

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 August 2015 to October 2015 received.

Table 1

Dose Ranges (mSv)	August 2015			September 2015			October 2015		
	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	1	1	0	16	16	0	9	9
5-10	0	36	36	1	140	141	0	100	100
1-5	53	1040	1093	51	1590	1641	44	1654	1698
1or less	1083	8369	9452	1144	8034	9178	1037	7850	8887
Total	1136	9446	10582	1196	9780	10976	1081	9613	10694
Max. (mSv)	3.38	10.30	10.30	5.60	15.30	15.30	3.07	14.42	14.42
Ave. (mSv)	0.21	0.43	0.41	0.24	0.67	0.63	0.19	0.63	0.58

• 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 September 30, 2015 and from March 11, 2011 to October 31, 2015, 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 September in 2015 and from April to October in 2015, 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 - September 2015			March 2011 - October 2015			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	305	238	543	306	245	551	1	7	8
50-75	333	1604	1937	333	1655	1988	0	51	51
20-50	631	6197	6828	632	6245	6877	1	48	49
10-20	612	5551	6163	617	5594	6211	5	43	48
5-10	496	5265	5761	494	5293	5787	-2	28	26
1-5	847	9403	10250	857	9457	10314	10	54	64
1or less	1264	12322	13586	1260	12416	13676	-4	94	90
Total	4638	40604	45242	4649	40929	45578	11	325	336
Max. (mSv)	678.80	238.42	678.80	678.80	238.42	678.80	-	-	-
Ave. (mSv)	22.47	11.40	12.54	22.47	11.46	12.58	-	-	-

- 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 - September 2015			April 2015 - October 2015			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	0	159	159	0	250	250	0	91	91
10-20	14	898	912	16	1052	1068	2	154	156
5-10	57	1555	1612	73	1695	1768	16	140	156
1-5	326	4645	4971	359	4893	5252	33	248	281
1 or less	1167	6801	7968	1138	6672	7810	-29	-129	-158
Total	1564	14058	15622	1586	14562	16148	22	504	526
Max. (mSv)	15.43	37.68	37.68	18.50	37.68	37.68	-	-	-
Ave. (mSv)	1.07	2.89	2.71	1.19	3.21	3.01	-	-	-

- 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)	August 2015	September 2015	October 2015	March 2011 - October 2015
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	1	0	129
1-5	47	43	0	145
1 or less	532	523	0	51
Total	579	567	0	1203
Max. (mSv)	3.38	5.60	-	102.69
Ave. (mSv)	0.31	0.35	-	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 October 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.

- 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.
- The figure shown in the dose range ,“Above 100mSv,” in the cumulative data during the period from March 2011 to October 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 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 August to October 2015.

Table 5 (Equivalent dose to the skin)

Dose Ranges (mSv)	August 2015			September 2015			October 2015		
	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	7	7	0	12	12	0	0	0
10-20	0	37	37	0	73	73	0	37	37
5-10	1	129	130	5	320	325	0	181	181
1-5	56	1370	1426	59	1826	1885	47	1831	1878
1or less	1079	7903	8982	1132	7549	8681	1034	7564	8598
Total	1136	9446	10582	1196	9780	10976	1081	9613	10694
Max. (mSv)	5.80	49.20	49.20	7.70	31.50	31.50	3.97	19.54	19.54
Ave. (mSv)	0.23	0.66	0.62	0.29	0.97	0.89	0.19	0.76	0.71

- 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 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)	August 2015			September 2015			October 2015		
	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	1	1	0	0	0
10-20	0	3	3	0	30	30	0	37	37
5-10	0	64	64	1	237	238	0	181	181
1-5	53	1245	1298	56	1700	1756	47	1831	1878
1 or less	1083	8134	9217	1139	7812	8951	1034	7564	8598
Total	1136	9446	10582	1196	9780	10976	1081	9613	10694
Max. (mSv)	3.38	11.80	11.80	5.90	26.50	26.50	3.97	19.54	19.54
Ave. (mSv)	0.22	0.51	0.48	0.25	0.79	0.73	0.19	0.76	0.71

• 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 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 September, 2015 and from April to October, 2015) 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 - September 2015			April 2015 - October 2015			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	4	4	0	4	4	0	0	0
75-100	0	1	1	0	1	1	0	0	0
50-75	0	9	9	0	11	11	0	2	2
20-50	2	529	531	4	667	671	2	138	140
10-20	19	1261	1280	20	1370	1390	1	109	110
5-10	66	1559	1625	80	1658	1738	14	99	113
1-5	338	4127	4465	368	4387	4755	30	260	290
1 or less	1139	6568	7707	1114	6464	7578	-25	-104	-129
Total	1564	14058	15622	1586	14562	16148	22	504	526
Max. (mSv)	29.30	136.91	136.91	29.41	137.49	137.49	-	-	-
Ave. (mSv)	1.22	3.99	3.72	1.33	4.36	4.06	-	-	-

• 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 - September 2015			April 2015 - October 2015			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	0	0	0	0	0
50-75	0	2	2	0	4	4	0	2	2
20-50	0	319	319	0	426	426	0	107	107
10-20	14	1059	1073	17	1246	1263	3	187	190
5-10	62	1594	1656	81	1735	1816	19	141	160
1-5	328	4376	4704	355	4567	4922	27	191	218
1 or less	1160	6708	7868	1133	6584	7717	-27	-124	-151
Total	1564	14058	15622	1586	14562	16148	22	504	526
Max. (mSv)	15.93	54.50	54.50	19.90	60.74	60.74	-	-	-
Ave. (mSv)	1.11	3.37	3.14	1.22	3.76	3.51	-	-	-

• 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.