

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 month.

Table 1. External Exposure Dose

Dose Ranges (mSv)	July 2017			August 2017			September 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	0	0	0	0	0
5-10	0	55	55	0	19	19	0	12	12
1-5	14	847	861	19	651	670	15	608	623
1 or less	1001	7211	8212	979	7164	8143	976	7042	8018
Total	1015	8115	9130	998	7834	8832	991	7662	8653
Maximum (mSv)	3.80	11.50	11.50	3.20	7.60	7.60	3.04	6.40	6.40
Average (mSv)	0.13	0.42	0.39	0.13	0.32	0.30	0.11	0.28	0.26

• 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 August 31, 2017 and from April 1, 2016 to September 30, 2017, and Table 3: from April 1, 2017 to August 31, 2017 and from April 1, 2017 to September 30, 2017 for comparison.

Table 2. Cumulative Exposure Dose for Five Years

Dose Ranges (mSv)	April 2016 - August 2017			April 2016 - September 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	6	6	0	7	7	0	1	1
20-50	0	565	565	0	613	613	0	48	48
10-20	53	1381	1434	54	1399	1453	1	18	19
5-10	116	1637	1753	127	1680	1807	11	43	54
1-5	460	4515	4975	472	4541	5013	12	26	38
1 or less	1175	7473	8648	1199	7566	8765	24	93	117
Total	1804	15577	17381	1852	15806	17658	48	229	277
Maximum (mSv)	18.55	53.46	53.46	19.21	55.39	55.39	-	-	-
Average (mSv)	1.59	3.87	3.63	1.61	3.95	3.71	-	-	-

• 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 - August 2017			April 2017 - September 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	21	21	0	30	30	0	9	9
10-20	0	313	313	0	404	404	0	91	91
5-10	14	666	680	17	717	734	3	51	54
1-5	201	2238	2439	230	2526	2756	29	288	317
1 or less	1138	7204	8342	1166	7119	8285	28	-85	-57
Total	1353	10442	11795	1413	10796	12209	60	354	414
Maximum (mSv)	6.84	29.53	29.53	8.84	29.57	29.57	-	-	-
Average (mSv)	0.54	1.58	1.46	0.60	1.73	1.60	-	-	-

• 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)	July 2017			August 2017			September 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	2	2	0	0	0	0	0	0
10-20	1	24	25	0	12	12	0	1	1
5-10	0	153	153	1	84	85	0	48	48
1-5	18	1031	1049	22	798	820	15	769	784
1 or less	996	6905	7901	975	6940	7915	976	6844	7820
Total	1015	8115	9130	998	7834	8832	991	7662	8653
Maximum (mSv)	10.40	29.40	29.40	5.20	15.70	15.70	3.04	13.39	13.39
Average (mSv)	0.15	0.62	0.57	0.15	0.46	0.43	0.12	0.37	0.34

• 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 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)	July 2017			August 2017			September 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	6	6	0	2	2	0	1	1
5-10	0	102	102	1	50	51	0	48	48
1-5	16	1039	1055	19	786	805	15	769	784
1 or less	999	6968	7967	978	6996	7974	976	6844	7820
Total	1015	8115	9130	998	7834	8832	991	7662	8653
Maximum (mSv)	3.80	14.00	14.00	5.20	10.90	10.90	3.04	13.39	13.39
Average (mSv)	0.13	0.53	0.49	0.14	0.40	0.37	0.12	0.37	0.34

• 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 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 August 31, 2017 and from April 1, 2017 to September 30, 2017 for comparison.

Table 7. Equivalent Dose to the Skin

Dose Ranges (mSv)	April 2017 - August 2017			April 2017 - September 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	0	0	0	1	1	0	1	1
50-75	0	7	7	0	9	9	0	2	2
20-50	0	167	167	0	201	201	0	34	34
10-20	3	472	475	5	554	559	2	82	84
5-10	18	752	770	19	799	818	1	47	48
1-5	202	2377	2579	230	2593	2823	28	216	244
1 or less	1130	6667	7797	1159	6639	7798	29	-28	1
Total	1353	10442	11795	1413	10796	12209	60	354	414
Maximum (mSv)	14.90	71.70	71.70	15.53	81.49	81.49	-	-	-
Average (mSv)	0.61	2.32	2.12	0.67	2.50	2.29	-	-	-

• 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 - August 2017			April 2017 - September 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	1	1	0	1	1
50-75	0	6	6	0	6	6	0	0	0
20-50	0	114	114	0	136	136	0	22	22
10-20	0	413	413	1	508	509	1	95	96
5-10	17	737	754	20	789	809	3	52	55
1-5	200	2325	2525	229	2564	2793	29	239	268
1 or less	1136	6847	7983	1163	6792	7955	27	-55	-28
Total	1353	10442	11795	1413	10796	12209	60	354	414
Maximum (mSv)	9.61	66.00	66.00	10.48	79.39	79.39	-	-	-
Average (mSv)	0.57	2.08	1.91	0.62	2.27	2.08	-	-	-

• 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.