

Exposure Dose Distribution

1. Effective Dose from External Exposure

Table 1 shows the distribution of external exposure dose of workers who were involved in radiation work at the Fukushima Daiichi Nuclear Power Station for the past three months.

Table 1. External Exposure Dose

Dose Ranges (mSv)	October 2017			November 2017			December 2017		
	TEPCO Employees	Contractors	Total	TEPCO Employees	Contractors	Total	TEPCO Employees	Contractors	Total
Above 100	0	0	0	0	0	0	0	0	0
75-100	0	0	0	0	0	0	0	0	0
50-75	0	0	0	0	0	0	0	0	0
20-50	0	0	0	0	0	0	0	0	0
10-20	0	2	2	0	5	5	0	0	0
5-10	0	32	32	0	35	35	0	14	14
1-5	29	715	744	23	660	683	22	565	587
1 or less	1051	6887	7938	1026	6874	7900	898	6681	7579
Total	1080	7636	8716	1049	7574	8623	920	7260	8180
Maximum (mSv)	2.50	10.30	10.30	2.40	11.20	11.20	2.52	9.88	9.88
Average (mSv)	0.13	0.37	0.34	0.12	0.37	0.34	0.14	0.30	0.28

• The values of the exposure dose and the number of the workers in the table above are subject to change, because there are times when APD data are replaced with monthly dose data measured by integral dosimeters. Or dose data of workers who wore only an integral dosimeter (ex., workers who entered only the Main Anti-earthquake Building) need to be updated in the table after the publication of the data.

2. Sum of External and Internal Exposure Dose (Effective Dose)

Table 2 shows the distribution of cumulative exposure dose of workers who are involved in radiation work at Fukushima Daiichi for five years, starting on April 1, 2016. Table 3 shows the distribution of cumulative exposure dose in the fiscal year of 2017. Two different periods of time are shown in the Table 2: from April 1, 2016 to November 30, 2017 and from April 1, 2016 to December 31, 2017, and Table 3: from April 1, 2017 to November 30, 2017 and from April 1, 2017 to December 31, 2017 for comparison.

Table 2. Cumulative Exposure Dose for Five Years

Dose Ranges (mSv)	April 2016 - November 2017			April 2016 - December 2018			Difference		
	TEPCO Employees	Contractors	Total	TEPCO Employees	Contractors	Total	TEPCO Employees	Contractors	Total
Above 100	0	0	0	0	0	0	0	0	0
75-100	0	0	0	0	0	0	0	0	0
50-75	0	11	11	0	13	13	0	2	2
20-50	2	718	720	2	771	773	0	53	53
10-20	70	1516	1586	77	1540	1617	7	24	31
5-10	129	1771	1900	127	1817	1944	-2	46	44
1-5	460	4511	4971	481	4512	4993	21	1	22
1 or less	1224	7762	8986	1205	7803	9008	-19	41	22
Total	1885	16289	18174	1892	16456	18348	7	167	174
Maximum (mSv)	22.38	58.94	58.94	22.85	60.36	60.36	-	-	-
Average (mSv)	1.72	4.20	3.94	1.79	4.29	4.03	-	-	-

• The values of the exposure dose and the number of the workers in the table above are subject to change, because there are times when APD data are replaced with monthly dose data measured by integral dosimeters. Or dose data of workers who wore only an integral dosimeter (ex., workers who entered only the Main Anti-earthquake Building) need to be updated in the table after the publication of the data.

• No significant internal exposure has been reported since October 2011.

Table 3. Cumulative Exposure Dose in the Fiscal Year of 2017

Dose Ranges (mSv)	April 2017 - November 2017			April 2017 - December 2017			Difference		
	TEPCO Employees	Contractors	Total	TEPCO Employees	Contractors	Total	TEPCO Employees	Contractors	Total
Above 100	0	0	0	0	0	0	0	0	0
75-100	0	0	0	0	0	0	0	0	0
50-75	0	0	0	0	0	0	0	0	0
20-50	0	50	50	0	58	58	0	8	8
10-20	2	618	620	2	737	739	0	119	119
5-10	41	862	903	49	881	930	8	19	27
1-5	258	3046	3304	281	3153	3434	23	107	130
1 or less	1176	6883	8059	1163	6863	8026	-13	-20	-33
Total	1477	11459	12936	1495	11692	13187	18	233	251
Maximum (mSv)	11.72	29.57	29.57	11.95	29.57	29.57	-	-	-
Average (mSv)	0.76	2.15	1.99	0.84	2.29	2.12	-	-	-

• The values of the exposure dose and the number of the workers in the table above are subject to change, because there are times when APD data are replaced with monthly dose data measured by integral dosimeters. Or dose data of workers who wore only an integral dosimeter (ex., workers who entered only the Main Anti-earthquake Building) need to be updated in the table after the publication of the data.

3. Sum of External and Internal Exposure Dose of Workers Exposed to Especially High Radiation (Effective Dose)

Table 4 shows the distribution of cumulative exposure dose of workers exposed to especially high radiation.*¹

Table 4. Cumulative Exposure Dose (workers exposed to especially high radiation)

Dose Ranges (mSv)	March 2011 - September 2015
Above 100	1
75-100	191
50-75	233
20-50	267
10-20	186
5-10	129
1-5	145
1 or less	51
Total	1203
Maximum (mSv)	102.69
Average (mSv)	36.49

(Since October 2015, TEPCO Holdings has opted not to report to the Labour Standards Inspection Office about workers exposed to especially high radiation.)

*1. Workers exposed to especially high radiation means workers who are involved in operations in which they could be exposed to the emergency exposure dose limit (100mSv), which is stipulated in "Ordinance on Prevention of Ionizing Radiation Hazards, Chapter 7." In more detail, they are workers engaged in the work to maintain the function of the cooling facility to cool down the reactor facility or the spent fuel tank in the reactor facility, the steam turbine and its related facilities or the surrounding area where the radiation doses exceed 0.1mSv/h. Or they are workers who would engage in keeping running the function to control or prevent the release of a large number of radioactive materials should it be likely to occur due to malfunction or damage of the reactor facility.

So far workers who have worked as "workers exposed to especially high radiation" are all TEPCO employees.

*2. The number of "workers exposed to especially high radiation" each month is the number of the workers who reported working as such workers in a given month and were engaged in that work. The figures in the cumulative data during the period from March 2011 to September

2015 in Table 4 above include the numbers of workers who have been reported to work as “workers exposed to especially high radiation” at least once.

*3. The values of the exposure dose and the number of the workers in the table above are subject to change, because there are times when APD data are replaced with monthly dose data measured by integral dosimeters. Or the dose data of workers who wore only an integral dosimeter (ex., workers who entered only the Main Anti-earthquake Building) need to be updated in the table after the publication of the data.

*4. The figure shown in the dose range, “Above 100mSv,” in the cumulative data during the period from March 2011 to September 2015 is the figure when the March 2011 data of the internal exposure dose were reevaluated in July 2013.

4. Equivalent Dose

Table 5 and Table 6 show equivalent dose to the skin and the lens of the eyes of the workers, respectively, who were involved in radiation work at the Fukushima Daiichi Nuclear Power Station for the past three months.

Table 5. Equivalent Dose to the Skin

Dose Ranges (mSv)	October 2017			November 2017			December 2017		
	TEPCO Employees	Contractors	Total	TEPCO Employees	Contractors	Total	TEPCO Employees	Contractors	Total
Above 500	0	0	0	0	0	0	0	0	0
300-500	0	0	0	0	0	0	0	0	0
250-300	0	0	0	0	0	0	0	0	0
200-250	0	0	0	0	0	0	0	0	0
150-200	0	0	0	0	0	0	0	0	0
100-150	0	0	0	0	0	0	0	0	0
75-100	0	0	0	0	0	0	0	0	0
50-75	0	0	0	0	0	0	0	0	0
20-50	0	0	0	0	1	1	0	0	0
10-20	0	17	17	0	36	36	0	1	1
5-10	0	87	87	0	124	124	0	61	61
1-5	38	961	999	34	927	961	26	701	727
1 or less	1042	6571	7613	1015	6486	7501	894	6497	7391
Total	1080	7636	8716	1049	7574	8623	920	7260	8180
Maximum (mSv)	4.70	19.00	19.00	3.10	20.40	20.40	2.52	12.47	12.47
Average (mSv)	0.16	0.53	0.49	0.14	0.59	0.54	0.15	0.39	0.36

• The values of the exposure dose and the number of the workers in the table above are subject to change, because there are times when APD data are replaced with monthly dose data measured by integral dosimeters. Or the dose data of workers who wore only an integral dosimeter (ex., workers who entered only the Main Anti-earthquake Building) need to be updated in the table after the publication of the data.

• Equivalent dose is a measure of the radiation dose to organs and tissues, and the equivalent dose limit to the skin is 500mSv/year (the emergency exposure dose limit is 1Sv).

• Equivalent dose to the skin is measured at a depth of 70 micrometers from the skin surface. When the equivalent dose is measured with a dosimeter other than the one put on around the chest and the abdomen, for example, a finger dosimeter, the maximum measurement value is counted as the equivalent dose.

Table 6. Equivalent Dose to the Lens of the Eyes

Dose Ranges (mSv)	October 2017			November 2017			December 2017		
	TEPCO Employees	Contractors	Total	TEPCO Employees	Contractors	Total	TEPCO Employees	Contractors	Total
Above 150	0	0	0	0	0	0	0	0	0
100-150	0	0	0	0	0	0	0	0	0
75-100	0	0	0	0	0	0	0	0	0
50-75	0	0	0	0	0	0	0	0	0
20-50	0	0	0	0	1	1	0	0	0
10-20	0	4	4	0	28	28	0	1	1
5-10	0	73	73	0	87	87	0	61	61
1-5	32	890	922	26	886	912	26	701	727
1 or less	1048	6669	7717	1023	6572	7595	894	6497	7391
Total	1080	7636	8716	1049	7574	8623	920	7260	8180
Maximum (mSv)	2.50	12.10	12.10	2.60	20.40	20.40	2.52	12.47	12.47
Average (mSv)	0.14	0.47	0.43	0.12	0.53	0.48	0.15	0.39	0.36

• The values of the exposure dose and the number of the workers in the table above are subject to change, because there are times when APD data are replaced with monthly dose data measured by integral dosimeters. Or the dose data of workers who wore only an integral dosimeter (ex., workers who entered only the Main Anti-earthquake Building) need to be updated in the table after the publication of the data.

• Equivalent dose is a measure of the radiation dose to organs and tissues, and the equivalent dose limit to the lens of the eye is 150mSv/year (the emergency exposure dose limit is 300mSv).

• The equivalent dose to the lens of the eyes is measured at a depth of 70 micrometers from the skin surface using a dosimeter put on around the chest or the abdomen, and thus the shielding effect of face masks is not taken into consideration.

5. Cumulative Equivalent Dose

Table 7 and Table 8 show the distribution of cumulative equivalent dose to the skins and the lens of the eyes of the workers, respectively, who were involved in radiation work at the Fukushima Daiichi Nuclear Power Station during two different periods of time, from April 1, 2017 to November 30, 2017 and from April 1, 2017 to December 31, 2017 for comparison.

Table 7. Equivalent Dose to the Skin

Dose Ranges (mSv)	April 2017 - November 2017			April 2017 - December 2017			Difference		
	TEPCO Employees	Contractors	Total	TEPCO Employees	Contractors	Total	TEPCO Employees	Contractors	Total
Above 500	0	0	0	0	0	0	0	0	0
300-500	0	0	0	0	0	0	0	0	0
250-300	0	0	0	0	0	0	0	0	0
200-250	0	0	0	0	0	0	0	0	0
150-200	0	0	0	0	0	0	0	0	0
100-150	0	0	0	0	0	0	0	0	0
75-100	0	3	3	0	4	4	0	1	1
50-75	0	23	23	0	34	34	0	11	11
20-50	0	284	284	1	308	309	1	24	25
10-20	9	813	822	9	898	907	0	85	85
5-10	50	938	988	55	979	1034	5	41	46
1-5	256	2900	3156	275	2969	3244	19	69	88
1 or less	1162	6498	7660	1155	6500	7655	-7	2	-5
Total	1477	11459	12936	1495	11692	13187	18	233	251
Maximum (mSv)	19.95	88.20	88.20	22.28	91.34	91.34	-	-	-
Average (mSv)	0.86	3.18	2.92	0.94	3.36	3.09	-	-	-

• The values of the exposure dose and the number of the workers in the table above are subject to change, because there are times when APD data are replaced with monthly dose data measured by integral dosimeters. Or the dose data of workers who wore only an integral dosimeter (ex., workers who entered only the Main Anti-earthquake Building) need to be updated in the table after the publication of the data.

Table 8. Equivalent Dose to the Lens of the Eyes

Dose Ranges (mSv)	April 2017 - November 2017			April 2017 - December 2017			Difference		
	TEPCO Employees	Contractors	Total	TEPCO Employees	Contractors	Total	TEPCO Employees	Contractors	Total
Above 150	0	0	0	0	0	0	0	0	0
100-150	0	0	0	0	0	0	0	0	0
75-100	0	2	2	0	3	3	0	1	1
50-75	0	20	20	0	31	31	0	11	11
20-50	0	184	184	0	195	195	0	11	11
10-20	5	739	744	6	854	860	1	115	116
5-10	44	962	1006	49	988	1037	5	26	31
1-5	257	2929	3186	279	3007	3286	22	78	100
1 or less	1171	6623	7794	1161	6614	7775	-10	-9	-19
Total	1477	11459	12936	1495	11692	13187	18	233	251
Maximum (mSv)	11.79	86.10	86.10	12.85	86.10	86.10	-	-	-
Average (mSv)	0.79	2.84	2.61	0.87	3.03	2.78	-	-	-

• The values of the exposure dose and the number of the workers in the table above are subject to change, because there are times when APD data are replaced with monthly dose data measured by integral dosimeters. Or the dose data of workers who wore only an integral dosimeter (ex., workers who entered only the Main Anti-earthquake Building) need to be updated in the table after the publication of the data.