Inter-Agency Committee on Radiation Safety (IACRS)
Statement on Managing Exposure
due to Radon at Home and at Work

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Objectives:
To promote consistency and co-ordination of policies with respect to the following areas of common interest:

- applying principles
- criteria and standards of radiation protection and safety
- translating them into regulatory terms
- co-ordinating research and development
- advancing education and training
- promoting widespread information exchange
- facilitating the transfer of technology and know-how
- Providing services in radiation protection and safety
Statement on Managing Exposure Due to Radon at Home & At Work

- Position statements of IOs
- Co-sponsors of GSR Part 3
- Includes background discussion on
  - Radon and progeny exposure characteristics and pathways
  - Application of RLs and dose limits
  - Dose estimation
  - GSR Part 3 & 2013/59/Euratom Directive coverage
- Recent developments in Rn DCFs based on ICRP 137 (occupational intakes of radionuclides) with comparison to UNSCEAR values
- The October 2019 IAEA TM on the Implications of the new DCFs for radon

Rn-222 protection for Workers

• Universal approach
• Protection against radon is based on
  – Measurement
  – Control of levels of radon concentration in air (caution on aerosol parameters, equilibrium, uncertainty)
• Dose estimates are required in certain situations for workers (caution on mining, mineral processing, water treatment & supply, multiple exposure pathway)
  – effective dose coefficients are calculated with ICRP reference biokinetic and dosimetric models.
  – Use of dose conversion factors
  – Sufficient information and dosimetric data (even site-specific dose coefficients)
• Optimisation is the key, radon levels remain above the national reference level
• Application of graded approach
Radon – reminder for new dose conversion factors

**Workplaces**

ICRP 65 (1993)  5 mSv/WLM

ICRP 137 (2018)  ≈ **10 mSv/WLM** – for underground mines and buildings

20 mSv/WLM – indoor work involving substantial physical activity, exposure in tourist caves

GSR Part 3 (2014)  **1000 Bq/m^3 ≈ 10 mSv in a year**

DCF Rn-222 progeny: 1.4 mSv/mJh m^-3  3 mSv/mJh m^-3

DCF Rn-220 progeny: 0.48 mSv/mJh m^-3  1.5 mSv/mJh m^-3

- GSR Part 3 based on ICRP 115
- 300 Bq/m^3 for dwellings and 1000 Bq/m^3 for workplaces, both corresponding to 10 mSv/a
Position

• ICRP DCFs used for RP are consistent with the UNSCEAR review.
• The UNSCEAR dose coefficient value is at the lower end of the range of calculated values, whereas the ICRP reference dose coefficient is close to the central value.
• IACRS therefore supports the continued implementation by national authorities of the requirements in GSR Part 38 for managing exposure due to radon in homes and workplaces, with emphasis on optimization of protection and the use of a graded approach.
At a glance

• Some MSs still use ICRP 65 DCF and ICRP 60 for RP system
• GSR Part 3 (based on ICRP 103) - adopt in many MSs into national regulations (observation from 2020 International Conference)
• ICRP DCFs for workplaces result in higher estimated doses and may lead to more regulatory control efforts
• Several MS raised a need for harmonized approach and implementation of ICRP DCFs (discussed and position statement guides)
• ICRP DCFs occupational exposure (especially existing exposure situations) have significant impact on national regulations and the system of radiation protection in many MSs
GSR Part 3 Requirements on natural sources

TREATED AS **Planned exposure situations**

- Mining and processing of raw materials that involve exposure due to radioactive material
- Mineral extraction, mineral processing facilities
- Natural sources
  - Material containing natural radionuclides above specified level
  - (U/Th decay chains > 1 Bq/g; K-40 > 10 Bq/g)
  - Rn-222 and Rn-220 & their progeny
    - in workplace where radon levels above reference level
    - occupational exposure due to other radionuclides in the uranium or thorium decay chain is controlled as planned exposure situation

**Existing exposure situations** – reference levels

General reference levels (applicable to both natural and artificial sources):

- Normally in the range 1–20 mSv/a

- **Radon**:
  - Expressed in terms of radon activity concentration in air
  - \( \leq 1000 \text{ Bq/m}^3 \) in workplaces
For ORPAS

- No change in the review mechanism, particular focus might be needed depending on the infrastructure of requesting country
- Requires more attention on industrial process involving NORM (where Rn is dominant exposure pathway)
- Observation from completed ORPAS missions: Radon mitigation at workplaces is driven by a combination of limitation and optimisation combined with regulatory oversight
  - provide other non-radiological benefits (fresh air, safer mining, reduced other hazardous exposures, etc.)
Thank you!

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