

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 October 2015 to December 2015 received.

Table 1

Dose Ranges (mSv)	October 2015			November 2015			December 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	9	9	0	7	7	0	4	4
5-10	0	145	145	0	110	110	0	66	66
1-5	52	1699	1751	48	1447	1495	43	1256	1299
1 or less	1130	7864	8994	1119	7924	9043	1014	7989	9003
Total	1182	9717	10899	1167	9488	10655	1057	9315	10372
Max. (mSv)	3.20	14.42	14.42	4.96	13.88	13.88	2.59	13.27	13.27
Ave. (mSv)	0.22	0.70	0.64	0.22	0.61	0.57	0.18	0.51	0.47

• 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 November 30, 2015 and from March 11, 2011 to December 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 November in 2015 and from April to December 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 - November 2015			March 2011 - December 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	311	259	570	314	270	584	3	11	14
50-75	330	1692	2022	329	1717	2046	-1	25	24
20-50	632	6308	6940	633	6350	6983	1	42	43
10-20	619	5632	6251	620	5665	6285	1	33	34
5-10	495	5330	5825	495	5360	5855	0	30	30
1-5	874	9507	10381	879	9551	10430	5	44	49
1 or less	1254	12477	13731	1259	12565	13824	5	88	93
Total	4665	41229	45894	4679	41502	46181	14	273	287
Max. (mSv)	678.80	238.42	678.80	678.80	238.42	678.80	-	-	-
Ave. (mSv)	22.45	11.53	12.64	22.43	11.57	12.67	-	-	-

- 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.
- There has been no significant internal radiation exposure reported since October 2011.

Table 3

Dose Ranges (mSv)	April 2015 - November 2015			April 2015 - December 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	1	334	335	2	387	389	1	53	54
10-20	25	1276	1301	29	1433	1462	4	157	161
5-10	83	1795	1878	95	1944	2039	12	149	161
1-5	395	5045	5440	424	5079	5503	29	34	63
1 or less	1111	6548	7659	1089	6548	7637	-22	0	-22
Total	1615	14998	16613	1639	15391	17030	24	393	417
Max. (mSv)	20.20	37.68	37.68	21.06	38.61	38.61	-	-	-
Ave. (mSv)	1.36	3.55	3.34	1.45	3.77	3.54	-	-	-

- 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)	October 2015	November 2015	December 2015	March 2011 - December 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	0	0	129
1-5	0	0	0	145
1 or less	0	0	0	51
Total	0	0	0	1203
Max. (mSv)	-	-	-	102.69
Ave. (mSv)	-	-	-	36.50

(The number of “workers exposed to especially high radiation” has not been notified since October 2015.)

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’s employees.

2. The number of “workers exposed to especially high radiation” each month is the number of the workers who applied to work 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 December 2015 in Table 4 above include the number of workers who used to be “workers exposed to especially high radiation” as well.

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 December 2015 is the figure when the March 2011 data of the internal exposure dose were reexamined 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 October to December 2015.

Table 5 (Equivalent dose to the skin)

Dose Ranges (mSv)	October 2015			November 2015			December 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	2	2	0	0	0	0	0	0
10-20	0	74	74	0	43	43	0	5	5
5-10	3	369	372	3	239	242	0	87	87
1-5	61	1925	1986	65	1743	1808	45	1433	1478
1 or less	1118	7347	8465	1099	7463	8562	1012	7790	8802
Total	1182	9717	10899	1167	9488	10655	1057	9315	10372
Max. (mSv)	7.10	47.70	47.70	8.70	17.80	17.80	2.80	13.27	13.27
Ave. (mSv)	0.26	1.02	0.94	0.27	0.84	0.78	0.19	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)	October 2015			November 2015			December 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	0	0	0	0	0
10-20	0	27	27	0	15	15	0	5	5
5-10	1	236	237	0	169	169	0	87	87
1-5	51	1848	1899	52	1628	1680	45	1433	1478
1 or less	1130	7606	8736	1115	7676	8791	1012	7790	8802
Total	1182	9717	10899	1167	9488	10655	1057	9315	10372
Max. (mSv)	5.30	19.70	19.70	4.96	13.88	13.88	2.80	13.27	13.27
Ave. (mSv)	0.22	0.84	0.77	0.23	0.72	0.66	0.19	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 November, 2015 and from April to December, 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 - November 2015			April 2015 - December 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	5	5	0	5	5	0	0	0
75-100	0	1	1	0	1	1	0	0	0
50-75	0	24	24	0	35	35	0	11	11
20-50	7	846	853	8	936	944	1	90	91
10-20	31	1546	1577	34	1651	1685	3	105	108
5-10	92	1827	1919	109	1916	2025	17	89	106
1-5	395	4417	4812	420	4485	4905	25	68	93
1 or less	1090	6332	7422	1068	6362	7430	-22	30	8
Total	1615	14998	16613	1639	15391	17030	24	393	417
Max. (mSv)	32.60	142.77	142.77	33.16	142.94	142.94	-	-	-
Ave. (mSv)	1.56	4.94	4.61	1.66	5.16	4.82	-	-	-

• 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 - November 2015			April 2015 - December 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	11	11	0	18	18	0	7	7
20-50	2	526	528	2	592	594	0	66	66
10-20	30	1428	1458	34	1582	1616	4	154	158
5-10	84	1858	1942	98	1978	2076	14	120	134
1-5	393	4707	5100	421	4761	5182	28	54	82
1 or less	1106	6468	7574	1084	6460	7544	-22	-8	-30
Total	1615	14998	16613	1639	15391	17030	24	393	417
Max. (mSv)	21.43	70.10	70.10	23.66	73.57	73.57	-	-	-
Ave. (mSv)	1.40	4.15	3.89	1.50	4.39	4.11	-	-	-

• 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.