

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)	October 2016			November 2016			December 2016		
	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	0	0	0	5	5	0	3	3
5-10	0	48	48	0	50	50	2	41	43
1-5	21	875	896	29	1000	1029	15	824	839
1 or less	1142	7705	8847	1167	7646	8813	1004	7595	8599
Total	1163	8628	9791	1196	8701	9897	1021	8463	9484
Maximum (mSv)	2.40	8.34	8.34	3.10	12.00	12.00	6.24	13.10	13.10
Average (mSv)	0.14	0.42	0.39	0.15	0.45	0.42	0.15	0.38	0.35

• 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 2016. Two different periods of time are shown in the Table 2 and Table 3: from April 1, 2016 to November 30, 2016 and from April 1, 2016 to December 31, 2016 for comparison.

Table 2. Cumulative Exposure Dose for Five Years

Dose Ranges (mSv)	April 2016 - November 2016			April 2016 - December 2016			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	78	78	0	93	93	0	15	15
10-20	4	499	503	6	612	618	2	113	115
5-10	42	963	1005	54	1087	1141	12	124	136
1-5	307	3876	4183	333	3945	4278	26	69	95
1 or less	1252	7317	8569	1223	7290	8513	-29	-27	-56
Total	1605	12733	14338	1616	13027	14643	11	294	305
Maximum (mSv)	11.21	38.76	38.76	11.63	38.76	38.76	-	-	-
Average (mSv)	0.85	2.10	1.96	0.94	2.29	2.14	-	-	-

• 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 2016

Dose Ranges (mSv)	April 2016 - November 2016			April 2016 - December 2016			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	78	78	0	93	93	0	15	15
10-20	4	499	503	6	612	618	2	113	115
5-10	42	963	1005	54	1087	1141	12	124	136
1-5	307	3876	4183	333	3945	4278	26	69	95
1 or less	1252	7317	8569	1223	7290	8513	-29	-27	-56
Total	1605	12733	14338	1616	13027	14643	11	294	305
Maximum (mSv)	11.21	38.76	38.76	11.63	38.76	38.76	-	-	-
Average (mSv)	0.85	2.10	1.96	0.94	2.29	2.14	-	-	-

• 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)	October 2016			November 2016			December 2016		
	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	0	0	0	3	3	0	0	0
10-20	0	39	39	0	38	38	0	12	12
5-10	0	132	132	0	157	157	2	62	64
1-5	28	1099	1127	34	1191	1225	15	940	955
1 or less	1135	7358	8493	1162	7312	8474	1004	7449	8453
Total	1163	8628	9791	1196	8701	9897	1021	8463	9484
Maximum (mSv)	3.80	18.50	18.50	3.80	22.50	22.50	7.05	18.99	18.99
Average (mSv)	0.16	0.62	0.56	0.16	0.66	0.60	0.16	0.44	0.41

• 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)	October 2016			November 2016			December 2016		
	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	4	4	0	8	8	0	12	12
5-10	0	79	79	0	109	109	2	62	64
1-5	25	1036	1061	29	1117	1146	15	940	955
1 or less	1138	7509	8647	1167	7467	8634	1004	7449	8453
Total	1163	8628	9791	1196	8701	9897	1021	8463	9484
Maximum (mSv)	2.40	11.40	11.40	3.10	14.00	14.00	7.05	18.99	18.99
Average (mSv)	0.15	0.50	0.46	0.15	0.54	0.49	0.16	0.44	0.41

• 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, 2016 to November 30, 2016 and from April 1, 2016 to December 31, 2016 for comparison.

Table 7. Equivalent Dose to the Skin

Dose Ranges (mSv)	April 2016 - November 2016			April 2016 - December 2016			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	5	5	0	5	5	0	0	0
75-100	0	3	3	0	3	3	0	0	0
50-75	0	12	12	0	19	19	0	7	7
20-50	1	357	358	1	394	395	0	37	37
10-20	8	770	778	12	889	901	4	119	123
5-10	48	1100	1148	56	1163	1219	8	63	71
1-5	312	3477	3789	341	3545	3886	29	68	97
1 or less	1236	7009	8245	1206	7009	8215	-30	0	-30
Total	1605	12733	14338	1616	13027	14643	11	294	305
Maximum (mSv)	21.20	125.00	125.00	21.27	125.00	125.00	-	-	-
Average (mSv)	0.93	3.18	2.93	1.03	3.39	3.13	-	-	-

• 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 2016 - November 2016			April 2016 - December 2016			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	0	0	0	0	0
50-75	0	9	9	0	13	13	0	4	4
20-50	0	164	164	0	190	190	0	26	26
10-20	4	653	657	8	782	790	4	129	133
5-10	45	1088	1133	54	1198	1252	9	110	119
1-5	309	3641	3950	337	3683	4020	28	42	70
1 or less	1247	7178	8425	1217	7161	8378	-30	-17	-47
Total	1605	12733	14338	1616	13027	14643	11	294	305
Maximum (mSv)	11.30	57.50	57.50	11.63	58.34	58.34	-	-	-
Average (mSv)	0.87	2.55	2.36	0.96	2.78	2.58	-	-	-

• 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 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.