

**Tenth Irish National Radon Forum
Thursday 17 January 2013**

International Requirements for the Control of Radon

Trevor Boal, IAEA-NSRW



IAEA

International Atomic Energy Agency

Content

- IAEA Safety Standards
- Requirements for radon
- Conclusion

IAEA Mandate

IAEA Statute (Article III.A.6)

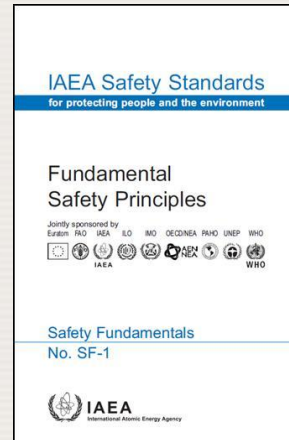
- “To establish or adopt, in consultation with the competent organs of the United Nations and with the specialized agencies concerned, standards of safety for the protection of health and minimization of danger to life and property”
- “...and to provide for the application of these standards”

Hierarchy of Safety Standards

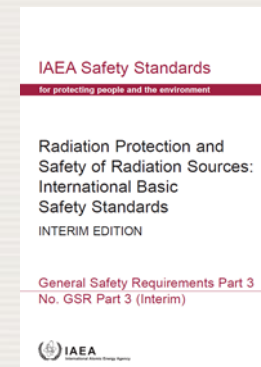
Fundamentals

Requirements

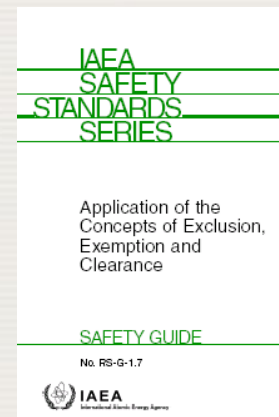
Guides



underlying principles - aimed at politicians and regulatory authorities



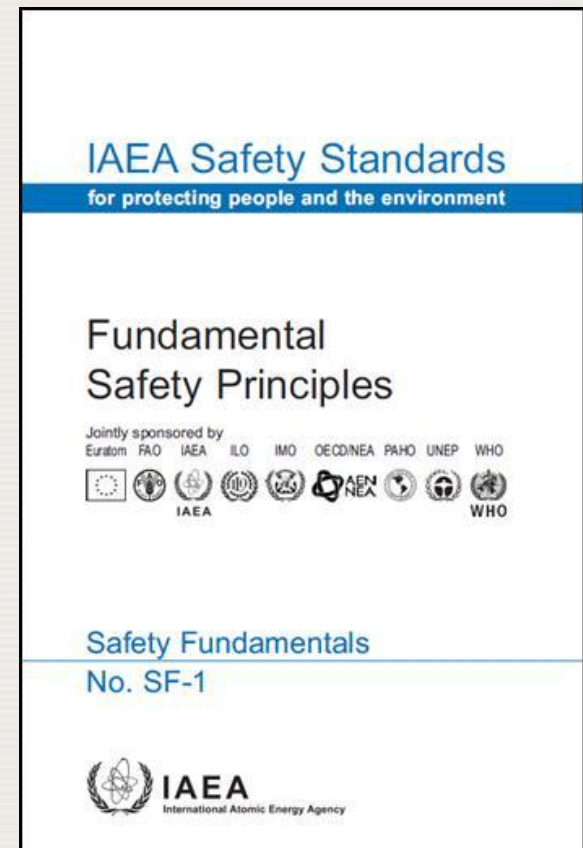
specify obligations and responsibilities (“shall” statements)



recommendations to support requirements (“should” statements)

Safety Fundamentals

- Principle 10: **Protective actions to reduce existing or unregulated radiation risks must be justified and optimized**
 - Radon



Safety Requirements

- GSR Part 3 (revised BSS) approved by Board of Governors in September 2011
- Interim edition - November 2011
- Cosponsored edition to be published in 2013
 - WHO
 - ILO
 - PAHO
 - EC
 - NEA/OECD
 - FAO
 - UNEP



IAEA Safety Standards

for protecting people and the environment

Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards

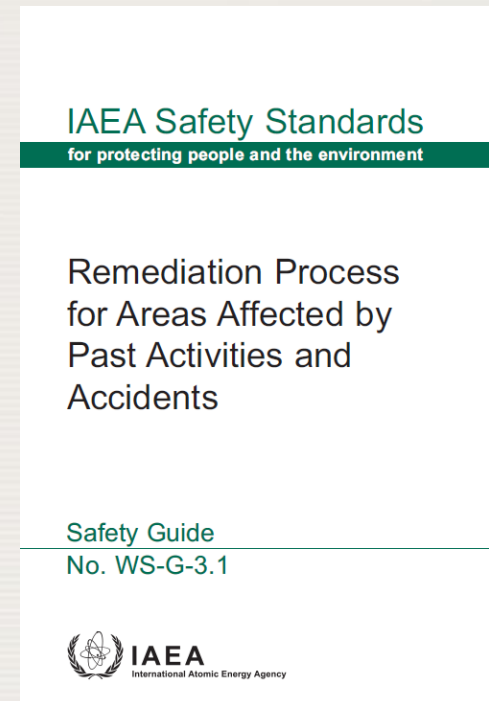
INTERIM EDITION

General Safety Requirements Part 3
No. GSR Part 3 (Interim)



Safety Guides

- DS421: Protection of the Public against Exposure Indoors due to Natural Sources of Radiation
 - NEW Safety Guide
 - Comment from Member States closed 13 Aug 2012
 - To be cosponsored by WHO



Radon in dwellings

- **Dwellings** and other buildings of high occupancy factors for members of the public (e.g. schools)

Radon indoors

The government shall ensure that:

(a) Information is gathered on activity concentrations of radon in dwellings and other buildings of high occupancy factors for members of the public (e.g. schools) through appropriate means such as representative radon surveys

- Review existing data on radon
- If no data exists, initiate localized surveys
- Carry out national survey

(b) Relevant information on the exposure due to radon and the associated health risks, including increased risks relating to smoking, is provided to members of the public and other interested parties

- Information on distribution of radon worldwide / within country
- Scientific evidence on health risks
- Basics of radon mitigation

Radon indoors

- Where activity concentrations of radon that are of concern for public health are identified, the government shall ensure that an action plan is established comprising coordinated actions to reduce radon levels for existing buildings and for future buildings

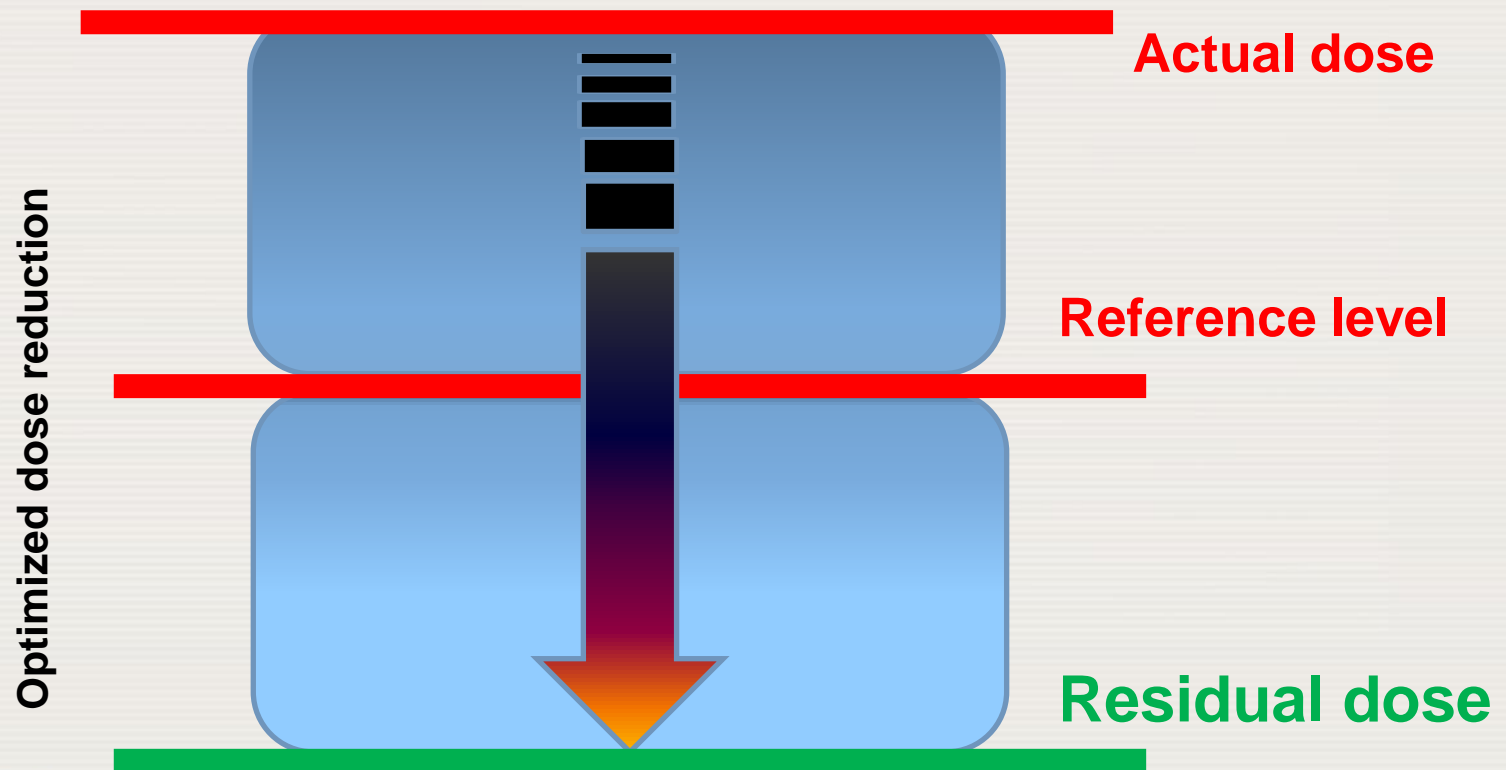
Justification and Optimization

The government and the regulatory body or other relevant authority shall ensure that remedial actions and protective actions are justified and that the protection and safety is optimized.

- Justified – the protective actions yield sufficient benefits to outweigh the detriments associated with taking them
- Optimized – the best level of protection under the prevailing circumstances. The reference level serves as a boundary condition in defining the range of options for the purposes of optimization in implementing protective actions
 - For radon, reference level set in terms of activity concentration (Bq/m^3), rather than effective dose (mSv), for reasons of practicality

Reference levels

- optimised protective actions or strategy should be aimed at reducing any exposures that are above the reference level to a level that is below the reference level



Radon Action Plan

- **National radon policy**
 - Government to assign responsibility for establishing and implementing the action plan (organization for radiation safety)
 - Consultation with other national organizations – radiation measurements, public health, building standards,
- **Provision of information**
 - Information on radon action plan
 - Public, homeowners, building professionals
- **National survey of radon in dwellings**
 - Estimate average exposure to radon of the population and the range of exposures occurring
 - Identify areas where higher than average radon levels are likely to be found

Radon Action Plan

- **Measurement protocols**
 - Measurement period, type of detectors, seasonal correction factors
 - Quality control programme
 - Inter-comparison exercises
- **Setting a reference level for dwellings**
 - Not to exceed an average annual concentration of 300 Bq/m³
 - Take into account prevailing social and economic circumstances
 - Chosen so that resulting activities are practicable and manageable
- **Radon prone areas**
 - “high radon area” or “radon affected area”
 - Identify those regions where the highest radon concentrations are likely to be found so that these can be specifically targeted e.g. by specifying particular building techniques, making measurements

Radon Action Plan

- **Control and reduction of exposure to radon**
 - Corrective measures for existing dwellings
 - Priority for those dwellings that greatly exceed the reference level
 - Availability and effectiveness of cost effective radon mitigation techniques
 - Decision on whether mitigation is carried out left to owners of dwellings
 - Government to determine the circumstances under which remedial action is to be mandatory or is to be voluntary
 - Rental accommodation
 - Sale of dwellings
 - Building codes for new dwellings – radon prone areas
- **Evaluation of effectiveness**
 - Reduction in number/percentage of dwellings above reference level
 - Reduction in average radon level

Radon in workplaces

- Workplaces

Radon in workplaces

- **Planned exposure situations**

- Exposure to radon takes place in workplaces that involve the mining and processing of raw materials that involve exposure to radioactive material, regardless of the levels of radon
 - e.g. uranium mine, mineral sand mine
- Workplaces where it is not possible or not acceptable to reduce the radon level below the reference level for workplaces
 - e.g. show cave
 - Apply graded approach to control of such workplaces
 - Subject to dose limit for planned exposure situations
 - Radon may be one of several pathways for exposure of workers – gamma, inhalation of dust

Radon in workplaces

- **Existing exposure situations**
 - In other workplaces, radon is managed as an existing exposure situation, and controlled through the use of reference level for workplaces and optimization of protection.
 - The value of the reference level not to exceed an average annual concentration of 1000 Bq/m³
 - e.g. offices, factories

Conclusion

- Countries to consider if control of radon is necessary
- Information on radon levels to be collected
- Information on exposure due to radon and health risks to be provided to the public and other interested parties
- Where radon levels are of concern for public health, an action plan needs to be established
 - Set national reference level for radon
 - Develop and implement appropriate building codes
 - Establish control strategies for existing buildings
 - Provide information to interested parties
 - Close cooperation among national authorities

Thank you for your attention



t.boal@iaea.org

