Public radiation protection against radon
Russian Federation: 2019 update

Sergey Kiselev
Federal Target Program:
Radon 1994

Main tasks

- regulatory basis
- national radon survey
- federal radon database
- development of methods, materials and technologies

Federal level

- Estimation of population exposure to radon and natural sources
- Health effects studies
- Development of methods, materials and technologies to reduce exposure of the population from natural sources

Regional level

- Regional and local surveys
- Regional Databases
- Identification of areas exposed to radon exposure
- Radon mitigation techniques to reduce exposure of the population in the premises
- Regular inspection during the construction of new buildings

FTP Ensuring nuclear and radiation safety:
2005 - present time

Regional Workshop for Sharing the Best Practices in the Implementation of Radon Action
Velingrad, Bulgaria, 9-11 April, 2019
Federal Service for Surveillance on Consumer Rights Protection and Human Wellbeing

Radiation Hygiene Scientific Research Institute n.a. P.V. Ramzayev

Involved parties

Federal Medical Biological Agency

Research and Technical Center of Radiation-Chemical Safety and Hygiene

State Research Centre Burnasyan Federal medical biophysical centre

RUSSIAN ACADEMY OF SCIENCES

SCIENTIFIC RESEARCH

MAIN AREAS OF RESPONSIBILITIES

ALL TERRITORIES EXCEPT closed administrative territorial entity, nuclear fuel cycle facilities, radiation hazardous objects

Involved parties

➢ Development of recommendations and guidance documents
➢ Federal Radon Database
➢ Inspection (public places, workplaces)

closed administrative territorial entity, nuclear fuel cycle facilities, radiation hazardous objects

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State Policy Fundamentals of the Russian Federation in the Field of Nuclear and Radiation Safety up to 2025

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- Improvement of state control (supervision) over the radon impact on human health in dwellings, kindergartens, public and industrial buildings

- Maintaining the lowest exposure doses to the public due to natural radiation sources, including radon and its decay products.

- Strategic planning:
  - To reduce the number of people living in radon prone areas and exposed to unacceptably high radon levels,
  - To reduce the average value of individual radon risk for the entire population of the country.

The goal:

- introduction of exposure situation approach to radiation safety according new BSS (2014)
- introduction new concept of regulation in existing exposure situation
Proposals in National Radiation Safety Standards:

• **Reference level** versus **action level**.

• National reference level & Regional Reference Levels

• **National reference level** - the upper limit of optimization, fixed value/Radon limits during building commissioning.

• **Regional Reference Levels** – not fixed values– depends on the real situation on the ground

• The discussion about indicators of regulated radon values: **radon progeny or radon gas concentration**

• **Thoron regulation** - restriction to monitoring of building materials.

**Equilibrium Equivalent Concentration, EEC, Bq/m³**

\[ E E C_{Rn + Tn} = E E C_{Rn} + 4.6 \times E E C_{Tn} \]

- **EEC** - indoor Rn progeny
- **EEC** - indoor Tn progeny
- \(4,6 = K_{d(Tn)} / K_{d(Rn)}\)

\[ EEC = F \times A_{Rn} \]

- **F** - equilibrium factor,
- **A** - actual radon concentration
Radon data accumulation.

STEP BY STEP APPROACH

Regional Workshop for Sharing the Best Practices in the Implementation of Radon Action
Velingrad, Bulgaria, 9-11 April, 2019
Uranium Thorium ores. 1940s - uranium geological maps.

Regional Workshop for Sharing the Best Practices in the Implementation of Radon Action
Velingrad, Bulgaria, 9-11 April, 2019
Interregional radiological centers (methodical & practical support) (Rospotrebnadzor)
Radiation monitoring labs (radon measurements)

Federal Supervision Service for Protection of Consumers’ Rights and Public Welfare (Rospotrebnadzor)
Federal Medical Biological Agency (FMBA)

Radon data accumulation

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FEDERAL RADON DATABASE SINCE 2007
More than 10 million measurements

Annual Radiation-Hygienic Certificate of RF.
SSND detectors

SCIENTIFIC RADON-2018 DATABASE (NEAR 40,000 ADDRESSED INTEGRAL MEASUREMENTS)
**Radon measurements issues**

- Methodological aspects of radon surveys
- Guidance & guidelines
- Equipment
- Qualified staff
- Data accumulation

**Regulatory issues**

- Citizenship appeal on radon issues Public – authorities feedback
- Supervision during building construction
- Stakeholder involvement
- Organization and holding events on radon mitigation in buildings
- Methodological support of supervisory activities

**The level of significance of the problem of ensuring the radon safety of the population in the region**

**EXISTING PROBLEMS**

**RESPONSE TO FEDERAL AUTHORITIES**

**Regional Workshop for Sharing the Best Practices in the Implementation of Radon Action**

Velingrad, Bulgaria, 9-11 April, 2019
What has been done

- Preparation of printed materials (books, booklets)
- Development of information posters
- Development of Guidance for building Professionals
- Questionnaires on regular basis with reginal offices

- Upcoming Scientific events:
  - Radon conference in Yekaterinburg (March, 2020)

- Legislative and regulatory framework
  - Proposal were prepared in Fundamental of state policy
  - National Radiation Safety standards
  - Offers to order by FMBA to regional offices to improve radon data collection

- Development of new equipment for integral measurements

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Financial support is enough (only for scientific research initiatives (not enough budgets for regions))

Lack of "Radon industry infrastructure" for the public involvement

- Not enough building professionals specializing in radon issues
- No training courses in this area
- Not enough radon monitoring net coverage
- Lack of the public awareness in the regions
Next STEPS and NEW Challenges

➢ Revision of the legal regulations in accordance with new epidemiological findings and current WHO, ICRP, IAEA recommendations.

➢ Update of ongoing activities:
  • enhancing cooperation infrastructure between local, regional and national authorities;
  • implementation of radon preventive Strategies including development of technologies to construct radon-safe buildings.

➢ Synchronization of the radon program with the associated national programs (anti-smoking & energy saving).

➢ Improving public awareness of health problems caused by radon.
Thank you for your attention