

# OCCUPATIONAL RADIATION EXPOSURE AT LIGHT WATER COOLED POWER REACTORS

Annual Report  
1977



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U. S. Nuclear Regulatory Commission

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**OCCUPATIONAL RADIATION EXPOSURE  
AT LIGHT WATER COOLED  
POWER REACTORS**

**Annual Report  
1977**

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**Licensing Operations Evaluation Branch  
Division of Technical Support  
Office of Management and Program Analysis  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555**



## SUMMARY

This report presents an updated compilation of occupational radiation exposures at commercial light water cooled nuclear power reactors (LWRs) for the years 1969 through 1977. The information contained in this document was derived from reports submitted to the United States Nuclear Regulatory Commission in accordance with requirements of individual plant Technical Specifications, and in accordance with Part 20.407 of Title 10, Chapter 1, Code of Federal Regulations (10 CFR Part 20.407).

An additional 4 LWRs completed a full calendar year of commercial operation for the first time in 1977. This report now encompasses data from 57 commercially operating U.S. nuclear power plants. The number of personnel monitored at LWRs increased approximately 10% in 1977, and the average collective dose to personnel (man-rem per reactor-year) increased 14% over the 1976 average. The average number of personnel receiving measurable exposure per reactor increased 11%, and the average exposure per individual in 1977 was 0.8 rem per person.



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OCCUPATIONAL RADIATION EXPOSURE  
AT  
LIGHT WATER COOLED POWER REACTORS  
1977

INTRODUCTION

This report contains a compilation of the occupational radiation exposures at light water nuclear reactors (LWRs) for the years 1969 through 1977. Data from those plants completing a full year of commercial operation for the first time in 1977 have been added to information previously collected and published as WASH-1311,<sup>1</sup> NUREG-75/032,<sup>2</sup> NUREG-0109,<sup>3</sup> and NUREG-0323.<sup>4</sup> Appendix B of this report contains the data submitted to the USNRC in accordance with the requirements of 10 CFR Part 20.407, which annually requires power reactor licensees to submit a statistical summary report of personnel monitoring information recorded during the year. Appendix C contains a compilation of information submitted annually to the NRC in accordance with individual license Technical Specifications requirements and guidance provided in Regulatory Guide 1.16, "Reporting of Operating Information - Appendix A Technical Specifications."

The compilation of occupational radiation exposure data through 1975 contained in reference (3) was reworked in some cases to remain consistent with aforementioned requisites for inclusion in this document. Figures on radiation exposure relating to work and job functions were calculated from data submitted by the licensees in accordance with guidance provided in Regulatory Guide 1.16 (see Appendix C). The plant operating data in Appendix A, including the calculated value of megawatt-years generated, was obtained or derived from information included in NUREG-0020-1, "Operating Units Status Report," January 1978. These reports are available in local public document rooms (LPRDs) located near each licensed plant or in the U.S. Nuclear Regulatory Commission's Public Document Room at 1717 H Street, Washington, D.C., 20555.

The term man-rem is a unit of collective dose and, as used in this report, is the summation of the occupational radiation exposures of all individuals at the plant site, including utility station personnel, other utility personnel brought in on a temporary basis, and contractor personnel. Because all licensees did not report data consistently in the format suggested by Regulatory Guide 1.16, the annual man-rem exposure figures used in all calculations (with the exception of Tables 11 and 12) were determined by summing the product of the numbers of individuals in each annual exposure range specified in 10 CFR

Part 20.407 by the mid-point exposure in each range. The annual man-rem totals thus determined are presented in Appendix A for each plant site.

Personnel figures used in all calculations were those reported in accordance with 10 CFR Part 20.407 because personnel data received from licensees varied with differing interpretations of Regulatory Guide 1.16. Personnel data for each plant site are included in Appendix A.

TABLE 1  
MAN-REM SUMMARY

a. SUMMARY - LIGHT WATER REACTORS					
	Number of Reactors	Average Rated Capacity* (MWe)	Average MW-Yr Generated	Average Man-Rem/ Reactor-Year	Yearly Average Man-Rem/ MW-Year
1969	7	247	167	178	1.1
1970	9	332	224	377	1.7
1971	11	318	257	315	1.2
1972	17	463	332	386	1.2
1973	23	526	336	594	1.8
1974	32	587	334	427	1.3
1975	44	644	406	457	1.1
1976	53	676	411	499	1.2
1977	57	688	486	570	1.2

b. PRESSURIZED WATER REACTORS					
	Number of Reactors	Average Rated Capacity* (MWe)	Average MW-Yr Generated	Average Man-Rem/ Reactor-Year	Yearly Average Man-Rem/ MW-Year
1969	4	349	248	165	0.7
1970	4	349	245	685	2.8
1971	5	377	304	336	1.1
1972	8	464	287	464	1.4
1973	11	541	434	841	2.1
1974	18	613	367	364	1.0
1975	26	642	459	309	0.7
1976	30	699	444	460	1.0
1977	34	697	564	396	0.8

c. BOILING WATER REACTORS					
	Number of Reactors	Average Rated Capacity* (MWe)	Average MW-Yr Generated	Average Man-Rem/ Reactor-Year	Yearly Average Man-Rem/ MW-Year
1969	3	112	58	195	3.4
1970	5	318	207	131	0.6
1971	6	269	218	297	1.4
1972	9	463	340	318	0.9
1973	12	512	283	368	1.3
1974	14	553	290	507	1.7
1975	18	646	331	670	2.0
1976	23	647	367	549	1.5
1977	23	645	396	828	2.1

\*Maximum Dependable Capacity (Net) - the dependable gross electrical output as measured at the output terminals of the turbine generator during the most restrictive seasonal conditions (usually summer) less the normal station service loads.

#### PERSONNEL EXPOSURE SUMMARY

Table 1 provides a summary of the plant data presented in Appendix A.\* Man-rem per reactor-year and man-rem per megawatt-year were calculated using annual man-rem figures reported by each light water cooled nuclear power reactor (LWR) that had operated commercially at least one full calendar year as of January 1, 1978. The average exposure per reactor-year and the average exposure per megawatt-year are presented in Table 1, summarized by all LWRs and categorized by pressurized water reactors (PWRs), and boiling water reactors (BWRs). The average exposure for each reactor at each station was determined by dividing the total exposure reported for the station by the number of reactors at that particular site.

The data presented in Table 1 has been plotted in Figures 1 and 2. Figure 1 illustrates that the average man-rem per reactor-year for BWRs increased in 1977 while the average man-rem per reactor decreased for PWRs. In Figure 2 the increase in man-rem per megawatt-year for BWRs is illustrated. Also, man-rem per megawatt-year is shown to have decreased for PWRs during the 1977 calendar year.

Analysis of the data from the period 1969 through 1977 determined that the 9-year average occupational exposure for operating BWRs was

\*For multi-unit sites, the data displayed in Appendix A is the total for all units, with the exception of Millstone Units 1 and 2, which are presented separately as a BWR and PWR, respectively.

FIGURE 1  
AVERAGE MAN-REM/REACTOR YEAR

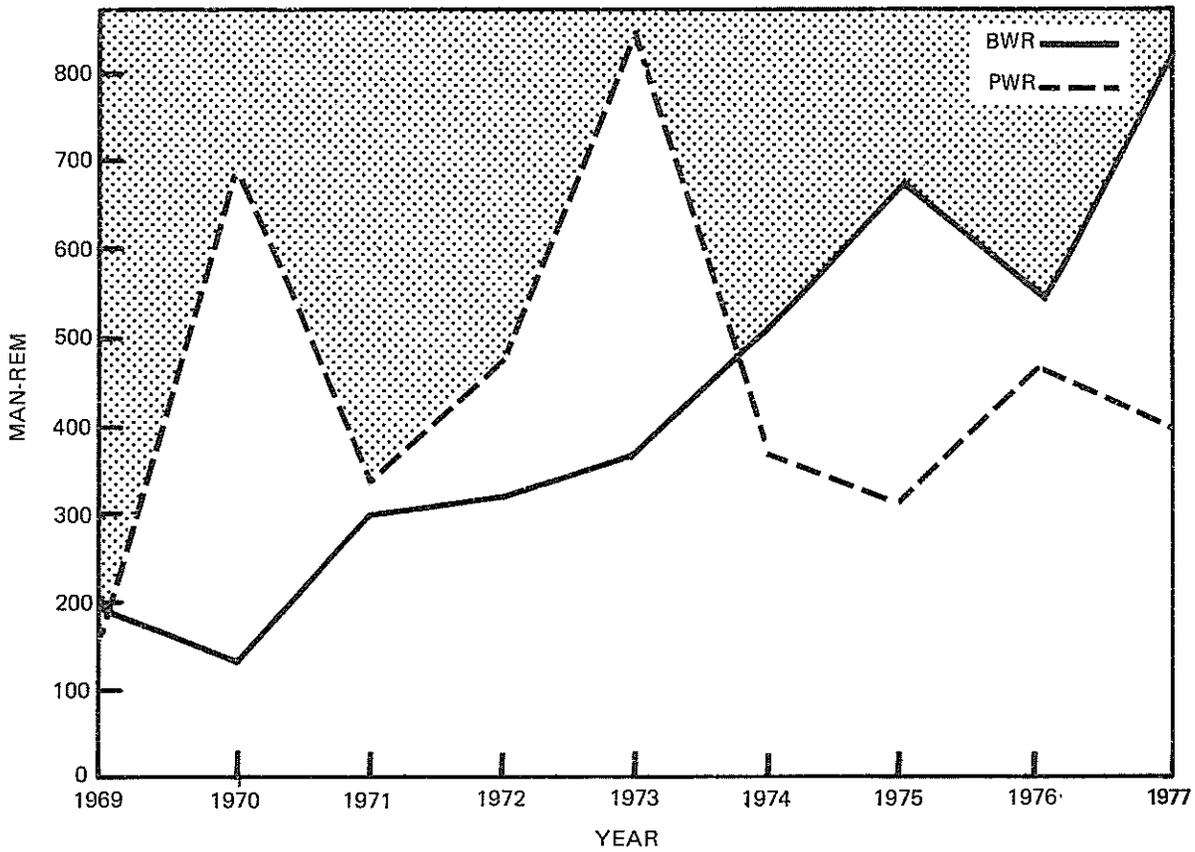
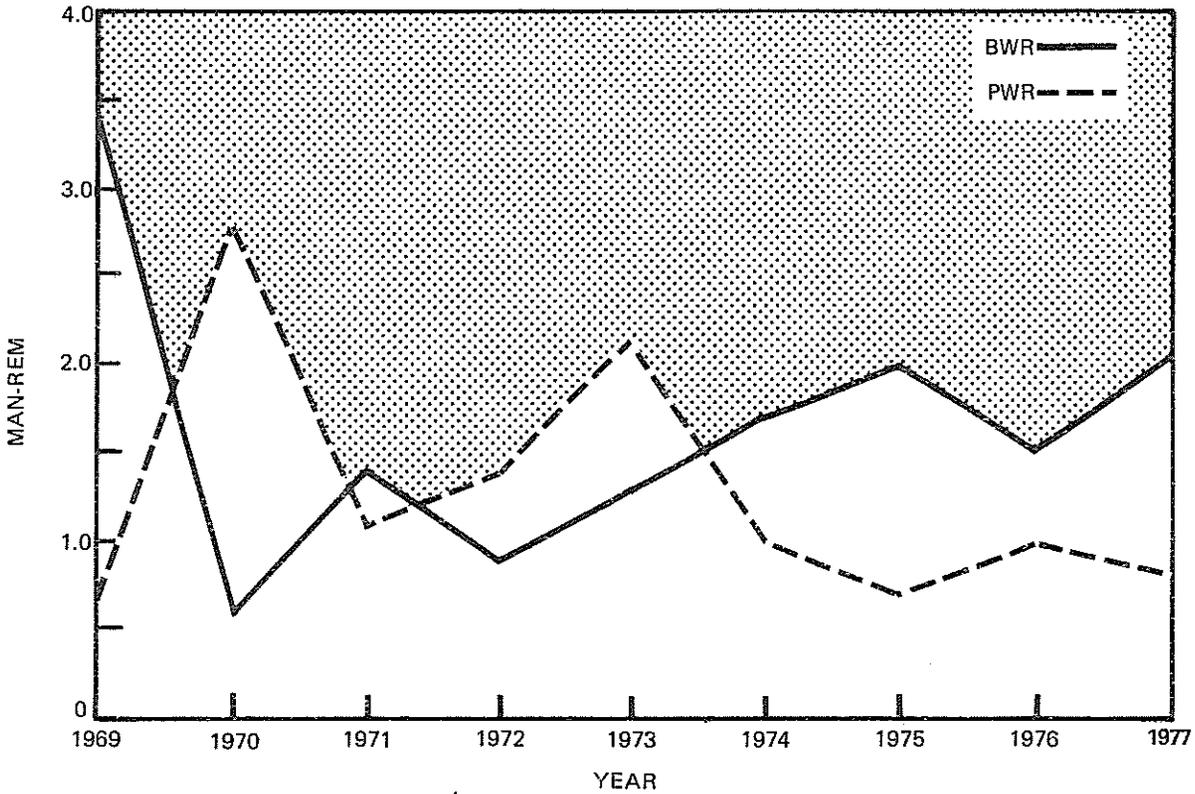


FIGURE 2  
AVERAGE MAN-REM/MW-YR



approximately 1.7 man-rem per megawatt-year, and for PWRs was approximately 1.0 man-rem per megawatt-year. The average man-rem per megawatt-year for all commercial light water cooled nuclear power reactors listed in Appendix A for this 9-year period was approximately 1.3 man-rem per megawatt-year.

Because this report is based on data from only 57 commercially operating nuclear power reactors, unusual events or conditions at even a small number of these reactors could have an inordinate impact on the results of any statistical analyses. Tables 2 through 7 present a listing of commercial operating plants ranked by man-rem per megawatt-year, man-rem per person and total man-rem exposure at each site. These tables are included to illustrate the frequency distribution of selected plant site statistics. The cost of generating electricity by nuclear power, as measured in terms of man-rem exposure per megawatt-year generated, is displayed in Tables 2 and 3. A large man-rem to megawatt-year ratio in combination with a high yearly man-rem total (Tables 4 and 5) generally indicates that a plant was shutdown for extensive maintenance or modifications. In 1977 BWR's performed a great deal of feedwater nozzle/sparger work which accounted for a large percentage of the exposures at these plants. Other major activities included work on core spray lines, the reactor water cleanup system, main steam isolation valves, and main condenser. At PWR's large exposures were incurred during inspection and repair of steam generator tubes.<sup>5</sup>

TABLE 2  
SUMMARY OF MAN-REM PER MEGAWATT-YEAR  
AT LWRS - 1977 \*

<u>Plant Site</u>	<u>Man-Rem/MW-Yr</u>	<u>Plant Site</u>	<u>Man-Rem/MW-Yr</u>
1. Palisades	0.16	20. Indian Point 1, 2, 3	0.88
2. Trojan	0.22	21. Robinson 2	0.89
3. St. Lucie	0.23	22. Calvert Cliffs 1	0.94
4. Beaver Valley 1	0.24	23. Hatch 1	1.04
5. Kewaunee	0.33	24. Quad Cities 1, 2	1.06
Prairie Island 1, 2	0.33	Turkey Point 3, 4	1.06
6. Cooper	0.37	25. Ginna	1.10
7. Maine Yankee	0.40	26. Haddam Neck	1.33
8. Arkansas 1	0.42	27. Dresden 1, 2, 3	1.49
9. Millstone 2	0.47	28. Peach Bottom 2, 3	1.93
10. Point Beach 1, 2	0.49	29. Surry 1, 2	2.03
11. Cook 1	0.52	30. Fitzpatrick	2.35
12. Three Mile Island 1	0.54	Monticello	2.35
13. Rancho Seco	0.55	31. Yankee Rowe	2.86
14. Vermont Yankee	0.61	32. San Onofre 1	3.00
15. Browns Ferry 1, 2	0.65	33. Brunswick 2	3.84
16. Millstone 1	0.68	34. Nine Mile Point 1	3.98
17. Zion 1, 2	0.74	35. Oyster Creek	4.18
18. Fort Calhoun	0.84	36. Big Rock Point	7.66
19. Duane Arnold	0.85	37. Pilgrim 1	9.92
Oconee 1, 2, 3	0.85	38. LaCrosse	19.82

\* Note: Humboldt Bay did not operate in 1977 and is not included in this table.

TABLE 3  
MAN-REM PER MEGAWATT-YEAR AT BWRs AND PWRs  
1977

A. BWRs *			
<u>Plant Site</u>	<u>Man-Rem/MW-Yr</u>	<u>Plant Site</u>	<u>Man-Rem/MW-Yr</u>
1. Cooper	0.37	10. Fitzpatrick	2.35
2. Vermont Yankee	0.61	Monticello	2.35
3. Browns Ferry 1, 2	0.65	11. Brunswick 2	3.84
4. Millstone 1	0.68	12. Nine Mile Point 1	3.98
5. Duane Arnold	0.85	13. Oyster Creek	4.18
6. Hatch 1	1.04	14. Big Rock Point	7.66
7. Quad Cities 1, 2	1.06	15. Pilgrim 1	9.92
8. Dresden 1, 2, 3	1.49	16. LaCrosse	19.82
9. Peach Bottom 2, 3	1.93		
B. PWRs			
<u>Plant Site</u>	<u>Man-Rem/MW-Yr</u>	<u>Plant Site</u>	<u>Man-Rem/MW-Yr</u>
1. Palisades	0.16	13. Zion 1, 2	0.74
2. Trojan	0.22	14. Fort Calhoun	0.84
3. St. Lucie	0.23	15. Oconee 1, 2, 3	0.85
4. Beaver Valley 1	0.24	16. Indian Point 1, 2, 3	0.88
5. Kewaunee	0.33	17. Robinson 2	0.89
Prairie Island 1, 2	0.33	18. Calvert Cliffs 1	0.94
6. Maine Yankee	0.40	19. Turkey Point 3, 4	1.06
7. Arkansas 1	0.42	20. Ginna	1.10
8. Millstone 2	0.47	21. Haddam Neck	1.33
9. Point Beach 1, 2	0.49	22. Surry 1, 2	2.03
10. Cook 1	0.52	23. Yankee Rowe	2.86
11. Three Mile Island 1	0.54	24. San Onofre	3.01
12. Rancho Seco	0.55		

\* Note: Humboldt Bay did not operate in 1977 and is not included in this table.

TABLE 4

SUMMARY OF EXPOSURES AT LWRS - 1977

<u>Plant Site</u>	<u>Total Man-Rem</u>	<u>Plant Site</u>	<u>Total Man-Rem</u>
1. Beaver Valley 1	87	22. Robinson 2	455
2. Palisades	100	23. Hatch 1	465
3. Kewaunee	139	24. Calvert Cliffs 1	547
4. St. Lucie	152	25. Haddam Neck	641
5. Trojan	174	26. San Onofre 1	847
6. Cooper	197	27. Browns Ferry 1, 2	863
7. LaCrosse	224	28. Monticello	1000
8. Millstone 2	242	29. Zion 1, 2	1003
9. Maine Yankee	245	30. Quad Cities 1, 2	1031
10. Arkansas 1	256	31. Turkey Point 3, 4	1036
11. Vermont Yankee	258	32. Indian Point 1, 2, 3	1070
12. Fort Calhoun	297	33. Fitzpatrick	1080
13. Cook 1	299	34. Brunswick 2	1119
Duane Arnold	299	35. Oconee 1, 2, 3	1328
14. Prairie Island 1, 2	300	36. Nine Mile Point	1383
15. Big Rock Point	334	37. Oyster Creek	1614
16. Yankee Rowe	356	38. Dresden 1, 2, 3	1693
17. Three Mile Island 1	359	39. Humboldt Bay	1904
18. Rancho Seco	390	40. Peach Bottom 2, 3	2036
19. Millstone 1	392	41. Surry 1, 2	2307
20. Ginna	401	42. Pilgrim	3142
21. Point Beach 1, 2	429		

TABLE 5

EXPOSURES AT BWRS AND PWRS - 1977

<u>A. BWRS</u>			
<u>Plant Site</u>	<u>Total Man-Rem</u>	<u>Plant Site</u>	<u>Total Man-Rem</u>
1. Cooper	197	10. Quad Cities 1, 2	1031
2. LaCrosse	224	11. Fitzpatrick	1080
3. Vermont Yankee	258	12. Brunswick 2	1119
4. Duane Arnold	299	13. Nine Mile Point	1383
5. Big Rock Point	334	14. Oyster Creek	1614
6. Millstone 1	392	15. Dresden 1, 2, 3	1693
7. Hatch 1	465	16. Humboldt Bay	1904
8. Browns Ferry 1, 2	863	17. Peach Bottom 2, 3	2036
9. Monticello	1000	18. Pilgrim	3142

<u>B. PWRS</u>			
<u>Plant Site</u>	<u>Total Man-Rem</u>	<u>Plant Site</u>	<u>Total Man-Rem</u>
1. Beaver Valley 1	87	14. Rancho Seco	390
2. Palisades	100	15. Ginna	401
3. Kewaunee	139	16. Point Beach 1, 2	429
4. St. Lucie	152	17. Robinson 2	455
5. Trojan	174	18. Calvert Cliffs 1	547
6. Millstone 2	242	19. Haddam Neck	641
7. Maine Yankee	245	20. San Onofre 1	847
8. Arkansas 1	256	21. Zion 1, 2	1003
9. Fort Calhoun	297	22. Turkey Point 3, 4	1036
10. Cook 1	299	23. Indian Point 1, 2, 3	1070
11. Prairie Island 1, 2	300	24. Oconee 1, 2, 3	1328
12. Yankee Rowe	356	25. Surry 1, 2	2307
13. Three Mile Island 1	359		

TABLE 6

AVERAGE ANNUAL DOSE PER PERSON  
AT LWRS - 1977

<u>Plant Site</u>	<u>Avg. Man-Rem Per Person</u>	<u>Plant Site</u>	<u>Avg. Man-Rem Per Person</u>
1. Calvert Cliffs 1	0.24	20. Brunswick 2	0.74
2. Beaver Valley 1	0.26	21. Ginna	0.76
3. Trojan	0.29	Rancho Seco	0.76
4. Palisades	0.30	22. Indian Point 1, 2, 3	0.77
5. Three Mile Island 1	0.32	23. Fitzpatrick	0.78
6. St. Lucie	0.34	24. Turkey Point 3, 4	0.79
7. Hatch 1	0.36	25. Oconee 1, 2, 3	0.83
Millstone 1	0.36	26. San Onofre 1	0.85
Millstone 2	0.36	27. Dresden 1, 2, 3	0.91
8. Cook 1	0.37	28. Oyster Creek	0.96
9. Vermont Yankee	0.40	29. Point Beach 1, 2	1.03
10. Prairie Island 1, 2	0.42	30. Quad Cities 1, 2	1.14
11. Arkansas 1	0.43	31. Monticello	1.16
12. Kewaunee	0.45	32. Surry 1, 2	1.24
13. Browns Ferry 1, 2	0.46	33. Nine Mile Point 1	1.27
14. Maine Yankee	0.48	34. Zion 1, 2	1.28
15. Yankee Rowe	0.49	35. LaCrosse	1.59
16. Duane Arnold	0.55	36. Pilgrim	1.68
17. Fort Calhoun	0.56	37. Humboldt Bay	1.79
18. Cooper	0.63		
19. Big Rock Point	0.72		
Haddam Neck	0.72		
Peach Bottom 2, 3	0.72		
Robinson 2	0.72		

TABLE 7

AVERAGE ANNUAL DOSE PER PERSON  
AT BWRs AND PWRs - 1977

A. BWRs			
<u>Plant Site</u>	<u>Avg. Man-Rem Per Person</u>	<u>Plant Site</u>	<u>Avg. Man-Rem Per Person</u>
1. Hatch 1	0.36	8. Fitzpatrick	0.78
Millstone 1	0.36	9. Dresden 1, 2, 3	0.91
2. Vermont Yankee	0.40	10. Oyster Creek	0.96
3. Browns Ferry 1, 2	0.46	11. Quad Cities 1, 2	1.14
4. Duane Arnold	0.55	12. Monticello	1.16
5. Cooper	0.63	13. Nine Mile Point 1	1.27
6. Big Rock Point	0.72	14. LaCrosse	1.59
Peach Bottom 2, 3	0.72	15. Pilgrim	1.68
7. Brunswick 2	0.74	16. Humboldt Bay	1.79

B. PWRs			
<u>Plant Site</u>	<u>Avg. Man-Rem Per Person</u>	<u>Plant Site</u>	<u>Avg. Man-Rem Per Person</u>
1. Calvert Cliffs 1	0.24	14. Fort Calhoun	0.56
2. Beaver Valley 1	0.26	15. Haddam Neck	0.72
3. Trojan	0.29	Robinson 2	0.72
4. Palisades	0.30	16. Ginna	0.76
5. Three Mile Island 1	0.32	Rancho Seco	0.76
6. St. Lucie	0.34	17. Indian Point 1, 2, 3	0.77
7. Millstone 2	0.36	18. Turkey Point 3, 4	0.79
8. Cook 1	0.37	19. Oconee 1, 2, 3	0.83
9. Prairie Island 1, 2	0.42	20. San Onofre 1	0.85
10. Arkansas 1	0.43	21. Point Beach 1, 2	1.03
11. Kewaunee	0.45	22. Surry 1, 2	1.24
12. Maine Yankee	0.48	23. Zion 1, 2	1.28
13. Yankee Rowe	0.49		

Additional information on repair and maintenance activities at each plant can be found in the report, Nuclear Power Plant Operating Experience, NUREG-0483.<sup>6</sup>

#### EXPOSURE TO INDIVIDUALS

As shown in Table 8, an average of 742 persons per reactor received measurable exposure at commercial LWRs in 1977. This represents an increase of 11% over the number of personnel per reactor that received measurable exposure in 1976. The average exposure per individual increased slightly to approximately 0.8 rem in 1977.

Figure 3 presents a summary of information collected from commercial nuclear operating reactors for the period 1969 through 1977. During this nine year period, the number of reactors in commercial operation has increased from 7 LWRs in 1969 to 57 in 1977. The total number of individuals who received measurable exposure at all LWRs, and the average exposure per person, are presented with the number of individuals monitored for exposure and the total annual dose received each year. As Figure 3 illustrates, the total man-rem received each year has been distributed over an increasingly large work force.

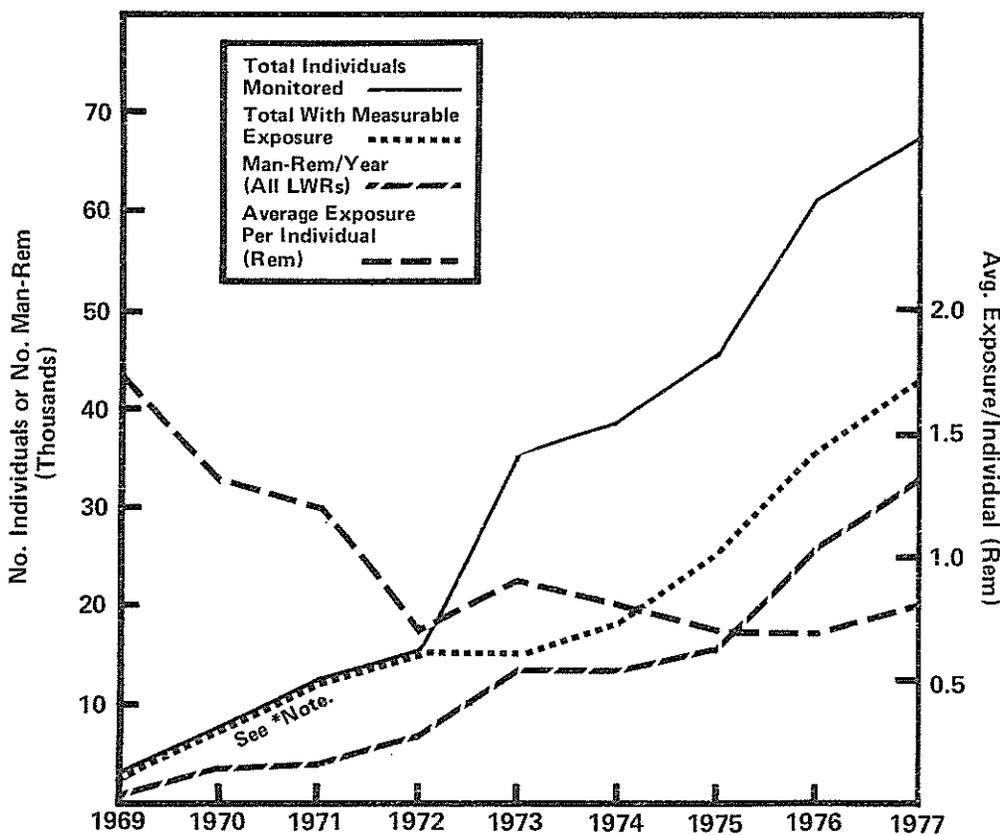
Table 9 is a summary of the annual whole body exposures received by the individuals monitored for exposure at LWRs. The individual

TABLE 8

OCCUPATIONAL RADIATION EXPOSURE PER INDIVIDUAL		
Year	Average Exposure Per Individual (Rems)	Average Number of Personnel With Measurable Exposure Per Reactor
1969	1.7	149
1970	1.3	380
1971	1.2	309
1972	0.7	345
1973	0.9	634
1974	0.8	567
1975	0.7*	625
1976	0.7	669
1977	0.8	742

\*This figure was recalculated to reflect a correction in the 1975 Appendix A personnel data for Surry 1&2.

FIGURE 3  
AVERAGE EXPOSURE PER INDIVIDUAL  
1969-1977



\*Note: Data on personnel monitored who received no measurable exposure not available prior to 1973.

TABLE 9

SUMMARY OF ANNUAL WHOLE BODY EXPOSURES BY INCREMENT - LWR'S 5  
(For Those Personnel at Licensee Stations Included in Appendix A)

Year	No Measurable Exposure	Number of Individuals										Total With Measurable Exposure	Total Monitored				
		0-1	0-2	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9			9-10	10-11	11	
1969	-	2607		144	144	70	26	5	2	0	0	0	0	0	0	2854	2854
1970	-	6953		184	184	175	92	102	11	1	0	0	0	0	0	7518	7518
1971	-	9660		328	328	146	107	17	11	0	0	0	0	0	0	10269	10269
1972	-	14783		536	536	205	114	47	23	10	6	6	6	0	0	15730	15730
1973	20717	10249		2449	1585	432	237	117	71	38	16	7	7	0	0	15201	35918
1974	20240	13455		2491	1375	470	226	86	30	6	0	0	0	0	0	18139	38379
1975	20188	18277		3892	1903	707	426	169	60	24	12	0	1	0	0	25471	45659
1976	25704	26636		4880	2354	789	487	188	70	26	11	5	1	0	0	35447	61151
1977	24868	31298		6162	2837	1130	569	141	66	36	21	6	0	0	0	42266	67134

exposures occurring during the period 1969-1977 have been categorized by the exposure increments specified in 10 CFR Part 20.407(b). In 1977 the total number of individuals monitored for exposure at licensed LWRs increased 10% over the 1976 figure. During this same period, the number of personnel receiving measurable exposure increased approximately 19%. The data indicate that the number of individuals that received whole body exposures less than 5 rem increased 19% in 1977, but that annual doses in excess of 5 rem decreased by 10%.

The number of persons receiving whole body exposures in excess of the limits established by 10 CFR Part 20.101 at commercial reactors are reported for the years 1971 through 1977 in Table 10. During 1977 the requirement in 10 CFR Part 20.405 for reporting exposures to excessive concentrations of radioactive material was changed from 40 MPC-hours (Maximum Permissible Concentration per hour) in any seven consecutive days to 520 MPC-hours in any calendar quarter. Approximately 0.04% of the persons monitored for radiation exposure at commercial reactors received whole body overexposures in 1977.

#### EXPOSURE BY WORK AND JOB FUNCTION

Tables 11, 12 and 13 present data submitted in accordance with Regulatory Guide 1.16 on radiation exposures at commercial nuclear power reactors. Licensees are requested to categorize exposure and personnel data by work and job functions specified in Reg. Guide 1.16. In some

TABLE 10

OVEREXPOSURES AT COMMERCIAL POWER REACTORS<sup>5</sup>

<u>Year</u>	<u>Number of Overexposures to External Radiation</u>	<u>Whole Body Man-Rem Involved</u>	<u>Whole Body Maximum Exposure (Rems)</u>	<u>Report of Exposure to Excessive Concentration of Radioactive Material</u>	<u>Maximum Exposure</u>
1971	2	4.5	3.1	21	6.1 rem (thyroid)
1972	16	49.7	5.1	2	2000 MPC-hr
1973	19	61.2	4.0	0	-
1974	43	155.9	6.1	12	433 MPC-hr
1975	14	44.2	3.8	7	13.5 rem (Tung)
1976	20	74.3	10.1	1	248 MPC-hr
1977	28	56.0	3.6	0	-

cases, licensee data required recategorization by NRC staff. These cases are so noted in Appendix C. Categorization of personnel data is not included in this report because personnel data received from the licensees continue to vary due to differing interpretations of the format guidance presented in Regulatory Guide 1.16.\*

Table 11a displays the distribution of exposure by work function as reported by the licensees. Workers involved in routine and special maintenance functions continue to acquire approximately 71% of all exposures at nuclear power plants, as was the case in 1975 and 1976. The total dose to contractor personnel exceeded exposures to utility personnel (utility personnel brought in on a temporary basis as well as those individuals who are utility station personnel) by approximately 6% in 1977. Contractor personnel, however, received a greater percentage of exposure than utility personnel in only two work functions, Inservice Inspection and Special Maintenance. Exposures to contractor personnel performing special maintenance functions were almost two and one-half times the total dose received by utility personnel in the same category.

Categorization of personnel dose in 1977 by job function is presented in Table 12. Each work function listed in Table 11 is subdivided into five basic job functions: Maintenance, Operations,

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\*Regulatory Guide 1.16 is currently under revision. Proposed changes will provide further clarification on reporting of personnel data and should eliminate this problem.

TABLE 11

PERSONNEL DOSE BY WORK FUNCTION (1977)  
PER DATA SUPPLIED BY LICENSEE IN ACCORDANCE WITH R.G. 1.16

a. TABULATION OF MAN-REM BY WORK FUNCTION

<u>Work Function</u>	<u>Station Employees</u>	<u>Utility Employees</u>	<u>Contract Workers and Others</u>	<u>Total</u>
Reactor Operations	2626	224	427	3277
Routine Maintenance	3470	1544	3708	8722
Inservice Inspection	205	245	1536	1986
Special Maintenance	1700	2123	9398	13221
Waste Processing	1207	36	554	1797
Refueling	<u>852</u>	<u>390</u>	<u>829</u>	<u>2071</u>
Totals	10060	4562	16452	31074

b. PERCENTAGES OF EXPOSURE BY WORK FUNCTION

<u>Work Function</u>	<u>Utility</u>	<u>Contractor</u>	<u>Total</u>
Reactor Operations	9.2%	1.4%	10.5%
Routine Maintenance	16.1%	11.9%	28.1%
Inservice Inspection	1.5%	4.9%	6.4%
Special Maintenance	12.3%	30.2%	42.5%
Waste Processing	4.0%	1.8%	5.8%
Refueling	<u>4.0%</u>	<u>2.7%</u>	<u>6.7%</u>
Totals	47.1%	52.9%	100%

Health Physics, Supervisory and Engineering. Over 70% of reported exposures occurred in the maintenance functions. Utility personnel exposures exceeded contractor exposures except in maintenance and engineering. By job function, total dose to contractor personnel exceeded utility exposures by approximately 4% in 1977. Table 13 displays a breakdown of this data by BWRs and PWRs.

TABLE 12

PERSONNEL DOSE BY JOB FUNCTION AT LWR'S (1977)

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a. TABULATION OF ANNUAL DOSE BY JOB FUNCTION (REMS)

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<u>Personnel Job Function</u>	<u>Station Employees</u>	<u>Utility Employees</u>	<u>Contract Workers and Others</u>	<u>Total</u>
Maintenance	4182	3759	11569	19510
Operations	2485	69	47	2601
Health Physics	943	36	865	1844
Supervisory	648	79	401	1128
Engineering	<u>556</u>	<u>288</u>	<u>1170</u>	<u>2014</u>
TOTALS	8814	4231	14052	27097*

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b. PERCENTAGES OF EXPOSURE BY JOB FUNCTION

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<u>Personnel Job Function</u>	<u>Utility</u>	<u>Contractor</u>	<u>Total</u>
Maintenance	29.3%	42.7%	72.0%
Operations	9.4%	0.2%	9.6%
Health Physics	3.6%	3.2%	6.8%
Supervisory	2.7%	1.5%	4.2%
Engineering	<u>3.1%</u>	<u>4.3%</u>	<u>7.4%</u>
TOTALS	48.1%	51.9%	100%

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\*The remaining 3977 man-rem of the 31074 man-rem total reported in Table 5 were not categorized by job function by the licensees.

TABLE 13

PERSONNEL DOSE BY JOB FUNCTION AT BWRs AND PWRs (1977)

a. ANNUAL DOSE BY JOB FUNCTION AT BWRs (REMS)

<u>Personnel Job Function</u>	<u>Station Employees</u>	<u>Contract Workers and Others</u>	<u>Total</u>
Maintenance	4354	8060	12414
Operations	1614	46	1660
Health Physics	541	569	1110
Supervisory	513	196	709
Engineering	<u>462</u>	<u>784</u>	<u>1246</u>
TOTALS	7484	9655	17139

b. ANNUAL DOSE BY JOB FUNCTION AT PWRs (REMS)

<u>Personnel Job Function</u>	<u>Station Employees</u>	<u>Contract Workers and Others</u>	<u>Total</u>
Maintenance	3587	3509	7096
Operations	940	1	941
Health Physics	438	296	734
Supervisory	214	205	419
Engineering	<u>382</u>	<u>386</u>	<u>768</u>
TOTALS	5561	4397	9958

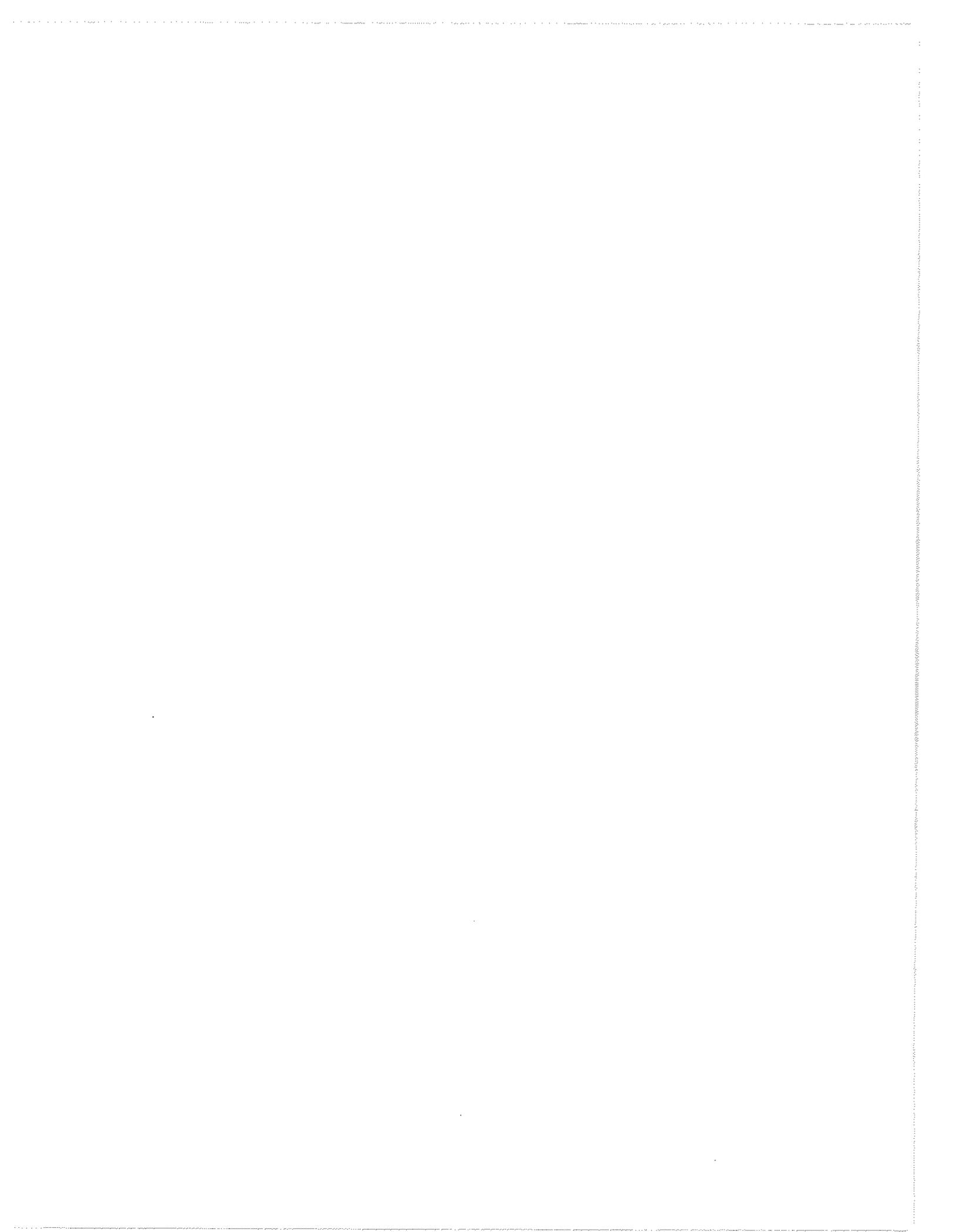
REFERENCES

1. Murphy, T. D., A Compilation of Occupational Radiation Exposures from Light Water Cooled Nuclear Power Plants, 1969-1973, USAEC, WASH-1311, May 1974.
2. Murphy, T. D., Hinson, C. S., Occupational Radiation Exposures at Light Water Cooled Nuclear Power Reactors, 1969-1974, USNRC, NUREG-75/032, June 1975.
3. Murphy, T. D., et al., Occupational Radiation Exposure at Light Water Cooled Nuclear Power Reactors, 1969-1975, NUREG-0109.
4. Johnson, L. A., Occupational Radiation Exposure at Light Water Cooled Power Reactors, 1976, USNRC, NUREG-0323, March 1978.
5. Brooks, B. G., Occupational Radiation Exposure, Tenth Annual Report, 1977, USNRC, NUREG-0463, October 1978.
6. Beebe, M. R., Nuclear Power Plant Operating Experience, NUREG-0483, February 1979.

APPENDIX A

PERSONNEL, EXPOSURE AND POWER  
GENERATION SUMMARY

NOTE: Personnel and man-rem data in this Appendix were derived from licensee reports submitted in accordance with 10 CFR 20.407.



Reporting Organization	Year	Mega-watt year (MW-YR)	Unit Availability Factor	PERSONNEL	ANNUAL MAN-REM					Average Exposure REM per person	MAN-REM per MW-YR
					Total	Operations	Maintenance	Contractor	Station/Utility		
ARKANSAS 1 Docket 50-313; DPR-51 1st commercial operation 12/74 Type - PWR Capacity - 836 MWe	1975	588.0	76.5	147	46	27	262	100	189	0.31	0.1
	1976	464.6	56.6	476	289	28	228	111	145	0.61	0.62
	1977	610.3	76.8	601	256					0.43	0.42
BEAVER VALLEY 1 Docket 50-334; DPR-66 1st commercial operation 10/76 Type - PWR Capacity - 800 MWe	1977	355.6	57.0	331	87	8	79	58	29	0.26	0.24
BIG ROCK POINT Docket 50-155; DPR-6 1st commercial operation 3/63 Type - BWR Capacity - 65 MWe	1969	43.2		165	136					0.82	3.1
	1970	43.5		290	194					0.67	4.5
	1971	44.4		260	184					0.7	4.1
	1972	43.5		195	181					0.92	4.1
	1973	50.9		119	336			140	196	2.8	6.6
	1974	40.7	70.3	281	276	54	222	42	234	0.98	6.6
	1975	35.1	59.8	216	180	58	122	20	160	0.83	5.1
	1976	29.5	50.1	488	289	82	207	105	184	0.59	9.80
1977	43.6	73.4	465	334	94	240	60	274	0.72	7.66	
BROWNS FERRY 1, 2 Docket 50-259, 50-260; DPR-33, -52 1st commercial operation 8/74, 3/75 Type - BWR Capacity - 1065 MWe, 1065 MWe	1975	328.9	17.8	2380	325					0.14	1.0
	1976	337.6	26.9	2207	234					0.11	0.69
	1977	1327.5	73.0	1858	863	60	803	249	614	0.46	0.65

Reporting Organization	Year	Mega-watt year (MW-YR)	Unit Availability Factor	PERSONNEL	ANNUAL MAN-REM					Average Exposure REM per person	MAN-REM per MW-YR
					Total	Operations	Maintenance	Contractor	Station/Utility		
BRUNSWICK 2 Docket 50-234; DPR-62 1st commercial operation 11/75 Type - BWR Capacity - 790 MWe	1976	297.2	56.0	1265	326	15	311	222	104	0.26	1.10
	1977	291.1	55.7	1512	1119	48	1071	782	337	0.74	3.84
CALVERT CLIFFS 1 Docket 50-317; DPR-53 1st commercial operation 5/75 Type - PWR Capacity - 810 MWe	1976	753.4	95.2	507	74	28	46	8	66	0.15	0.10
	1977	583.0	72.1	2265	547	36	511	224	323	0.24	0.94
COOK 1 Docket 50-315; DPR-58 1st commercial operation 8/75 Type - PWR Capacity - 1044 MWe	1976	807.4	83.1	395	116	13	103	71	45	0.29	0.14
	1977	573.0	76.1	802	299	21	278	138	161	0.37	0.52
COOPER STATION Docket 50-298; DPR-46 1st commercial operation 7/74 Type - BWR Capacity - 764 MWe	1975	456.4	83.6	175	96	25	71	16	80	0.55	0.2
	1976	433.3	75.5	763	350	39	311	210	140	0.46	0.81
	1977	538.2	86.2	315	197	50	147	66	131	0.63	0.37

Reporting Organization	Year	Mega-watt year (MW-YR)	Unit Availability Factor	PERSONNEL Total With Exposure	ANNUAL MAN-REM					Average Exposure REM per person	MAN-REM per MW-YR
					Total	Operations	Main-tenance	Contractor	Station/Utility		
DRESDEN 1, 2, 3 Docket 50-10, 50-237, 50-249; DPR-10, -19, -25 1st commercial operation 7/60, 6/72, 11/71 Type - BWR Capacity - 197, 772, 773 MWe	1969	89.4			286						3.2
	1970	304.0			143						.5
	1971	394.5			715						1.8
	1972	1243.7			728						.6
	1973	1112.2			909	138	771	333	576		.8
	1974	842.5	54.9	1341	1662	254	2955	2111	1605		2.0
	1975	708.1	54.6	1594	3209	228	1452	749	1098		4.5
	1976	1127.2	80.8	3671	1680	228	1452	749	931		1.49
	1977	1132.9	77.0	1862	1693	316	1377	693	1000		1.49
						105	14	91	62	43	
DUANE ARNOLD Docket 50-331; DPR-49 1st commercial operation 2/75 Type - BWR Capacity - 515 MWe	1976	305.2	78.0	350	299	36	263	221	79		0.85
	1977	353.6	78.9	538							
FITZPATRICK Docket 50-333; DPR-59 1st commercial operation 7/75 Type - BWR Capacity - 800 MWe	1976	489.0	71.6	600	202	14	1066	937	143		0.41
	1977	460.5	68.4	1380	1080						2.35
FORT CALHOUN Docket 50-285; DPR-40 1st commercial operation 6/74 Type - PWR Capacity - 445 MWe	1975	252.3	67.4	469	298	28	285	93	205		1.2
	1976	265.9	69.5	516	313	33	264	38	275		1.18
	1977	351.8	79.4	535	297			72	225		0.84

Reporting Organization	Year	Mega-watt year (MW-YR)	Unit Availability Factor	PERSONNEL		ANNUAL MAN-REM					Average Exposure REM per person	MAN-REM per MW-YR
				Total With Exposure	Total	Operations	Maintenance	Contractor	Station/Utility			
GINNA Docket 50-244; DPR-18 1st commercial operation 3/70 Type - PWR Capacity - 470 MWe	1970	268.5		170	207	94	113	15	192	1.21	0.8	
	1971	327.8		340	430	69	361	108	322	1.26	1.3	
	1972	295.6		677	1032	71	961	278	754	1.52	3.4	
	1973	409.5		421	244	60	184	91	153	0.58	0.6	
	1974	253.7	62.4	884	1224					1.38	4.8	
	1975	365.2	76.7	558	496	29	607	210	426	0.89	1.4	
	1976	248.8	58.2	758	636	15	386	120	281	0.84	2.56	
	1977	365.6	85.5	530	401					0.76	1.10	
	HADDAM NECK (CONN. YANKEE) Docket 50-213; DPR-61 1st commercial operation 1/68 Type - PWR Capacity - 550 MWe	1969	397.6		138	106			27	79	0.77	0.5
		1970	424.7		734	689			463	226	0.94	1.7
1971		502.2		289	342			166	176	1.18	0.8	
1972		515.6		355	325			181	144	0.91	0.7	
1973		293.1		841	673			525	148	0.80	2.1	
1974		519.1	91.2	550	201	19	650	253	196	0.37	0.4	
1975		494.3	89.9	795	669	5	444	440	201	0.84	1.4	
1976		482.9	82.5	644	449	59	582			0.70	0.93	
1977		480.7	83.9	894	641					0.72	1.33	
HATCH 1 Docket 50-321; DPR-57 1st commercial operation 12/75 Type - BWR Capacity - 700 MWe		1976	496.3	83.8	630	134	79	55	4	130	0.21	0.27
	1977	446.8	66.3	1303	465	96	369	220	245	0.36	1.04	

Reporting Organization	Year	Mega-watt year (MW-YR)	Unit Availability Factor	PERSONNEL		ANNUAL MAN-REM					Average Exposure REM per person	MAN-REM per MW-YR
				Total With Exposure	Total	Operations	Maintenance	Contractor	Station/Utility			
HUMBOLDT BAY Docket 50-133; DPR-7 1st commercial operation 2/63 Type - BWR Capacity - 63 MWe	1969	40.6		125	164	69	95	12	152	1.31	4.0	
	1970	49.3		115	209	130	79	37	172	1.81	4.3	
	1971	39.6		140	292	114	178	65	227	2.1	7.7	
	1972	43.1		127	253	81	172	57	196	1.99	5.9	
	1973	50.1		235	261	59	202			1.11	5.3	
	1974	43.4	83.8	296	318	103	215			1.07	7.1	
	1975	45.3	83.9	303	332	128	204	110	222	1.10	7.3	
	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	-	
*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 Capacity - 0, 864, 873 MWe	1969	183.3		298	298						1.6	
	1970	43.3		1639	1639						33.0	
	1971	154.0		768	768						5.0	
	1972	142.3		967	967						6.6	
	1973	0		2998	5134	692	4442	2778	2356	1.71	1.6	
	1974	556.1	59.4	1019	910					0.89	1.6	
	1975	584.4	74.8	480	626	147	479	42	584	1.3	1.1	
	1976	273.9	34.8	1590	1950	154	1796	172	1778	1.23	7.12	
	1977	1278.3	75.3	1391	1070	189	881	383	687	0.77	0.88	
KEWAUNEE Docket 50-305; DPR-43 1st commercial operation 6/74 Type - PWR Capacity - 521 MWe	1975	401.9	88.2	54	25	1	24	11	14	0.5	0.06	
	1976	405.9	78.9	381	270	16	254	193	77	0.71	0.67	
	1977	425.0	79.9	312	139	8	131	76	63	0.45	0.33	

\*INDIAN POINT 1 was defueled in 1975.

Reporting Organization	Year	Mega-watt year (MW-YR)	Unit Availability Factor	PERSONNEL		ANNUAL MAN-REM					Average Exposure REM per person	MAN-REM per MW-YR
				Total With Exposure	Total	Operations	Main-tenance	Contractor	Station/Utility			
LACROSSE Docket 50-409; DPR-45 1st commercial operation 9/69 Type - BWR Capacity - 48 MWe	1971	33.1		218	158						0.72	5.0
	1972	29.2		151	172						1.13	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	40	71	6	105		1.42	7.3
	1976	21.2	47.6	118	111	60	164	8	216		0.94	5.24
	1977	11.3	33.7	141	224						1.59	19.82
MAINE YANKEE Docket 50-209; DPR-36 1st commercial operation 12/72 Type - PWR Capacity - 760 MWe	1973	408.7		422	121						0.29	0.3
	1974	432.6	68.7	620	420	64	356	61	60		0.68	1.0
	1975	542.9	79.9	577	347	16	331	188	232		0.60	0.6
	1976	712.2	95.0	244	85	27	58	197	150		0.35	0.12
	1977	617.6	82.2	508	245	46	199	112	133		0.48	0.40
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		1152	620	117	503	395	225		0.54	2.7
	1974	430.3	79.1	2477	1430						0.58	3.3
	1975	465.4	75.6	2587	2022	54	1140	955	239		0.78	4.3
	1976	449.8	76.1	1377	1194	118	274	159	233		0.87	2.65
	1977	575.7	89.6	1075	392						0.36	0.68
MILLSTONE POINT 2 Docket 50-336; DPR-65 1st commercial operation 12/75 Type - PWR Capacity - 796 MWe	1976	545.7	78.7	620	168	26	142	73	95		0.27	0.31
	1977	518.7	65.7	667	242	38	204	153	89		0.36	0.47

Reporting Organization	Year	Mega-watt year (MW-YR)	Unit Availability Factor	PERSONNEL Total With Exposure	ANNUAL MAN-REM					Average Exposure REM per person	MAN-REM per MW-YR
					Total	Operations	Maintenance	Contractor	Station/Utility		
MONTICELLO Docket 50-363; DPR-22 1st commercial operation 6/71 Type - BWR Capacity - 536 MWe	1972	424.4		99	61	40	21	1	60	0.61	0.1
	1973	389.5		276	154	42	112	59	95	0.56	0.4
	1974	349.3	74.9	842	349			91	258	0.41	1.0
	1975	344.8	72.2	1353	263	59	204	51	212	1.0	3.9
	1976	476.4	91.5	325	1000	135	865	661	339	0.81	0.55
	1977	425.6	79.9	860						1.16	2.35
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	0.2
	1971	346.5		1006	195	43	152	63	89	0.19	0.6
	1972	381.8		735	285	59	226	28	198	0.38	0.8
	1973	411.0		550	517	127	390	108	409	0.94	1.3
	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	1.04	1.9
	1976	484.6	88.2	392	428	52	376	229	199	1.09	0.88
	1977	347.4	59.2	1093	1383	41	1342	883	500	1.27	3.98
OCONEE 1, 2, 3 Docket 50-269, -270, -287; DPR-38, -47, -55 1st commercial operation 7/73, 9/74, 12/74 Type - PWR Capacity - 860, 860, 860 MWe	1974	724.3	60.1	844	517	18	499	144	373	0.61	0.7
	1975	1838.3	75.5	541	457	66	391	83	374	0.84	0.3
	1976	1561.4	63.0	1215	1026	65	961	219	807	0.84	0.66
	1977	1569.1	65.9	1595	1328	244	1084	295	1035	0.83	0.85

Reporting Organization	Year	Mega-watt year (MW-YR)	Unit Availability Factor	PERSONNEL Total With Exposure	ANNUAL MAN-REM					Average Exposure REM per person	MAN-REM per MW-YR
					Total	Operations	Maintenance	Contractor	Station/Utility		
OYSTER CREEK Docket 50-219; DPR-16 1st commercial operation 12/69 Type - BWR Capacity - 620 MWe	1969	40.1		95	63	21	42	11	52	0.66	0.2
	1970	413.6		249	240	50	190	92	148	0.96	0.5
	1971	448.9		339	582	150	432	167	415	1.71	1.1
	1972	515.0		782	1236	195	1041	683	553	1.58	2.9
	1973	424.6		935	984	166	818	162	822	1.05	2.3
	1974	434.5	70.4	1210	1132	168	964	269	863	0.94	3.0
	1975	373.6	73.3	1582	1078	70	1008	587	491	0.68	2.36
	1976	456.5	79.3	1673	1614	76	1538	1048	566	0.96	4.18
	1977	385.7	70.1								
PALISADES Docket 50-255; DPR-20 1st commercial operation 12/71 Type - PWR Capacity - 635 MWe	1972	216.8		901	78	16	1093	647	462	1.23	3.8
	1973	286.8		774	1109					0.81	60.0
	1974	10.5	5.5	474	627					0.62	0.97
	1975	300.2	64.5	742	292	23	673	109	587	0.94	2.01
	1976	346.9	55.2	332	696	13	87	23	77	0.30	0.16
	1977	616.6	91.4								
PEACH BOTTOM 2, 3 Docket 50-277; -278; DPR-44, -56 1st commercial operation 12/74, 12/74 Type - BWR Capacity - 1051, 1035 MWe	1975	1234.3	80.9	971	228	180	660	434	406	0.24	0.18
	1976	1379.2	73.0	2136	840	223	1813	1374	662	0.39	0.61
	1977	1052.4	58.7	2827	2036					0.72	1.93
PILGRIM 1 Docket 50-293; DPR-35 1st commercial operation 12/72 Type - BWR Capacity - 670 MWe	1973	484.0		53	74	29	45			1.4	0.2
	1974	234.1	39.2	454	415					0.91	1.8
	1975	308.1	71.3	473	744	132	612	384	360	1.6	2.4
	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	9.92

Reporting Organization	Year	Mega-watt year (MW-YR)	Unit Availability Factor	PERSONNEL		ANNUAL MAN-REM					Average Exposure REM per person	MAN-REM per MW-YR
				Total With Exposure	Total	Operations	Main-tenance	Contractor	Station/Utility			
POINT BEACH 1, 2 Docket 50-266; -301; DPR-24, -27 1st commercial operation 12/70 4/73 Type - PWR Capacity - 495, 495 MWe	1972	378.3			580							1.5
	1973	693.7		729	570	70	500	81	214		0.78	0.8
	1974	760.2	81.3	400	295	70	225				0.74	0.4
	1975	801.2	82.9	339	456	58	312	107	263		1.3	0.6
	1976	857.3	86.7	313	370	63	366	212	217		1.18	0.43
1977	873.9	87.3	417	429						1.03	0.49	
PRAIRIE ISLAND 1, 2 Docket 50-282, -306; DPR-42, -60 1st commercial operation 12/73, 12/74 Type, PWR Capacity - 507, 507 MWe	1974	181.9	43.9	150	18			5	13		0.12	0.1
	1975	836.0	83.3	477	123						0.26	0.15
	1976	725.2	76.6	818	447	68	379	235	212		0.55	0.62
	1977	922.9	87.2	718	300	73	227	60	240		0.42	0.33
QUAD CITIES 1, 2 Docket 50-254, -265; DPR-29, -30 1st commercial operation 2/73, 3/73 Type - BWR Capacity - 769, 769 MWe	1973	1209.6		533	201	28	173	59	142		0.37	0.2
	1974	958.1	72.3	678	482	98	1287	36	446		0.71	0.5
	1975	833.6	68.4	1972	1385	269	1382	592	793		0.70	1.7
	1976	951.2	73.1	1225	1651	108	923	648	1003		1.35	1.74
	1977	970.1	84.0	907	1031			373	658		1.14	1.06
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		0.20	0.22
	1977	706.4	77.1	515	390	61	329	248	142		0.76	0.55

Reporting Organization	Year	Mega-watt year (MW-YR)	Unit Availability Factor	PERSONNEL		ANNUAL MAN-REM					Average Exposure REM per person	MAN-REM per MW-YR
				Total With Exposure	Total	Operations	Maintenance	Contractor	Station/Utility			
ROBINSON 2 Docket 50-261; DPR-23 1st commercial operation 3/71 Type - PWR Capacity - 665 MWe	1971	295.3		283	364	7	357	351	13	1.28	1.2	
	1972	580.0		245	215	42	173	137	78	0.87	0.4	
	1973	455.1		831	695		487			0.83	1.5	
	1974	578.1	83.3	853	672	185				0.78	1.2	
	1975	501.8	72.7	849	1142	30	685	457	758	1.35	2.3	
	1976	585.5	84.7	597	715	52	403	191	199	1.20	1.22	
	1977	511.5	85.2	634	455					0.72	0.89	
SAN ONOFRE 1 Docket 50-206; DPR-13 1st commercial operation 1/68 Type - PWR Capacity - 436 MWe	1969	289.8		123	42	10	32	5	37	0.34	0.2	
	1970	365.9		251	155	13	142	59	96	0.61	0.4	
	1971	362.1		121	50	12	38	3	47	0.41	0.1	
	1972	372.2		326	256	29	227	117	139	0.78	0.7	
	1973	273.7		878	329	37	292	157	172	0.37	1.2	
	1974	377.8	86.1	219	71					0.32	0.2	
	1975	389.0	87.4	424	292	147	733	629	251	0.75	0.7	
	1976	297.9	70.2	1330	880	77	770	451	396	0.66	2.95	
1977	281.2	63.7	985	847					0.85	3.0		
ST. LUCIE 1 Docket 50-335; DPR-67 1st commercial operation 12/76 Type - PWR Capacity - 777 MWe	1977	788.4	92.6	591	174	30	144	105	69	0.29	0.22	
SURRY 1, 2 Docket 50-280, -281; DPR-32, -37 1st commercial operation 12/72, 5/73 Type - PWR Capacity - 775, 775 MWe	1973	829.4		936	152	72	812			0.16	0.2	
	1974	717.4	49.8	1715	884	25	1524	1000	549	0.52	1.2	
	1975	1029.7	70.8	1948	1549	444	2721	1873	1292	0.8	1.5	
	1976	930.7	60.4	2753	3165	348	1959	1380	927	1.15	3.40	
	1977	1139.0	72.2	1860	2307					1.24	2.03	

Reporting Organization	Year	Mega-watt year (MW-YR)	Unit Availability Factor	PERSONNEL Total With Exposure	ANNUAL MAN-REM					Average Exposure REM per person	MAN-REM per MW-YR
					Total	Operations	Main-tenance	Contractor	Station/Utility		
THREE MILE ISLAND 1 Docket 50-289; DPR-50 1st commercial operation 9/74 Type - PWR Capacity - 792 MWe	1975	675.9	82.2	168	83	23	263	21	62	0.49	0.1
	1976	530.0	65.4	819	286	15	344	69	217	0.35	0.54
	1977	664.5	80.9	1122	359			128	231	0.32	0.54
TROJAN Docket 50-344; NPF-1 1st commercial operation 5/76 Type - PWR Capacity - 1080 MWe	1977	788.4	92.6	591	174	30	144	105	69	0.29	0.22
TURKEY POINT 3, 4 Docket 50-250, -251; DPR-31, -41 1st commercial operation 12/72, 9/73 Type - PWR Capacity - 666, 666 MWe	1973	565.9		444	78	88	366	202	252	0.18	0.1
	1974	966.4		794	454	270	605	558	317	0.57	0.5
	1975	1003.7	74.9	1175	875	89	1095	868	316	0.74	0.87
	1976	974.2	71.2	1647	1184	94	942	522	514	0.72	1.21
	1977	979.5	82.8	1319	1036					0.79	1.06
VERMONT YANKEE Docket 50-271; DPR-28 1st commercial operation 11/72 Type - BWR Capacity - 504 MWe	1973	222.1		244	85	24	192	103	113	0.35	0.4
	1974	303.5		357	216	64	75	57	82	0.61	0.7
	1975	429.0	87.8	247	139	36	375	246	165	0.56	0.3
	1976	389.6	77.1	815	411	83	175	90	168	0.50	1.05
	1977	423.5	85.1	641	258					0.40	0.61

Reporting Organization	Year	Mega-watt year (MW-YR)	Unit Availability Factor	PERSONNEL	ANNUAL MAN-REM					Average Exposure REM per person	MAN-REM per MM-YR	
					Total	Operations	Maintenance	Contractor	Station/Utility			
YANKEE ROWE Docket 50-29; DPR-3 1st commercial operation 7/61 Type - PWR Capacity - 175 MWe	1969	123.1		Total With Exposure 193	215	46	169	78	91	1.1	1.8	
	1970	146.1		355	255	60	195	98	97	0.71	1.8	
	1971	173.5		155	90	44	46	19	71	0.58	0.5	
	1972	78.7		282	255	60	195	147	108	0.90	3.2	
	1973	127.1		263	146			70	76	0.56	1.1	
	1974	111.3		243	205			99	106	0.84	1.8	
	1975	145.1	82.4	210	138	62	76	78	60	0.66	1.0	
	1976	152.2	89.8	152	59	17	42	4	55	0.39	0.39	
	1977	124.6	73.9	725	356	28	328	174	182	0.49	2.86	
	ZION 1, 2 Docket 50-295, -304; DPR-39, -48 1st commercial operation 12/73, 9/74 Type - PWR Capacity - 1010, 1010 MWe	1974	425.3	71.1	306	56	16	101	13	43	0.18	0.2
		1975	1181.5	74.9	1433	117	64	507	45	72	0.08	0.1
		1976	1134.9	61.9	774	571	43	960	257	314	0.74	0.50
		1977	1358.6	75.0	784	1003			561	442	1.28	0.74

APPENDIX B

LICENSED NUCLEAR POWER FACILITIES

1977 Whole Body Exposures

10 CFR Part 20.407 Data



APPENDIX B

LICENSED NUCLEAR POWER FACILITIES  
CY 1977 Whole Body Exposures (Per 10 CFR 20.407 Reports)

Exposure Ranges (Rems)

Plant Name and License No.*	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	Total Personnel Monitored	Total With Measurable Exposure
Arkansas 1 DPR-51, PWR	247	251	116	78	43	33	63	16	1							848	601
Beaver Valley 1 DPR-66, PWR	676	193	73	39	9	1	6	2	7	1						1,007	331
Big Rock Point DPR-6, BWR	28	213	58	33	23	16	61	46	4	9	2					493	465
Browns Ferry 1, 2 DPR-33, -52; BWR	2,558	631	410	288	155	113	197	64								4,416	1,858
Brunswick 2 DPR-62, BWR	2,020	517	244	189	114	83	173	120	49	21	2					3,532	1,512
Calvert Cliffs 1 DPR-53, PWR	654	1,323	397	235	123	64	117	6								2,919	2,265
Cook 1 DPR-58, PWR	1,190	386	130	82	56	59	82	7								1,992	802

\*NOTE: Only those facilities which had completed at least one full year of commercial operation as of December 31, 1977 are included in this summary.

APPENDIX B (Cont'd)  
Exposure Ranges (Rems)

Plant Name and License No.	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	Total Personnel Monitored	Total With Measurable Exposure
Cooper Station DPR-46, BWR	783	117	39	35	34	18	52	13	7							1,098	315
Dresden 1,2,3 DPR-10,-19,-25; BWR	1,059	493	296	210	165	110	277	188	102	19	2					2,921	1,862
Duane Arnold DPR-49, BWR	636	180	78	73	63	39	87	18								1,174	538
Fitzpatrick DPR-59, BWR	650	260	232	241	146	114	257	104	18	7	1					2,030	1,380
Fort Calhoun DPR-40, PWR	58	248	44	58	45	36	75	20	7	2						593	535
Ginna DPR-18, PWR	147	112	70	79	52	48	145	22	2							677	530
Haddam Neck DPR-61, PWR	230	279	124	98	93	72	149	64	7	5	2	1				1,124	894
Hatch 1 DPR-57, BWR	320	515	327	180	100	61	103	15	2							1,623	1,303

APPENDIX B (Cont'd)  
Exposure Ranges (Rems)

Plant Name and License No.	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	Total Personnel Monitored	Total With Measurable Exposure
Humboldt Bay <sup>a</sup> DPR-7, BWR	85	157	72	72	56	43	212	204	155	92						1,148	1,063
Indian Point 1,2,3 <sup>b</sup> DPR-5,-26; PWR	607	333	255	235	143	92	173	88	54	16	2					1,998	1,391
Kewaunee DPR-43, PWR	80	112	58	49	25	21	46	1								392	312
LaCrosse DPR-45, BWR	64	38	21	5	5	3	16	21	15	11	6					205	141
Maine Yankee DPR-36, PWR	532	254	47	37	47	31	76	16								1,040	508
Millstone Point 1 <sup>c</sup> DPR-21, BWR	290	537	236	119	48	31	66	18	11	8	1					1,365	1,075
Millstone Point 2 <sup>c</sup> DPR-65, PWR	130	333	147	74	30	19	41	11	7	5						847	667

<sup>a</sup>Humboldt Bay was shutdown 7-2-77 for seismic modifications and did not operate the rest of the year.  
<sup>b</sup>Indian Point 1 was defueled in 1975. Unit 3 was shutdown 10 weeks at the end of 1977 for turbine repairs.  
<sup>c</sup>Personnel figures for Millstone Point Units 1 and 2 are approximations.

APPENDIX B (Cont'd)  
Exposure Ranges (Rems)

Plant Name and License No.	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	Total Personnel Monitored	Total With Measurable Exposure
Monticello DPR-22, BWR	637	186	96	84	59	49	165	174	35	8	4					1,497	860
Nine Mile Point 1 DPR-63, BWR	915	218	98	68	54	76	347	163	29	20	20					2,008	1,093
Oconee 1,2,3 DPR-38,-47,-55; PWR	282	466	205	169	143	125	262	174	50	1						1,877	1,595
Oyster Creek DPR-16, BWR	180	297	215	232	159	125	458	120	38	16	11	2				1,853	1,673
Palisades DPR-20, PWR	328	149	62	52	36	15	18									660	332
Peach Bottom 2,3 DPR-24,-27; PWR	1,072	897	403	359	245	171	498	185	47	13	7	2				3,899	2,827
Pilgrim 1 DPR-35, BWR	250	320	246	198	114	112	276	227	111	159	39	31	24	13	5	2,125	1,875
Point Beach 1,2 DPR-24,-27; PWR	408	71	56	47	43	26	110	47	11	5	1					825	417

APPENDIX B (Cont'd)  
Exposure Ranges (Rems)

Plant Name and License No.	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	Total Personnel Monitored	Total With Measurable Exposure
Prairie Island 1,2 DPR-42,-60; PWR	231	297	140	98	62	37	63	15	6							949	718
Quad Cities 1,2 DPR-29,-30; BWR	984	251	113	100	66	47	124	76	87	40	1	2				1,891	907
Rancho Seco DPR-54, PWR	285	100	93	80	59	45	95	32	9	2						800	515
Robinson 2 DPR-23, PWR	696	264	87	50	46	35	86	28	23	14	1					1,330	634
San Onofre 1 DPR-13, PWR	858	259	107	133	72	76	226	82	25	5						1,843	985
St. Lucie DPR-67, PWR	851	197	116	50	25	16	31	8	2							1,296	445
Surry 1, 2 DPR-32,-27; PWR	97	517	222	149	102	111	338	194	115	48	28	19	8	8	1	1,957	1,860
Three Mile Island DPR-50, PWR	118	504	249	148	66	66	86	3								1,240	1,122

APPENDIX B (Cont'd)  
Exposure Ranges (Rems)

Plant Name and License No.	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	Total Personnel Monitored	Total With Measurable Exposure
Trojan NPF-1, PWR	369	231	129	124	61	23	22	1								960	591
Turkey Point 3,4 DPR-31,-41; PWR	1,014	407	214	175	95	78	186	99	39	21	5					2,333	1,319
Vermont Yankee DPR-28, BWR	535	292	80	86	64	50	59	10								1,176	641
Yankee Rowe DPR-3, PWR	1,018	407	54	48	52	34	85	40	4	1						1,743	725
Zion 1, 2 DPR-39,-48; PWR	646	158	75	91	60	62	153	95	51	20	6	9	4			1,430	784
TOTALS	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	42,266

APPENDIX C

ANNUAL MAN-REM SUMMARY

Reg. Guide 1.16 Data

Note: A "+" after a plant name indicates that licensee input was reclassified by NRC staff.



APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Arkansas 1		Total: 208.877		
Work and Job Function	Total Man-Rem			
	Station Employees	Utility Employees	Contract Employees	
<b>Reactor Operations &amp; Surveillance</b>				
Maintenance Personnel	8.063	0	0.127	
Operations Personnel	7.293	0	0	
Health Physics Personnel	6.748	0	0	
Supervisory Personnel	0.656	0	0	
Engineering Personnel	0	0	0	
<b>Routine Maintenance</b>				
Maintenance Personnel	5.046	0.198	8.351	
Operations Personnel	0	0	0	
Health Physics Personnel	0	0	0	
Supervisory Personnel	0	0	0.136	
Engineering Personnel	0	0	0	
<b>Inservice Inspection</b>				
Maintenance Personnel	1.210	0	19.706	
Operations Personnel	0	0	0	
Health Physics Personnel	0	0	0	
Supervisory Personnel	0	0	1.008	
Engineering Personnel	0.634	0.209	0	
<b>Special Maintenance</b>				
Maintenance Personnel	21.115	0.222	20.172	
Operations Personnel	0.958	0	0	
Health Physics Personnel	0.679	0	0	
Supervisory Personnel	0.244	0	1.055	
Engineering Personnel	0.604	0	1.506	
<b>Waste Processing</b>				
Maintenance Personnel	9.477	0.299	0	
Operations Personnel	0.281	0	0	
Health Physics Personnel	2.224	0	0.137	
Supervisory Personnel	2.086	0	0	
Engineering Personnel	0.841	0	0	
<b>Refueling</b>				
Maintenance Personnel	26.714	0.840	13.409	
Operations Personnel	10.784	0	0	
Health Physics Personnel	4.989	0	8.904	
Supervisory Personnel	3.527	0	0.916	
Engineering Personnel	2.541	0.227	14.741	
<b>Totals</b>				
Maintenance Personnel	71.625	1.559	61.765	
Operations Personnel	19.316	0	0	
Health Physics Personnel	14.64	0	9.041	
Supervisory Personnel	6.513	0	3.115	
Engineering Personnel	4.62	0.436	16.247	
<b>Grand Totals - Man-Rems</b>	<b>116.714</b>	<b>1.995</b>	<b>90.168</b>	

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Beaver Valley 1

Total: 65.522

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	0	0	0
Operations Personnel	5.389	0	0
Health Physics Personnel	0.105	0	0
Supervisory Personnel	0.150	0	0.110
Engineering Personnel	0	0	0
Routine Maintenance			
Maintenance Personnel	8.393	1.175	1.655
Operations Personnel	0	0	0
Health Physics Personnel	5.190	0	0
Supervisory Personnel	0.875	0	0
Engineering Personnel	0	0	0
Inservice Inspection			
Maintenance Personnel	0	0	0
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0.360	0	0
Special Maintenance			
Maintenance Personnel	0	0	41.750
Operations Personnel	0	0	0
Health Physics Personnel	0.130	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0.110	0	0
Waste Processing			
Maintenance Personnel	0	0	0.130
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Refueling			
Maintenance Personnel	0	0	0
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Totals			
Maintenance Personnel	8.393	1.175	43.535
Operations Personnel	5.389	0	0
Health Physics Personnel	5.425	0	0
Supervisory Personnel	1.025	0	0.110
Engineering Personnel	0.47	0	0
Grand Totals - Man-Rems	20.702	1.175	43.645

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Big Rock Point

Total: 353.147

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	2.016	4.178	1.082
Operations Personnel	33.583	0.603	0
Health Physics Personnel	42.535	1.143	0
Supervisory Personnel	11.574	0	0
Engineering Personnel	1.746	0.451	0
Routine Maintenance			
Maintenance Personnel	48.124	77.007	22.357
Operations Personnel	5.780	2.098	0
Health Physics Personnel	8.946	0	0
Supervisory Personnel	9.546	1.325	8.000
Engineering Personnel	7.275	0.104	0
Inservice Inspection			
Maintenance Personnel	3.204	4.009	17.887
Operations Personnel	0.291	5.741	0
Health Physics Personnel	0.837	0	0
Supervisory Personnel	0.893	0	0
Engineering Personnel	3.350	0	0
Special Maintenance			
Maintenance Personnel	4.301	0	0.364
Operations Personnel	0.819	0	0
Health Physics Personnel	0.787	0	0
Supervisory Personnel	0.373	0	0
Engineering Personnel	0.055	0	0
Waste Processing			
Maintenance Personnel	0.989	0.142	1.044
Operations Personnel	1.778	0	0
Health Physics Personnel	0.447	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Refueling			
Maintenance Personnel	0.215	0	13.076
Operations Personnel	3.048	0	0
Health Physics Personnel	0.024	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Totals			
Maintenance Personnel	58.849	85.336	55.81
Operations Personnel	45.299	8.442	0
Health Physics Personnel	53.576	1.143	0
Supervisory Personnel	22.386	1.325	8.000
Engineering Personnel	12.426	0.555	0
Grand Totals - Man-ReMs	192.536	96.801	63.81

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Browns Ferry 1, 2

Total: 679.9

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	11.3	15.3	0
Operations Personnel	6.7	0	0
Health Physics Personnel	4.7	0.4	0
Supervisory Personnel	0	0	0
Engineering Personnel	0.6	5.4	3.0
Routine Maintenance			
Maintenance Personnel	56.3	202.9	2.6
Operations Personnel	1.2	0	0
Health Physics Personnel	5.9	0.9	0.2
Supervisory Personnel	0	0	0
Engineering Personnel	0.6	11.1	11.8
Inservice Inspection			
Maintenance Personnel	0	0	0
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Special Maintenance			
Maintenance Personnel	8.8	98.8	2.9
Operations Personnel	3.1	0	0
Health Physics Personnel	1.5	0.6	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	28.1	175.4
Waste Processing			
Maintenance Personnel	0	0	0
Operations Personnel	0.2	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Refueling			
Maintenance Personnel	0	14.5	0
Operations Personnel	4.0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	1.1	0
Totals			
Maintenance Personnel	76.4	331.5	5.5
Operations Personnel	15.2	0	0
Health Physics Personnel	12.1	1.9	0.2
Supervisory Personnel	0	0	0
Engineering Personnel	1.2	45.7	190.2
Grand Totals - Man-Rems	104.9	379.1	195.9

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Brunswick 1 †

Total: 1086.082

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	1.286	0	0.228
Operations Personnel	33.935	0	0.090
Health Physics Personnel	5.587	0.388	0
Supervisory Personnel	1.335	0	0
Engineering Personnel	2.747	0.315	0.450
Routine Maintenance			
Maintenance Personnel	26.691	3.516	47.117
Operations Personnel	0	0	0
Health Physics Personnel	2.352	0.388	1.511
Supervisory Personnel	0	0	0
Engineering Personnel	2.747	0.316	0
Inservice Inspection			
Maintenance Personnel	0	0	0
Operations Personnel	0	0	0
Health Physics Personnel	0	0	4.534
Supervisory Personnel	0	0.771	0
Engineering Personnel	9.620	1.969	57.760
Special Maintenance			
Maintenance Personnel	67.118 *	33.469	415.566 *
Operations Personnel	0	0	0
Health Physics Personnel	12.939 *	3.680 *	16.626 *
Supervisory Personnel	0	0.823	0
Engineering Personnel	10.987	0.425	6.171
Waste Processing			
Maintenance Personnel	21.637	0	97.708 *
Operations Personnel	28.279	0	0
Health Physics Personnel	6.175	0.388	3.023
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	1.349
Refueling			
Maintenance Personnel	10.496	0	97.999
Operations Personnel	32.050	0	0
Health Physics Personnel	2.352	0.388	4.534
Supervisory Personnel	0	0	0
Engineering Personnel	1.831	0	4.416
Totals			
Maintenance Personnel	127.228	36.985	658.618
Operations Personnel	94.264	0	0.09
Health Physics Personnel	29.405	5.232	30.228
Supervisory Personnel	1.335	1.594	0
Engineering Personnel	27.932	3.025	70.146
Grand Totals - Man-Rems	280.164	46.836	759.082

\* Includes exposures reported under "deconning" by licensee.

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Calvert Cliffs 1

Total: 401.614

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	0.823	0.101	3.092
Operations Personnel	7.822	0	0
Health Physics Personnel	4.805	0.632	4.563
Supervisory Personnel	3.808	0	0.602
Engineering Personnel	0.503	0	0
Routine Maintenance			
Maintenance Personnel	15.486	0.805	3.528
Operations Personnel	5.051	0.712	0
Health Physics Personnel	7.884	0	1.688
Supervisory Personnel	1.856	0	0.491
Engineering Personnel	0.742	0	0.274
Inservice Inspection			
Maintenance Personnel	1.777	38.404	9.450
Operations Personnel	0.253	0	0
Health Physics Personnel	0.341	0	0.112
Supervisory Personnel	0	0	0.129
Engineering Personnel	0	0	0
Special Maintenance			
Maintenance Personnel	46.551	39.735	97.790
Operations Personnel	2.047	2.916	0.231
Health Physics Personnel	7.606	2.175	22.609
Supervisory Personnel	0.676	0.656	1.837
Engineering Personnel	0.795	1.619	4.432
Waste Processing			
Maintenance Personnel	0	0	0
Operations Personnel	0	0	0
Health Physics Personnel	0.277	0.686	1.050
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Refueling			
Maintenance Personnel	24.971	10.407	6.585
Operations Personnel	0.584	0.320	0
Health Physics Personnel	2.036	0.915	2.200
Supervisory Personnel	0.215	0.107	0
Engineering Personnel	0.129	0	3.723
Totals			
Maintenance Personnel	89.608	89.452	120.445
Operations Personnel	15.757	3.948	0.231
Health Physics Personnel	22.949	4.408	32.222
Supervisory Personnel	6.555	0.763	3.059
Engineering Personnel	2.169	1.619	8.429
Grand Totals - Man-Rems	137.038	100.19	164.386

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Cook 1		Total: 260.356		
Work and Job Function	Total Man-Rem			
	Station Employees	Utility Employees	Contract Employees	
<b>Reactor Operations &amp; Surveillance</b>				
Maintenance Personnel	0.947	0	0.060	
Operations Personnel	13.245	0	0.384	
Health Physics Personnel	2.149	0	0.177	
Supervisory Personnel	0.956	0	0	
Engineering Personnel	0.152	0	0	
<b>Routine Maintenance</b>				
Maintenance Personnel	53.127	0	2.867	
Operations Personnel	0.419	0	0	
Health Physics Personnel	3.503	0	0	
Supervisory Personnel	2.012	0	0	
Engineering Personnel	0.640	0	0.284	
<b>Inservice Inspection</b>				
Maintenance Personnel	8.123	0	49.151	
Operations Personnel	0	0	0	
Health Physics Personnel	0.010	0	6.748	
Supervisory Personnel	0.080	0	1.692	
Engineering Personnel	0.302	0	0.117	
<b>Special Maintenance</b>				
Maintenance Personnel	11.168	0	15.277	
Operations Personnel	0.212	0	0	
Health Physics Personnel	1.825	0	0.309	
Supervisory Personnel	0.600	0	0.328	
Engineering Personnel	1.552	0	0.384	
<b>Waste Processing</b>				
Maintenance Personnel	11.001	0	16.119	
Operations Personnel	4.510	0	0	
Health Physics Personnel	3.814	0	0	
Supervisory Personnel	0.343	0	0	
Engineering Personnel	0.126	0	0	
<b>Refueling</b>				
Maintenance Personnel	16.356	0	19.747	
Operations Personnel	0.029	0	0	
Health Physics Personnel	0.160	0	4.498	
Supervisory Personnel	2.752	0	1.757	
Engineering Personnel	0.344	0	0	
<b>Totals</b>				
Maintenance Personnel	100.722	0	103.221	
Operations Personnel	18.415	0	0.384	
Health Physics Personnel	11.461	0	11.732	
Supervisory Personnel	6.743	0	3.777	
Engineering Personnel	3.116	0	0.785	
<b>Grand Totals - Man-Rems</b>	<b>140.457</b>	<b>0</b>	<b>119.899</b>	

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Cooper

Total: 195.111

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	1.130	0	0.220
Operations Personnel	26.964	0	0
Health Physics Personnel	7.633	0	0
Supervisory Personnel	8.524	0	0
Engineering Personnel	4.284	1.175	0
Routine Maintenance			
Maintenance Personnel	53.488	0	39.187
Operations Personnel	1.033	0	0
Health Physics Personnel	2.118	0	0
Supervisory Personnel	1.056	0	0.075
Engineering Personnel	1.310	0	0
Inservice Inspection			
Maintenance Personnel	0.244	0	2.613
Operations Personnel	0.067	0	0
Health Physics Personnel	1.003	0	0
Supervisory Personnel	0	0	7.060
Engineering Personnel	0.200	0	0
Special Maintenance			
Maintenance Personnel	2.424	0	13.479
Operations Personnel	0.193	0	0
Health Physics Personnel	0.638	0	0
Supervisory Personnel	0.109	0	1.605
Engineering Personnel	0.910	0	0
Waste Processing			
Maintenance Personnel	1.661	0	0
Operations Personnel	2.248	0	0
Health Physics Personnel	1.415	0	0
Supervisory Personnel	0.012	0	0
Engineering Personnel	0	0	0
Refueling			
Maintenance Personnel	3.067	0	1.203
Operations Personnel	5.617	0	0
Health Physics Personnel	0.776	0	0
Supervisory Personnel	0.199	0	0
Engineering Personnel	0.171	0	0
Totals			
Maintenance Personnel	62.014	0	56.702
Operations Personnel	36.122	0	0
Health Physics Personnel	13.583	0	0
Supervisory Personnel	9.900	0	8.740
Engineering Personnel	6.875	1.175	0
Grand Totals - Man-Rems	128.494	1.175	65.442

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Dresden 1, 2, 3

Total: 1634.9

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	9.7	0	0
Operations Personnel	207.0	0	0
Health Physics Personnel	26.3	0	0
Supervisory Personnel	16.4	0	0
Engineering Personnel	46.2	0	0
Routine Maintenance*			
Maintenance Personnel	321.0	0	669.2
Operations Personnel	24.7	0	0
Health Physics Personnel	49.4	0	0
Supervisory Personnel	121.2	0	0
Engineering Personnel	0	0	0
Inservice Inspection			
Maintenance Personnel	-	-	-
Operations Personnel	-	-	-
Health Physics Personnel	-	-	-
Supervisory Personnel	-	-	-
Engineering Personnel	-	-	-
Special Maintenance			
Maintenance Personnel	0	46.0	0
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Waste Processing			
Maintenance Personnel	0	0	0
Operations Personnel	48.2	0	0
Health Physics Personnel	6.6	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Refueling			
Maintenance Personnel	0	0	0
Operations Personnel	38.8	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	4.2	0	0
Engineering Personnel	0	0	0
Totals			
Maintenance Personnel	330.7	46.0	669.2
Operations Personnel	318.7	0	0
Health Physics Personnel	82.3	0	0
Supervisory Personnel	141.8	0	0
Engineering Personnel	46.2	0	0
Grand Totals - Man-Rems	919.7	46.0	669.2

\*Includes Inservice Inspection Exposures.

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Duane Arnold

Total: 274.779

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	5.204	0	0
Operations Personnel	18.922	0	0
Health Physics Personnel	1.847	0	0
Supervisory Personnel	3.991	0	0
Engineering Personnel	2.172	0.234	0.412
Routine Maintenance			
Maintenance Personnel	11.002	0	0
Operations Personnel	0	0	0
Health Physics Personnel	2.719	0	0
Supervisory Personnel	0.585	0	0
Engineering Personnel	0.053	0.124	0
Inservice Inspection			
Maintenance Personnel	0	0	0
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	6.245
Special Maintenance			
Maintenance Personnel	7.607	0	182.130
Operations Personnel	0.224	0	0
Health Physics Personnel	0.204	0	8.244
Supervisory Personnel	0.086	0	0
Engineering Personnel	0.348	2.592	4.636
Waste Processing			
Maintenance Personnel	0	0	0
Operations Personnel	0	0	0
Health Physics Personnel	10.589	0	0
Supervisory Personnel	0.141	0	0
Engineering Personnel	0	0	0
Refueling			
Maintenance Personnel	0	0	0
Operations Personnel	2.055	0	0
Health Physics Personnel	0	0	1.531
Supervisory Personnel	0.882	0	0
Engineering Personnel	0	0	0
Totals			
Maintenance Personnel	23.813	0	182.130
Operations Personnel	21.201	0	0
Health Physics Personnel	15.359	0	9.775
Supervisory Personnel	5.685	0	0
Engineering Personnel	2.573	2.95	11.293
Grand Totals - Man-Rems	68.631	2.95	203.198

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Fitzpatrick †

Total: 948.752

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	1.308	0.049	5.153
Operations Personnel	3.225	0	0.025
Health Physics Personnel	0.121	0	0.480
Supervisory Personnel	0.994	0	0.136
Engineering Personnel	0.043	0.022	0.438
Routine Maintenance			
Maintenance Personnel	12.365	0.466	71.307
Operations Personnel	1.563	0	0.149
Health Physics Personnel	1.232	0	0.661
Supervisory Personnel	1.636	0	0.780
Engineering Personnel	0.427	0	3.934
Inservice Inspection			
Maintenance Personnel	0.389	0.022	10.852
Operations Personnel	0.553	0	0.005
Health Physics Personnel	0.284	0	1.108
Supervisory Personnel	0.657	0	0.404
Engineering Personnel	0.070	0	3.636
Special Maintenance			
Maintenance Personnel	41.152	3.709	628.517
Operations Personnel	13.684	0	1.009
Health Physics Personnel	3.640	0	9.081
Supervisory Personnel	9.013	0.113	6.436
Engineering Personnel	3.327	0.030	39.594
Waste Processing			
Maintenance Personnel	3.470	0.11	34.517
Operations Personnel	12.184	0	0.055
Health Physics Personnel	1.221	0	0.371
Supervisory Personnel	0.462	0	0.378
Engineering Personnel	0.06	0.005	0.285
Refueling			
Maintenance Personnel	5.129	0.245	3.171
Operations Personnel	1.044	0	0
Health Physics Personnel	0.292	0	0.338
Supervisory Personnel	0.628	0	0.024
Engineering Personnel	0.379	0	0.585
Totals			
Maintenance Personnel	63.813	4.601	753.517
Operations Personnel	32.253	0	1.243
Health Physics Personnel	6.790	0	12.039
Supervisory Personnel	13.39	0.113	8.158
Engineering Personnel	4.306	0.057	48.472
Grand Totals - Man-Rems	120.552	4.771	823.429

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Fort Calhoun

Total: 355.939

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
<b>Reactor Operations &amp; Surveillance</b>			
Maintenance Personnel	3.577	0.663	3.116
Operations Personnel	12.735	0.020	0
Health Physics Personnel	10.131	0.483	4.749
Supervisory Personnel	1.116	0.189	0
Engineering Personnel	1.846	1.440	0
<b>Routine Maintenance</b>			
Maintenance Personnel	18.335	8.779	5.475
Operations Personnel	0.115	0	0
Health Physics Personnel	0.121	0.100	0
Supervisory Personnel	0.120	0.029	0
Engineering Personnel	0.169	0.208	0
<b>Inservice Inspection</b>			
Maintenance Personnel	2.138	9.425	18.360
Operations Personnel	0.010	0	0
Health Physics Personnel	0.051	0	0.040
Supervisory Personnel	0.040	0.093	0
Engineering Personnel	0.615	0.984	0
<b>Special Maintenance</b>			
Maintenance Personnel	33.250	17.333	14.992
Operations Personnel	0.913	0.005	0
Health Physics Personnel	4.280	0.024	0
Supervisory Personnel	0.691	0.036	0
Engineering Personnel	3.189	0.820	0
<b>Waste Processing</b>			
Maintenance Personnel	15.599	9.812	2.453
Operations Personnel	3.665	0	0
Health Physics Personnel	3.467	0.005	0.110
Supervisory Personnel	0.143	0	0
Engineering Personnel	0.229	0.015	0
<b>Refueling</b>			
Maintenance Personnel	19.973	53.731	26.158
Operations Personnel	11.152	0	0
Health Physics Personnel	1.354	0.135	10.734
Supervisory Personnel	4.977	1.213	0
Engineering Personnel	4.388	5.821	0
<b>Totals</b>			
Maintenance Personnel	92.872	99.743	70.554
Operations Personnel	28.590	0.025	0
Health Physics Personnel	19.404	0.747	15.633
Supervisory Personnel	7.087	1.560	0
Engineering Personnel	10.436	9.288	0
<b>Grand Totals - Man-Rems</b>	<b>158.389</b>	<b>111.363</b>	<b>86.187</b>

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Ginna

Total: 371.29

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	2.45	0	0
Operations Personnel	11.05	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Routine Maintenance			
Maintenance Personnel	30.59	83.40	63.51
Operations Personnel	0	0	0
Health Physics Personnel	6.53	0.27	2.48
Supervisory Personnel	1.73	1.50	0
Engineering Personnel	1.05	2.50	0
Inservice Inspection			
Maintenance Personnel	0.50	3.40	2.40
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Special Maintenance			
Maintenance Personnel	1.50	7.50	22.59
Operations Personnel	0	0	0
Health Physics Personnel	0.60	0	1.00
Supervisory Personnel	0	0	0.50
Engineering Personnel	0	0	0.50
Waste Processing			
Maintenance Personnel	8.00	0	15.00
Operations Personnel	9.50	0	0
Health Physics Personnel	3.50	0	1.20
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Refueling			
Maintenance Personnel	0	75.60	1.20
Operations Personnel	4.45	0	0
Health Physics Personnel	0.50	0	0.50
Supervisory Personnel	0	2.50	0
Engineering Personnel	1.79	0	0
Totals			
Maintenance Personnel	43.04	169.90	104.7
Operations Personnel	25.00	0	0
Health Physics Personnel	11.13	0.27	5.18
Supervisory Personnel	1.73	4.00	0.50
Engineering Personnel	2.84	2.50	0.50
Grand Totals - Man-Rems	83.74	176.67	110.88

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Haddam Neck

Total: 708.698

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	3.722	0.503	2.760
Operations Personnel	32.824	0	0
Health Physics Personnel	12.365	0.005	4.360
Supervisory Personnel	2.816	0.550	2.288
Engineering Personnel	0.738	2.081	0.080
Routine Maintenance			
Maintenance Personnel	30.881	48.733	14.775
Operations Personnel	1.397	0	0
Health Physics Personnel	0.830	0	9.135
Supervisory Personnel	4.245	0.065	1.787
Engineering Personnel	3.022	1.993	0.538
Inservice Inspection			
Maintenance Personnel	0.795	1.525	18.545
Operations Personnel	0.430	0	0
Health Physics Personnel	0.100	0	0
Supervisory Personnel	0.165	0	0.060
Engineering Personnel	0.485	1.504	0.675
Special Maintenance			
Maintenance Personnel	7.138	8.613	235.075
Operations Personnel	1.500	0	0
Health Physics Personnel	0.640	0.005	11.245
Supervisory Personnel	0.410	0.830	21.086
Engineering Personnel	0.205	2.778	2.683
Waste Processing			
Maintenance Personnel	0.445	0.335	1.941
Operations Personnel	1.997	0	0
Health Physics Personnel	0.635	0	19.186
Supervisory Personnel	0.030	0	0.680
Engineering Personnel	0.035	0	0.045
Refueling			
Maintenance Personnel	6.877	20.591	111.674
Operations Personnel	11.447	0	0
Health Physics Personnel	0.905	0.970	18.135
Supervisory Personnel	0.965	0.195	8.370
Engineering Personnel	1.210	1.630	1.415
Totals			
Maintenance Personnel	49.858	80.3	384.77
Operations Personnel	49.595	0	0
Health Physics Personnel	15.475	0.98	62.061
Supervisory Personnel	8.631	1.64	34.271
Engineering Personnel	5.695	9.986	5.436
Grand Totals - Man-Rems	129.254	92.906	486.538

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Hatch 1		Total: 431		
Work and Job Function	Total Man-Rem			
	Station Employees	Utility Employees	Contract Employees	
Reactor Operations & Surveillance				
Maintenance Personnel*	0	3	0	
Operations Personnel	53	0	0	
Health Physics Personnel	15	0	0	
Supervisory Personnel	0	0	0	
Engineering Personnel	5	0	13	
Routine Maintenance				
Maintenance Personnel*	70	0	0	
Operations Personnel	18	0	0	
Health Physics Personnel	0	0	0	
Supervisory Personnel	0	0	0	
Engineering Personnel	0	0	0	
Inservice Inspection				
Maintenance Personnel*	0	0	0	
Operations Personnel	0	0	0	
Health Physics Personnel	0	0	0	
Supervisory Personnel	0	0	0	
Engineering Personnel	0	0	67	
Special Maintenance				
Maintenance Personnel*	28	14	0	
Operations Personnel	14	0	0	
Health Physics Personnel	0	0	0	
Supervisory Personnel	0	0	0	
Engineering Personnel	0	0	97	
Waste Processing				
Maintenance Personnel*	0	0	0	
Operations Personnel	0	0	0	
Health Physics Personnel	0	0	0	
Supervisory Personnel	0	0	0	
Engineering Personnel	0	0	0	
Refueling				
Maintenance Personnel*	7	0	0	
Operations Personnel	0	0	0	
Health Physics Personnel	0	0	0	
Supervisory Personnel	0	0	0	
Engineering Personnel	0	0	27	
Totals				
Maintenance Personnel*	105	17	0	
Operations Personnel	85	0	0	
Health Physics Personnel	15	0	0	
Supervisory Personnel	0	0	0	
Engineering Personnel	5	0	204	
Grand Totals - Man-Rems	210	17	204	

\*Maintenance data includes information reported as Construction exposures.

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Humboldt Bay

Total: 1857

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	0	0	0
Operations Personnel	16	0	0
Health Physics Personnel	1	0	0
Supervisory Personnel	3	0	2
Engineering Personnel	1	0	0
Routine Maintenance			
Maintenance Personnel	33	6	1
Operations Personnel	0	0	0
Health Physics Personnel	3	0	0
Supervisory Personnel	1	0	0
Engineering Personnel	1	0	0
Inservice Inspection			
Maintenance Personnel	0	3	0
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	1	0
Special Maintenance			
Maintenance Personnel	11	719	865
Operations Personnel	2	0	0
Health Physics Personnel	2	2	55
Supervisory Personnel	3	25	23
Engineering Personnel	5	32	3
Waste Processing			
Maintenance Personnel	0	0	0
Operations Personnel	9	0	0
Health Physics Personnel	1	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Refueling			
Maintenance Personnel	0	0	0
Operations Personnel	25	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	2	0	0
Engineering Personnel	1	0	0
Totals			
Maintenance Personnel	44	728	866
Operations Personnel	52	0	0
Health Physics Personnel	7	2	55
Supervisory Personnel	9	25	25
Engineering Personnel	8	33	3
Grand Totals - Man-Rems	120	788	949

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Indian Point 1, 2, 3*		Total: 964.7		
Work and Job Function	Total Man-Rem			
	Station Employees	Utility Employees	Contract Employees	
Reactor Operations & Surveillance	170.7	0	0	
Maintenance Personnel	-	-	-	
Operations Personnel	-	-	-	
Health Physics Personnel	-	-	-	
Supervisory Personnel	-	-	-	
Engineering Personnel	-	-	-	
Routine Maintenance	146.1	0	0	
Maintenance Personnel	-	-	-	
Operations Personnel	-	-	-	
Health Physics Personnel	-	-	-	
Supervisory Personnel	-	-	-	
Engineering Personnel	-	-	-	
Inservice Inspection	0	0	0	
Maintenance Personnel	-	-	-	
Operations Personnel	-	-	-	
Health Physics Personnel	-	-	-	
Supervisory Personnel	-	-	-	
Engineering Personnel	-	-	-	
Special Maintenance	6.6	189.5	311.5	
Maintenance Personnel	-	-	-	
Operations Personnel	-	-	-	
Health Physics Personnel	-	-	-	
Supervisory Personnel	-	-	-	
Engineering Personnel	-	-	-	
Waste Processing	106.8	0	33.5	
Maintenance Personnel	-	-	-	
Operations Personnel	-	-	-	
Health Physics Personnel	-	-	-	
Supervisory Personnel	-	-	-	
Engineering Personnel	-	-	-	
Refueling	0	0	0	
Maintenance Personnel	-	-	-	
Operations Personnel	-	-	-	
Health Physics Personnel	-	-	-	
Supervisory Personnel	-	-	-	
Engineering Personnel	-	-	-	
Totals				
Maintenance Personnel	-	-	-	
Operations Personnel	-	-	-	
Health Physics Personnel	-	-	-	
Supervisory Personnel	-	-	-	
Engineering Personnel	-	-	-	
Grand Totals - Man-Rems	430.2	189.5	345.0	

\*Breakdown by Job Function not provided by licensee.

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Kewaunee

Total: 130.689

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	0	0	0
Operations Personnel	6.629	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	1.127	0	0.010
Engineering Personnel	0.216	0	0
Routine Maintenance			
Maintenance Personnel	5.371	2.889	33.448
Operations Personnel	0.015	0	0
Health Physics Personnel	2.508	0	4.399
Supervisory Personnel	0	0.020	0.858
Engineering Personnel	0	0	0
Inservice Inspection			
Maintenance Personnel	0	0	2.405
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0.240	0.807
Engineering Personnel	0	0.019	0
Special Maintenance			
Maintenance Personnel	10.650	10.082	11.714
Operations Personnel	0.613	0	0
Health Physics Personnel	2.641	0	0
Supervisory Personnel	0.432	0.236	0.634
Engineering Personnel	0.169	0.043	0.528
Waste Processing			
Maintenance Personnel	1.163	0	0.480
Operations Personnel	1.300	0	0
Health Physics Personnel	3.002	0	0
Supervisory Personnel	0.889	0	0
Engineering Personnel	0	0	0
Refueling			
Maintenance Personnel	2.194	3.844	16.247
Operations Personnel	1.558	0	0
Health Physics Personnel	0.100	0	0
Supervisory Personnel	0.722	0.230	0.124
Engineering Personnel	0	0.133	0
Totals			
Maintenance Personnel	19.378	16.815	64.294
Operations Personnel	10.115	0	0
Health Physics Personnel	8.251	0	4.399
Supervisory Personnel	3.170	0.726	2.433
Engineering Personnel	0.385	0.195	0.528
Grand Totals - Man-Rems	41.299	17.736	71.654

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: LaCrosse

Total: 217.017

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	1.137	0	0
Operations Personnel	37.692	0	1.889
Health Physics Personnel	7.157	0	0
Supervisory Personnel	9.858	0	0
Engineering Personnel	0.791	0	0
Routine Maintenance			
Maintenance Personnel	13.522	0	0
Operations Personnel	7.562	0	0
Health Physics Personnel	5.424	0	0
Supervisory Personnel	4.025	0	0
Engineering Personnel	4.059	0	0
Inservice Inspection			
Maintenance Personnel	0.191	0	0
Operations Personnel	0.220	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	1.293	0	0
Engineering Personnel	0.139	0	3.132
Special Maintenance			
Maintenance Personnel	58.361	0	1.108
Operations Personnel	6.104	0	0
Health Physics Personnel	10.951	0	0
Supervisory Personnel	6.480	0	0
Engineering Personnel	4.590	0	1.125
Waste Processing			
Maintenance Personnel	2.539	0	0
Operations Personnel	1.040	0	0
Health Physics Personnel	7.791	0	0.618
Supervisory Personnel	2.747	0	0
Engineering Personnel	1.011	0	0
Refueling			
Maintenance Personnel	1.459	0	0
Operations Personnel	5.890	0	0
Health Physics Personnel	1.750	0	0
Supervisory Personnel	3.330	0	0
Engineering Personnel	2.032	0	0
Totals			
Maintenance Personnel	77.209	0	1.108
Operations Personnel	58.508	0	1.889
Health Physics Personnel	33.073	0	0.618
Supervisory Personnel	27.733	0	0
Engineering Personnel	12.622	0	4.257
Grand Totals - Man-Rems	209.145	0	7.872

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Maine Yankee

Total: 301.070

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	2.089	0	0.974
Operations Personnel	20.449	0	0
Health Physics Personnel	8.784	0	0.405
Supervisory Personnel	9.345	1.807	2.845
Engineering Personnel	7.828	1.289	0.821
Routine Maintenance			
Maintenance Personnel	29.280	0.020	0.585
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0.563	0.330	4.948
Engineering Personnel	0.077	0	0.010
Inservice Inspection			
Maintenance Personnel	8.305	0.020	13.977
Operations Personnel	1.431	0	0
Health Physics Personnel	0.220	0	0.125
Supervisory Personnel	0.463	0.490	19.292
Engineering Personnel	1.402	0.470	15.329
Special Maintenance			
Maintenance Personnel	1.040	0	0
Operations Personnel	0.190	0	0
Health Physics Personnel	0.050	0	0
Supervisory Personnel	0	0	1.496
Engineering Personnel	0.035	0.015	0.020
Waste Processing			
Maintenance Personnel	0.818	0	0.080
Operations Personnel	1.569	0	0
Health Physics Personnel	0.040	0	0.566
Supervisory Personnel	0.070	0.012	0.390
Engineering Personnel	0.070	0	0
Refueling			
Maintenance Personnel	35.017	0.548	26.765
Operations Personnel	17.298	0	0
Health Physics Personnel	1.812	0	5.093
Supervisory Personnel	2.051	1.336	43.103
Engineering Personnel	5.765	1.167	0.682
Totals			
Maintenance Personnel	76.549	0.588	42.381
Operations Personnel	40.937	0	0
Health Physics Personnel	10.906	0	6.189
Supervisory Personnel	12.492	3.975	72.074
Engineering Personnel	15.177	2.941	16.862
Grand Totals - Man-Rems	156.061	7.504	137.506

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Millstone 1

Total: 349.977

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	9.310	0.015	17.317
Operations Personnel	46.835	0	0.055
Health Physics Personnel	10.365	0	5.435
Supervisory Personnel	12.715	0.015	1.585
Engineering Personnel	0.285	0.245	1.000
Routine Maintenance			
Maintenance Personnel	21.205	0.590	8.900
Operations Personnel	0.605	0	0
Health Physics Personnel	0.345	0	0.075
Supervisory Personnel	0.430	0	0.100
Engineering Personnel	0.270	0.195	0.215
Inservice Inspection			
Maintenance Personnel	0.040	0.015	0.090
Operations Personnel	0.035	0	0
Health Physics Personnel	0.040	0	0
Supervisory Personnel	0.095	0.010	0.040
Engineering Personnel	0.130	0.145	0.100
Special Maintenance			
Maintenance Personnel	66.066	1.545	67.735
Operations Personnel	2.425	0	0
Health Physics Personnel	1.190	0	1.040
Supervisory Personnel	2.810	0.210	4.465
Engineering Personnel	2.595	4.375	4.424
Waste Processing			
Maintenance Personnel	6.040	0.045	17.025
Operations Personnel	12.665	0	0
Health Physics Personnel	2.230	0	1.440
Supervisory Personnel	0.850	0	2.615
Engineering Personnel	0.090	0.160	2.260
Refueling			
Maintenance Personnel	0.285	0	3.235
Operations Personnel	0.310	0	0
Health Physics Personnel	0.030	0	0.180
Supervisory Personnel	0	0.005	0.920
Engineering Personnel	0.200	0.065	1.600
Totals			
Maintenance Personnel	102.946	2.21	114.302
Operations Personnel	62.875	0	0.055
Health Physics Personnel	14.200	0	8.170
Supervisory Personnel	16.900	0.24	9.725
Engineering Personnel	3.570	5.185	9.599
Grand Totals - Man-Rems	200.491	7.635	141.851

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Millstone 2

Total: 216.85

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	0.655	0.030	3.820
Operations Personnel	9.684	0.005	0.060
Health Physics Personnel	4.865	0.010	9.312
Supervisory Personnel	1.465	0	0.385
Engineering Personnel	0.955	0.110	2.430
Routine Maintenance			
Maintenance Personnel	3.100	2.490	1.835
Operations Personnel	1.380	0	0
Health Physics Personnel	0.150	0	0.075
Supervisory Personnel	0.110	0	0.065
Engineering Personnel	0.070	0.140	0.090
Inservice Inspection			
Maintenance Personnel	2.309	2.153	11.393
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0.139	0	2.205
Engineering Personnel	0.185	0.435	9.843
Special Maintenance			
Maintenance Personnel	20.109	14.995	59.040
Operations Personnel	0.650	0	0
Health Physics Personnel	0.530	0	0.720
Supervisory Personnel	0.305	0.030	5.345
Engineering Personnel	0.980	2.005	15.998
Waste Processing			
Maintenance Personnel	0.155	0	1.255
Operations Personnel	1.060	0	0
Health Physics Personnel	0.610	0	0
Supervisory Personnel	0.330	0	0
Engineering Personnel	0.040	0	0.050
Refueling			
Maintenance Personnel	6.015	0.205	11.960
Operations Personnel	0.700	0	0
Health Physics Personnel	0.010	0	0
Supervisory Personnel	0.180	0.000	0.520
Engineering Personnel	0.295	0.010	0.795
Totals			
Maintenance Personnel	32.343	19.873	89.303
Operations Personnel	13.474	0.005	0.060
Health Physics Personnel	6.165	0.010	10.107
Supervisory Personnel	2.529	0.030	8.52
Engineering Personnel	2.525	2.700	29.206
Grand Totals - Man-ReMs	57.036	22.618	137.196

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Monticello

Total: 906.944

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	8.056	0	0
Operations Personnel	65.773	0	0
Health Physics Personnel	15.415	0	0
Supervisory Personnel	9.901	3.331	3.487
Engineering Personnel	9.901	3.331	3.486
Routine Maintenance			
Maintenance Personnel	51.963	28.871	0.220
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Inservice Inspection			
Maintenance Personnel	0	0	0
Operations Personnel	0	0	18.567
Health Physics Personnel	0	0	0.447
Supervisory Personnel	0	0.257	1.883
Engineering Personnel	0	0.258	1.883
Special Maintenance			
Maintenance Personnel	35.533	57.436	526.019
Operations Personnel	0	0	0
Health Physics Personnel	1.760	0	31.365
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Waste Processing			
Maintenance Personnel	5.157	0	0
Operations Personnel	3.977	0	6.364
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Refueling			
Maintenance Personnel	0.711	1.642	0.238
Operations Personnel	4.161	0	0.390
Health Physics Personnel	0	0	1.371
Supervisory Personnel	0	0	2.905 *
Engineering Personnel	0	0	0.885
Totals			
Maintenance Personnel	101.420	87.949	526.477
Operations Personnel	73.911	0	25.321
Health Physics Personnel	17.175	0	33.184
Supervisory Personnel	9.901	3.588	8.275
Engineering Personnel	9.901	3.589	6.253
Grand Totals - Man-ReMs	212.308	95.126	599.510

\* Includes exposures reported under 'Security' by licensee.

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Nine Mile Point 1 †

Total: 1313.754

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	13.596	4.332	2.156
Operations Personnel	4.385	0	0
Health Physics Personnel	8.226	0.008	0.083
Supervisory Personnel	3.531	0.050	0.523
Engineering Personnel	0.399	0.505	0.841
Routine Maintenance			
Maintenance Personnel	10.63	1.111	1.153
Operations Personnel	0.535	0	0
Health Physics Personnel	0.620	0	0.280
Supervisory Personnel	0.534	0.010	0.055
Engineering Personnel	0.155	0.028	0.457
Inservice Inspection			
Maintenance Personnel	6.931	9.584	24.319
Operations Personnel	0.105	0	0
Health Physics Personnel	1.222	0.020	0
Supervisory Personnel	3.382	0.060	1.328
Engineering Personnel	1.980	0.917	2.715
Special Maintenance			
Maintenance Personnel	130.221	132.704	688.565
Operations Personnel	5.382	0	0
Health Physics Personnel	11.918	0.277	4.456
Supervisory Personnel	8.23	1.422	81.017
Engineering Personnel	3.468	9.104	13.577
Waste Processing			
Maintenance Personnel	29.484	8.085	2.856
Operations Personnel	13.242	0	0
Health Physics Personnel	3.267	0	0.115
Supervisory Personnel	2.084	0	0.040
Engineering Personnel	0	0.053	0.651
Refueling			
Maintenance Personnel	19.429	15.362	11.523
Operations Personnel	2.836	0	0
Health Physics Personnel	1.403	0.171	0.407
Supervisory Personnel	2.564	0.240	0.008
Engineering Personnel	0.629	0.968	1.23
Totals			
Maintenance Personnel	210.291	171.178	730.572
Operations Personnel	26.485	0	0
Health Physics Personnel	26.656	0.476	5.341
Supervisory Personnel	20.325	1.782	82.971
Engineering Personnel	6.631	11.575	19.471
Grand Totals - Man-Rems	290.388	185.011	838.355

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Oconee 1, 2, 3

Total: 1331.555

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	32.270	42.685	18.055
Operations Personnel	71.890	0.565	0
Health Physics Personnel	29.430	0.820	7.355
Supervisory Personnel	1.135	0.150	0.230
Engineering Personnel	34.505	3.085	2.835
Routine Maintenance			
Maintenance Personnel	43.825	118.925	8.500
Operations Personnel	13.635	0	0
Health Physics Personnel	2.485	0.335	3.220
Supervisory Personnel	2.365	0.030	0
Engineering Personnel	9.790	2.375	11.860
Inservice Inspection			
Maintenance Personnel	3.350	54.340	31.735
Operations Personnel	0.095	0	0
Health Physics Personnel	0.335	0.010	2.925
Supervisory Personnel	0	0.260	0
Engineering Personnel	10.900	1.820	87.395
Special Maintenance			
Maintenance Personnel	86.110	119.935	7.885
Operations Personnel	25.400	0	0
Health Physics Personnel	6.545	0.455	4.800
Supervisory Personnel	4.185	0	0
Engineering Personnel	25.295	11.740	49.450
Waste Processing			
Maintenance Personnel	2.770	4.700	9.905
Operations Personnel	17.670	0	0
Health Physics Personnel	1.475	0.015	0.110
Supervisory Personnel	0.450	0	0
Engineering Personnel	0.710	0.040	0.120
Refueling			
Maintenance Personnel	60.275	109.650	13.040
Operations Personnel	50.945	0	0
Health Physics Personnel	7.565	0.995	25.530
Supervisory Personnel	0.245	0	0
Engineering Personnel	11.385	6.270	10.370
Totals			
Maintenance Personnel	228.600	450.235	89.120
Operations Personnel	179.635	0.565	0
Health Physics Personnel	47.835	2.630	43.940
Supervisory Personnel	8.380	0.440	0.230
Engineering Personnel	92.585	25.330	162.030
Grand Totals - Man-Rems	557.035	479.200	295.32

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Oyster Creek

Total: 1546.36

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
<b>Reactor Operations &amp; Surveillance</b>			
Maintenance Personnel	0	0	0
Operations Personnel	47.410	0	1.525
Health Physics Personnel	2.500	0	0
Supervisory Personnel	3.355	0.475	0.615
Engineering Personnel	5.525	2.705	8.355
<b>Routine Maintenance</b>			
Maintenance Personnel	109.105	0	0
Operations Personnel	1.550	4.760	0
Health Physics Personnel	12.400	0	0
Supervisory Personnel	5.680	1.370	0
Engineering Personnel	5.085	2.500	0
<b>Inservice Inspection</b>			
Maintenance Personnel	0	0	19.075
Operations Personnel	1.550	0	0
Health Physics Personnel	0.800	0	2.335
Supervisory Personnel	1.300	0.310	1.620
Engineering Personnel	4.515	0.385	37.925
<b>Special Maintenance</b>			
Maintenance Personnel	57.535	62.460	748.075
Operations Personnel	22.950	0	1.210
Health Physics Personnel	10.600	0	80.590
Supervisory Personnel	2.935	0.710	36.430
Engineering Personnel	11.895	9.660	37.965
<b>Waste Processing</b>			
Maintenance Personnel	43.450	0	2.730
Operations Personnel	77.825	0	0
Health Physics Personnel	9.000	0	2.075
Supervisory Personnel	2.265	0	0
Engineering Personnel	6.555	0	0.135
<b>Refueling</b>			
Maintenance Personnel	4.900	0	15.450
Operations Personnel	2.370	0	0
Health Physics Personnel	0.500	0	0.575
Supervisory Personnel	0.285	0	3.110
Engineering Personnel	2.335	0.880	4.175
<b>Totals</b>			
Maintenance Personnel	214.99	62.460	785.33
Operations Personnel	153.655	4.760	2.735
Health Physics Personnel	35.800	0	85.575
Supervisory Personnel	15.820	2.865	41.775
Engineering Personnel	35.910	16.130	88.555
<b>Grand Totals - Man-Rems</b>	<b>456.175</b>	<b>86.215</b>	<b>1003.970</b>

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF MAN-REM  
AND NUMBER OF PERSONNEL BY WORK AND JOB FUNCTION

Plant: Palisades

Total: 89.845

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	0.285	0	0
Operations Personnel	5.039	0	0
Health Physics Personnel	3.175	0	0
Supervisory Personnel	0.775	0.316	0
Engineering Personnel	1.929	0	0
Routine Maintenance			
Maintenance Personnel	24.842	3.681	0
Operations Personnel	0.459	0	0
Health Physics Personnel	0.927	0	0
Supervisory Personnel	2.249	0	0
Engineering Personnel	0.450	0	0
Inservice Inspection			
Maintenance Personnel	0	0	0
Operations Personnel	0.052	0	0
Health Physics Personnel	0.206	0	0
Supervisory Personnel	0.191	0	0
Engineering Personnel	0.341	0	0
Special Maintenance			
Maintenance Personnel	9.672	0	14.532
Operations Personnel	0.094	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0.166	0	0
Engineering Personnel	4.500	0	0.907
Waste Processing			
Maintenance Personnel	0.969	0	0
Operations Personnel	2.057	0	0
Health Physics Personnel	0.596	0	0
Supervisory Personnel	0.294	0	0
Engineering Personnel	0.010	0	0
Refueling			
Maintenance Personnel	0.235	0.320	0
Operations Personnel	0.175	0	0
Health Physics Personnel	0.032	0	0
Supervisory Personnel	0.002	0	0
Engineering Personnel	4.752	0	5.615
Totals			
Maintenance Personnel	36.003	4.001	14.532
Operations Personnel	7.876	0	0
Health Physics Personnel	4.936	0	0
Supervisory Personnel	3.677	0	0
Engineering Personnel	11.982	0.316	6.522
Grand Totals- Man-Rems	64.474	4.317	21.054

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Peach Bottom 2, 3

Total: 1873.74

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	0.15	38.22	20.80
Operations Personnel	26.75	18.92	1.80
Health Physics Personnel	9.49	1.11	55.75
Supervisory Personnel	0.39	0.23	0.33
Engineering Personnel	5.82	9.00	16.73
Routine Maintenance			
Maintenance Personnel	3.33	424.58	745.36
Operations Personnel	1.04	1.58	9.8
Health Physics Personnel	1.09	0	106.21
Supervisory Personnel	0	0	0.17
Engineering Personnel	0.29	4.83	2.34
Inservice Inspection			
Maintenance Personnel	0	45.71	37.15
Operations Personnel	0	6.50	2.70
Health Physics Personnel	0	0	0.36
Supervisory Personnel	0	0	3.05
Engineering Personnel	0	0.21	0.25
Special Maintenance			
Maintenance Personnel	0	0.21	232.87
Operations Personnel	0	0	0
Health Physics Personnel	0	0	1.81
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	8.77
Waste Processing			
Maintenance Personnel	0	0.85	0.80
Operations Personnel	6.65	0	0
Health Physics Personnel	0	0	9.00
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Refueling			
Maintenance Personnel	0	1.87	1.21
Operations Personnel	0.66	0	0
Health Physics Personnel	0	0	7.00
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Totals			
Maintenance Personnel	3.48	511.44	1038.19
Operations Personnel	35.10	27.00	14.30
Health Physics Personnel	10.58	1.11	180.13
Supervisory Personnel	0.39	0.23	3.55
Engineering Personnel	6.11	14.04	28.09
Grand Totals - Man-ReMs	55.66	553.82	1264.26

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF MAN-REM  
AND NUMBER OF PERSONNEL BY WORK AND JOB FUNCTION

Plant: Pilgrim 1		Total: 2566.978		
Work and Job Function	Total Man-Rem			
	Station Employees	Utility Employees	Contract Employees	
<b>Reactor Operations &amp; Surveillance</b>				
Maintenance Personnel	24.777	0	0	
Operations Personnel	42.074	0	0	
Health Physics Personnel	8.604	0	6.238	
Supervisory Personnel	29.483	0	0	
Engineering Personnel	6.693	0	1.638	
<b>Routine Maintenance</b>				
Maintenance Personnel	49.553	0	127.154	
Operations Personnel	15.086	0	0	
Health Physics Personnel	12.906	1.531	20.714	
Supervisory Personnel	28.133	0	0	
Engineering Personnel	4.8	13.355	0	
<b>Inservice Inspection</b>				
Maintenance Personnel	0	0	155.577	
Operations Personnel	0	0	0	
Health Physics Personnel	0	0	7.238	
Supervisory Personnel	0	5.970	0	
Engineering Personnel	0	4.452	16.386	
<b>Special Maintenance</b>				
Maintenance Personnel	69.375	77.803	1088.737	
Operations Personnel	36.461	0	0	
Health Physics Personnel	39.076	1.750	78.618	
Supervisory Personnel	35.166	0	0	
Engineering Personnel	13.962	44.610	81.103	
<b>Waste Processing</b>				
Maintenance Personnel	59.464	0	149.753	
Operations Personnel	75.202	5.364	0	
Health Physics Personnel	8.604	0	11.476	
Supervisory Personnel	0	0	0	
Engineering Personnel	10.733	0	0	
<b>Refueling</b>				
Maintenance Personnel	24.777	0	20.718	
Operations Personnel	18.539	0	0	
Health Physics Personnel	9.124	0	12.476	
Supervisory Personnel	7.033	0	0	
Engineering Personnel	4.692	0	0	
<b>Totals</b>				
Maintenance Personnel	227.946	77.803	1541.939	
Operations Personnel	187.362	5.364	0	
Health Physics Personnel	78.314	3.281	136.760	
Supervisory Personnel	99.815	5.970	0	
Engineering Personnel	40.88	62.417	99.127	
<b>Grand Totals- Man-ReMs</b>	<b>634.317</b>	<b>154.835</b>	<b>1777.826</b>	

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF MAN-REM  
AND NUMBER OF PERSONNEL BY WORK AND JOB FUNCTION

Plant: Point Beach 1, 2 †

Total: 470.712

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			0*
Maintenance Personnel	0.215	0	-
Operations Personnel	38.336	0	-
Health Physics Personnel	28.606	0	-
Supervisory Personnel	0.199	0	-
Engineering Personnel	1.306	0	-
Routine Maintenance			5.856*
Maintenance Personnel	61.312	0	-
Operations Personnel	1.763	0	-
Health Physics Personnel	1.706	0	-
Supervisory Personnel	0	0	-
Engineering Personnel	0	0	-
Inservice Inspection			7.296*
Maintenance Personnel	26.261	0	-
Operations Personnel	14.075	0	-
Health Physics Personnel	0.572	0	-
Supervisory Personnel	0.757	0	-
Engineering Personnel	0.736	0	-
Special Maintenance			219.227*
Maintenance Personnel	34.298	0	-
Operations Personnel	2.873	0	-
Health Physics Personnel	0.182	0	-
Supervisory Personnel	0	0	-
Engineering Personnel	0.166	0	-
Waste Processing			
Maintenance Personnel	0	0	-
Operations Personnel	9.263	0	-
Health Physics Personnel	1.645	0	-
Supervisory Personnel	0	0	-
Engineering Personnel	0	0	-
Refueling			
Maintenance Personnel	0	0	-
Operations Personnel	12.045	0	-
Health Physics Personnel	0.669	0	-
Supervisory Personnel	0	0	-
Engineering Personnel	1.348	0	-
Totals			
Maintenance Personnel	122.086	0	-
Operations Personnel	78.355	0	-
Health Physics Personnel	33.380	0	-
Supervisory Personnel	0.956	0	-
Engineering Personnel	3.556	0	-
<b>Grand Totals- Man-Reps</b>	<b>238.333</b>	<b>0</b>	<b>232.379*</b>

\*Breakdown by Job Function not provided by licensee.

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF MAN-REM  
AND NUMBER OF PERSONNEL BY WORK AND JOB-FUNCTION

Plant: Prairie Island 1, 2		Total: 277.581		
Work and Job Function	Total Man-Rem			
	Station Employees	Utility Employees	Contract Employees	
<b>Reactor Operations &amp; Surveillance</b>				
Maintenance Personnel	2.039	0	0	
Operations Personnel	32.875	5.633	0	
Health Physics Personnel	16.980	0	0.140	
Supervisory Personnel	4.812	0.238	0	
Engineering Personnel	3.418	1.055	0.651	
<b>Routine Maintenance</b>				
Maintenance Personnel	4.850	0.737	0	
Operations Personnel	0.206	0.235	0	
Health Physics Personnel	0.191	0	0	
Supervisory Personnel	0.022	0	0	
Engineering Personnel	0.565	0	0	
<b>Inservice Inspection</b>				
Maintenance Personnel	0.432	7.445	0	
Operations Personnel	0	0	0	
Health Physics Personnel	0.063	0	2.696	
Supervisory Personnel	0	0.015	0.446	
Engineering Personnel	0.611	0	30.389	
<b>Special Maintenance</b>				
Maintenance Personnel	43.919	24.322	10.162	
Operations Personnel	3.514	9.094	0	
Health Physics Personnel	1.372	0	3.652	
Supervisory Personnel	0.981	0.669	0.058	
Engineering Personnel	1.896	0.297	4.091	
<b>Waste Processing</b>				
Maintenance Personnel	2.359	0	0	
Operations Personnel	10.890	0	0	
Health Physics Personnel	2.700	0	0	
Supervisory Personnel	0.413	0	0	
Engineering Personnel	0.367	0	0	
<b>Refueling</b>				
Maintenance Personnel	12.424	13.266	0	
Operations Personnel	3.021	3.13	0	
Health Physics Personnel	0.242	0	3.536	
Supervisory Personnel	2.438	0.706	0	
Engineering Personnel	0.952	0.363	0	
<b>Totals</b>				
Maintenance Personnel	66.023	45.77	10.162	
Operations Personnel	50.509	18.092	0	
Health Physics Personnel	21.548	0	10.024	
Supervisory Personnel	8.666	1.628	0.504	
Engineering Personnel	7.809	1.715	35.131	
<b>Grand Totals- Man-Reps</b>	<b>154.555</b>	<b>67.205</b>	<b>55.821</b>	

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Quad Cities 1 & 2 †

Total: 1014.3

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	2.0	0	0
Operations Personnel	50.9	0	0
Health Physics Personnel	18.9	0	0
Supervisory Personnel	12.6	0	0
Engineering Personnel	21.5	0	0
Routine Maintenance *			366.5 <sup>a</sup>
Maintenance Personnel	229.0	0	-
Operations Personnel	9.1	0	-
Health Physics Personnel	11.3	0	-
Supervisory Personnel	45.7	0	-
Engineering Personnel	0	0	-
Inservice Inspection			
Maintenance Personnel	-	-	-
Operations Personnel	-	-	-
Health Physics Personnel	-	-	-
Supervisory Personnel	-	-	-
Engineering Personnel	-	-	-
Special Maintenance			
Maintenance Personnel	0	20.4	0
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Waste Processing			
Maintenance Personnel	1.4	0	0
Operations Personnel	154.1	0	0
Health Physics Personnel	32.8	0	0
Supervisory Personnel	16.2	0	0
Engineering Personnel	0	0	0
Refueling			
Maintenance Personnel	0	0	0
Operations Personnel	20.5	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	1.4	0	0
Engineering Personnel	0	0	0
Totals			
Maintenance Personnel	232.4	20.4	-
Operations Personnel	234.6	0	-
Health Physics Personnel	63.0	0	-
Supervisory Personnel	75.9	0	-
Engineering Personnel	21.5	0	-
Grand Totals - Man-Rems	627.4	20.4	366.5

\*Includes Inservice Inspection Exposures.

<sup>a</sup>Breakdown by Job Function not provided by licensee.

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Rancho Seco

Total: 406.35

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	5.34	0.45	31.51
Operations Personnel	8.13	0.13	0
Health Physics Personnel	7.12	0	6.95
Supervisory Personnel	0.61	0	1.07
Engineering Personnel	1.96	0	0.80
Routine Maintenance *			
Maintenance Personnel	40.47	2.17	86.71
Operations Personnel	6.42	0	0
Health Physics Personnel	9.27	0	6.69
Supervisory Personnel	0.47	0	2.14
Engineering Personnel	2.46	0	1.87
Inservice Inspection			
Maintenance Personnel	-	-	-
Operations Personnel	-	-	-
Health Physics Personnel	-	-	-
Supervisory Personnel	-	-	-
Engineering Personnel	-	-	-
Special Maintenance			
Maintenance Personnel	28.25	5.75	74.09
Operations Personnel	0.73	0	0
Health Physics Personnel	5.00	0	8.37
Supervisory Personnel	0.67	0	0.80
Engineering Personnel	1.96	0	11.21
Waste Processing			
Maintenance Personnel	5.41	0.08	22.17
Operations Personnel	3.27	0	0
Health Physics Personnel	3.21	0	0.80
Supervisory Personnel	0.41	0	0
Engineering Personnel	0.54	0	0
Refueling			
Maintenance Personnel	2.10	0.48	2.94
Operations Personnel	4.47	0.19	0
Health Physics Personnel	0.21	0	0.03
Supervisory Personnel	0	0	0
Engineering Personnel	0.44	0	0.03
Totals			
Maintenance Personnel	81.57	8.93	217.42
Operations Personnel	23.02	0.32	0
Health Physics Personnel	24.81	0	22.84
Supervisory Personnel	2.16	0	4.01
Engineering Personnel	7.36	0	13.91
Grand Totals - Man-Rems	138.92	9.25	258.18

\*Includes Inservice Inspection Exposures.

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: H. B. Robinson 2 †

Total: 455.491

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	1.057	0	1.266
Operations Personnel	33.209	0	0
Health Physics Personnel	10.311	1.063	0.014
Supervisory Personnel	0.590	0.362	0
Engineering Personnel	3.516	0.603	0
Routine Maintenance			
Maintenance Personnel	32.999	0	22.793
Operations Personnel	0	0	0
Health Physics Personnel	2.864	1.006	0
Supervisory Personnel	0	0	0
Engineering Personnel	1.318	0.603	0
Inservice Inspection			
Maintenance Personnel	0	0	0
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0.033
Engineering Personnel	0	0	0
Special Maintenance			
Maintenance Personnel	58.522*	13.981	154.161*
Operations Personnel	5.629	0	0
Health Physics Personnel	11.457*	4.364*	0
Supervisory Personnel	0	0	0
Engineering Personnel	5.604	4.223	0
Waste Processing			
Maintenance Personnel	15.600	0.603*	44.725*
Operations Personnel	17.449	0	0
Health Physics Personnel	4.010	1.006	0
Supervisory Personnel	0	0	0
Engineering Personnel	0.550	0	0
Refueling			
Maintenance Personnel	0	0	0
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Totals			
Maintenance Personnel	108.178 *	14.584 *	222.945 *
Operations Personnel	56.287	0	0
Health Physics Personnel	28.642 *	7.439 *	0.014
Supervisory Personnel	0.590	0.362	0.033
Engineering Personnel	10.988	5.429	0
Grand Totals - Man-ReMs	204.685	27.814	222.992

\*Includes exposures reported under "deconning" by licensee.

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: St. Lucie

Total: 130.57

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	0	0	0
Operations Personnel	7.90	0	0
Health Physics Personnel	4.51	0	0
Supervisory Personnel	0.15	0	0.21
Engineering Personnel	0.26	0	0
Routine Maintenance			
Maintenance Personnel	43.69	0	12.53
Operations Personnel	0.33	0	0
Health Physics Personnel	5.57	0.22	0.13
Supervisory Personnel	0.15	0.11	0.79
Engineering Personnel	0	0	0.14
Inservice Inspection *			
Maintenance Personnel	3.35	0	5.94
Operations Personnel	15.63	0	0
Health Physics Personnel	6.47	0	0
Supervisory Personnel	0.71	0.11	0.41
Engineering Personnel	1.24	0	1.65
Special Maintenance			
Maintenance Personnel	-	-	-
Operations Personnel	-	-	-
Health Physics Personnel	-	-	-
Supervisory Personnel	-	-	-
Engineering Personnel	-	-	-
Waste Processing			
Maintenance Personnel	10.55	0	0
Operations Personnel	2.91	0	0
Health Physics Personnel	4.91	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Refueling			
Maintenance Personnel	0	0	0
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Totals			
Maintenance Personnel	57.59	0	18.47
Operations Personnel	26.77	0	0
Health Physics Personnel	21.46	0.22	0.13
Supervisory Personnel	1.01	0.22	1.41
Engineering Personnel	1.50	0	1.79
Grand Totals - Man-Rems	108.33	0.44	21.80

\*Includes Special Maintenance Exposures.

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF MAN-REM  
AND NUMBER OF PERSONNEL BY WORK AND JOB FUNCTION

Plant: San Onofre

Total: 867.71

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	3.580	0.530	10.980
Operations Personnel	15.360	0	0
Health Physics Personnel	8.100	1.080	0
Supervisory Personnel	1.350	0.960	2.520
Engineering Personnel	10.510	5.840	17.920
Routine Maintenance			
Maintenance Personnel	51.870	171.460	293.290
Operations Personnel	3.140	0	0
Health Physics Personnel	7.210	1.770	0
Supervisory Personnel	3.590	11.420	18.840
Engineering Personnel	6.200	7.940	32.420
Inservice Inspection			
Maintenance Personnel	0	8.820	4.880
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0.500	0
Engineering Personnel	0	0	0.960
Special Maintenance			
Maintenance Personnel	13.710	39.540	36.650
Operations Personnel	3.890	0	0
Health Physics Personnel	3.550	0.680	0
Supervisory Personnel	1.210	3.930	0
Engineering Personnel	8.000	1.660	26.700
Waste Processing			
Maintenance Personnel	6.300	0.330	2.070
Operations Personnel	1.460	0	0
Health Physics Personnel	0.730	0	0
Supervisory Personnel	0	0	1.440
Engineering Personnel	0	0	0.130
Refueling			
Maintenance Personnel	0	0	10.570
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	2.120
Totals			
Maintenance Personnel	75.46	220.68	358.44
Operations Personnel	23.85	0	0
Health Physics Personnel	19.59	3.53	0
Supervisory Personnel	6.15	16.81	22.8
Engineering Personnel	24.71	15.44	80.25
Grand Totals- Man-ReMs	149.76	256.46	461.49

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Surry 1, 2 †

Total: 2417.323

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance	315.441 *	6.233 *	43.097 *
Maintenance Personnel	-	-	-
Operations Personnel	-	-	-
Health Physics Personnel	-	-	-
Supervisory Personnel	-	-	-
Engineering Personnel	-	-	-
Routine Maintenance	296.440 *	44.732 *	53.226 *
Maintenance Personnel	-	-	-
Operations Personnel	-	-	-
Health Physics Personnel	-	-	-
Supervisory Personnel	-	-	-
Engineering Personnel	-	-	-
Inservice Inspection			
Maintenance Personnel	0	0	0
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Special Maintenance	109.663 *	95.978 *	1204.776 *
Maintenance Personnel	-	-	-
Operations Personnel	-	-	-
Health Physics Personnel	-	-	-
Supervisory Personnel	-	-	-
Engineering Personnel	-	-	-
Waste Processing	62.436 *	0	19.144 *
Maintenance Personnel	-	-	-
Operations Personnel	-	-	-
Health Physics Personnel	-	-	-
Supervisory Personnel	-	-	-
Engineering Personnel	-	-	-
Refueling	31.374 *	9.544 *	125.239 *
Maintenance Personnel	-	-	-
Operations Personnel	-	-	-
Health Physics Personnel	-	-	-
Supervisory Personnel	-	-	-
Engineering Personnel	-	-	-
Totals			
Maintenance Personnel	-	-	-
Operations Personnel	-	-	-
Health Physics Personnel	-	-	-
Supervisory Personnel	-	-	-
Engineering Personnel	-	-	-
Grand Totals - Man-Rems	815.354	156.487	1445.482

\* Breakdown by job function not provided by licensee.

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Three Mile Island 1

Total: 239.742

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	0.559	0.015	0.030
Operations Personnel	6.234	0	0
Health Physics Personnel	0.876	0.003	0
Supervisory Personnel*	2.055	0.020	0.132
Engineering Personnel	0.200	0.074	0.066
Routine Maintenance			
Maintenance Personnel	15.751	0.928	0.338
Operations Personnel	2.137	0.090	0
Health Physics Personnel	0.398	0.030	0
Supervisory Personnel*	1.293	0.005	0.035
Engineering Personnel	0.073	0.088	0.043
Inservice Inspection			
Maintenance Personnel	0.345	0.023	11.936
Operations Personnel	2.090	0	0
Health Physics Personnel	0.292	0.002	0.014
Supervisory Personnel*	0.281	0.103	0.635
Engineering Personnel	0.293	0.227	0.056
Special Maintenance			
Maintenance Personnel	21.122	2.376	60.735
Operations Personnel	4.638	0.020	0
Health Physics Personnel	3.266	0.001	0.605
Supervisory Personnel*	5.430	0.107	3.874
Engineering Personnel	0.287	0.814	1.019
Waste Processing			
Maintenance Personnel	16.269	1.869	3.919
Operations Personnel	3.995	0	0
Health Physics Personnel	0.308	0.020	0
Supervisory Personnel*	3.272	0.133	0.203
Engineering Personnel	0.097	0.079	0.050
Refueling			
Maintenance Personnel	21.282	6.220	1.170
Operations Personnel	16.321	0	0
Health Physics Personnel	0.772	0	0
Supervisory Personnel*	9.975	0.266	0.037
Engineering Personnel	0.612	0.202	0.607
Totals			
Maintenance Personnel	75.328	11.431	78.128
Operations Personnel	35.415	0.110	0
Health Physics Personnel	5.912	0.056	0.619
Supervisory Personnel*	22.306	0.634	4.916
Engineering Personnel	1.562	1.484	1.841
Grand Totals - Man-Rems	140.523	13.715	85.504

\*Includes exposures reported for "Administrative Personnel" by licensee.

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Trojan

Total: 151.318

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	0.522	0.141	0.060
Operations Personnel	8.588	0	0.022
Health Physics Personnel	13.114	0	0.020
Supervisory Personnel	0.962	0.010	0.079
Engineering Personnel	0.291	0.081	2.628
Routine Maintenance *			
Maintenance Personnel	1.355	9.614	15.355
Operations Personnel	0.015	0.010	0
Health Physics Personnel	0	0.025	5.251
Supervisory Personnel	0.008	0.420	0.292
Engineering Personnel	0.143	0.611	0.495
Inservice Inspection			
Maintenance Personnel	-	-	-
Operations Personnel	-	-	-
Health Physics Personnel	-	-	-
Supervisory Personnel	-	-	-
Engineering Personnel	-	-	-
Special Maintenance			
Maintenance Personnel	16.002	6.458	62.544
Operations Personnel	0.070	0.008	0
Health Physics Personnel	0.597	0	0.102
Supervisory Personnel	0.229	0.070	2.861
Engineering Personnel	0.488	0.213	0.233
Waste Processing			
Maintenance Personnel	0	0	0.021
Operations Personnel	0	0	0
Health Physics Personnel	0.096	0	0.109
Supervisory Personnel	0	0	1.071
Engineering Personnel	0.024	0	0.010
Refueling			
Maintenance Personnel	0	0	0
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Totals			
Maintenance Personnel	17.879	16.213	77.980
Operations Personnel	8.673	0.018	0.022
Health Physics Personnel	13.807	0.025	5.482
Supervisory Personnel	1.199	0.500	4.303
Engineering Personnel	0.946	0.905	3.366
Grand Totals - Man-Rems	42.504	17.661	91.153

\*Includes Inservice Inspection Exposures

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF MAN-REM  
AND NUMBER OF PERSONNEL BY WORK AND JOB FUNCTION

Plant: Turkey Point 3, 4

Total: 1455.79

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	3.58	22.44	4.26
Operations Personnel	55.96	0	0
Health Physics Personnel	2.73	0	25.48
Supervisory Personnel	0	0	4.78
Engineering Personnel	12.38	0	0
Routine Maintenance			
Maintenance Personnel	398.14	156.64	55.30
Operations Personnel	8.56	0	0
Health Physics Personnel	2.44	0	0
Supervisory Personnel	5.42	0	4.86
Engineering Personnel	3.32	0	0
Inservice Inspection			
Maintenance Personnel	0	0	601.78
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	8.32
Engineering Personnel	24.48	0	0
Special Maintenance			
Maintenance Personnel	0.24	0	29.02
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	3.12	0	0
Waste Processing			
Maintenance Personnel	0	0	0
Operations Personnel	0.42	0	0
Health Physics Personnel	1.64	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Refueling			
Maintenance Personnel	11.76	0	0
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	8.72	0	0
Totals			
Maintenance Personnel	413.72	179.08	690.36
Operations Personnel	64.94	0	0
Health Physics Personnel	6.81	0	25.48
Supervisory Personnel	5.42	0	17.96
Engineering Personnel	52.02	0	0
Grand Totals- Man-ReMs	542.91	179.08	733.8

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF MAN-REM  
AND NUMBER OF PERSONNEL BY WORK AND JOB FUNCTION

Plant: Vermont Yankee

Total: 256.181

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	14.391	0.725	5.069
Operations Personnel	29.925	0	0.334
Health Physics Personnel	11.031	0	8.707
Supervisory Personnel	0.297	0	0
Engineering Personnel	8.262	2.227	1.069
Routine Maintenance			
Maintenance Personnel	24.272	62.117	65.033
Operations Personnel	2.793	0	0.020
Health Physics Personnel	0.235	0	2.093
Supervisory Personnel	0	0	0
Engineering Personnel	0.225	0.154	0.166
Inservice Inspection			
Maintenance Personnel	0.182	1.313	2.397
Operations Personnel	0.020	0	0
Health Physics Personnel	0.005	0	0.202
Supervisory Personnel	0	0	0
Engineering Personnel	0	0.376	0.405
Special Maintenance			
Maintenance Personnel	0.166	0.452	1.055
Operations Personnel	0.218	0	0
Health Physics Personnel	0.162	0	0.121
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0.024
Waste Processing			
Maintenance Personnel	0.105	0.130	0
Operations Personnel	2.050	0	0
Health Physics Personnel	0	0	0.125
Supervisory Personnel	0.004	0	0
Engineering Personnel	0	0	0
Refueling			
Maintenance Personnel	1.411	3.061	0.827
Operations Personnel	0.569	0	0.025
Health Physics Personnel	0.143	0	1.171
Supervisory Personnel	0	0	0
Engineering Personnel	0.228	0.049	0.040
Totals			
Maintenance Personnel	40.527	67.798	74.381
Operations Personnel	35.575	0	0.379
Health Physics Personnel	11.576	0	12.419
Supervisory Personnel	0.301	0	0
Engineering Personnel	8.715	2.806	1.704
Grand Totals- Man-Rems	96.694	70.604	88.883

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF MAN-REM  
AND NUMBER OF PERSONNEL BY WORK AND JOB FUNCTION

Plant: Yankee Rowe

Total: 314.954

Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	2.306	0.489	0.297
Operations Personnel	9.139	0	0
Health Physics Personnel	7.581	0.444	2.332
Supervisory Personnel	0.195	0.090	0.318
Engineering Personnel	0.749	0.459	0.038
Routine Maintenance			
Maintenance Personnel	7.900	13.381	5.425
Operations Personnel	0.816	0	0
Health Physics Personnel	1.196	0	0.407
Supervisory Personnel	0.057	0.255	0.983
Engineering Personnel	0.007	0.303	0.010
Inservice Inspection			
Maintenance Personnel	1.451	13.774	9.128
Operations Personnel	3.763	0	0
Health Physics Personnel	0.518	0.020	0.300
Supervisory Personnel	4.102	1.669	0.882
Engineering Personnel	2.985	1.963	2.310
Special Maintenance			
Maintenance Personnel	16.098	24.688	77.120
Operations Personnel	0.627	0	0
Health Physics Personnel	3.227	0	8.656
Supervisory Personnel	1.183	0.357	17.750
Engineering Personnel	0.129	2.475	0.122
Waste Processing			
Maintenance Personnel	0.237	0.315	0.109
Operations Personnel	1.565	0	0
Health Physics Personnel	0.195	0.058	4.095
Supervisory Personnel	0	0	0.805
Engineering Personnel	0	0	0.002
Refueling			
Maintenance Personnel	6.612	14.197	7.695
Operations Personnel	10.134	0	0
Health Physics Personnel	0.912	0.107	14.937
Supervisory Personnel	0.716	0.825	0.420
Engineering Personnel	0.264	0.237	0.043
Totals			
Maintenance Personnel	34.604	66.844	99.774
Operations Personnel	26.044	0	0
Health Physics Personnel	13.629	0.629	30.727
Supervisory Personnel	6.253	3.196	21.158
Engineering Personnel	4.134	5.437	2.525
Grand Totals- Man-ReMs	84.664	76.106	154.184

APPENDIX C  
STANDARD FORMAT FOR ANNUAL REPORTING OF  
MAN-REM BY WORK AND JOB FUNCTION

Plant: Zion 1, 2

Total: 978.4

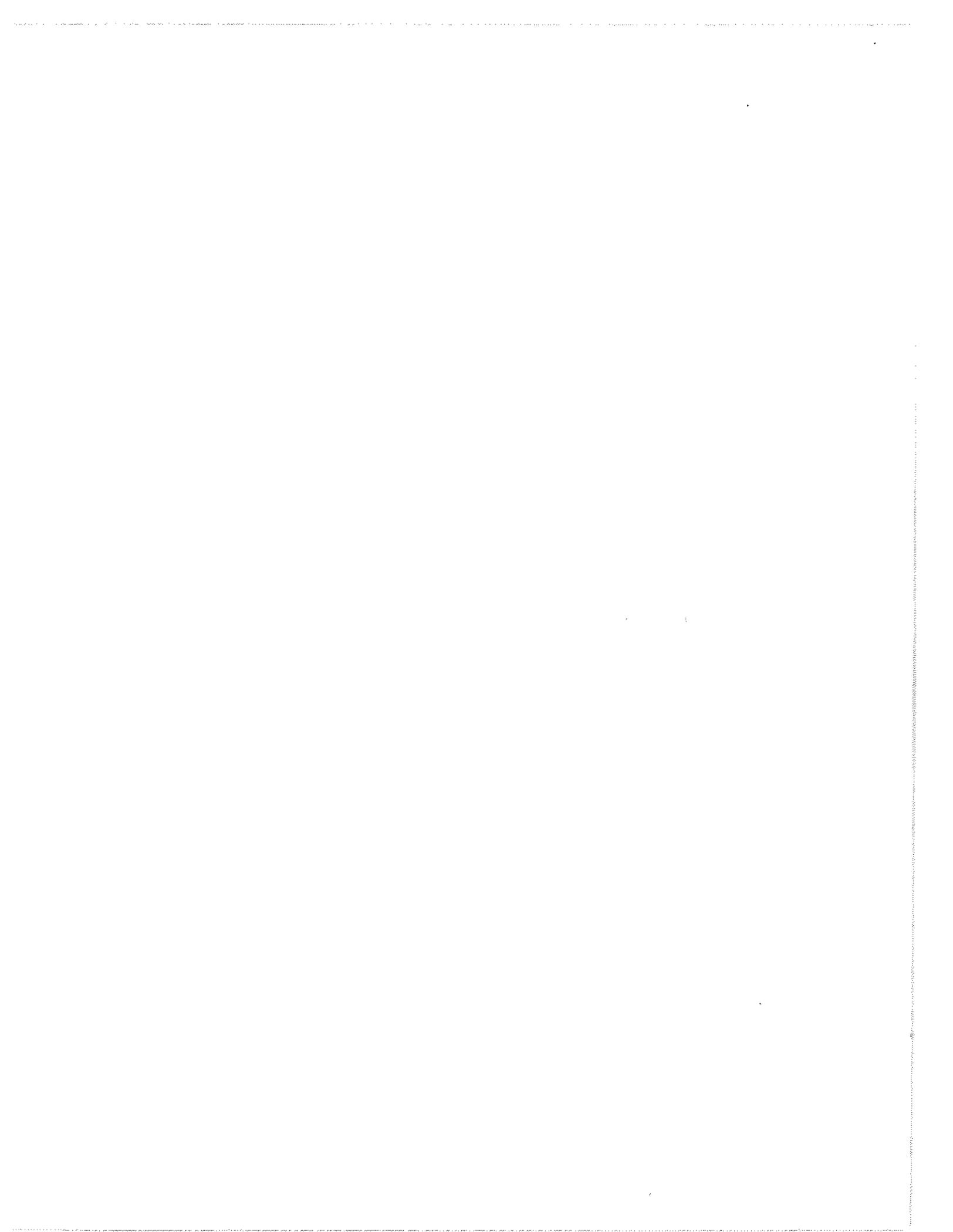
Work and Job Function	Total Man-Rem		
	Station Employees	Utility Employees	Contract Employees
Reactor Operations & Surveillance			
Maintenance Personnel	1.4	0	0
Operations Personnel	4.2	0	0
Health Physics Personnel	4.0	0	0
Supervisory Personnel	3.1	0	0
Engineering Personnel	29.5	0	0
Routine Maintenance*			
Maintenance Personnel	176.6	0	547
Operations Personnel	78.6	0	-
Health Physics Personnel	33.2	0	-
Supervisory Personnel	45.7	0	-
Engineering Personnel	0	0	-
Inservice Inspection			
Maintenance Personnel	-	-	-
Operations Personnel	-	-	-
Health Physics Personnel	-	-	-
Supervisory Personnel	-	-	-
Engineering Personnel	-	-	-
Special Maintenance			
Maintenance Personnel	0	10.9	0
Operations Personnel	0	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Waste Processing			
Maintenance Personnel	0	0	0
Operations Personnel	14.0	0	0
Health Physics Personnel	12.3	0	0
Supervisory Personnel	0	0	0
Engineering Personnel	0	0	0
Refueling			
Maintenance Personnel	0	0	0
Operations Personnel	12.2	0	0
Health Physics Personnel	0	0	0
Supervisory Personnel	5.7	0	0
Engineering Personnel	0	0	0
Totals			
Maintenance Personnel	178.0	10.9	547
Operations Personnel	109.0	0	0
Health Physics Personnel	49.5	0	0
Supervisory Personnel	54.5	0	0
Engineering Personnel	29.5	0	0
Grand Totals - Man-Rems	420.5	10.9	547

\*Includes Inservice Inspection exposures.



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16. ABSTRACT <i>(200 words or less)</i> <p>           This report presents an updated compilation of occupational radiation exposures at commercial light water cooled nuclear power reactors (LWRs) for the years 1969 through 1977. Data from 57 U.S. nuclear power plants that completed at least one full year of commercial operation as of January 1, 1978 are included. The number of personnel monitored at LWRs increased approximately 10% in 1977, and the average collective dose to personnel (man-rem per reactor-year) increased 14% over the 1976 average. The average number of personnel receiving measurable exposure per reactor increased 11%, and the average exposure per individual in 1977 was 0.8 rem per person.         </p>					
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