Information to the Public: challenges for a consensus on an Index of Environmental Radioactivity.

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Abstract. How can one translate into simple qualitative words the complexity of the results of radioactive measurements in the environment? In 2008, ASN launched an internal reflexion on the ways to inform the public on the radioactivity levels in the environment in order to identify the difficulties in designing a scale or an index of environmental radioactivity levels. After the presentation of a rather extensive demonstration model by ASN in 2008 to HCTISN (Haut Comité pour la Transparence et l'Information sur la Sécurité Nucléaire), ASN constituted a pluralist working group (WG) in the beginning of 2009 to share its reflexions and to design an index. A provisional index was then established by the WG. The chosen criteria can be used by the public, with simple arithmetic operations from available data in order to determine the level of the index. The HCTISN members, as all the WG members, were asked to produce their viewpoints (September 2011) on the project; an experiment within an exercise was realised (January 2012), followed by a test on a public panel (March 2012).

Key words: ASN, environment, index, public, radioactivity.

ASN issued in 2011 a project of an index of environmental radioactivity [1] resulting from 3 years of intense debates within the working group. Contradictory viewpoints were expressed by licensees, radioprotection experts and NGOs on the construction of the index, its representation and associated terms. An on-going experimentation is aimed at testing journalist and public response to this project of informational index. Meanwhile, a leaflet was build for the information of the averted public.

1.Viewpoints on the project

The viewpoints are on the construction of the index, the representation and the vocabulary used to present it.

1.1 The construction

The value of the index must be available quickly. From the beginning, there is an oscillation between the choice to use simple methods, and the need for others, to translate the natural and the artificial radioactivity, including "food indicators", and from others the need to not discriminate the localities where the natural radioactivity is higher, or at some highest, than in others.

Some considered the simple methods still too complex. Others think it not sufficiently based on dosimetry estimation, even if this estimation is far too complex to be calculated for each location with measured values and by the public.

The boundaries between the levels are simply defined, with regulation or international references. Finally, the food indicators were considered too complex to be included in the calculation of the index, as some considerations ought to be given to the local alimentary habits.

It was acted that for this project, until further developments of other indicators, that only air and water will be considered and only for the artificial part of the radioactivity.

1.2 The representation

The number of levels and the representation with three colours has encountered some proposals, from two levels up to five and from two colours up to five colours. The main limit to the use of more than 3 colours is the definition of a value for the index, above 10.

The binary approach of two colours, very similar to "black or white", was rapidly discarded, as interpreted too simply as "bad or good". A five colours system was discarded, as the differences between the upper levels were difficult to assay with a kind of acknowledged reference values.

The choice of the colours (green, yellow, red) was discussed, but an agreement was found for a presentation like “atmospheric quality index” or “meteorological alert scale”.

The choice of “yellow” or “orange” is still in debate. On one side, “yellow” is interpreted as a level being more an attention than being a potential risk, and “orange” is interpreted as a level which necessitates a careful attention, with a potential threat. On the other side, “orange” is usually used in the road sign or for indexes, when a special attention is needed.

1.3 The vocabulary

The choice of the words is sensitive. Among many to be avoided, the adjectives: natural, normal, acceptable and sanitary. The examples in the leaflet for the averted public and the comments or their absence accompanying the data were the subject of many debates.

To qualify the green level, the associations are opposed to “natural” or “normal” or “acceptable”. “Natural” is viewed as “before any human activity”, and “normal” should be used only as if no human activity had interfered with a natural situation. “Acceptable” is interpreted as to allow the discharges in the environment.

The yellow level is difficult to describe with an absolute approval of all the parties. “Significant” has a meaning in metrology which differs from the common language. “Marked” is viewed commonly as some definitive evolution, with a negative feeling. “Important” is implicit of some quantity above a reference.

To comment the red level, the licensees are opposed to the use of “health”. Many possibilities of presence of artificial radioactivity for a red level are without any consequence on health for the public.

In the leaflet, as the data are available to the public, it was necessary to comment the values used as examples, as close as possible to the time being (historical or legacy) context.

2. Experimentation within an emergency exercise

The High Council on Transparency and Information on Nuclear Safety (HCTISN) stated, in its Opinion No. 2 of 23 September 2008 on the event that took place on 7 July 2008, at the company SOCATRI’s premises, that it “wished (…) to become involved in the study and the development, by the authorities, of a scale to assess the seriousness of the accident, due to the dispersal of radioactivity in the environment, so that the general public may better understand the events it faced”.

An internal experiment was done within an emergency exercise in 2011 independently of the scenario builders and of the other participants. The conclusion was that the levels defined with the simulated values described simply the quality of the environment and were in accordance with the protection measures of the public.

2.1 The emergency exercise of 2012

An exercise was done the 31 January 2012, with a media pressure. The index was tested independently of the scenario builders. The simulated values of gamma dose rates generated by the gaseous discharges are used to qualify the environment. To calculate the index, the observed mean value before the discharge is subtracted. To inform the journalists, the leaflet build for the information of the averted public is used.

2.2 The feedback

The levels defined with these values are compatible with the anticipated actions envisaged for the population. The spokesperson, as a first test without any training, found the use of the leaflet alone very difficult. The representation of the levels was useful to the journalists.

With the application of the index to the simulated values of the scenario, the sheltering zone was indicated as yellow, the evacuation zone as red, and the unaffected zone as green.

Expecting to communicate on doses to the public, the spokesperson found difficult to communicate with the index, which applies only to the environment. 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 journalists have esteemed that it was attractive and informative to illustrate the various numbers representing the gamma dose rates with such a visual, with appropriate colours. The visual is the coloured locations, on a map, of the measures in the environment. The "yellow" was more or less preferred to be "orange".

3. Public test

A commercial society, independent from the licensees and associations, has been chosen to conduct a restricted public test: understanding of the objectives of the index, use of the index on the Réseau National de Mesure (RNM) website (www.mesure-radioactivite.fr). The test is planned from March 2012 to April 2012. The final results will be available for May 2012.

3.1 The composition of the panel

The composition of the panel (table 1), 30 persons, has been debated within the Communication working group of the RNM. The licensees have provided only one potential volunteer.

Common public: 5	any location
Association: 1	any kind: cultural, local, sport…
Risk-averted neighbours of industrial sites: 5	any industrial site but nuclear
Users of the RNM website: 5	from different locations
Environment protection association: 1	any location
Individuals from a scientific branch: 4	2 students, 2 professors
Commission Locale d'Information (CLI): 2	2 different locations
Member of HCTISN: 1	anyone of the members
Elected people: 4	commune near a nuclear site: 2, commune with a punctual confrontation to a radiological risk: 2
Journalists: 2	1 of scientific press, 1 of general press

Table 1: composition of the panel.

3.2 The questions

The contractor is in charge to organize the individual tests with their resources. The duration of each test is evaluated to 2 hours. The test is built within a renewal of the initial test conducted for the launch of the RNM website. It is built in 3 phases.

Phase 1 (10 to 15 minutes): the person is invited to express freely and shortly his needs for information and services, on his habits of browsing and on his expectations about the websites on radioactivity, nuclear and environment. He is invited to speak about his feelings towards scales (meteorology, air quality), and on the index.

Phase 2 (45 to 55 minutes): the person browses on the RNM website, freely to discover it. Then, he has to realize some tasks, following instructions. At the end, he is shown a model with the index, with various representations.

Phase 3 (10 to 15 minutes): the person makes a synthesis of the strong and weak points of the RNM site, the interest and usefulness of the index, and his expectations of improvement.

3.3 The analysis of the results

The analysis of the results will be available in May 2012. They will guide the provisional integration planed on the RNM website (www.mesure-radioactivite.fr).

4. Conclusion

The bases used for the project are no more contested by the licensees, but are still unconvincing for some associations. The representation and the vocabulary used to present it are more or less accepted, but are without any competitors. The provisional integration planed on the RNM website (www.mesure-radioactivite.fr) will allow a further test on a large public.

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References

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