

Exposure Dose Distribution

1. External Exposure Dose of Radiation Workers at the Fukushima Daiichi Nuclear Power Station (Effective Dose)

Table 1 shows what levels of external radiation exposure the workers who were involved in radiation work at the Fukushima Daiichi Nuclear Power Station from November 2015 to January 2016 received.

Table 1

Dose Ranges (mSv)	November 2015			December 2015			January 2016		
	TEPCO's Employees	Contractors	Total	TEPCO's Employees	Contractors	Total	TEPCO's 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	7	7	0	5	5	0	5	5
5-10	0	110	110	0	73	73	0	48	48
1-5	48	1447	1495	47	1335	1382	35	1144	1179
1 or less	1119	7924	9043	1122	8026	9148	985	8005	8990
Total	1167	9488	10655	1169	9439	10608	1020	9202	10222
Maximum (mSv)	4.96	13.88	13.88	2.70	13.50	13.50	3.02	16.44	16.44
Average (mSv)	0.22	0.61	0.57	0.21	0.56	0.52	0.17	0.47	0.44

• 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. External and Internal Exposure Doses of Radiation Workers at the Fukushima Daiichi Nuclear Power Station (Effective Dose)

Table 2 shows what levels of both external and internal radiation exposure the workers who were involved in radiation work at the Fukushima Daiichi Nuclear Power Station received during the two different periods of time, from March 11, 2011 to December 31, 2015 and from March 11, 2011 to January 31, 2016, comparing the data figures of the two periods to indicate whether they increased, decreased or were the same. Table 3 shows data on the radiation exposure dose of the workers who were engaged in radiation work at the station during the different periods of time, from April to December 2015 and from April 2015 to January 2016, and the comparison results of the data figures between those periods are indicated in the table, as well.

Table 2

Dose Ranges (mSv)	March 2011 - December 2015			March 2011 - January 2016			Difference		
	TEPCO's Employees	Contractors	Total	TEPCO's Employees	Contractors	Total	TEPCO's Employees	Contractors	Total
Above 250	6	0	6	6	0	6	0	0	0
200-250	1	2	3	1	2	3	0	0	0
150-200	26	2	28	26	2	28	0	0	0
100-150	117	20	137	117	20	137	0	0	0
75-100	314	270	584	316	279	595	2	9	11
50-75	329	1721	2050	328	1745	2073	-1	24	23
20-50	633	6357	6990	633	6410	7043	0	53	53
10-20	620	5658	6278	621	5671	6292	1	13	14
5-10	496	5371	5867	496	5405	5901	0	34	34
1-5	880	9539	10419	887	9584	10471	7	45	52
1 or less	1258	12566	13824	1256	12685	13941	-2	119	117
Total	4680	41506	46186	4687	41803	46490	7	297	304
Maximum (mSv)	678.80	238.42	678.80	678.80	238.42	678.80	-	-	-
Average (mSv)	22.43	11.59	12.69	22.44	11.61	12.70	-	-	-

- 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 radiation exposure dose has been reported since October 2011.

Table 3

Dose Ranges (mSv)	April 2015 - December 2015			April 2015 - January 2016			Difference		
	TEPCO's Employees	Contractors	Total	TEPCO's Employees	Contractors	Total	TEPCO's 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	2	388	390	4	437	441	2	49	51
10-20	30	1438	1468	35	1599	1634	5	161	166
5-10	97	1962	2059	106	2042	2148	9	80	89
1-5	425	5076	5501	450	5125	5575	25	49	74
1 or less	1088	6534	7622	1057	6614	7671	-31	80	49
Total	1642	15398	17040	1652	15817	17469	10	419	429
Maximum (mSv)	21.13	38.61	38.61	21.31	38.97	38.97	-	-	-
Average (mSv)	1.48	3.80	3.58	1.58	3.97	3.75	-	-	-

- 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. External and Internal Exposure Doses of “Workers Exposed to Especially High Radiation” (Effective Dose)

Table 4 shows what levels of both external and internal radiation exposure “workers exposed to especially high radiation”^{*1} received.^{*2}

Table 4

Dose Ranges (mSv)	November 2015	December 2015	January 2016	March 2011 - January 2016
Above 100	0	0	0	1
75-100	0	0	0	191
50-75	0	0	0	233
20-50	0	0	0	267
10-20	0	0	0	186
5-10	0	0	0	129
1-5	0	0	0	145
1 or less	0	0	0	51
Total	0	0	0	1203
Maximum (mSv)	-	-	-	102.69
Average (mSv)	-	-	-	36.50

(Since October 2015, TEPCO has opted not to report to the Labour Standards Inspection Office on “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 January 2016 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 January 2016 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 doses to the skin and the lens of the eye of the workers, respectively, who were involved in radiation work at the Fukushima Daiichi Nuclear Power Station from November 2015 to January 2016.

Table 5 (Equivalent dose to the skin)

Dose Ranges (mSv)	November 2015			December 2015			January 2016		
	TEPCO's Employees	Contractors	Total	TEPCO's Employees	Contractors	Total	TEPCO's 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	3	3	0	0	0
10-20	0	43	43	0	18	18	0	11	11
5-10	3	239	242	0	194	194	0	87	87
1-5	65	1743	1808	56	1635	1691	36	1416	1452
1 or less	1099	7463	8562	1113	7589	8702	984	7688	8672
Total	1167	9488	10655	1169	9439	10608	1020	9202	10222
Maximum (mSv)	8.70	17.80	17.80	5.00	24.10	24.10	3.02	16.44	16.44
Average (mSv)	0.27	0.84	0.78	0.24	0.76	0.70	0.17	0.57	0.53

• 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 eye)

Dose Ranges (mSv)	November 2015			December 2015			January 2016		
	TEPCO's Employees	Contractors	Total	TEPCO's Employees	Contractors	Total	TEPCO's 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	15	15	0	6	6	0	11	11
5-10	0	169	169	0	97	97	0	87	87
1-5	52	1628	1680	50	1530	1580	36	1416	1452
1or less	1115	7676	8791	1119	7806	8925	984	7688	8672
Total	1167	9488	10655	1169	9439	10608	1020	9202	10222
Maximum (mSv)	4.96	13.88	13.88	3.10	13.50	13.50	3.02	16.44	16.44
Average (mSv)	0.23	0.72	0.66	0.22	0.63	0.58	0.17	0.57	0.53

• 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 eye 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 face masks have does not affect the measurement results.

5. Cumulative Data of Equivalent Dose

Table 7 and Table 8 show the cumulative data (during the two different periods of time, from April to December 2015 and from April 2015 to January 2016) of equivalent doses to the skin and the lens of the eyes of the workers, respectively, who were engaged in radiation work at the Fukushima Daiichi Nuclear Power Station.

Table 7 (Equivalent dose to the skin)

Dose Ranges (mSv)	April 2015 - December 2015			April 2015 - January 2016			Difference		
	TEPCO's Employees	Contractors	Total	TEPCO's Employees	Contractors	Total	TEPCO's 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	1	1	0	2	2	0	1	1
50-75	0	39	39	0	50	50	0	11	11
20-50	9	977	986	12	1068	1080	3	91	94
10-20	35	1670	1705	38	1783	1821	3	113	116
5-10	108	1922	2030	115	1956	2071	7	34	41
1-5	424	4450	4874	451	4538	4989	27	88	115
1or less	1066	6334	7400	1036	6415	7451	-30	81	51
Total	1642	15398	17040	1652	15817	17469	10	419	429
Maximum (mSv)	33.30	142.94	142.94	33.93	143.57	143.57	-	-	-
Average (mSv)	1.71	5.28	4.93	1.80	5.47	5.12	-	-	-

• 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 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 eye)

Dose Ranges (mSv)	April 2015 - December 2015			April 2015 - January 2016			Difference		
	TEPCO's Employees	Contractors	Total	TEPCO's Employees	Contractors	Total	TEPCO's 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	19	19	0	24	24	0	5	5
20-50	2	597	599	4	676	680	2	79	81
10-20	34	1582	1616	36	1767	1803	2	185	187
5-10	99	1987	2086	108	2020	2128	9	33	42
1-5	425	4762	5187	454	4817	5271	29	55	84
1 or less	1082	6451	7533	1050	6512	7562	-32	61	29
Total	1642	15398	17040	1652	15817	17469	10	419	429
Maximum (mSv)	23.73	73.60	73.60	23.91	77.52	77.52	-	-	-
Average (mSv)	1.53	4.43	4.15	1.63	4.64	4.36	-	-	-

• 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.