

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 July 2015 to September 2015 received.

Table 1

Dose Ranges (mSv)	July 2015			August 2015			September 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	7	7	0	1	1	0	14	14
5-10	1	134	135	0	36	36	0	99	99
1-5	56	1646	1702	53	1040	1093	47	1544	1591
1 or less	1116	8140	9256	1083	8369	9452	1032	8022	9054
Total	1173	9927	11100	1136	9446	10582	1079	9679	10758
Max. (mSv)	5.10	10.72	10.72	3.38	10.30	10.30	4.79	14.01	14.01
Ave. (mSv)	0.26	0.66	0.62	0.21	0.43	0.41	0.21	0.60	0.56

• 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 August 31, 2015 and from March 11, 2011 to September 30, 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 August in 2015 and from April to September 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 - August 2015			March 2011 - September 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	302	225	527	305	237	542	3	12	15
50-75	335	1556	1891	333	1602	1935	-2	46	44
20-50	627	6136	6763	628	6185	6813	1	49	50
10-20	611	5548	6159	615	5556	6171	4	8	12
5-10	496	5202	5698	496	5250	5746	0	48	48
1-5	844	9310	10154	847	9415	10262	3	105	108
1 or less	1236	12251	13487	1264	12334	13598	28	83	111
Total	4601	40252	44853	4638	40603	45241	37	351	388
Max. (mSv)	678.80	238.42	678.80	678.80	238.42	678.80	-	-	-
Ave. (mSv)	22.59	11.34	12.49	22.46	11.38	12.52	-	-	-

- 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 - August 2015			April 2015 - September 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	97	97	0	149	149	0	52	52
10-20	6	681	687	14	876	890	8	195	203
5-10	39	1431	1470	54	1563	1617	15	132	147
1-5	293	4291	4584	320	4633	4953	27	342	369
1 or less	1159	6993	8152	1173	6832	8005	14	-161	-147
Total	1497	13493	14990	1561	14053	15614	64	560	624
Max. (mSv)	12.62	35.89	35.89	14.79	37.47	37.47	-	-	-
Ave. (mSv)	0.93	2.53	2.37	1.03	2.84	2.66	-	-	-

- 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)	July 2015	August 2015	September 2015	March 2011 - September 2015
Above 100	0	0	0	1
75-100	0	0	0	191
50-75	0	0	0	233
20-50	0	0	0	264
10-20	0	0	0	189
5-10	1	0	0	129
1-5	48	47	40	145
1 or less	537	532	501	51
Total	586	579	541	1203
Max. (mSv)	5.10	3.38	4.79	102.69
Ave. (mSv)	0.38	0.31	0.29	36.46

(The number of “workers exposed to especially high radiation” in September 2015 was 574, and 33 among them did not work at the site.)

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 September 2015 in Table 4 above include the number of workers who used to be “workers exposed to especially high radiation” as well.

- 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 September 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 July to September 2015.

Table 5 (Equivalent dose to the skin)

Dose Ranges (mSv)	July 2015			August 2015			September 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	1	1	0	0	0	0	0	0
20-50	0	8	8	0	7	7	0	1	1
10-20	0	45	45	0	37	37	0	29	29
5-10	2	334	336	1	129	130	1	142	143
1-5	62	1891	1953	56	1370	1426	53	1764	1817
1or less	1109	7648	8757	1079	7903	8982	1025	7743	8768
Total	1173	9927	11100	1136	9446	10582	1079	9679	10758
Max. (mSv)	6.40	68.00	68.00	5.80	49.20	49.20	5.09	26.27	26.27
Ave. (mSv)	0.28	0.96	0.89	0.23	0.66	0.62	0.22	0.70	0.65

- 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)	July 2015			August 2015			September 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	1	1
10-20	0	11	11	0	3	3	0	29	29
5-10	1	234	235	0	64	64	1	142	143
1-5	57	1772	1829	53	1245	1298	53	1764	1817
1 or less	1115	7910	9025	1083	8134	9217	1025	7743	8768
Total	1173	9927	11100	1136	9446	10582	1079	9679	10758
Max. (mSv)	5.10	18.60	18.60	3.38	11.80	11.80	5.09	26.27	26.27
Ave. (mSv)	0.26	0.79	0.73	0.22	0.51	0.48	0.22	0.70	0.65

• 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 August, 2015 and from April to September, 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 - August 2015			April 2015 - September 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	5	5	0	8	8	0	3	3
20-50	1	336	337	1	466	467	0	130	130
10-20	11	1080	1091	17	1220	1237	6	140	146
5-10	44	1465	1509	63	1578	1641	19	113	132
1-5	315	3875	4190	335	4160	4495	20	285	305
1 or less	1126	6727	7853	1145	6616	7761	19	-111	-92
Total	1497	13493	14990	1561	14053	15614	64	560	624
Max. (mSv)	27.80	136.84	136.84	28.34	136.91	136.91	-	-	-
Ave. (mSv)	1.04	3.46	3.22	1.15	3.81	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 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 - August 2015			April 2015 - September 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	0	0	0	2	2	0	2	2
20-50	0	204	204	0	297	297	0	93	93
10-20	8	866	874	14	1055	1069	6	189	195
5-10	41	1466	1507	60	1604	1664	19	138	157
1-5	300	4070	4370	321	4365	4686	21	295	316
1 or less	1148	6887	8035	1166	6730	7896	18	-157	-139
Total	1497	13493	14990	1561	14053	15614	64	560	624
Max. (mSv)	14.20	48.80	48.80	15.12	54.27	54.27	-	-	-
Ave. (mSv)	0.95	2.94	2.74	1.07	3.31	3.08	-	-	-

• 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.