



CRIIRAD

Commission de Recherche
et d'Information Indépendantes
sur la Radioactivité



CRMS and CRIIRAD Press Release
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Consequences of the Fukushima Daiichi nuclear disaster

In Japan, external irradiation still leads to an unacceptable risk level for hundreds of thousands of people

1 / A lot of people are still living in highly contaminated territories

During the first weeks after March 11th 2011, the radioactive cesium deposits on the soils have been of great magnitude in Japan.

Only the population living in a **20 km circle** around the Fukushima Daiichi nuclear reactor has been evacuated in the first days of the nuclear accident ; but the fallouts affect a very vast territory, far beyond the forbidden zone of 20 km and far beyond the Fukushima Prefecture. Depending on weather conditions, contaminated air masses swept over hundreds of kilometers and precipitations (rain and snow) percolated radioactive particles down on the ground. **Cesium 134 and 137 deposits** are the cause of a lasting contamination.

When decaying, cesium atoms emit very penetrating gamma radiations. They can travel over 60 meters in the air. This is what allowed the Americans to plot charts on the fallouts using heliported probes. These radiations can penetrate walls and windows and irradiate people within their homes. This irradiation will decay very slowly. This is due principally to the cesium 137 and 134 that have long half-lives (30 years and 2 years respectively). This means that the cesium 137 radioactivity will be divided by half in 30 years. We can estimate that within twelve months, the **cesium 134** radioactivity will decline by **30 %** and the **cesium 137** by **3%**. The ambient radiation will be reduced by about **22 %**. The contamination of soil is generating, and will continue to do so for a long time to come, a flux of gamma radiation causing the irradiation of populations in widespread areas.

According to official maps published by MEXT¹, the cesium 137 deposition exceeded 30 000 Bq/m² over large areas of Fukushima, Tochigi and Gunma prefectures and also parts of Miyagi, Ibaraki, and Chiba prefectures.

After April 22nd 2011, the Japanese authorities decided to organize additional evacuations in "**Planned Evacuation Zones**" : territories situated beyond the 20 km "forbidden zone" but where the cumulated dose due to the persistent contamination of the soil may exceed a level of **20 milliSieverts** per year. This corresponds to a cancer risk 20 times higher than the "acceptable" threat. It is even more outrageous that the inhabitants of these territories have already been exposed very extensively (see Appendix 2). The dose, above which the long term risk of cancer is considered as unacceptable by the

¹ MEXT is the Japanese ministry for Education, Culture, Sport, Science and Technology

ICRP (International Commission on Radiological Protection) is **1 millisievert per annum**, which corresponds to **17 cancers² for each 100 000 exposed persons**.

According to the Japanese government, a place where the dose rate is below **0.23 µSv/h**, is a place where the long term dose due to Fukushima would be below **1 mSv/year**.

It should be noted that this calculation does not include doses due to the internal contamination that these people continue to receive by **ingesting** contaminated foods nor the dose due to the **inhalation** of dusts from the resuspension of contaminated soils and from the continuous releases of radioactive substances from the Fukushima Daiichi reactors (According to TEPCO and the authorities, about 10 millions Becquerel of cesium are still discharged every hour).

This means that when the ambient dose rate monitored outside is above **0.23 µSv/h**, the cumulated annual dose due to this external exposure leads to an unacceptable long term risk. The official maps published by MEXT in December 2011 show that this is the case in **large portions of Fukushima prefecture**, but also in territories belonging to **Miyagi, Tochigi, Gunma, Ibaraki and Chiba** prefectures.

Therefore, in the absence of appropriate protective measures, **hundreds of thousands of people** are still receiving, during year 2012, unacceptable radiation doses.

2 / Example of Fukushima city and Oguni area of Date city (dose rate monitored in June 2012)

Two examples are summarized below (see location in Appendix 3) based on survey field measurements carried out by the CRIIRAD and CRMS laboratories, in **June 2012**. Detailed measurements and pictures are included in CRIIRAD report N°12-88. Videos are available on the links mentioned below.

On these territories, the cesium 134 and 137 radioactive fallouts are several hundreds of thousands Bq/m². For example, CRIIRAD monitored³ **over 700 000 Bq/m²** in the Watari district of Fukushima city.

In the city of **Fukushima**, located 60-65 km away from the nuclear plant, the dose rates measured at 1 meter above ground in the outside, were typically over 3 times, even over 10 times above normal. For example **0.84 µSv/h** on the sidewalk in front of our hotel in the center of the city. In one of the most contaminated part of the city (Watari area), dose rates on car parkings or private houses gardens were exceeding **0.8 µSv/h** and more.

The irradiation is still measurable within buildings floors. Measurements carried out on the 7th floor of an hotel showed a radiation increase of 70 % when moving from the center of the room to the windows. In Watari area, even inside a restaurant, on the table, the dose rate was **0.27 µSv/h** (first floor). The inhabitants that we met received no support for evacuation or decontamination. Many of them asked us not to communicate on such results in order to limit the risk of losing clients or being blamed by the neighbors.

In the rural area of **Oguni** (Date city) - located about 10 km east of the city of Fukushima and 55 km north-west from the damaged nuclear reactors - dose rates were **above 1 µSv/h** in many areas, for example in the surroundings of the Community Center where CRMS installed a laboratory, or near a private house.

²For many independent scientists these figures given by ICRP publication N°103 (year 2007) are underestimating the actual level of risk.

³ See CRIIRAD press release of July 7th, 2011.

http://www.criirad.org/actualites/dossier2011/japon_bis/en_anglais/11-07-07_cpcriirad_eng.pdf

3 / Decontamination efforts are not sufficient

CRIIRAD performed measurements at another private house of Oguni area which has been decontaminated. According to official reports, the dose rate in August 2011 was between 2.5 and 3 $\mu\text{Sv/h}$. Despite decontamination work performed between October and December 2011, the dose rate that we monitored in June 2012 was still **0.37 to 0.98 $\mu\text{Sv/h}$** in the immediate surroundings of the house and between **0.3 and 0.56 $\mu\text{Sv/h}$** inside the house.

CRIIRAD calculated that, for this family, the cumulated external irradiation due to Fukushima fallout will be between **1.8 and 6 mSv during year 2012** (even after decontamination). This shows that the decontamination process is not sufficient enough and that the people should be given compensation for being able to evacuate to non contaminated territories.

4 / Need for a new law in order to improve the protection and compensation of the people affected by the Fukushima disaster

A lot of people in Fukushima prefecture, and in other areas of Japan, are still receiving annual doses in excess of 1 mSv/year. This is true even in big cities like Fukushima city. The priority is therefore to obtain a national strategy for supporting the people affected by the contamination (compensation, support for relocation, etc..).

In Japan, a new law, called "Child Victim's Law" was passed in the Diet on **21st June of 2012**. It is introducing the concept of "Target support areas" where the inhabitants should receive support for either evacuation, staying there or coming back. But many issues remain unclear.

The main one is to clarify the annual dose above which a territory will be classified as "Target support area". The lawyers' group called SAFLAN, "Citizens' Forum for the TEPCO Nuclear Disaster Victims' Support Act⁴" and the members of the Diet who have been working to establish the law are requesting that the "target area" criteria should be at **1 mSv/year** or below (cumulated dose, for both external and internal exposure, in addition to natural radiation).

The clarifications should be included in **additional legislations** but they are postponed to **January of 2013**.

International pressure is welcomed so that the final legislation be effective for lowering the doses still accumulated by Japanese citizens including children and pregnant women.

During year 2011, hundreds of thousands of people already received doses far above "acceptable" limits. During year 2012, many citizens are still accumulating doses in excess of 1 mSv. This is increasing the risk of various pathologies (including cancer) in the long term. As the risk is cumulative with the dose, everything should be done to enable people to move to non contaminated territories.

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⁴ Representative is Mr. Nakate (former president of Fukushima Network for Saving Children from Radiation). CRMS is one of the supporting groups.

Appendix 1 / A few words about CRMS and CRIIRAD

What is CRMS ?

CRMS (Citizen's Radioactivity Measurement Station) is a non-profit organization, created in Japan in 2011, whose goal is to improve people protection against ionizing radiation. It is an independent organisation with a mission to offer people tools which allow everybody to have access to knowledge in the field of radioprotection, to learn how to measure radiation and thus to get protected in an autonomous way. CRMS is monitoring radiation at people's request and is publishing the data on its website and/or on other media in order to share this information with more people.

The radioactivity measurements, basically of food samples (using gamma spectrometers) and/or of people internal contamination (using a whole body counter (WBC)), are performed by citizens at 9 different stations in Fukushima prefecture and 1 station in Tokyo.

More information at :

<http://www.crms-jpn.com/>

<http://en.crms-jpn.com/>

<http://fr.crms-jpn.com/>

What is CRIIRAD ?

CRIIRAD (Commission for Independent Research and Information about RADiation) is a French Non Governmental Organization created in 1986. In 1986, French citizens were surprised by the dishonesty of the French Government about the actual contamination of the French territory by iodine 131 and radioactive caesium coming from Chernobyl. In order to make independent measurements CRIIRAD created its own private Laboratory.

CRIIRAD Laboratory is equipped with 2 gamma spectrometry HpGe detectors in order to measure gamma emitting radionuclides, a liquid scintillation counter in order to measure tritium and alpha and beta emitters and on site equipment (portable radiation meters and a gamma spectrometer, radon monitors, etc..). The CRIIRAD laboratory is accredited by the French Nuclear Safety Authority (ASN).

From 1987 to 1993, CRIIRAD Laboratory established a map of Chernobyl caesium contamination over France. From 1996 to 1998, CRIIRAD demonstrated⁵ that, due to Chernobyl fallout, some soil samples in the Alps (mountains) were radioactive waste.

After the Fukushima nuclear disaster (March 2011), CRIIRAD made an assessment of the consequences on the French territory and gave support to Japanese citizens in their effort to create CRMS.

For additional information about CRIIRAD cooperation with CRMS during year 2011 see the document (in French) :

http://www.criirad.org/actualites/dossier2011/japon_bis/crms/extrait_Japon.pdf

and

http://www.criirad.org/actualites/dossier2011/japon_bis/en_anglais/english.html

More information at : www.criirad.org

⁵ B. Chareyron / "Chernobyl fallout over France. The specific situation of the alpine environment" / In International Journal of Radiation Medicine – special issue 4 (1-4), 2002, p. 163-172.

See also : "Contaminations radioactives : atlas France et Europe" written by CRIIRAD and M.André Paris, éd. Yves Michel, Feb. 2002

Appendix 2 / A population already severely exposed to radiations

The persisting contamination in iodine 131 of the soils sampled by the CRIIRAD laboratory at the end of May 2011 in Fukushima city allowed to determine the initial iodine 131 fallouts in millions of Bq/m².

The iodine 131 has a half-life of 8 days, its radioactivity was therefore over 600 times higher during the fallouts. This attests of the severe contamination in the air during the incursion of the contaminated plumes, in particular on March 15th, 2011.

Other radioactive substances were also present and which significantly decayed since such as : cesium 136, tellurium 129, tellurium 132, iodine 132, iodine 133, etc.. as well as radioactive gases such as xenon 133 and krypton 85 that did not build-up in the soils.

The inhabitants of this city have been subjected to a very severe internal contamination, first, by inhaling contaminated air and mostly by ingesting foods contaminated by the deposits of radioactive substances.

The Japanese authorities adopted consumption restrictions within the FUKUSHIMA prefecture only on March 21st and 23rd (according to food types).

Populations therefore consumed, for a period of over a week, extremely contaminated foods without any restriction notice and with no information.

Some people may have therefore received effective doses of several dozens milliSievert and doses to the thyroid gland exceeding the Sievert.

For the record, the initial contamination of the spinach supply in iodine 131, at 100 km south of the nuclear plant was such that when consuming 200 grams, a young child would exceed the maximal annual dose limit of 1 milliSievert. At 40 kilometers northwest, the plants were so contaminated that the annual limit would be reached when consuming only 5 grams.

It is essential that the exposed populations obtain reliable assessments on the dose levels they have been receiving and it is of utmost importance to strive to control further exposure in the future.

Appendix 3 / location of Fukushima city ; Watari area (W) of Fukushima city and Oguni area (O) of Date city

Map published by MEXT (dose rate April 29th 2011)

 : District of DATE
W : WATARI area
O : OGUNI area

Results of airborne monitoring by MEXT and DOE
 (Readings of air dose monitoring inside 80km zone of Fukushima Dai-ichi NPP)

