How to Treat with the New German Radiation Protection Act?

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Introduction to the German Regulatory System
German Nuclear Regulations in a Global Context

- Global Level
- European Level
- National Level

German Constitution

- Germany is a Federation (Bund) consisting of 16 states (Länder / Bundesländer)
- German Basic Law defines on which topic whether the federal republic or the states are responsible
- Execution of federal laws in principle within states responsibilities
- Regulatory Body composed of Federal Government authorities and State Government authorities

Hierarchy of German Nuclear Regulations

- Federal Level
- General Level
- Authority Level
- Industry Level

- Generally binding
- Binding for authorities
- Binding to specified order limits or the individual case
- Technical specifications for components and systems, operation and operating norms
Composition of the German Regulatory Body

German Nuclear Regulations: Responsibilities

<table>
<thead>
<tr>
<th>Regulatory function</th>
<th>Federal Government authorities</th>
<th>States (&quot;Länder&quot;) government authorities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishment of national safety requirements and regulations</td>
<td>X/participation</td>
<td>X/*</td>
</tr>
<tr>
<td>Licensing and Inspection</td>
<td>oversight</td>
<td>X/*</td>
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<tr>
<td>Enforcement of applicable regulations and the terms of licences</td>
<td>oversight</td>
<td>X/*</td>
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<tr>
<td>Regulatory safety research</td>
<td>X/*</td>
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<tr>
<td>Monitoring of events, operating experience and implementation</td>
<td>X/*</td>
<td>X/*</td>
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<tr>
<td>Radiation protection, environmental monitoring</td>
<td>X/*</td>
<td>X/*</td>
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<tr>
<td>Emergency preparedness</td>
<td>X/*</td>
<td>X/*</td>
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<td>International co-operation</td>
<td>X/*</td>
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</tbody>
</table>

\* = responsible for implementation

Doses in Germany
Natural sources vs. man-made sources
Effective annual doses in Germany

Cosmic: 0.3 mSv
Terrestrial: 0.4 mSv
Food: 0.3 mSv
Radon: 1.1 mSv
Medic: 1.7 mSv
R&D – NPP – Fallout – Chernobyl: <0.01 mSv

Increasing consideration of natural radiation in international recommendation and national legislation!

Background and Objective of the German Radiation Protection Act

Background: Announcement of European Basic Safety Standards (BSS) in 2013/2014

„EU Basic Standards“
- Directive 2013/59/Euratom
- Consolidation of several guidelines in one document
- Fundamentals and principles of the general radiation protection regime essentially unchanged
- Consideration of ICRP 103 and other recommendations
- Largely consistent with the IAEA Basic Safety Standards
  - Parallel development in close co-operation
  - Especially: numerical values harmonised
  - But: different degree of detail and legal status
- Implementation of EU BSS in national law by 6 February 2018
Objective: Amendment and Separate Formal and Legal Basis for Radiation Protection

Implementation of the EU Basis Standards
- System of radiation protection acc. to ICRP 103
- New areas of regulation

Modernisation of radiation protection law
- Execution-friendly design
- Adaptation of the emergency preparedness concept on the basis of lessons learned from Fukushima

Consolidation of applicable laws and ordinances
- Parts of the Atomic Energy Act
- Precautionary Radiation Protection Act
- Radiation Protection Ordinance
- X-Ray Ordinance

System of Radiation Protection

Exposure situations
- Planned exposure situations (Part 2)
- Existing exposure situations (Part 4)
- Emergency exposure situations (Part 3)

Rad. protection principles
- Justification (§ 6)
- Optimisation (§ 8)
- Dose limitation (§ 9)

Exposure criteria
- Occupational exposure
- Medical exposure
- Exposure of the population

Early detection

Work Activities and Practices

Radon
Selected Modifications

Changes in Connection with the Official prior Checking of Activities

- **Licence**
  - Notification (examination simplified, no restraint)
  - Registration (only information of the authority)
- **Outside the scope of radiation protection law**
  - No licence or notification required (exemption)

- **Notification procedure**
  - Operation of X-ray devices (nearly unchanged)
  - NORM workplaces (in future from 1 mSv per calendar year)
  - New: Employment of flight personnel and astronauts
  - New: NORM residues remaining subject to supervision
- Other activities involving NORM residues have to be registered

Changes in Connection with Occupational Radiation Exposure

- **The proven system** with radiation protection supervisor (§ 69) and radiation protection officer (§ 70, necessary qualification) is retained
- Radiation Protection Responsible remains responsible for "all" duties
- Radiation Protection Officer/Expert (RPO) for the duties (and powers) within the scope of the appointment
- In future, a RPO will be required in extra areas:
  - Notification of activities involving NORM work so far
  - Transport of radioactive materials
  - Operation of air- and spacecraft
Changes in Connection with Limit Values

Occupationally exposed individuals (§ 78):
(2) Lowered limit for the dose to the eye's lens: 20 mSv/a (according to ICRP recommendation)

Individuals of the population (§ 80):
(1),(2) Limit values apply to the total sum of all activities with licence/notification
(4) Authority co-ordinates overall observance
   (so far only for discharges)
Limit values otherwise essentially unchanged!

New Regulations: Protection against Radon in Interior Spaces (1)

- Reference values for radon
  - In workplaces: 300 Bq/m³
  - In habitable rooms: 300 Bq/m³

- Definition of areas (§ 121)
  - With a considerable number of expected exceeded limit values

New Regulations: Protection against Radon in Interior Spaces (2)

- Radon action plan (§ 122, BMUB)
  - Inhabitable rooms and workplaces
  - Information, explanation of the strategy
  - Suggestion of technical measures
  - Locally adapted strategy and measurements performed by the Länder

- Newly constructed buildings (§ 123)
  - Measures that prevent or hamper radon entry
  - Protection against moisture sufficient outside the defined areas
Changes in Emergency Preparedness

- Comprehensive juridification necessary, implementation largely in federal law intended
- Emergency management system (prevention and reaction)
  - Contingency plans of federation and Länder (§§ 98 - 101)
  - Integral picture of radiological situation
  - Intermeshing of radiation protection law and other areas (disaster control, transport, waste, food monitoring, …)
- Protection of the deployment forces
  - Person carrying out a defined task in an emergency or a different hazard situation and who may be exposed when doing so
  - Instruction, training, further qualification (§ 113 ff.)
- Definition of reference values

Radiation Protection in Emergency Exposure Situations

Major changes (selection):
- Consistent structuring of prevention in contingency plans
  - Based on reference scenarios
- Introduction of optimised protection strategies
  - Orientation on reference value concept
  - Aim: less than 100 mSv effective dose in 1st year
  - Combination of short- and long-term measures, constant adaptation to the situation
- Establishment of a federal radiological situation centre (§ 106)
  - Under the aegis of the BMUB
  - Preparation of an overview of the radiological situation according to § 108
  - Support by BfS, BfE, GRS and BBK

Summary and Conclusion
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- German Radiation Protection Act serves for the implementation of the EU Basic Standards
  - Structuring based on exposure situations
  - Definition of radiation protection principles (strengthening justification)
  - Licensing and notification procedure, regulatory supervision
  - Regulations concerning radon, building materials, contaminated areas
  - Determination of limit values and reference levels

- Pending: issuing of ordinances
  - Material protective provisions
  - Dose determination
  - Events in connection with medical application
  - Clearance
  - … and many more details