Belgian regulations with respect to the management of radioactively contaminated sites: experiences, challenges and prospects

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Overview of legacy / NORM sites in Belgium

- Site of a former radium extraction plant (UMICORE): contamination of landfill site + riverbanks + streets (slags used in road construction)

  $\Rightarrow$ between a few Bq/g till ~ 1 kBq/g.

- Former Ferro-Niobium extraction facility (from coltan): landfilling of contaminated slags

  $\Rightarrow$ contamination up to 60 Bq/g Th-232, 12 Bq/g U-238

Overview of legacy / NORM sites in Belgium (2)

- Phosphogypsum / CaF_2 stacks (legacy + in operation)

e.g. former PG stack: 0.5 – 0.6 Bq/g Ra-226 + radon flux measurements 62 mBq/(m²s)

⇒Project by government to build a jail on site !

- Others: steel industry discharge sites (refractories, slags)

Current regulations: NORM activities

General framework: directive 96/29/EURATOM
Current NORM industries as **« work activities »**

Transposed into Royal Decree of July, 20 2001

a) Positive list of work activities:

- Phosphate industry
- Zircon industry
- Extraction of rare earths
- Tin foundries
- Production of thoriated welding electrodes

Industries of these sectors compelled to make dose-assessment of workers + population

b) FANC may define radon-prone areas: all workplaces located in radon-prone areas must be subject to Rn-monitoring

Current regulations: intervention

General framework: directive 96/29/EURATOM

« **Interventions in case of lasting exposure** »

« *Where the Member States have identified a situation leading to lasting exposure resulting from the after effects of a radiological emergency or a past practice, they shall, if necessary and to the extent of the exposure risk involved, ensure that:*

(a) the area concerned is demarcated;

(b) arrangements for the monitoring of exposure are made;

(c) any appropriate intervention is implemented, taking account of the real characteristics of the situation;

(d) access to or use of land or buildings situated in the demarcated area is regulated. »

Transposed into Royal Decree of July, 20 2001
(Art. 72bis)

Challenges

1. *Criteria for evaluation of necessity to intervention ?*
2. *Administrative procedure to apply ?*
3. *Who is liable for the intervention (investigations, remediation) ?*
4. *Rules for transfer of property, financing,… ?*
5. *Interaction with non RP regulations ?*

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New regulation under development

Step by step administrative procedure

1. **Orientation investigation** (*validation* of risk ⇒ contaminated grounds in a official **register**)
2. **Descriptive investigation** (*assessment* of radiological risk)
3. **Pre-study** over intervention/clean-up options (*choose* the remediation strategy) + concertation with stakeholders
4. **Clean-up or risk-management project** (*elimination / control* of risk) (risk-management = e.g. restrictions on the use of the grounds or monitoring program)

Liabilities

1° **operator** / **user** of the facilities located on the site where the contamination comes from;

2° if no operator/user, **owner** of the site where the contamination comes from.

+ in case of *transfer of property* of contaminated ground
⇒ obligation for the seller to inform the buyer (via register)

Technical criteria's

Technical recommandations:

- "Generic content of an orientation or descriptive investigation"
- "Intervention levels for lasting exposure situations"

- *dose < 0.3 mSv: never intervention*
- *0.3 < Dose < 1 mSv: intervention rarely justified*
- *1 < dose < 3 mSv: intervention generally justified*
- *Dose > 3 mSv: intervention always justified*

Interface with non-RP authorities

- Radioactive contamination generally mixed with non radioactive contamination

- Belgium: RP = competency of *federal state* /
other environmental aspects = competency of *Regions*

⇒ **Entangled regulations** – need for consistency between RP regulations and regulations related to non radioactive contamination

- Exchange of information between administrations: identification of potentially contaminated sites

- Defining modalities of collaboration for concrete cases

Interface with non-RP authorities (2)

- Definition of **common terminology**:

For example:

⇒ Link between "NORM" **positive list** of RP regulation and European classification of economic activities - **NACE codes** (EC REGULATION No 1893/2006):

e.g. code 23.20 "Manufacture of refractory products"

⇒ Link between "NORM" **residues** and European **waste codes** (2001/118/EC - Commission Decision as regards the list of wastes):

e.g. 06 01 04* waste from the manufacture of phosphoric/phosphorous acid
10 01 02 coal fly ash, ...

- Common **methodology** for risk-assessment: taking into account radiological and chemical-toxical parameters as a whole in the decision-making process

What next ?

In expectation new law (still to be approved at political level) ?

Use of current regulations with respect to work activities:

- Current work activities (e.g. phosphate industry) may be obliged to perform risk-assessment for their waste disposal sites

- If radon = most important exposure pathway, NORM-contaminated site may just be considered as "Radon-prone area" (Rn of *industrial* instead of *geological* origin)

  $\Rightarrow$ obligation of *Rn-monitoring + prevention measures in building construction*

Conclusions

- Importance of collaboration with non RP authorities (regulatory and administrative consistency, exchange of information, coherence in the risk-assessement and in the decision-making process,...)

- New regulations must still be approved politically (some “touchy” points: liability, transfer of property,...)

- Current regulations on work activities (including consideration of contaminated sites as “radon-prone areas”) already allow some (limited) control of contaminated sites.

Conclusions

➢ Many open issues !

- disposal of waste from remediation activities: regulatory status (radioactive waste or not ?) + acceptation criterias
- definition of measurements protocol and quality assessment program
- ...

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