

## Information report

# Detection in October 2017 of Ruthenium 106<sup>1</sup> in France and in Europe:

## Results of IRSN's investigations

Update of information report of November 9, 2017

**IRSN publishes a report that summarizes the various investigations it conducted following the detection of Ruthenium 106 in France and Europe in October 2017. This report was presented by IRSN on January 31, 2018 in Moscow (Russia) on the occasion of the first meeting of the International Commission of Experts set up by the Russian authorities, dedicated to the examination of the origin of Ruthenium 106.**

Ruthenium 106 was detected in October 2017 by several European networks involved in the monitoring of atmospheric radioactive contamination, at levels of a few milliBecquerels per cubic meter of air. As soon as it became aware of the first detections of Ruthenium 106 in the atmosphere in Europe, IRSN mobilized all its means of radiological monitoring of the atmosphere. IRSN first made sure that the levels of concentration in the air in Ruthenium-106 and their evolution in Europe and a fortiori in France were of no consequence for human health and for the environment. Then, based on the meteorological conditions provided by Météo France and the measurement results available in European countries, IRSN carried out simulations to locate the release zone, to assess the quantity of Ruthenium released, as well as the period and the duration of the release.

IRSN publishes today a report summarizing the various analyses carried out by the Institute from the available data and its own knowledge to understand the origin of the rejection of Ruthenium 106. This report incorporates the elements already presented on November 9, 2017 in IRSN's information note and is supplemented by the results of the investigations conducted since. This report concludes that the release of a significant quantity of Ruthenium, located between the Volga and the Urals, and which would have occurred at the end of September 2017 during an operation using spent fuel cooled for approximately two years, is the hypothesis that best explains the measurements taken from atmospheric radioactivity monitoring stations in different European countries. IRSN speculates on the age of the fuel due to the detection, in some measurements, of Ruthenium 103 with a ratio relative to the Ruthenium 106 characteristic of a spent fuel removed from a nuclear reactor since about 2 years.

This report was presented by IRSN on January 31, 2018 in Moscow on the occasion of the first meeting of the International Commission of Experts set up by the Russian authorities, dedicated to the examination of the origin of Ruthenium 106. IRSN's conclusions are in agreement with those of the Commission regarding the importance of the rejection, the impossibility of an origin linked to a

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<sup>1</sup> Ruthenium 106 is a radionuclide of artificial origin. It is a fission product from the nuclear industry. This radionuclide is also used in the medical field for brachytherapy treatments.

medical source or a satellite, as well as the hypothesis of an incident during a treatment operation of irradiated fuel cooled about two years.

However, uncertainty remains as to the location of the site of the release. For IRSN, one possible hypothesis is that of a rejection resulting from an incident occurring during an operation using spent fuel cooled for approximately two years at the Mayak plant (Russia) which is located in an area between the Volga and the Urals. The Russian Nuclear Safety Authority, based on its inspections, claims that no incidents occurred between August and November 2017 at the Dimitrovgrad and Mayak facilities in the area identified by IRSN.

The Commission decided to continue its work by first analysing all the measurements taken and the local weather conditions communicated by the Russian Authorities and then asking for further measurements in the Chelyabinsk region. The next meeting is scheduled for April 11, 2018 in Moscow.

Communiqué from IBRAE (Nuclear Safety Institute of the Russian Academy of Sciences) following the Commission: <http://en.ibrae.ac.ru/newstext/883/>