Association CRIIRAD Laboratoire

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CRIIRAD Memo
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Iodine- 131 Europe

Detection of Iodine-131 in the Ambient Air in Europe during January 2017
It is necessary to determine the origin of this phenomenon

An Abnormal Presence of Iodine-131 in the Ambient Air

In a press release dated the 13th of February 2017, the French Radioprotection and Nuclear Safety Institute (IRSN) indicated[1] that "**iodine-131, a radionuclide of artificial origins, was detected in January 2017 in trace amounts in the air at surface-level in Europe**." Iodine-131 was detected between the 9th and the 16th of January in Norway, Finland, and Poland; between the 17th and the 23rd of January in the Czech Republic; between the 16th and the 30th of January in Germany; between the 18th and the 26th of January in France; and between the 17th and the 24th of January in Spain.

Iodine-131 is a relatively short-lived (with a half-life of 8 days) artificial radionuclide that emits beta and gamma rays.

The detected levels of this isotope are extremely low: the highest levels of iodine-131 (in aerosol form) were found in **Poland**, where levels were registered at **5.92 µBq/m³** (microbecquerel per cubic meter) following a sampling that took place between the 9th and the 16th of January 2017. In France, the highest levels reported by IRSN were **0.31 µBq/m³** (from a sampling carried out between the 18th and the 25th of January 2017 in Puy-de-Dôme).

Comparison with Chernobyl and Fukushima

The Commission for Independent Research and Information on Radioactivity (CRIIRAD), with support from many local communities and their residents, manages an alert network (air samplers)[2] in the Rhône Valley (France) that can detect a level of radioactive contamination in the ambient air which could be potentially worrisome to public health.

The analysis[3] of the air filters collected in the Rhône Valley from the month of January 2017, carried out at the CRIIRAD laboratory, did not indicate the presence of iodine-131. The detection limits are on the order of **19-112 µBq/m³** for iodine-131 as aerosols and **60-116 µBq/m³** for gaseous iodine-131.

This sampling equipment is unable to precisely evaluate levels of contaminants in microbecquerels per cubic meter, and the high-volume samplers required for such a task necessitate heavy investment to erect. It was, however, able to detect radioactive fallout from **Fukushima**, which was around 10,000 times higher than the levels measured in France this January; such fallout readings of **several millibecquerels per cubic meter** were picked up by CRIIRAD in **March and April of 2011** in Valence (France) (see Appendix 1). Furthermore, it would be able to detect fallout of the magnitude registered in 1986 in France following

[1] http://www.irsn.fr/FR/Actualites_presse/Actualites/Pages/20170213_Detection-iode-radioactif-en-Europe-durant-le-mois-de-janvier-2017.aspx - .WKK3ijVkH2b
[2] http://balises.criirad.org/
[3] http://balises.criirad.org/Resultats_analyses_labo/Janvier_2017-Fevrier_2017.pdf

the **Chernobyl** Disaster, when iodine-131 levels were tens of millions of times higher than those detected in January.

Necessity of Researching the Origin of the Iodine-131 Contamination

A number of installations in Europe and neighboring countries are **authorized to emit iodine-131** into the atmosphere. Among these installations are those associated with the production of nuclear energy (electronuclear plants, reprocessing plants, etc.), as well as installations related to the use of iodine-131 for medical purposes (reactors for producing such isotopes, nuclear medical services, waste incinerators, etc.).

The presence of trace amounts of iodine-131 in the atmospheres of several European countries in January 2017 could be linked to the specific weather conditions of the previous weeks, which have caused heavy pollution of fine particulate and engendered the stagnation of this particulate in the lower layers of the atmosphere. In this case, the iodine-131 anomalies would not be related to an increase in radioactive emissions, but rather to a decrease in dilution possibilities. Recall that, in effect, the **authorization of radioactive emissions** is based upon a principle of **dilution**, which ensures that the concentrations of radioactive pollutants are sufficiently diluted (and thus more difficult to detect), but which also increases the number of citizens vulnerable to exposure.

Considering the available information, the hypothesis concerning poor meteorological conditions appears most probable. Nevertheless, the dearth of available measurements does not allow for the exclusion of the possibility of abnormally increased iodine-131 emissions at one or more of the aforementioned installations. **If this should be the case, it would be imperative to identify the origin of these emissions, because residents could become exposed to non-negligible doses**.

In **November of 2011**, for example, iodine-131 had been detected in the air of several European countries, and the inquiry[4] was able to identify a production institute in Budapest (Hungary) as the cause of the iodine-131 emissions. The results processed by the CRIIRAD laboratory in November 2011 verified notable iodine-131 and iodine-125 contamination of vegetation in Budapest some kilometers away from the nuclear site.

In regards to the detection of iodine-131 in several European countries in January 2017, CRIIRAD has today sent a letter to IRSN in order to determine the institute's position on the hypothesis of accidental iodine- 131 emission.

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[4] http://www.criirad.org/actualites/dossier2011/hongrie/iode131-hongrie.html

Appendix 1

Level of Iodine-131 in the Air in Valence (France) from the March 26th to May 9th 2011

Iodine-131 resulting from Fukushima was detected by CRIIRAD in the Rhône Valley (France). Example data is provided for Valence, as detected between the 28th of March 2011 and the 20th-25th of April 2011.

Around 80% of the iodine-131 was in gaseous form (blue color in the graph) undetectable by particulate samplers. In the graph, the activity of particulate iodine-131 apperas in green colour. Figures in grey colour are below detection limit.