Information to the public: challenges for a consensus on an index of environmental radioactivity

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The French Nuclear Safety Authority (ASN) issued in 2011 a provisional index of environmental radioactivity resulting from 3 years of intense debate within the pluralist working group. Contradictory viewpoints were expressed by licensees, radioprotection experts and NGOs on index's design, presentation, associated messages and condition of use.

Allow access to complex radioactive measurements in the environment

A comprehensive information

A general consensus was found on a factual and descriptive evaluation of the radioactivity level on the environment.

The project does not take dosimetry into account, as it would be far too complex to calculate the index for each measured value. Risk of confusion between dose and health impact is also an important inhibiting factor.

A reactive index, quickly available

The provisional index is immediately calculated with the last available data in the air (gross alpha and beta aerosols, gamma dose rate) and water (gross alpha and beta, tritium). The food indicators were set aside, as local eating habits should be taken into account. This would be incompatible with the aim for a reactive index.

An evaluation of added radioactivity

In order to avoid discriminating localities where radioactivity is naturally high, the index is centred on artificial radioactivity[1].

Regulation or international references

- Basic Safety Standard AIEA n°115.
- Health Public Code (R1321-1 to 25): investigation and threshold values for the water to be used for human consumption.
- Nuclear Safety Authority decision 2009-DC-0153 of 18 August 2009 on the intervention levels for radiological emergency situation.

→ The provisional index applies to air and water, on the artificial part of radioactivity.

A presentation based on existing atmospheric quality index

From 5 to 3 levels

The initial index had 5 levels, but the two upper levels were difficult to assay without acknowledged reference values.

The binary approach was rapidly discarded, as too simply interpreted as "bad or good".

An agreement was found on a three colours index (green, yellow, red) referring to existing atmospheric quality index presentation.

10 ⩽ red	Radiological pollution of the environment
1 < yellow < 10	Important presence of radioactivity in the environment
green ⩽ 1	Conformity to the regulation

A sensitive choice of associated messages and terms

The explanations associated with levels were subject to many debates.

• Low level

NOGs are opposed to "natural" or "normal" which are to be used only if no human activity had interfered with a natural situation. "Acceptable" is interpreted as a permissive message towards limited discharges in the environment. It was chosen to refer to the "conformity to the regulation".

• Intermediate level

Members of the working group had mixed opinion on the choice of "yellow" or "orange". Licensees were afraid "orange" to be interpreted as a potential threat as it is clearly an alert sign in the road sign or in other indexes.
"Yellow", reputed more neutral, remains difficult to describe. Terms as "significant"[2] or "marked" are not appropriate as their meaning in metrology or chemistry differs from common language. The adjective "important" is intended to implicitly point out a quantity of radioactivity above the reference level.

• Upper level

Licensees are opposed to any "health" reference for, in many cases, no consequence on health is to be expected. The tough but factual "Radiological pollution" was a preferred option.

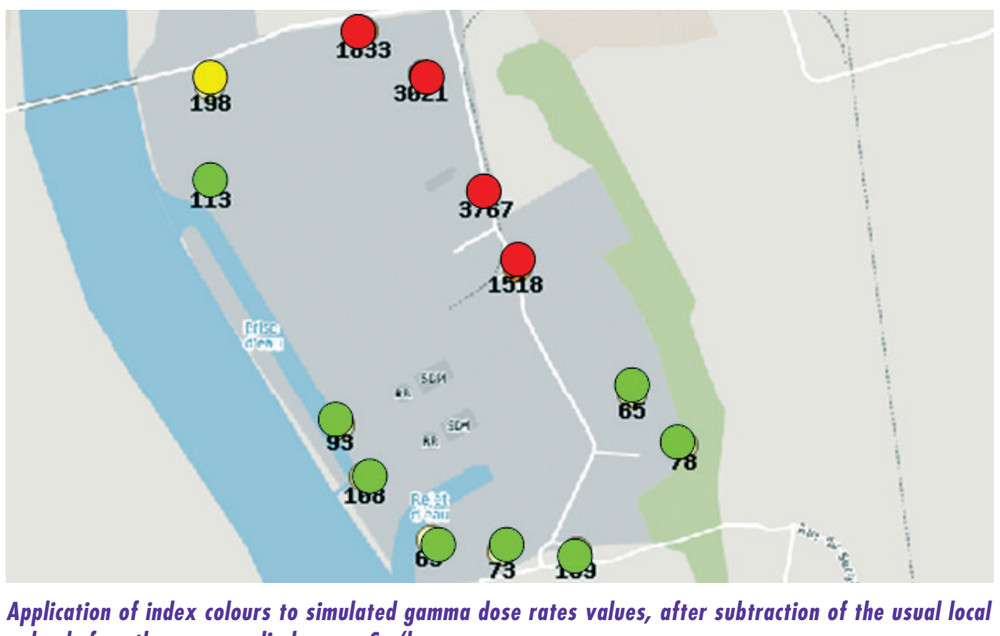
Use in post-accidental situations

Is the index appropriate for public information in a radiological accident context?
This question raises the issue of reactive and relevant measurements in the affected area, so the working group was reluctant to admit this use. However, the reliability of the index relies undoubtedly on its capacity to explain abnormal situations in a comprehensive way.

→ The provisional index applies to environmental measures regardless of the situation normal or post-accidental.

Experimentation within an emergency exercise

The index interest towards journalists in emergency situations was tested during the 31 January 2012 radiological emergency exercise.
The journalists found the graphic approach of the gamma dose rates attractive and informative though the accompanying explanations were to be improved.
The test highlighted the difficulty to address messages restricted on the radiological impact to the environment while the public is expecting first and foremost clear information on the health risks.
The test was conclusive on the consistency of levels defined with the anticipated actions envisaged for the population.



Application of index colours to simulated gamma dose rates values, after subtraction of the usual local value before the gaseous discharge. nSv/h

[1] Subtraction of the gamma dose rate moving average, calculated on an elapsed time of 12 months or on the available data, apart from anomalous values.
[2] Value above the detection sensitivity threshold of the measuring instruments.

ASN is conducting in 2012 an experiment of the index of environmental radioactivity. A user survey planed in March-April is aimed at testing public response to this provisional information tool. Final results will guide the integration planed on the website *www.mesure-radioactivite.fr*

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