Radionuclides detected at the CTBT radionuclide observatory station in Takasaki (as of May 30, 2011)

source: http://www.cpdnp.jp/pdf/110603Takasaki_report_May30.pdf

1. The readings of air trapped from March 12 to 14 at the Takasaki Observatory were analyzed by the CTBTO Secretariat. The results showed several particulate radionuclides normally undetected; namely, cesium (Cs) -134, 136 and 137, iodine (I) -131 ~ 133, lanthanum (La) -140, tellurium (Te) -129, 129m, 132, and technetium (Tc)-99m, were detected at very high concentrations.
These radionuclides are thought to have originated from the Fukushima Daiichi nuclear power plant disaster, but it is not certain that they were contained in the air trapped from March 12 to 14. They may have come flying during the measuring operation (the 15th and later) to contaminate the detector and its surroundings. Therefore, the observed radionuclides are qualitatively correct, but the concentrations may not be accurate.

2. As for the analysis of measurements of air trapped after March 15 at the Takasaki Observatory, in addition to radionuclides detected above, barium (Ba) -140 was detected. Activity concentrations of these radionuclides showed a first peak on March 15-16, a second on March 20-21, and a third on 29-30. Peaks are occasionally detected thereafter. Weather conditions such as wind and rainfall are believed to have influenced the second peak and thereafter.

3. The Takasaki Observatory also measures radionuclides in the form of noble gases. Since March 15, xenon(Xe)-133 was detected with its peak on the 21st. This also is believed to have come from the Fukushima nuclear power plant. As gases much denser than normal have penetrated into the detection devece, accurate concentrations can not be measured. This is why we indicated only the estimate figures. (Refer to Appendix for the transition of radionuclide particulate and noble gases.)

(Notes)
Figures for March 14-15 are missing, because the detectors stopped due to the "planned power cut" in the Takasaki region on March 16.

High figures of the particulate radionuclides on March 20-21 seem due to the rain effects.

The peak on March 29-30 may have been due to the dust raised by relatively strong wind, but it is difficult to determin the cause.

Also the peak of radioactive xenon on March 21 seems to be highly affected by the rain that day.

Sample trapping usually takes place from 6:55 to 6:55 of the next day. However, due to power failure, trapping of samples took place 6:55-8:11 on March 16-17, 8:11- 6:57 on March 17-18, and 6:57-6:55 on March 18-19.

Trapping period[4]		Particulate radioactive nucleides measured by CTBT Takasaki Observatory (μBq/m³)[5] (Created based on the report of the CTBTO Secretariat)										
start	end	Ba-140	Cs-134	Cs-136	Cs-137	I-131	I-132	La-140	Tc-99m	Te-129	Te-129m	Te-132
2011/03/12[6]	2011/03/13		15	5	12	83	82					110
2011/03/13[7]	2011/03/14		613	160	714	2,668	5,219	62	3,564	387	1,046	7,792
2011/03/15	2011/03/16	312,725	6,921,136	857,713	5,644,666	14,680,552	11,156,850	1,770,189		2,127,038	22,588,878	27,094,139
2011/03/16	2011/03/17	542	14,311	2,781	16,380	55,607	35,700	1,521	130,378	7,792	13,173	25,177
2011/03/17	2011/03/18		10,504	1,983	12,216	43,995	25,014	1,080	34,136	6,392	11,630	42,269
2011/03/18	2011/03/19	413	6,038	1,069	6,962	91,602	9,899	635	18,669	3,029	5,154	18,541
2011/03/19	2011/03/20	216	6,832	1,202	7,853	86,329	7,753	648	31,343	2,571	4,607	13,208
2011/03/20	2011/03/21	36,955	3,245,380	520,784	3,786,101	5,198,745	2,291,605	52,445		1,156,208	2,001,238	4,630,415
2011/03/21	2011/03/22		162,698	25,047	190,805	2,155,559	647,795	1,816	614,911	390,275	678,983	1,292,724
2011/03/22	2011/03/23	292	30,417	4,281	35,306	2,117,153	42,514	787	336,046	30,962	56,138	86,643
2011/03/23	2011/03/24	103	6,979	976	7,950	50,455	5,267	238	31,088	4,548	7,667	10,064
2011/03/24	2011/03/25		3,178	435	3,638	46,889	3,123	274	10,978	3,220	6,233	6,060
2011/03/25	2011/03/26		2,625	330	2,985	23,269	1,236	131	4,395	1,423	2,776	2,236
2011/03/26	2011/03/27		1,620	200	1,834	6,504	634	122		840	1,582	1,109
2011/03/27	2011/03/28		1,627	192	1,835	6,672	485	82		901	1,406	845
2011/03/28	2011/03/29		2,793	247	3,094	14,315	509	137	12,302	1,049	2,283	954
2011/03/29	2011/03/30	2,703	103,850	6,504	118,508	94,354	5,267	4,187	462,684	17,654	30,660	12,648
2011/03/30	2011/03/31	880	51,797	3,070	58,792	32,084	2,406	1,549	187,601	7,906	15,406	4,882
2011/03/31	2011/04/01		2,104	182	2,380	5,974	220	84	2,326	910	1,569	400
2011/04/01	2011/04/02	169	3,346	277	3,850	12,038	323	135	3,081	1,566	3,255	584
2011/04/02	2011/04/03	128	4,429	349	5,080	4,529	230	286		1,382	2,532	457
2011/04/03	2011/04/04	74	2,508	190	2,872	3,829	126	158		847	1,745	244
2011/04/04	2011/04/05		2,143	158	2,473	4,313	83	86		747	1,674	170
2011/04/05	2011/04/06		1,696	118	1,906	3,373	70	50		735	1,591	133
2011/04/06	2011/04/07		3,806	202	4,294	8,706	97	118	1,848	1,296	2,492	202
2011/04/07	2011/04/08		4,345	214	4,866	8,252	78	91		1,390	2,460	159
2011/04/08	2011/04/09		2,422	140	2,721	5,260	53	65		1,068	1,782	109
2011/04/09	2011/04/10	156	8,144	311	9,009	8,399	86	228	3,790	2,057	3,769	164
2011/04/10	2011/04/11	74	5,074	220	5,715	5,921	48	128		1,506	2,994	111
2011/04/11	2011/04/12	58	4,295	226	4,973	2,070	33	87		1,128	1,911	66
2011/04/12	2011/04/13		3,238	147	3,688	3,130	21	65		927	1,515	40
2011/04/13	2011/04/14		2,391	115	2,726	2,303	15	52		733	1,395	20
2011/04/14	2011/04/15		3,262	142	3,794	2,996	12	83		899	1,721	17
2011/04/15	2011/04/16	107	7,833	325	9,369	2,370	32	185		2,173	3,907	54
2011/04/16	2011/04/17	91	5,543	219	6,510	1,634		140		1,473	2,478	23
2011/04/17	2011/04/18	607	39,079	922	43,690	37,979	40	957		4,386	8,169	77
2011/04/18	2011/04/19	143	15,920	379	17,911	14,722		330		2,240	3,815	33
2011/04/19	2011/04/20		1,490	57	1,694	845		18		530	858	
2011/04/20	2011/04/21	342	29,566	613	33,444	22,791		437		2,519	3,912	
2011/04/21	2011/04/22	121	14,202	330	16,287	9,739		224		1,810	3,353	
2011/04/22	2011/04/23	583	50,039	1,003	57,221	17,614		983		4,616	8,460	
2011/04/23	2011/04/24	20	2,029	55	2,408	486		37		446	784	
2011/04/24	2011/04/25	13	2,696	62	3,175	878		36		444	762	

Trapping period[4]		Particulate radioactive nucleides measured by CTBT Takasaki Observatory (μBq/m³)[5] (Created based on the report of the CTBTO Secretariat)										
start	end	Ba-140	Cs-134	Cs-136	Cs-137	I-131	I-132	La-140	Tc-99m	Te-129	Te-129m	Te-132
2011/04/25	2011/04/26	18	1,559	32	1,853	321		23		345	649	
2011/04/26	2011/04/27		2,075	46	2,486	456		35		602	1,104	
2011/04/27	2011/04/28	20	2,987	62	3,562	373		60		635	1,161	
2011/04/28	2011/04/29	23	1,442	31	1,695	160		51		306	546	
2011/04/29	2011/04/30		2,215	35	2,603	375		42		262	526	
2011/04/30	2011/05/01		2,269	40	2,670	425		9		525	962	
2011/05/01	2011/05/02	28	3,046	55	3,677	242		39		547	1,047	
2011/05/02	2011/05/03		2,029	34	2,423	219		19		451	794	
2011/05/03	2011/05/04	91	15,994	199	18,819	3,616		156		1,118	1,822	
2011/05/04	2011/05/05		14,226	174	16,630	4,675		69		1,263	2,477	
2011/05/05	2011/05/06		3,892	49	4,573	752		22		233	485	
2011/05/06	2011/05/07		8,497	93	10,081	1,482		66		583	1,196	
2011/05/07	2011/05/08		1,794	21	2,112	210				293	630	
2011/05/08	2011/05/09		1,609	18	1,909	106		17		256	504	
2011/05/09	2011/05/10		1,366	13	1,626	100				286	579	
2011/05/10	2011/05/11		3,957	34	4,663	571		22		288	475	
2011/05/11	2011/05/12		899	12	1,055	70		8		192	271	
2011/05/12	2011/05/13		736	7	866	47				318	614	
2011/05/13	2011/05/14		1,322	12	1,600	39		17		190	401	
2011/05/14	2011/05/15		950	9	1,134	34				124	273	
2011/05/15	2011/05/16		896	6	1,060	48				167	331	
2011/05/16	2011/05/17		792	6	937	34				155	286	
2011/05/17	2011/05/18		803	8	957	28				280	548	
2011/05/18	2011/05/19		888	7	1,055	38				197	431	
2011/05/19	2011/05/20		1,119	7	1,343	41				173	322	
2011/05/20	2011/05/21		1,078	3	1,286	34		30		193	373	
2011/05/21	2011/05/22		1,102	9	1,328	24				197	323	
2011/05/22	2011/05/23		4,080	22	4,885	881		22		494	858	
2011/05/23	2011/05/24		2,419	11	2,857	380		9		424	758	
2011/05/24	2011/05/25		727	4	854	19				212	390	
2011/05/25	2011/05/26		2,650	11	3,174	821		11		338	587	
2011/05/26	2011/05/27		3,338	13	3,979	483		8		437	725	
2011/05/27	2011/05/28		646	4	759	21				234	442	
2011/05/28	2011/05/29		628	7	737	13				367	670	
2011/05/29	2011/05/30		573	2	672	9				85	218	

[4] The samples were usually collected from 6:55 to 6:55 of the next day, except for March 16-17 (6:55 - 8:11), 17-18 (8:11 - 6:57), and 18-19 (6:57 - 6:55) due to power failures.

[5] The density of radioactivity (μBq/m³) indicates the activity concentration of radionuclides in the air of one cubic meter. 1μBq = 1/1,000,000 Bq. And Bq/m³ = 1000mBq/m³.

[6] These are not reliable measurements (As for the figures for March 15 and after, CTBTO Secretariat has published a view that the degree of overestimation should be about 1% maximum.)

[7] (Same as above)

Radioactive noble gase (xenon) measured by CTBT Takasaki Observatory (Created based on the report of the CTBTO Secretariat)				
Trapping period		Activity Dencity* (Bq/m^3)		
start	end	Xe-133	Xe-131m	remarks
2011/03/15 3:43	2011/03/15 15:43	some kBq/m^3		
2011/03/15 17:55	2011/03/16 5:55	Out of measurement range		
2011/03/16 6:04	2011/03/16 18:04	Out of measurement range		
2011/03/16 18:04	2011/03/16 22:04	No measure due to power failure		
2011/03/16 22:10	2011/03/17 10:10	400		No correction of dead time[8] (dead time : 40 -75%)
2011/03/17 10:10	2011/03/17 22:10	50	1	
2011/03/17 22:49	2011/03/18 10:49	30	4	
2011/03/18 10:49	2011/03/18 22:49	4		
2011/03/18 22:49	2011/03/19 10:49	8.7		Including the impact of memory effect[9] (40-97%) No correction of dead time
2011/03/19 10:49	2011/03/19 22:49	1.5		
2011/03/19 2249	2011/03/20 10:49	4.8		
2011/03/19 21:00	2011/03/20 22:49	9.9	2.8	
2011/03/20 22:49	2011/03/2110:49	9.61	1.2	
2011/ 3/2110:49	2011/03/21 22:49	62.4	9.4	
2011/03/21 22:49	2011/03/22 10:49	44.6	5.5	
2011/03/22 10:49	2011/03/22 22:49	30.9	7.6	
2011/03/23 11:27	2011/03/23 23:27	8.8	0.46	
2011/03/23 23:27	2011/03/24 11:27	3.1		
2011/03/24 11:27	2011/03/24 23:47	4.59	0.294	
2011/03/24 23:47	2011/03/25 11:27	2.8	0.172	
2011/03/25 11:27	2011/03/25 23:47	1.46	0.156	
2011/03/25 23:27	2011/03/26 11:27	0.705		
2011/03/26 11:27	2011/03/26 23:27	1.2		
2011/03/26 23:27	2011/03/27 11:27	2.21		
2011/03/27 11:27	2011/03/27 23:27	2.34		
2011/03/27 14:27	2011/03/28 2:27	1.61		
2011/03/28 2:27	2011/03/28 14:27	0.931		
2011/03/28 23:27	2011/03/29 11:27	0.704	0.05	
2011/03/29 11:27	2011/03/29 23:27	0.87	0.099	

[8] Dead time: the time during which the radiation count rate is too high to measure.

[9] Memory effect: that of radioxenon penetrating into the plastic radiation detector and affecting subsequent measurements.

* Due to important effects of "dead time" and "memory effect" (see footnotes) at the time of measurement, these densities are estimated values.

* The CTBTO Secretariat has not published the radioactive noble gas concentrations in the form of quantitative figures for March 29 and after.