

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)	November 2016			December 2016			January 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	5	5	0	4	4	0	5	5
5-10	0	50	50	2	46	48	0	71	71
1-5	29	1000	1029	16	856	872	19	776	795
1 or less	1167	7646	8813	1144	7665	8809	922	7583	8505
Total	1196	8701	9897	1162	8571	9733	941	8435	9376
Maximum (mSv)	3.10	12.00	12.00	6.24	12.60	12.60	2.40	10.98	10.98
Average (mSv)	0.15	0.45	0.42	0.16	0.41	0.38	0.14	0.40	0.37

• 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 2016. Two different periods of time are shown in the Table 2 and Table 3: from April 1, 2016 to December 31, 2016 and from April 1, 2016 to January 31, 2017 for comparison.

Table 2. Cumulative Exposure Dose for Five Years

Dose Ranges (mSv)	April 2016 - December 2016			April 2016 - January 2017			Difference		
	TEPCO Employees	Contractors	Total	TEPCO Employees	Contractors	Total	TEPCO Employees	Contractors	Total
Above 100									
75-100									
50-75									
20-50	0	93	93	0	112	112	0	19	19
10-20	6	631	637	11	769	780	5	138	143
5-10	54	1076	1130	59	1178	1237	5	102	107
1-5	342	3964	4306	373	4092	4465	31	128	159
1 or less	1219	7266	8485	1194	7241	8435	-25	-25	-50
Total	1621	13030	14651	1637	13392	15029	16	362	378
Maximum (mSv)	11.71	38.83	38.83	11.85	38.83	38.83	-	-	-
Average (mSv)	0.96	2.32	2.16	1.03	2.50	2.34	-	-	-

• 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 2016

Dose Ranges (mSv)	April 2016 - December 2016			April 2016 - January 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	93	93	0	112	112	0	19	19
10-20	6	631	637	11	769	780	5	138	143
5-10	54	1076	1130	59	1178	1237	5	102	107
1-5	342	3964	4306	373	4092	4465	31	128	159
1 or less	1219	7266	8485	1194	7241	8435	-25	-25	-50
Total	1621	13030	14651	1637	13392	15029	16	362	378
Maximum (mSv)	11.71	38.83	38.83	11.85	38.83	38.83	-	-	-
Average (mSv)	0.96	2.32	2.16	1.03	2.50	2.34	-	-	-

• 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)	November 2016			December 2016			January 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	3	3	0	4	4	0	0	0
10-20	0	38	38	0	34	34	0	8	8
5-10	0	157	157	2	106	108	0	98	98
1-5	34	1191	1225	22	1074	1096	20	930	950
1 or less	1162	7312	8474	1138	7353	8491	921	7399	8320
Total	1196	8701	9897	1162	8571	9733	941	8435	9376
Maximum (mSv)	3.80	22.50	22.50	9.30	47.40	47.40	2.40	18.96	18.96
Average (mSv)	0.16	1.66	0.60	0.18	0.59	0.54	0.15	0.47	0.43

• 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)	November 2016			December 2016			January 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	0	0	0	0	0
10-20	0	8	8	0	7	7	0	8	8
5-10	0	109	109	2	68	70	0	98	98
1-5	29	1117	1146	16	976	992	20	930	950
1 or less	1167	7467	8634	1144	7520	8664	921	7399	8320
Total	1196	8701	9897	1162	8571	9733	941	8435	9376
Maximum (mSv)	3.10	14.00	14.00	9.30	19.40	19.40	2.40	18.96	18.96
Average (mSv)	0.15	0.54	0.49	0.17	0.47	0.43	0.15	0.47	0.43

• 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, 2016 to December 31, 2016 and from April 1, 2016 to January 31, 2017 for comparison.

Table 7. Equivalent Dose to the Skin

Dose Ranges (mSv)	April 2016 - December 2016			April 2016 - January 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	5	5	0	5	5	0	0	0
75-100	0	3	3	0	3	3	0	0	0
50-75	0	21	21	0	26	26	0	5	5
20-50	1	418	419	1	474	475	0	56	56
10-20	12	918	930	16	1032	1048	4	114	118
5-10	56	1135	1191	62	1185	1247	6	50	56
1-5	350	3565	3915	378	3705	4083	28	140	168
1 or less	1202	6965	8167	1180	6962	8142	-22	-3	-25
Total	1621	13030	14651	1637	13392	15029	16	362	378
Maximum (mSv)	21.30	125.00	125.00	21.33	125.00	125.00	-	-	-
Average (mSv)	1.05	3.49	3.22	1.13	3.69	3.41	-	-	-

• 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 2016 - December 2016			April 2016 - January 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	0	0	0	0	0	0	0	0
50-75	0	13	13	0	13	13	0	0	0
20-50	0	190	190	0	228	228	0	38	38
10-20	8	789	797	11	948	959	3	159	162
5-10	54	1198	1252	60	1265	1325	6	67	73
1-5	344	3704	4048	378	3833	4211	34	129	163
1 or less	1215	7136	8351	1188	7105	8293	-27	-31	-58
Total	1621	13030	14651	1637	13392	15029	16	362	378
Maximum (mSv)	12.80	58.40	58.40	14.78	59.45	59.45	-	-	-
Average (mSv)	0.98	2.80	2.60	1.06	3.02	2.80	-	-	-

• 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.