCE PERSONNEL	50	2	19		15.775	0.790	1.605	
OPERATING PERSONNEL	28	0	0		1.265	0.000	0.000	
HEALTH PHYSICS PERSONNEL	8	0	18		0.120	0.000	1.715	
SUPERVISORY PERSONNEL	15	2	2		2.360	0.035	0.065	
ENGINEERING PERSONNEL	8	0	9		0.595	0.000	0.270	
TOTAL	109	4	48	161	20.115	0.825	3.655	
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	301 (136)	27 (16)	1672 (1289)	2000 (1441)	108.455	6.920	483.435	598.810
OPERATING PERSONNEL	183 (74)	0	0	183 (74)	48.515	0.000	0.000	48.515
HEALTH PHYSICS PERSONNEL	150 (62)	1 (1)	251 (135)	402 (198)	35.245	0.080	39.955	75.280
SUPERVISORY PERSONNEL	153 (91)	109 (100)	110 (88)	372 (279)	43.540	23.725	16.420	83.685
ENGINEERING PERSONNEL	82 (58)	36 (33)	313 (243)	431 (334)	18.045	5.500	43.210	66.755
GRAND TOTAL	869 (421)	173 (150)	2346 (1755)	3388 (2326)	253.800	36.225	583.020	873.045 **

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

** NRC mandated requirements (i.e., TMI modifications, torus modifications, pipe supports, scram discharge) contributed 245 man-rem.

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

Plant: TPOINT BEACH 1, 2 (PWR)

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (> 100 mrem)				TOTAL MAN-REMS			
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REM
Reactor Operations & Surv.								
Maintenance Personnel					0.000			
Operating Personnel					32.830			
Health Physics Personnel					42.180			
Supervisory Personnel					1.160			
Engineering Personnel					0.010			
TOTAL					76.180		2,380	78,560
Routine Maintenance								
Maintenance Personnel					27.360			
Operating Personnel					0.000			
Health Physics Personnel					0.000			
Supervisory Personnel					0.000			
Engineering Personnel					0.000			
TOTAL					27.360		0,000	27,360
In-Service Inspection								
Maintenance Personnel					3.970			
Operating Personnel					9.870			
Health Physics Personnel					0.000			
Supervisory Personnel					2.930			
Engineering Personnel					0.280			
TOTAL					17.050		32,560	49,610
Special Maintenance								
Maintenance Personnel					34.655			
Operating Personnel					0.000			
Health Physics Personnel					0.000			
Supervisory Personnel					0.000			
Engineering Personnel					0.000			
TOTAL					34.655		1,073,620	1,108,275*
Waste Processing								
Maintenance Personnel					3.840			
Operating Personnel					9.320			
Health Physics Personnel					2.250			
Supervisory Personnel					0.000			
Engineering Personnel					0.000			
TOTAL					21,410		32,810	54,220
Refueling								
Maintenance Personnel					28.010			
Operating Personnel					7.810			
Health Physics Personnel					1.410			
Supervisory Personnel					0.000			
Engineering Personnel					3.150			
TOTAL					40,380		1,490	41,870
Total By Job Function								
Maintenance Personnel	91				97,835			
Operating Personnel	65				59,830			
Health Physics Personnel	38				51,840			
Supervisory Personnel	8				4,090			
Engineering Personnel	3				3,440			
GRAND TOTAL	205		1,232	1,437	217,035		1,142,860	1,359,895*

*451 man-rem due to Unit 1 steam generator replacement and 520 man-rem due to Unit 2 steam generator sleeving.

APPENDIX C

PLANT: PRAIRIE ISLAND 1,2 (PWR) NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)				TOTAL MAN-REMS			
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	2	0	0		1.579	0.359	0.013	
OPERATING PERSONNEL	31	0	0		5.753	0.008	0.079	
HEALTH PHYSICS PERSONNEL	12	0	2		3.990	0.001	0.881	
SUPERVISORY PERSONNEL	0	0	0		0.043	0.014	0.065	
ENGINEERING PERSONNEL	1	0	0		0.454	0.014	0.076	
TOTAL	46	0	2	48	11.819	0.396	1.114	13.329
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	33	19	3		11.777	10.349	1.435	
OPERATING PERSONNEL	3	0	0		0.846	0.082	0.030	
HEALTH PHYSICS PERSONNEL	6	0	1		1.111	0.000	0.221	
SUPERVISORY PERSONNEL	0	0	1		0.012	0.022	0.166	
ENGINEERING PERSONNEL	6	1	1		1.943	0.148	0.675	
TOTAL	48	20	6	74	15.689	10.601	2.527	28.817
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	18	6	62		5.770	2.821	39.963	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	19		0.404	0.000	4.476	
SUPERVISORY PERSONNEL	0	1	0		0.000	0.413	0.000	
ENGINEERING PERSONNEL	3	1	9		1.226	0.307	4.509	
TOTAL	23	8	90	121	7.400	3.541	48.948	59.889
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	49	44	18		20.567	23.718	7.987	
OPERATING PERSONNEL	4	0	0		1.316	0.000	0.000	
HEALTH PHYSICS PERSONNEL	10	0	7		2.288	0.043	2.175	
SUPERVISORY PERSONNEL	0	1	0		0.000	0.252	0.051	
ENGINEERING PERSONNEL	8	4	10		2.870	0.928	2.983	
TOTAL	71	49	35	155	27.041	24.941	13.196	65.178
WASTE PROCESSING								
MAINTENANCE PERSONNEL	13	4	0		3.833	1.205	0.128	
OPERATING PERSONNEL	1	0	0		0.384	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	0		2.916	0.010	0.066	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.012	0.004	
ENGINEERING PERSONNEL	0	0	0		0.032	0.001	0.000	
TOTAL	18	4	0	22	7.165	1.228	0.198	8.591
REFUELING								
MAINTENANCE PERSONNEL	31	59	0		12.620	20.074	0.015	
OPERATING PERSONNEL	21	0	0		4.995	0.023	0.000	
HEALTH PHYSICS PERSONNEL	2	0	9		0.703	0.000	2.411	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.117	0.003	
ENGINEERING PERSONNEL	0	0	0		1.328	0.149	0.323	
TOTAL	54	59	9	122	19.646	20.363	2.752	42.761
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	146	132	83	361	56.146	58.526	49.541	164.213
OPERATING PERSONNEL	60	0	0	60	13.294	0.113	0.109	13.516
HEALTH PHYSICS PERSONNEL	36	0	38	74	11.412	0.054	10.230	21.696
SUPERVISORY PERSONNEL	0	2	1	3	0.055	0.830	0.289	1.174
ENGINEERING PERSONNEL	18	6	20	44	7.853	1.547	8.566	17.966
GRAND TOTAL	260	140	142	542	88.760	61.070	68.735	218.565

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*Workers may be counted in more than one category.

APPENDIX C

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

1983

PLANT: QUAD CITIES 1,2

(BWR)

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	STATION EMPLOYEES	TOTAL MAN-REMS		TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS			UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	7	0	22		12.340	0.000	24.287	
OPERATING PERSONNEL	47	0	54		53.245	0.000	5.625	
HEALTH PHYSICS PERSONNEL	19	0	0		14.670	0.000	0.000	
SUPERVISORY PERSONNEL	48	0	0		24.676	0.000	0.000	
ENGINEERING PERSONNEL	43	14	4		25.105	0.480	1.532	
TOTAL	164	14	80	258	130.036	0.480	31.444	161.960
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	121	4	82		212.093	2.392	91.955	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	18	0	0		14.115	0.000	0.000	
SUPERVISORY PERSONNEL	62	0	0		32.089	0.000	0.000	
ENGINEERING PERSONNEL	9	0	0		4.744	0.000	0.000	
TOTAL	210	4	82	296	263.041	2.392	91.955	357.388
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	278		0.000	0.000	312.070	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	8		2.168	0.000	3.014	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	13	59	151		6.957	1.992	61.826	
TOTAL	16	59	437	512	9.125	1.992	376.910	388.027
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	0	39	1162		0.000	21.530	1304.103	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	5	0	27		4.336	0.000	9.826	
SUPERVISORY PERSONNEL	4	0	0		2.707	0.000	0.000	
ENGINEERING PERSONNEL	8	48	188		4.236	1.633	76.644	
TOTAL	17	87	1377	1481	11.279	23.163	1390.573	1425.015
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	47	0	6		53.175	0.000	0.650	
HEALTH PHYSICS PERSONNEL	11	0	0		8.672	0.000	0.000	
SUPERVISORY PERSONNEL	21	0	0		10.705	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	79	0	6	85	72.552	0.000	0.650	73.202
REFUELING								
MAINTENANCE PERSONNEL	0	0	3		0.000	0.000	2.740	
OPERATING PERSONNEL	20	0	0		21.920	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	0		2.168	0.000	0.000	
SUPERVISORY PERSONNEL	7	0	0		3.550	0.000	0.000	
ENGINEERING PERSONNEL	6	0	0		0.605	0.000	0.000	
TOTAL	36	0	3	39	28.243	0.000	2.740	30.983
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	128	43	1547	1718	224.433	23.922	1735.155	1983.510
OPERATING PERSONNEL	114	0	60	174	128.340	0.000	6.275	134.615
HEALTH PHYSICS PERSONNEL	59	0	35	94	46.129	0.000	12.840	58.969
SUPERVISORY PERSONNEL	142	0	0	142	73.727	0.000	0.000	73.727
ENGINEERING PERSONNEL	79	121	343	543	41.647	4.105	140.002	185.754
GRAND TOTAL	522	164	1985	2671	514.276	28.027	1894.272	2436.575

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* Workers may be counted in more than one category.

APPENDIX C

PLANT: *RANCHO SECO (PWR) NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION 1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	109	0	163		8.690	0.000	7.650	
OPERATING PERSONNEL	58	1	0		24.340	0.330	0.000	
HEALTH PHYSICS PERSONNEL	26	2	78		7.340	0.030	70.390	
SUPERVISORY PERSONNEL	22	2	35		1.110	0.010	4.000	
ENGINEERING PERSONNEL	53	23	125		4.450	0.970	8.670	
TOTAL	268	28	401	697	45.930	1.340	90.710	137.980
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	108	0	195		32.360	0.000	11.930	
OPERATING PERSONNEL	13	1	0		0.360	0.010	0.000	
HEALTH PHYSICS PERSONNEL	15	1	31		0.610	0.010	1.480	
SUPERVISORY PERSONNEL	10	0	7		1.830	0.000	0.170	
ENGINEERING PERSONNEL	27	7	71		1.710	0.070	3.500	
TOTAL	173	9	304	486	36.870	0.090	17.080	54.040
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	148	0	743		32.320	0.000	282.180	
OPERATING PERSONNEL	12	0	0		0.560	0.000	0.000	
HEALTH PHYSICS PERSONNEL	21	0	51		1.850	0.000	7.670	
SUPERVISORY PERSONNEL	8	0	32		0.950	0.000	6.180	
ENGINEERING PERSONNEL	33	10	130		6.410	0.230	14.420	
TOTAL	222	10	956	1188	42.090	0.230	310.450	352.770
WASTE PROCESSING								
MAINTENANCE PERSONNEL	69	1	187		11.820	0.030	55.280	
OPERATING PERSONNEL	29	0	0		0.820	0.000	0.000	
HEALTH PHYSICS PERSONNEL	25	0	35		6.680	0.000	5.860	
SUPERVISORY PERSONNEL	10	0	6		1.070	0.000	3.120	
ENGINEERING PERSONNEL	10	0	15		0.220	0.000	0.420	
TOTAL	143	1	243	387	20.610	0.030	64.680	85.320
REFUELING								
MAINTENANCE PERSONNEL	50	0	60		5.850	0.000	32.400	
OPERATING PERSONNEL	36	1	0		4.110	0.040	0.000	
HEALTH PHYSICS PERSONNEL	8	1	12		0.440	0.010	0.710	
SUPERVISORY PERSONNEL	6	0	8		0.730	0.000	5.740	
ENGINEERING PERSONNEL	26	0	29		2.050	0.000	7.270	
TOTAL	126	2	109	237	13.180	0.050	46.120	59.350
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	484	1	1348	1833	91.040	0.030	389.440	480.510
OPERATING PERSONNEL	148	3	0	151	30.190	0.380	0.000	30.570
HEALTH PHYSICS PERSONNEL	95	4	207	306	16.920	0.050	86.110	103.080
SUPERVISORY PERSONNEL	56	2	88	146	5.690	0.010	19.210	24.910
ENGINEERING PERSONNEL	149	40	370	559	14.840	1.270	34.280	50.390
GRAND TOTAL	932	50	2013	2995	158.680	1.740	529.040	689.460

* Workers may be counted in more than one category.

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APPENDIX C

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
1983

PLANT: ROBINSON

(PWR)

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	20	11	10		7.060	3.975	5.225	
OPERATING PERSONNEL	23	0	13		20.809	0.000	5.117	
HEALTH PHYSICS PERSONNEL	12	4	8		14.982	3.325	6.472	
SUPERVISORY PERSONNEL	3	1	1		1.150	0.250	0.175	
ENGINEERING PERSONNEL	37	13	5	161	15.385	4.125	2.025	90.075
TOTAL	95	29	37		59.386	11.675	19.014	
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	56	36	64		32.770	12.471	36.895	
OPERATING PERSONNEL	0	0	0		0.050	0.000	0.000	
HEALTH PHYSICS PERSONNEL	20	0	13		23.372	0.100	9.708	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.025	0.025	
ENGINEERING PERSONNEL	16	0	67	272	4.670	0.400	31.750	152.236
TOTAL	92	36	144		60.862	12.996	78.378	
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	0.000	0.000	0.000	0.000
TOTAL	0	0	0		0.000	0.000	0.000	
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	58	59	98		49.460	25.575	54.965	
OPERATING PERSONNEL	1	0	0		0.900	0.000	0.000	
HEALTH PHYSICS PERSONNEL	15	0	85		17.977	0.050	64.718	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.075	0.250	
ENGINEERING PERSONNEL	24	3	366	710	12.240	1.050	332.191	559.451
TOTAL	98	62	550		80.577	26.750	452.124	
WASTE PROCESSING								
MAINTENANCE PERSONNEL	7	0	36		4.700	0.200	25.475	
OPERATING PERSONNEL	17	0	0		17.026	0.000	0.000	
HEALTH PHYSICS PERSONNEL	3	0	14		3.596	0.000	12.420	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	4	81	0.000	0.025	3.925	67.367
TOTAL	27	0	54		25.322	0.225	41.820	
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	0.000	0.000	0.000	0.000
TOTAL	0	0	0		0.000	0.000	0.000	
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	141	106	208	455	93.990	42.221	122.560	258.771
OPERATING PERSONNEL	41	0	13	54	38.785	0.000	5.117	43.902
HEALTH PHYSICS PERSONNEL	50	4	120	174	59.927	3.475	93.318	156.720
SUPERVISORY PERSONNEL	3	1	2	6	1.150	0.350	0.450	1.950
ENGINEERING PERSONNEL	77	16	442	535	32.295	5.600	369.891	407.786
GRAND TOTAL	312	127	785	1224	226.147	51.646	591.336	869.129

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* Workers may be counted in more than one category.

APPENDIX C

PLANT: SALEM 1,2

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	2	0	0		1.518	0.017	0.326	
OPERATING PERSONNEL	2	0	0		3.602	0.012	0.095	
HEALTH PHYSICS PERSONNEL	1	0	0		0.913	0.000	2.116	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.023	0.170	
ENGINEERING PERSONNEL	0	0	0		0.015	0.177	0.000	
TOTAL	5	0	0	5	6.048	0.229	2.707	8.984
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	30	0	101		17.976	0.210	46.913	
OPERATING PERSONNEL	4	9	23		3.639	2.940	7.069	
HEALTH PHYSICS PERSONNEL	1	0	5		0.832	0.000	22.603	
SUPERVISORY PERSONNEL	0	0	2		0.000	0.094	0.950	
ENGINEERING PERSONNEL	0	0	0		0.020	0.479	0.020	
TOTAL	35	9	131	175	22.467	3.723	77.555	103.745
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	2	0	57		0.495	0.217	22.165	
OPERATING PERSONNEL	0	0	0		0.108	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	1		0.172	0.000	0.515	
SUPERVISORY PERSONNEL	0	0	1		0.000	0.135	0.405	
ENGINEERING PERSONNEL	0	1	0		0.000	0.442	0.000	
TOTAL	2	1	59	62	0.775	0.794	23.085	24.654
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	53	0	307		21.996	0.075	168.000	
OPERATING PERSONNEL	8	1	5		5.442	0.435	1.680	
HEALTH PHYSICS PERSONNEL	4	0	54		1.490	0.000	21.620	
SUPERVISORY PERSONNEL	0	1	5		0.000	0.145	1.950	
ENGINEERING PERSONNEL	1	1	0		0.176	0.923	0.040	
TOTAL	66	3	371	440	29.104	1.578	193.290	223.972
WASTE PROCESSING								
MAINTENANCE PERSONNEL	14	0	10		4.064	0.000	4.475	
OPERATING PERSONNEL	0	0	5		0.235	0.040	2.415	
HEALTH PHYSICS PERSONNEL	10	0	137		4.046	0.000	45.826	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	2	0	0		0.520	0.040	0.000	
TOTAL	26	0	152	178	8.865	0.080	52.716	61.661
REFUELING								
MAINTENANCE PERSONNEL	54	0	120		17.599	0.205	40.212	
OPERATING PERSONNEL	22	4	10		11.735	1.690	1.723	
HEALTH PHYSICS PERSONNEL	0	0	87		1.355	0.000	27.004	
SUPERVISORY PERSONNEL	0	1	3		0.000	0.180	1.829	
ENGINEERING PERSONNEL	0	1	0		0.044	0.820	0.110	
TOTAL	76	6	220	302	30.733	2.895	70.878	104.506
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	155	0	595	750	63.648	0.724	282.091	346.463
OPERATING PERSONNEL	36	14	43	93	24.761	5.117	12.982	42.860
HEALTH PHYSICS PERSONNEL	16	0	284	300	8.808	0.000	119.684	128.492
SUPERVISORY PERSONNEL	0	2	11	13	0.000	0.577	5.304	5.881
ENGINEERING PERSONNEL	3	3	0	6	0.775	2.881	0.170	3.826
GRAND TOTAL	210	19	933	1162	97.992	9.299	420.231	527.522

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APPENDIX C

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

PLANT: *SAN ONOFRE 1	(PWR)		1983				TOTAL MAN-REMS		
	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS	
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS						
<u>REACTOR OPERATIONS & SURV.</u>									
MAINTENANCE PERSONNEL	2	0	5		0.154	0.000	0.595		
OPERATING PERSONNEL	20	0	0		9.158	0.000	0.000		
HEALTH PHYSICS PERSONNEL	24	0	23		5.017	0.000	7.689		
SUPERVISORY PERSONNEL	1	0	0		0.110	0.000	0.000		
ENGINEERING PERSONNEL	6	0	1		0.893	0.000	0.100		
<u>TOTAL</u>	<u>53</u>	<u>0</u>	<u>29</u>	<u>82</u>	<u>15.332</u>	<u>0.000</u>	<u>8.384</u>	<u>23.716</u>	
<u>ROUTINE MAINTENANCE</u>									
MAINTENANCE PERSONNEL	24	0	96		10.416	0.000	36.653		
OPERATING PERSONNEL	1	0	0		0.042	0.000	0.000		
HEALTH PHYSICS PERSONNEL	7	0	69		0.121	0.000	29.292		
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000		
ENGINEERING PERSONNEL	16	0	26		5.349	0.000	6.612		
<u>TOTAL</u>	<u>48</u>	<u>0</u>	<u>191</u>	<u>239</u>	<u>15.928</u>	<u>0.000</u>	<u>72.557</u>	<u>88.485</u>	
<u>IN-SERVICE INSPECTION</u>									
MAINTENANCE PERSONNEL	1	0	1		0.016	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		
<u>TOTAL</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>2</u>	<u>0.016</u>	<u>0.000</u>	<u>0.000</u>	<u>0.016</u>	
<u>SPECIAL MAINTENANCE</u>									
MAINTENANCE PERSONNEL	0	0	1		0.000	0.000	0.005		
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		
<u>TOTAL</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>0.000</u>	<u>0.000</u>	<u>0.005</u>	<u>0.005</u>	
<u>WASTE PROCESSING</u>									
MAINTENANCE PERSONNEL	1	0	9		0.005	0.000	0.879		
OPERATING PERSONNEL	5	0	0		0.122	0.000	0.000		
HEALTH PHYSICS PERSONNEL	1	0	31		0.528	0.000	3.575		
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000		
ENGINEERING PERSONNEL	1	0	3		0.046	0.000	0.533		
<u>TOTAL</u>	<u>8</u>	<u>0</u>	<u>43</u>	<u>51</u>	<u>0.701</u>	<u>0.000</u>	<u>4.987</u>	<u>5.688</u>	
<u>REFUELING</u>									
MAINTENANCE PERSONNEL	1	0	0		0.050	0.000	0.000		
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000		
HEALTH PHYSICS PERSONNEL	0	0	5		0.000	0.000	0.131		
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000		
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000		
<u>TOTAL</u>	<u>1</u>	<u>0</u>	<u>5</u>	<u>6</u>	<u>0.050</u>	<u>0.000</u>	<u>0.131</u>	<u>0.181</u>	
<u>TOTAL BY JOB FUNCTION</u>									
MAINTENANCE PERSONNEL	29 (25)	0	112 (101)	141 (126)	10.641	0.000	38.132	48.773	
OPERATING PERSONNEL	26 (20)	0	0 (0)	26 (20)	9.322	0.000	0.000	9.322	
HEALTH PHYSICS PERSONNEL	32 (25)	0	128 (83)	160 (108)	5.666	0.000	40.687	46.353	
SUPERVISORY PERSONNEL	1 (1)	0	0	1	0.110	0.000	0.000	0.110	
ENGINEERING PERSONNEL	23 (21)	0	30 (28)	53 (49)	6.288	0.000	7.245	13.533	
<u>GRAND TOTAL</u>	<u>111 (92)</u>	<u>0</u>	<u>270 (212)</u>	<u>381 (304)</u>	<u>32.027</u>	<u>0.000</u>	<u>86.064</u>	<u>118.091</u>	

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

APPENDIX C

PLANT: SEQUOYAH 1,2 (PWR) NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION 1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	188	477	6		12.237	19.316	2.408	
OPERATING PERSONNEL	86	0	0		8.664	0.000	0.000	
HEALTH PHYSICS PERSONNEL	34	0	33		4.686	0.000	10.758	
SUPERVISORY PERSONNEL	32	11	2		5.011	0.720	0.128	
ENGINEERING PERSONNEL	48	60	7		5.296	7.044	0.315	
TOTAL	388	548	48	984	35.894	27.080	13.609	76.583
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	197	535	3		43.789	78.759	0.031	
OPERATING PERSONNEL	86	0	0		6.514	0.000	0.000	
HEALTH PHYSICS PERSONNEL	34	0	33		3.573	0.000	1.906	
SUPERVISORY PERSONNEL	32	11	2		5.408	1.753	0.109	
ENGINEERING PERSONNEL	49	74	39		9.364	14.430	9.045	
TOTAL	398	620	77	1095	68.648	94.942	11.054	174.681
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	37	295	0		0.243	29.878	0.000	
OPERATING PERSONNEL	38	0	0		0.144	0.000	0.000	
HEALTH PHYSICS PERSONNEL	11	0	23		0.284	0.000	3.915	
SUPERVISORY PERSONNEL	7	7	1		0.208	0.310	0.000	
ENGINEERING PERSONNEL	32	48	32		2.770	9.914	15.743	
TOTAL	125	350	56	531	3.649	40.102	19.659	63.410
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	174	508	0		3.435	91.244	0.000	
OPERATING PERSONNEL	75	0	0		0.445	0.000	0.000	
HEALTH PHYSICS PERSONNEL	25	0	21		0.586	0.000	0.311	
SUPERVISORY PERSONNEL	24	8	2		0.255	0.266	0.006	
ENGINEERING PERSONNEL	46	49	9		4.038	8.542	0.636	
TOTAL	344	565	32	941	8.759	100.052	0.953	109.764
WASTE PROCESSING								
MAINTENANCE PERSONNEL	158	239	2		3.545	3.006	0.250	
OPERATING PERSONNEL	81	0	0		7.768	0.000	0.000	
HEALTH PHYSICS PERSONNEL	32	0	20		1.586	0.000	0.164	
SUPERVISORY PERSONNEL	15	2	0		0.458	0.010	0.000	
ENGINEERING PERSONNEL	28	11	0		0.933	0.040	0.000	
TOTAL	314	252	22	588	13.390	3.056	0.414	16.860
REFUELING								
MAINTENANCE PERSONNEL	113	309	1		4.106	44.872	0.115	
OPERATING PERSONNEL	43	0	0		3.081	0.000	0.000	
HEALTH PHYSICS PERSONNEL	8	0	20		0.024	0.000	1.893	
SUPERVISORY PERSONNEL	17	6	1		2.070	0.069	0.002	
ENGINEERING PERSONNEL	42	31	0		2.955	6.552	0.000	
TOTAL	223	346	22	591	12.236	51.493	2.010	65.739
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	867	2363	12	3242	67.355	267.075	2.804	337.234
OPERATING PERSONNEL	409	0	0	409	26.616	0.000	0.000	26.616
HEALTH PHYSICS PERSONNEL	144	0	150	294	10.739	0.000	18.948	29.687
SUPERVISORY PERSONNEL	127	45	8	180	13.410	3.128	0.245	16.783
ENGINEERING PERSONNEL	245	273	87	605	24.456	46.522	25.739	96.717
GRAND TOTAL	1792	2681	257	4730	142.576	316.725	47.736	507.037

*Workers may be counted in more than one category.

APPENDIX C

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
1983

PLANT: ST LUCIE 1,2

(PWR)

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	2	0	0		0.440	0.000	0.000	
OPERATING PERSONNEL	5	0	0		2.970	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.130	0.000	0.240	
SUPERVISORY PERSONNEL	2	0	0		0.600	0.000	0.000	
ENGINEERING PERSONNEL	1	0	0		0.310	0.000	0.000	
TOTAL	10	0	0	10	4.450	0.000	0.240	4.690
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	47	18	90		32.300	11.320	47.520	
OPERATING PERSONNEL	8	2	0		5.370	1.550	0.000	
HEALTH PHYSICS PERSONNEL	3	0	6		3.170	0.000	5.800	
SUPERVISORY PERSONNEL	8	0	6		3.110	0.000	2.850	
ENGINEERING PERSONNEL	0	0	1		0.000	0.000	1.400	
TOTAL	66	20	103	189	43.950	12.870	57.570	114.390
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	5	3	86		2.970	2.170	56.940	
OPERATING PERSONNEL	3	0	0		0.770	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	3		2.070	0.000	3.780	
SUPERVISORY PERSONNEL	2	0	5		0.930	0.000	3.000	
ENGINEERING PERSONNEL	3	0	1		0.600	0.000	0.900	
TOTAL	15	3	95	113	7.340	2.170	64.620	74.130
SPECIAL MAINTENANCE **								
MAINTENANCE PERSONNEL	73	1	566		54.390	0.590	486.830	
OPERATING PERSONNEL	6	0	0		2.590	0.000	0.000	
HEALTH PHYSICS PERSONNEL	12	0	25		19.140	0.000	35.000	
SUPERVISORY PERSONNEL	17	0	50		8.660	0.000	46.680	
ENGINEERING PERSONNEL	1	0	28		0.300	0.000	32.790	
TOTAL	109	1	669	779	85.080	0.590	601.300	686.970
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	58		0.000	0.000	58.420	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	1	0	2		1.810	0.000	3.310	
SUPERVISORY PERSONNEL	1	0	3		0.780	0.000	0.910	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	2	0	63	65	2.590	0.000	62.640	65.230
REFUELING								
MAINTENANCE PERSONNEL	30	25	75		31.110	34.230	33.990	
OPERATING PERSONNEL	52	1	5		20.430	0.630	2.570	
HEALTH PHYSICS PERSONNEL	3	0	7		3.930	0.000	7.180	
SUPERVISORY PERSONNEL	8	0	3		3.370	0.000	1.650	
ENGINEERING PERSONNEL	0	0	4		0.000	0.000	1.870	
TOTAL	93	26	94	213	58.840	34.860	47.260	140.960
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	157	47	875	1079	121.210	48.310	683.700	853.220
OPERATING PERSONNEL	74	3	5	82	32.130	2.180	2.570	36.880
HEALTH PHYSICS PERSONNEL	21	0	43	64	30.250	0.000	55.310	85.560
SUPERVISORY PERSONNEL	38	0	67	105	17.450	0.000	55.090	72.540
ENGINEERING PERSONNEL	5	0	34	39	1.210	0.000	36.960	38.170
GRAND TOTAL	295	50	1024	1369	202.250	50.490	833.630	1086.370

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**Includes ICI flange mods., seal water injection mods., core cooling mods., core barrel repair, thermal shield removal and feedwater nozzle replacement.

APPENDIX C

PLANT: * SURRY 1,2		NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION						
		NUMBER OF PERSONNEL (>100 M-REM)			TOTAL MAN-REMS			
		1983						
		(PWR)						
WORK & JOB FUNCTION	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	172	65	170		55.642	3.345	16.366	
OPERATING PERSONNEL	192	13	10		206.335	0.128	0.446	
HEALTH PHYSICS PERSONNEL	33	12	139		43.141	5.119	121.448	
SUPERVISORY PERSONNEL	70	3	J		34.164	0.268	0.103	
ENGINEERING PERSONNEL	34	7	60		6.757	0.196	7.164	
TOTAL	501	100	382	983	346.039	9.056	145.527	500.622
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	179	139	599		433.266	167.396	703.560	
OPERATING PERSONNEL	127	31	45		41.877	4.103	20.360	
HEALTH PHYSICS PERSONNEL	42	8	206		9.716	0.116	96.205	
SUPERVISORY PERSONNEL	64	5	7		60.513	3.733	0.171	
ENGINEERING PERSONNEL	41	16	163		21.670	0.899	42.943	
TOTAL	453	199	1020	1672	567.042	176.247	863.239	1606.528
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	13	4	49		1.765	0.764	7.418	
OPERATING PERSONNEL	34	4	1		7.822	0.040	0.011	
HEALTH PHYSICS PERSONNEL	0	0	1		0.000	0.000	0.002	
SUPERVISORY PERSONNEL	3	0	0		0.108	0.000	0.000	
ENGINEERING PERSONNEL	28	4	29		14.788	0.051	10.008	
TOTAL	78	12	80	170	24.483	0.855	17.439	42.777
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	65	23	339		6.484	1.428	329.755	
OPERATING PERSONNEL	16	27	35		0.812	5.078	15.770	
HEALTH PHYSICS PERSONNEL	2	4	49		0.011	0.085	4.499	
SUPERVISORY PERSONNEL	10	1	7		0.738	0.004	0.175	
ENGINEERING PERSONNEL	10	26	48		0.678	7.366	14.203	
TOTAL	103	81	478	662	8.723	13.961	364.402	387.086
WASTE PROCESSING								
MAINTENANCE PERSONNEL	40	0	91		7.744	0.000	8.973	
OPERATING PERSONNEL	43	1	11		26.714	0.002	0.553	
HEALTH PHYSICS PERSONNEL	28	3	206		31.020	0.053	153.332	
SUPERVISORY PERSONNEL	10	0	2		6.270	0.000	0.060	
ENGINEERING PERSONNEL	9	1	11		3.787	0.001	0.959	
TOTAL	130	5	321	456	75.535	0.056	163.877	239.468
REFUELING								
MAINTENANCE PERSONNEL	44	44	16		5.907	13.158	2.489	
OPERATING PERSONNEL	40	9	2		7.326	1.139	1.192	
HEALTH PHYSICS PERSONNEL	5	0	20		0.459	0.000	1.343	
SUPERVISORY PERSONNEL	14	4	0		4.050	0.762	0.000	
ENGINEERING PERSONNEL	7	0	16		1.397	0.000	5.844	
TOTAL	110	57	54	221	19.139	15.059	10.868	45.066
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	513	275	1264	2052	510.808	186.091	1068.561	1765.460
OPERATING PERSONNEL	452	85	104	641	290.886	10.490	38.332	339.708
HEALTH PHYSICS PERSONNEL	110	27	621	758	84.347	5.373	376.829	466.549
SUPERVISORY PERSONNEL	171	13	19	203	105.843	4.767	0.509	111.119
ENGINEERING PERSONNEL	129	54	327	510	49.077	8.513	81.121	138.711
GRAND TOTAL	1375	454	2335	4164	1040.961	215.234	1565.352	2821.547

* Workers may be counted in more than one category.

APPENDIX C

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

PLANT: * THREE MILE ISLAND 1 (PWR)

1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	STATION EMPLOYEES	TOTAL MAN-REMS		TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS			UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	147	1	50		1.747	0.008	0.201	
OPERATING PERSONNEL	191	27	30		12.579	0.030	0.167	
HEALTH PHYSICS PERSONNEL	99	6	27		34.667	0.020	2.819	
SUPERVISORY PERSONNEL	80	4	22		2.374	0.027	0.061	
ENGINEERING PERSONNEL	77	17	57		2.411	0.081	0.230	
TOTAL	594	55	186	835	53.778	0.166	3.478	57.422
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	185	1	52		15.647	0.000	0.301	
OPERATING PERSONNEL	135	0	8		0.446	0.000	0.061	
HEALTH PHYSICS PERSONNEL	78	0	3		1.622	0.000	0.007	
SUPERVISORY PERSONNEL	55	0	8		0.919	0.000	0.016	
ENGINEERING PERSONNEL	21	4	19		0.240	0.012	0.053	
TOTAL	474	5	90	569	18.874	0.012	0.438	19.324
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	57	1	48		1.428	0.002	1.030	
OPERATING PERSONNEL	48	2	10		0.664	0.109	0.049	
HEALTH PHYSICS PERSONNEL	44	0	1		0.347	0.000	0.000	
SUPERVISORY PERSONNEL	31	0	4		0.779	0.000	0.157	
ENGINEERING PERSONNEL	17	10	41		1.584	0.038	4.450	
TOTAL	197	13	104	314	4.802	0.149	5.686	10.637
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	183	5	283		145.134	5.727	447.364	
OPERATING PERSONNEL	121	3	22		63.938	0.034	9.607	
HEALTH PHYSICS PERSONNEL	62	0	6		15.549	0.000	0.572	
SUPERVISORY PERSONNEL	72	1	29		29.395	0.004	22.262	
ENGINEERING PERSONNEL	56	23	89		6.190	1.151	35.901	
TOTAL	494	32	429	955	260.206	6.916	515.706	782.828
WASTE PROCESSING								
MAINTENANCE PERSONNEL	90	3	31		14.631	0.170	0.240	
OPERATING PERSONNEL	78	0	4		10.380	0.000	0.064	
HEALTH PHYSICS PERSONNEL	57	0	6		1.006	0.000	0.878	
SUPERVISORY PERSONNEL	23	0	5		2.495	0.000	0.331	
ENGINEERING PERSONNEL	6	1	5		1.430	0.000	0.028	
TOTAL	254	4	51	309	29.942	0.170	1.541	31.653
REFUELING								
MAINTENANCE PERSONNEL	1	0	0		0.002	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	1	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	2	0	0	2	0.002	0.000	0.000	0.002
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	663 (214)	11 (8)	464 (291)	1138 (513)	178.589	5.907	449.136	633.632
OPERATING PERSONNEL	573 (220)	32 (28)	74 (42)	679 (290)	88.007	0.173	9.948	98.128
HEALTH PHYSICS PERSONNEL	340 (112)	6 (6)	43 (35)	389 (153)	53.191	0.020	4.276	57.487
SUPERVISORY PERSONNEL	262 (102)	5 (4)	68 (43)	335 (149)	35.962	0.031	22.827	58.820
ENGINEERING PERSONNEL	177 (89)	55 (36)	211 (140)	443 (265)	11.855	1.282	40.662	53.799
GRAND TOTAL	2015 (737)	109 (82)	860 (551)	2984 (1370)	367.604	7.413	526.849	901.866

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

APPENDIX C

PLANT: *THREE MILE ISLAND 2 (PWR) NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION 1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	99	3	123		2.183	0.005	1.381	
OPERATING PERSONNEL	110	13	23		5.975	0.002	0.113	
HEALTH PHYSICS PERSONNEL	117	0	43		17.111	0.000	2.786	
SUPERVISORY PERSONNEL	64	0	16		0.595	0.000	0.316	
ENGINEERING PERSONNEL	35	1	85		1.297	0.000	2.985	
TOTAL	425	17	290	732	27.161	0.007	7.581	34.749
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	99	1	124		7.731	0.000	3.935	
OPERATING PERSONNEL	47	0	7		1.327	0.000	0.476	
HEALTH PHYSICS PERSONNEL	67	0	21		2.777	0.000	1.155	
SUPERVISORY PERSONNEL	28	0	7		0.258	0.000	0.028	
ENGINEERING PERSONNEL	14	1	29		0.045	0.000	0.039	
TOTAL	255	2	188	445	12.138	0.000	5.633	17.771
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	14	0	2		1.860	0.000	0.274	
OPERATING PERSONNEL	7	0	3		1.153	0.000	0.295	
HEALTH PHYSICS PERSONNEL	2	0	1		0.352	0.000	0.557	
SUPERVISORY PERSONNEL	2	0	1		0.158	0.000	0.025	
ENGINEERING PERSONNEL	1	0	11		0.098	0.000	1.945	
TOTAL	26	0	18	44	3.621	0.000	3.096	6.717
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	96	1	179		70.771	0.000	160.940	
OPERATING PERSONNEL	86	0	10		21.806	0.000	4.388	
HEALTH PHYSICS PERSONNEL	106	0	29		62.515	0.000	7.424	
SUPERVISORY PERSONNEL	36	0	17		7.128	0.000	4.031	
ENGINEERING PERSONNEL	23	1	66		2.782	0.000	18.767	
TOTAL	347	2	301	650	165.002	0.000	195.550	360.552
WASTE PROCESSING								
MAINTENANCE PERSONNEL	105	2	119		5.263	1.126	3.236	
OPERATING PERSONNEL	122	2	17		8.859	0.005	0.523	
HEALTH PHYSICS PERSONNEL	110	0	40		9.527	0.092	0.981	
SUPERVISORY PERSONNEL	53	0	14		1.829	0.000	0.018	
ENGINEERING PERSONNEL	38	0	70		0.260	0.000	0.283	
TOTAL	428	4	260	692	25.738	1.223	5.041	32.002
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	413 (124)	7 (2)	547 (191)	967 (317)	87.808	1.131	169.766	258.705
OPERATING PERSONNEL	372 (151)	15 (15)	60 (32)	447 (198)	39.120	0.007	5.795	44.922
HEALTH PHYSICS PERSONNEL	402 (118)	0	134 (49)	536 (167)	92.282	0.092	12.903	105.277
SUPERVISORY PERSONNEL	183 (83)	0	55 (28)	238 (111)	9.968	0.000	4.418	14.386
ENGINEERING PERSONNEL	111 (56)	3 (2)	261 (134)	375 (192)	4.482	0.000	24.019	28.501
GRAND TOTAL	1481 (532)	25 (19)	1057 (434)	2563 (985)	233.660	1.230	216.901	451.791

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

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APPENDIX C

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

PLANT: TROJAN

(PWR)

1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			TOTAL MAN-REMS
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	5	3	4		1.600	1.220	0.870	
OPERATING PERSONNEL	30	0	1		10.360	0.000	0.570	
HEALTH PHYSICS PERSONNEL	18	0	15		6.200	0.000	4.270	
SUPERVISORY PERSONNEL	0	0	3		0.130	0.020	2.760	
ENGINEERING PERSONNEL	2	0	0		0.700	1.020	0.030	
TOTAL	55	3	23	81	18.990	2.260	8.500	29.750
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	45	33	27		12.640	16.500	10.520	
OPERATING PERSONNEL	6	0	1		1.390	0.000	0.610	
HEALTH PHYSICS PERSONNEL	4	2	11		1.720	0.910	4.570	
SUPERVISORY PERSONNEL	2	0	10		0.430	0.020	7.270	
ENGINEERING PERSONNEL	3	5	1		1.520	3.100	0.230	
TOTAL	60	40	50	150	17.700	20.530	23.200	61.430
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.000	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	0	0	0	0	0.000	0.000	0.000	0.000
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	17	19	118		9.580	10.290	60.260	
OPERATING PERSONNEL	3	0	0		0.830	0.000	0.050	
HEALTH PHYSICS PERSONNEL	20	2	8		9.460	1.490	2.660	
SUPERVISORY PERSONNEL	3	0	7		0.680	0.010	2.860	
ENGINEERING PERSONNEL	1	2	0		0.310	0.670	0.090	
TOTAL	44	23	133	200	20.860	12.460	65.920	99.240
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	0		0.070	0.090	0.490	
OPERATING PERSONNEL	0	0	0		0.440	0.000	0.020	
HEALTH PHYSICS PERSONNEL	18	8	8		13.940	3.310	3.510	
SUPERVISORY PERSONNEL	0	0	0		0.010	0.000	0.030	
ENGINEERING PERSONNEL	0	0	0		0.000	0.000	0.000	
TOTAL	18	8	8	34	14.460	3.400	4.050	21.910
REFUELING								
MAINTENANCE PERSONNEL	17	0	5		15.830	0.360	0.990	
OPERATING PERSONNEL	12	0	0		20.560	0.000	0.020	
HEALTH PHYSICS PERSONNEL	12	0	17		3.440	0.040	5.080	
SUPERVISORY PERSONNEL	1	0	9		0.320	0.000	2.740	
ENGINEERING PERSONNEL	1	1	0		0.610	0.360	0.000	
TOTAL	43	1	31	75	40.760	0.760	8.830	50.350
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	84	55	154	293	39.720	28.460	73.130	141.310
OPERATING PERSONNEL	51	0	2	53	33.580	0.000	1.270	34.850
HEALTH PHYSICS PERSONNEL	72	12	59	143	34.760	5.750	20.090	60.600
SUPERVISORY PERSONNEL	6	0	29	35	1.570	0.050	15.660	17.280
ENGINEERING PERSONNEL	7	8	1	16	3.140	5.150	0.350	8.640
GRAND TOTAL	220	75	245	540	112.770	39.410	110.500	262.680

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APPENDIX C

PLANT: *TURKEY POINT 1,2 (PWR) NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION 1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	186	19	172		67.445	5.740	59.425	
OPERATING PERSONNEL	26	1	0		31.780	0.760	0.000	
HEALTH PHYSICS PERSONNEL	26	0	118		24.355	0.000	109.110	
SUPERVISORY PERSONNEL	17	2	7		7.795	0.490	2.390	
ENGINEERING PERSONNEL	37	1	27		12.635	0.560	13.990	
TOTAL	292	23	324	639	144.010	7.550	184.915	336.475
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	185	35	283		151.480	21.295	164.975	
OPERATING PERSONNEL	5	0	0		1.015	0.050	0.000	
HEALTH PHYSICS PERSONNEL	15	0	43		6.865	0.000	15.920	
SUPERVISORY PERSONNEL	5	0	3		1.635	0.155	0.645	
ENGINEERING PERSONNEL	13	0	9		7.670	0.090	3.245	
TOTAL	223	35	338	596	168.665	21.590	184.785	375.040
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	17	4	118		6.820	1.785	117.885	
OPERATING PERSONNEL	1	0	1		1.010	0.000	2.230	
HEALTH PHYSICS PERSONNEL	5	0	10		2.140	0.000	2.210	
SUPERVISORY PERSONNEL	3	0	3		1.900	0.000	3.215	
ENGINEERING PERSONNEL	8	3	4		2.110	1.215	0.720	
TOTAL	34	7	136	177	13.980	3.000	126.060	143.040
SPECIAL MAINTENANCE**								
MAINTENANCE PERSONNEL	128	24	1325		84.295	11.425	1878.730	
OPERATING PERSONNEL	5	0	0		1.755	0.000	0.000	
HEALTH PHYSICS PERSONNEL	15	0	93		8.790	0.000	56.515	
SUPERVISORY PERSONNEL	11	1	77		4.640	0.130	75.550	
ENGINEERING PERSONNEL	16	2	85		9.345	0.750	82.210	
TOTAL	175	27	1580	1782	108.825	13.105	2093.005	2214.935
WASTE PROCESSING								
MAINTENANCE PERSONNEL	18	1	2		7.585	0.750	0.620	
OPERATING PERSONNEL	0	0	0		0.210	0.000	0.000	
HEALTH PHYSICS PERSONNEL	7	0	21		6.870	0.000	11.495	
SUPERVISORY PERSONNEL	0	0	0		0.075	0.000	0.015	
ENGINEERING PERSONNEL	2	0	1		0.815	0.000	0.395	
TOTAL	27	1	24	52	15.555	0.750	12.525	28.830
REFUELING								
MAINTENANCE PERSONNEL	127	34	24		121.450	33.000	11.350	
OPERATING PERSONNEL	48	3	0		19.360	0.780	0.000	
HEALTH PHYSICS PERSONNEL	7	0	18		2.045	0.000	5.455	
SUPERVISORY PERSONNEL	8	0	5		3.990	0.070	1.205	
ENGINEERING PERSONNEL	20	1	2		16.580	0.120	0.905	
TOTAL	210	38	49	297	163.425	33.970	18.915	216.310
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	661 (229)	117 (48)	1924 (1507)	2702 (1784)	439.075	73.995	2232.785	2745.855
OPERATING PERSONNEL	85 (61)	4 (4)	1 (1)	90 (66)	55.130	1.590	2.230	58.950
HEALTH PHYSICS PERSONNEL	75 (28)	0	303 (184)	378 (212)	51.065	0.000	200.705	251.770
SUPERVISORY PERSONNEL	44 (28)	3 (3)	95 (83)	142 (114)	20.035	1.645	83.020	104.700
ENGINEERING PERSONNEL	96 (47)	7 (7)	128 (107)	231 (161)	49.155	2.735	101.465	153.355
GRAND TOTAL	961 (393)	131 (62)	2451 (1882)	3543 (2337)	614.460	79.965	2620.205	3314.630

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

**Steam generator replacement.

APPENDIX C

PLANT: VERMONT YANKEE (BWR) NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION 1983

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)			TOTAL PERSONS	TOTAL MAN-REMS			
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS		STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	10	0	2		18.860	0.000	1.218	
OPERATING PERSONNEL	67	0	1		66.710	0.000	0.101	
HEALTH PHYSICS PERSONNEL	24	2	52		44.612	0.303	51.750	
SUPERVISORY PERSONNEL	1	1	13		2.089	0.313	4.159	
ENGINEERING PERSONNEL	26	0	7		23.424	0.000	1.542	
TOTAL	128	3	75	206	155.695	0.616	58.770	215.081
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	33	129	582		79.085	220.192	329.652	
OPERATING PERSONNEL	20	0	0		9.881	0.000	0.000	
HEALTH PHYSICS PERSONNEL	5	0	15		2.355	0.000	5.216	
SUPERVISORY PERSONNEL	3	0	1		1.345	0.015	0.193	
ENGINEERING PERSONNEL	7	0	1		3.871	0.000	0.280	
TOTAL	68	129	599	796	96.537	220.207	335.341	652.085
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	1	102	211		0.329	87.001	110.719	
OPERATING PERSONNEL	2	0	0		0.888	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.031	0.000	0.058	
SUPERVISORY PERSONNEL	1	0	0		0.539	0.000	0.000	
ENGINEERING PERSONNEL	3	0	1		0.904	0.000	0.570	
TOTAL	7	102	212	321	2.691	87.001	111.347	201.039
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	19	69	612		41.595	114.325	278.051	
OPERATING PERSONNEL	11	0	0		5.103	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	7		1.217	0.000	2.694	
SUPERVISORY PERSONNEL	2	1	0		1.343	0.535	0.100	
ENGINEERING PERSONNEL	5	0	0		3.159	0.000	0.210	
TOTAL	39	70	619	728	52.417	114.860	281.055	448.332
WASTE PROCESSING								
MAINTENANCE PERSONNEL	0	0	0		0.000	0.000	0.000	
OPERATING PERSONNEL	8	0	0		7.412	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	8	0	0	8	7.412	0.000	0.000	7.412
REFUELING								
MAINTENANCE PERSONNEL	1	0	0		0.613	0.120	0.155	
OPERATING PERSONNEL	1	0	0		1.411	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.004	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	4	0	0		0.869	0.000	0.082	
TOTAL	6	0	0	6	2.897	0.120	0.237	3.254
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	64	300	1407	1771	140.482	421.638	719.795	1281.915
OPERATING PERSONNEL	109	0	1	110	91.405	0.000	0.101	91.506
HEALTH PHYSICS PERSONNEL	31	2	74	107	48.219	0.303	59.718	108.240
SUPERVISORY PERSONNEL	7	2	14	23	5.316	0.863	4.452	10.631
ENGINEERING PERSONNEL	45	0	9	54	32.227	0.000	2.684	34.911
GRAND TOTAL	256	304	1505	2065	317.649	422.804	786.750	1527.203 **

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* Workers may be counted in more than one category.

** NRC mandated torus modifications and piping resupports contributed 93 man-rems.

APPENDIX C

PLANT: *YANKEE-ROWE	NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION							
	(PWR)				1983			
	NUMBER OF PERSONNEL (>100 M-REM)				TOTAL MAN-REMS			
WORK & JOB FUNCTION	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	7	0	0		1.715	0.430	0.010	
OPERATING PERSONNEL	33	0	0		11.932	0.000	0.000	
HEALTH PHYSICS PERSONNEL	8	0	0		2.033	0.000	0.000	
SUPERVISORY PERSONNEL	1	0	0		0.310	0.000	0.065	
ENGINEERING PERSONNEL	0	1	0		0.265	0.290	0.340	
TOTAL	49	1	0	50	16.255	0.720	0.115	17.090
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	13	2	0		3.756	1.204	0.065	
OPERATING PERSONNEL	5	0	0		1.295	0.000	0.000	
HEALTH PHYSICS PERSONNEL	2	0	0		0.945	0.000	0.040	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.030	
ENGINEERING PERSONNEL	0	0	0		0.000	0.075	0.050	
TOTAL	20	2	0	22	5.996	1.279	0.185	7.460
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	22	16	1		15.450	6.650	1.415	
OPERATING PERSONNEL	2	0	2		0.575	0.000	2.025	
HEALTH PHYSICS PERSONNEL	7	0	1		2.895	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	6		0.020	0.000	0.090	
ENGINEERING PERSONNEL	0	4	0		0.165	1.355	0.070	
TOTAL	31	20	3	54	19.105	8.005	3.600	30.710
WASTE PROCESSING								
MAINTENANCE PERSONNEL	6	6	0		1.555	1.395	0.000	
OPERATING PERSONNEL	10	0	0		2.871	0.000	0.000	
HEALTH PHYSICS PERSONNEL	5	0	1		1.405	0.000	0.135	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.025	0.000	0.000	
TOTAL	21	6	1	28	5.856	1.395	0.135	7.386
REFUELING								
MAINTENANCE PERSONNEL	0	0	0		0.025	0.005	0.000	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	0	0	0		0.015	0.000	0.000	
SUPERVISORY PERSONNEL	0	0	0		0.000	0.000	0.000	
ENGINEERING PERSONNEL	0	0	0		0.010	0.040	0.000	
TOTAL	0	0	0	0	0.050	0.045	0.000	0.095
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	48	24	1	73	22.501	9.684	1.490	33.675
OPERATING PERSONNEL	50	0	2	52	16.673	0.000	2.025	18.698
HEALTH PHYSICS PERSONNEL	22	0	1	23	7.293	0.000	0.175	7.468
SUPERVISORY PERSONNEL	1	0	0	1	0.330	0.000	0.185	0.515
ENGINEERING PERSONNEL	0	5	0	5	0.465	1.760	0.160	2.385
GRAND TOTAL	121	29	4	154	47.262	11.444	4.035	62.741

*Workers may be counted in more than one category.

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APPENDIX C

NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION
1983

PLANT: ZION 1,2

(PWR)

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 M-REM)				TOTAL MAN-REMS			
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL PERSONS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT & OTHERS	TOTAL MAN-REMS
REACTOR OPERATIONS & SURV.								
MAINTENANCE PERSONNEL	46	0	24		20.560	0.000	12.070	
OPERATING PERSONNEL	57	0	0		23.143	0.000	0.000	
HEALTH PHYSICS PERSONNEL	9	0	45		4.077	0.000	9.500	
SUPERVISORY PERSONNEL	88	0	0		16.424	0.000	0.000	
ENGINEERING PERSONNEL	36	46	120		17.464	0.819	8.500	
TOTAL	236	46	189	471	81.668	0.819	30.070	112.557
ROUTINE MAINTENANCE								
MAINTENANCE PERSONNEL	31	0	66		61.028	0.000	213.215	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	19	0	46		8.197	0.000	53.126	
SUPERVISORY PERSONNEL	24	0	0		7.349	0.000	0.000	
ENGINEERING PERSONNEL	9	0	0		2.222	0.000	0.000	
TOTAL	83	0	112	195	78.796	0.000	266.341	345.137
IN-SERVICE INSPECTION								
MAINTENANCE PERSONNEL	40	0	334		14.217	0.000	67.844	
OPERATING PERSONNEL	26	0	0		2.819	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	66		1.909	0.000	8.222	
SUPERVISORY PERSONNEL	6	0	0		2.660	0.000	0.000	
ENGINEERING PERSONNEL	16	0	0		4.100	0.000	0.000	
TOTAL	92	0	400	492	25.705	0.000	76.066	101.771
SPECIAL MAINTENANCE								
MAINTENANCE PERSONNEL	80	99	675		102.366	7.981	348.313	
OPERATING PERSONNEL	0	0	0		0.000	0.000	0.000	
HEALTH PHYSICS PERSONNEL	18	0	26		12.435	0.000	59.167	
SUPERVISORY PERSONNEL	12	0	0		10.000	0.000	0.000	
ENGINEERING PERSONNEL	70	85	63		19.513	0.711	15.945	
TOTAL	180	184	764	1128	144.314	8.692	423.425	576.431
WASTE PROCESSING								
MAINTENANCE PERSONNEL	34	0	24		10.936	0.000	36.380	
OPERATING PERSONNEL	26	0	19		2.168	0.000	1.930	
HEALTH PHYSICS PERSONNEL	4	0	12		1.468	0.000	6.325	
SUPERVISORY PERSONNEL	10	0	0		2.745	0.000	0.000	
ENGINEERING PERSONNEL	8	0	0		0.875	0.000	0.000	
TOTAL	82	0	55	137	18.192	0.000	44.635	62.827
REFUELING								
MAINTENANCE PERSONNEL	20	0	115		9.624	0.000	23.115	
OPERATING PERSONNEL	24	0	0		17.062	0.000	0.000	
HEALTH PHYSICS PERSONNEL	4	0	19		1.293	0.000	1.615	
SUPERVISORY PERSONNEL	49	0	0		2.650	0.000	0.000	
ENGINEERING PERSONNEL	4	0	0		0.050	0.000	0.000	
TOTAL	101	0	134	235	30.679	0.000	24.730	55.409
TOTAL BY JOB FUNCTION								
MAINTENANCE PERSONNEL	251	99	1238	1588	218.731	7.981	700.937	927.649
OPERATING PERSONNEL	133	0	19	152	45.192	0.000	1.930	47.122
HEALTH PHYSICS PERSONNEL	58	0	214	272	29.379	0.000	137.955	167.334
SUPERVISORY PERSONNEL	189	0	0	189	41.828	0.000	0.000	41.828
ENGINEERING PERSONNEL	143	131	183	457	44.224	1.530	24.445	70.199
GRAND TOTAL	774	230	1654	2658	379.354	9.511	865.267	1254.132

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*Workers may be counted in more than one category.

APPENDIX D

Occupational Doses at Foreign Reactors

Note on: COMPARISON OF OCCUPATIONAL DOSES AT U.S. AND FOREIGN REACTORS

When comparisons of occupational radiation doses incurred at U.S. power reactors with those incurred at foreign power reactors are made, they are usually in terms of averages based on data reported by all U.S. reactors. In an effort to determine how newer U.S. plants might compare with the foreign plants, many of which are less than ten years old, the following analyses were performed.

1. In order to examine the exposures experienced at the newest U.S. plants, those plants that had completed no more than one full year of commercial operations as of 12/31/81 were selected. The collective dose and gross megawatt-years (electric) were summed for each year to yield the following results for PWRs (there are no BWRs that fit this criterion). The collective dose per megawatt-year indicates a decreasing trend, but there has not been enough time to fully allow for the effects of any cobalt buildup.

Year	No. of Sites	Collective Dose (man-rems)	Megawatt-Years	Dose Per MW-YR
1981	2	3518	2347	1.50
1982	6	5496	5537	0.99
1983	6	4676	6574	0.71

2. In an effort to examine the exposure experienced at the newer U.S. plants while taking into account cobalt buildup, those U.S. plants that had completed no more than one full year of commercial operation as of 12/31/77 were selected. To focus on the cobalt buildup, the collective dose and gross megawatt-years (electric) for the first three years of operation were not included in the summation of these two parameters. This yielded the following information, again for PWRs only.

Year Operation Begin	Year of Data	No. of Sites	Collective Dose (man-rems)	Megawatt- Years	Dose Per MW-Yr
1977	1980	3	1534	1349	1.14
1978	1981	8	3679	3869	0.62
1979	1982	9	6570	8315	0.79
1980	1983	9	6201	7964	0.78

These analyses indicate that the collective dose per megawatt-year at the newer U.S. PWRs is between 0.7 and 0.8. This can be compared to the following values of the collective dose per megawatt-year for foreign reactors. It appears that the value of this parameter is still two to four times that found for most foreign reactors (except the Japanese). Under an NRC contract,

Mr. J. Baum, Brookhaven National Lab., will soon publish the "Proceedings of an International Workshop on Historical Dose Experience and Dose Reduction at Nuclear Power Plants" which will have more details about the exposures experienced at many foreign reactors.

<u>Country</u>	<u>Reactor Type</u>	<u>1981</u>	<u>1982</u>
Japan	PWRs		0.61
France	PWRS	0.24	0.28
Britain	GCRs	0.67	0.36
Canada	PHWRs	0.25	
Sweden	BWRs & PWRs		0.2

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13 SUPPLEMENTARY NOTES

14 ABSTRACT (200 words or less)

This report summarizes the occupational radiation exposure information that has been reported to the U.S.N.R.C. by commercial nuclear power reactors during the years 1969 through 1983. The bulk of the data presented in the report was obtained from annual radiation exposure reports submitted in accordance with the requirements of 10 CFR 20.407 and license technical specifications. Data on workers terminating their employment at nuclear power facilities was obtained from reports submitted pursuant to 10 CFR 20.408. The annual reports submitted by the 76 nuclear power plants that had completed at least one full year of operation as of December 31, 1983, indicated that the number of personnel monitored during 1983 was 136,700 persons and the annual collective dose incurred by these individuals was 56,500 man-rems (man-cSv). The average annual dose for each worker that received a measurable dose was 0.66 rems(cSv), and the average collective dose per reactor was 753 man-rems (man-cSv). The termination reports revealed that some 56,500 individuals completed their employment with one or more reactor facilities during 1982.* Approximately 4,500 of these workers could be considered transients and they received an average dose of 1.11 rems(cSv).

*The most recent year for which most of the termination data are available for analysis.

15a KEY WORDS AND DOCUMENT ANALYSIS

occupational radiation exposure
nuclear power reactors

15b DESCRIPTORS

16 AVAILABILITY STATEMENT

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17 SECURITY CLASSIFICATION

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