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New ICRP 126

Protection against Radon Exposure

ICRP TG 81 (Committee 4)

- Creation in November 2009
- Describe the application of ICRP 103 to radon exposure
- Take into account the existing Publications (ICRP 65, ICRP 101, 2009 Statement on radon and ICRP 115)
- 6 months on the web for public consultation (December 2011 to June 2012)
- Many challenges to overcome
- Approved for publication by the MC in April 2014
- Publication as ICRP 126 late 2014

Membership

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Radon Exposure: characteristics

- **Existing exposure situation**: source already exists and cannot be deleted nor modified (control only on pathways)
- Some situations already managed as planned exposure situations
- **Ubiquity, heterogeneity** of exposures
- **Characterisation** of exposures is a prerequisite
- Who is exposed, where, when, how?
  - **At home** (essentially), in mixed-use buildings and workplaces
  - Global risk due to **low and moderate concentrations**
- Exposure in buildings may be > the level at which the risk has been demonstrated (≈200 $Bq.m^{-3}$)
- Environmental, health, economic, architectural, educational issues to address
- Energy saving policy may have bad influence on radon concentration

Many challenges to overcome

- Address radon exposure in dwelling from a **public health perspective**
- Reduce **global risk + highest exposures** (equity)
- Wide range of stakeholders - **Lack of awareness**
- **Responsibilities** (householder/occupants, seller/buyer, landlord/tenant, employer/employee…)
- Exposure at work often **adventitious**
- Risk for **smokers** >> risk for non-smokers
- **Children** likely to be exposed in long-term
- Efficiency need a **long-term** strategy
- New dose conversion factors

Recommended approach (ICRP 126)

- **Straightforward and realistic**
  - No distinction smokers / non-smokers
  - No specific requirements for children
- **Integrated**
  - All buildings whatever their use and occupants
- **Graded**
  - Based on the optimisation principle
  - According to specificities
  - Specific graded approach for workplaces
- **Ambitious**
  - Addressing both the highest exposures and the global risk
  - Not just below the RL

Current system (ICRP 65, ICRP 103, Statement)

Dwellings

- Existing exposure situation
- Public exposure
- RL = 10 mSv/y
- Derived RL = 300 Bq/m^3 or below (7000 h/y)
- ALARA (existing and new dwellings)

Workplaces

- RL = 10 mSv/y
- Entry point = 1000 Bq/m^3 (2000 h/y)

Below 1000 Bq/m^3:

- Existing exposure situation
- Public exposure
- ALARA

Above 1000 Bq/m^3:

- Managed as a planned exposure sit.
- Occupational exposure
- Corresponding requirements
- Dose limit

New ICRP 126 approach

Common case: all buildings

(dwellings, “common workplaces”, mixed-use buildings)

Except specific workplaces……

- Existing exposure situations
- Public exposure
- RL = 10 mSv/y
- Derived RL = 100 to 300 Bq/m^3
- ALARA (prevention + mitigation)
- Graded approach (action plan)
- Specific graded approach for workplaces:
  1. Action on concentration (derived RL)
  2. Action on dose (dose RL)
  3. Occupational exposure……

Qualitative criterion (national list)

Specific case: some workplaces (mines, spas…)

- Managed as planned exposure situations
- Occupational exposure
- Relevant requirements
- Dose limit: flexibility

Quantitative criterion (>10 mSv/y)

National action plan (1)

- After characterisation and justification
- **Prevention**
  - New buildings (building codes)
  - Coherence with other programmes (energy saving, tobacco, indoor air quality)
  - Building materials: to be dealt with upstream (as NORM)
- **Mitigation**
  - Existing buildings
  - Reduction of exposures (many techniques)

National action plan (2)

- **Crescendo of provisions**
  - Information, development of awareness, measurements, remediation, support (technical, financial)
  - Encourage self-help protective actions
  - Priorities (zoning…)
  - More or less enforcement of provisions
  - More or less consequences in case of failure (depending on responsibilities)

Dose coefficients for Radon (not in ICRP 126)

- C1/C2/C4 WG approved by MC (see summary of Sydney meeting)
- Single coef. for use in most circumstances: **12 mSv/WLM** (3.4 mSv per mJ h m^3)
- Additional data will be provided for circumstances significantly divergent from typical conditions where sufficient and reliable information is available to support an adjustment
- In buildings: 7.5 x 10^{-6} mSv/h.Bq.m^3 (with F = 0.4)
- The dose corresponding to 300 Bq m^3 is:
  - 4.5 mSv for 2000 hours of exposure (typical work year)
  - 15.8 mSv for 7000 hours of exposure (typical residential)
  - 19.8 mSv for 8760 hours of exposure (full year)
- Publication in OIR Part 3 (2016?)

Thank you for your attention