ICRP Radon Recommendations

IRPA 13

Session 10.2 – Existing exposure situations – Radon

May 14-18, 2012 – Glasgow, United-Kingdom

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IRSN - ICRP Committee 4

ICRP TG 81 (Committee 4)

- Creation in November 2009
- Describe and clarify the application of ICRP 103
- And ICRP 101 (Optimisation)
- Remain in line with ICRP 65
- Take into account the Statement on radon and future ICRP 115 (nominal risk x 2)
- Currently on the web for public consultation (up to the 8th of June, www.icrp.org)

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French mirror group

Characteristics of radon exposure (1)

- Who is exposed, where, when and how?
  - **At home** (essentially), in workplaces and in mixed-use buildings
  - Global risk due to **low and moderate** concentrations

- **Existing exposure situations**
  - Source already exists and cannot be deleted nor modified (control only on the pathways)
  - Some situations already managed as planned exposure situations

Characteristics of radon exposure (2)

- Similarities with other existing exposure situations
  - In particular with exposures in **contaminated territories** (ubiquity, variability, individual behaviour, self-help protective actions, many players, long-term strategies…)

- Many **challenges**
  - Public health dimension, lack of awareness, consistency with other policies, global risk versus highest exposures (equity), responsibilities, efficiency…

Recommended approach

- **Simple and realist**
  - No problem without solution
  - Same approach for smokers and non smokers
- **Integrated**
  - All buildings whatever their occupants
  - Mainly a public health dimension
- **Graded**
  - According to responsibilities
  - Taking into account specific situations (underground, spas)
- **Ambitious**
  - Through the selection of the reference level
  - Addressing both the highest exposures and the global risk

Application of the principles (1)

- **Justification of protection strategies**
  - Deemed to be justified (high cause of exposure, solutions do exist, improvement of the indoor air quality)
  - Decision by national authorities to implement a national action plan which is expected to do more good than harm

Application of the principles (2)

- **Optimisation of protection**
  - A unique dose reference level ± **10 mSv/a**
  - Upper value of RL for dwellings: **300 Bq.m^{-3}** (although > 10 mSv/a)
  - Idem for mixed-use buildings and "ordinary" workplaces
  - **Graded approach** according to responsibilities (landlord, seller…)
  - Specific graded approach for **workplaces**
    - 1st step = idem than dwellings
    - 2nd step = realism < 10 mSv/a
    - 3rd step : if > 10 mSv **or** when national positive list of radon prone work activities (underground, spas…) = occupational exposure (quantitative + qualitative criteria)

Application of the principles (3)

- **Application of dose limits**
  - Not a requirement for occupational exposure but a **principle** applicable only in **planned** exposure situations
  - Already applied in some situations (U mines)
  - To apply when occupational exposure ?
  - Flexibility (national level)

National action plan (1)

- **All buildings**
  - General case: collective protection through control of building
  - Specific cases (a few): control of individual doses
- **National Reference Level**
  - According to the national situation (as much possible close to 100 $Bq.m^{-3}$)
- **Crescendo** of provisions
  - Information, measurements, remediation, support (technical, financial…)
  - Encourage self-help protective actions
  - Priorities (zoning…), more or less enforcement, more or less consequences of failure

National action plan (2)

- **New buildings**
  - Prevention (building codes)
  - Coherence with energy saving programmes
- **Existing buildings**
  - Mitigation (reduction of exposure, many techniques)
- ALARA with **ambition**
  - Not just below the RL

Discussion (1)

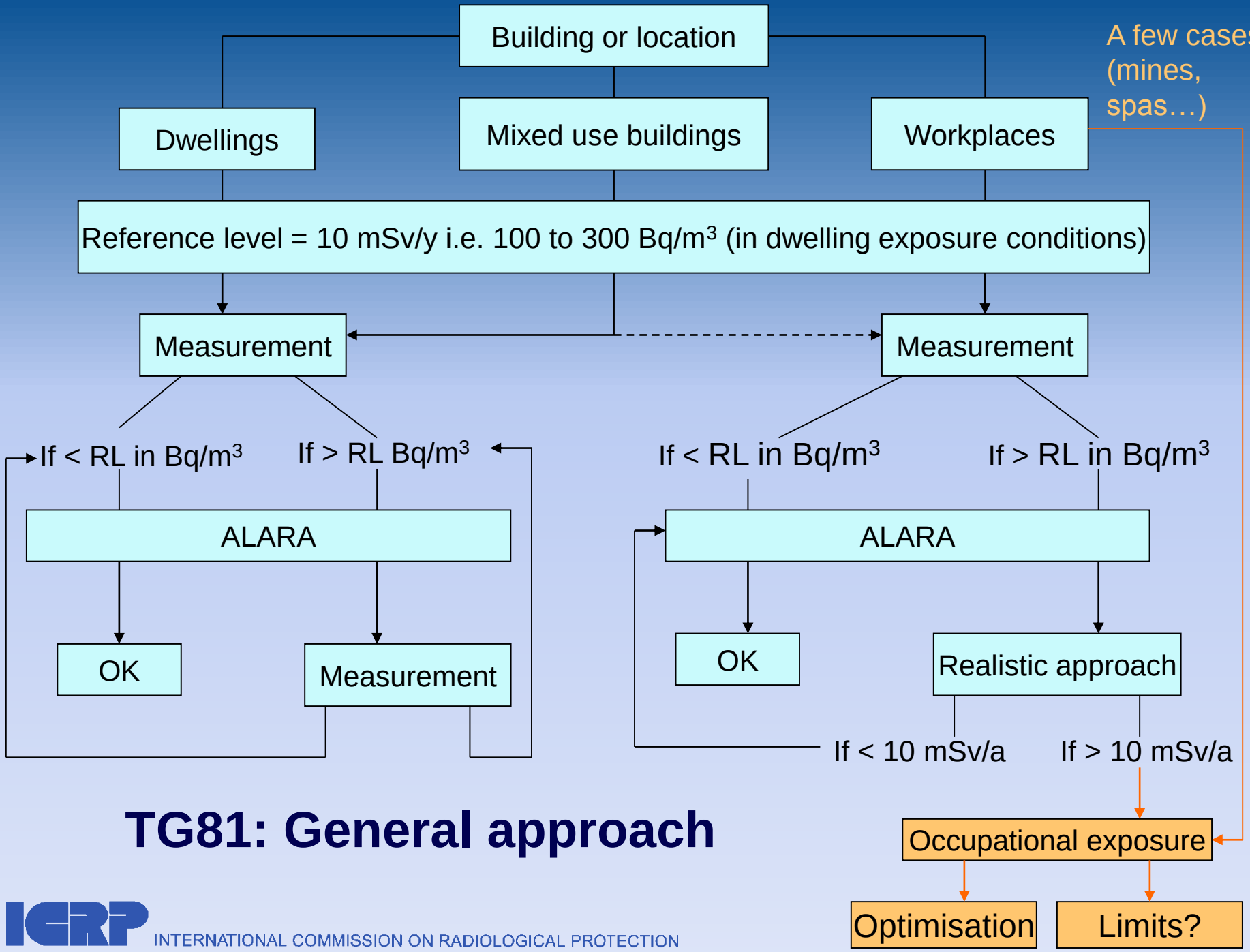
- **What means occupational exposure?**
  - When radon exposure to workers can reasonably be regarded as being the responsibility of the operating management (Pub 103 § 178)

- What about **workers** not occupationally exposed?
  - Managed as members of the public (Pub 65 § 86)

- **Entry point**:
  - Ambiguity of the concept (action level? reference level?)
  - 1,000 $Bq.m^{-3}$ is too high

Discussion (2)

- Application of **dose limits** (controversial issue)
  - In all workplaces? Cf. responsibility of employer + consistency of the protection at work
  - But problems
    - With adventitious radon exposure (offices, shops, workshops…)
    - In mixed-use buildings (What dose limit? Public/Occupational?)
    - With added dose
    - With other sources of radiation
  - Flexibility makes sense
  - In any case the upper value of tolerable risk for occupational exposure should not be exceeded (100 mSv/5 years with a maximum of 50 mSv in a year)



TG81: General approach

Other points

- Exposure to **thoron** is not a problem
- **Uranium mines**: waiting for the dose conversion factors from the Committee 2
- Approach expected to be applicable in **all existing exposure situations**

Main messages

- Start with an action plan for dwellings
  - Most part of the risk (because of time spent at home)
  - Prevention + mitigation
  - Optimisation below a RL, applied to the building
- Extend the action plan to mixed-use buildings
- Idem for “ordinary” workplaces
  - Adventitious radon exposure
  - Important part of the risk (not yet addressed)
- Do not forgot the cases where radon is not adventitious
  - Determined with quantitative/qualitative criteria
  - Small part of the risk but individual doses may be high
  - Occupational exposure (control of individual doses)
  - Dose limit = flexibility (choice at national level)

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