Joint Session of the
45th Meeting of the
Radiation Safety Standards Committee (RASSC)
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Waste Safety Standards Committee (WASSC)

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Requirements for Controlling Public Exposure in GSR Part 3
(planned and existing exposure situations)

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Generic requirements
Generic requirements

R1: Application of the principles of radiation protection
Parties with responsibilities for protection and safety shall ensure that the principles of radiation protection are applied for all exposure situations.

R2: Establishment of a legal and regulatory framework
The government shall establish and maintain a legal and regulatory framework for protection and safety and shall establish an effectively independent regulatory body with specified responsibilities and functions.

R3: Responsibilities of the regulatory body
The regulatory body shall establish or adopt regulations and guides for protection and safety and shall establish a system to ensure their implementation.

R4: Responsibilities for protection and safety
The person or organization responsible for facilities and activities that give rise to radiation risks shall have the prime responsibility for protection and safety. Other parties shall have specified responsibilities for protection and safety.

R5: Management for protection and safety
The principal parties shall ensure that protection and safety are effectively integrated into the overall management system of the organizations for which they are responsible.
Planned exposure situations
R8: Exemption and clearance
The government or the regulatory body shall determine which practices or sources within practices are to be exempted from some or all of the requirements of these Standards. The regulatory body shall approve which sources, including materials and objects, within notified practices or authorized practices may be cleared from regulatory control. (the order of 10 μSv/a or less; low probability scenarios not exceed 1 mSv/a).

R9: Responsibilities of registrants and licensees in planned exposure situations
Registrants and licensees shall be responsible for protection and safety in planned exposure situations. .. Shall assess the likelihood and magnitude of potential exposures, their likely consequences and the number of individuals who may be affected by them.

R10: Justification of practices
The government or the regulatory body shall ensure that only justified practices are authorized.
Not justified: deliberate addition of radioactive substances or by activation in food, feed, beverages, cosmetics; use of radiation or radioactive substances in commodities or in consumer products such as toys and personal jewellery or adornments; Human imaging using radiation that is performed as a form of art or for publicity purposes; Human imaging using radiation that is performed for occupational, legal or health insurance purposes and is undertaken without reference to clinical indication; Human imaging using radiation for the detection of concealed objects for anti-smuggling purposes.

More explicitly require protection of the public among other safety requirements
Planned exposure situations (II)

R11: Optimization of protection and safety
The government or the regulatory body shall establish and enforce requirements for the optimization of protection and safety, and registrants and licensees shall ensure that protection and safety is optimized.
… Shall establish or approve constraints on dose and on risk, as appropriate, or shall establish or approve a process for establishing such constraints, to be used in the optimization of protection and safety.
…for public exposure, registrants and licensees shall ensure, as appropriate, that relevant constraints are used in the optimization of protection and safety for any particular source within a practice.

R12: Dose limits
The government or the regulatory body shall establish dose limits for occupational exposure and public exposure, and registrants and licensees shall apply these limits.
… establish and enforce compliance with the dose limits …
… determine what additional restrictions, are required owing to possible combinations of doses from exposures due to different authorized practices.

R13: Safety assessment
The regulatory body shall establish and enforce requirements for safety assessment, and the person or organization responsible for a facility or activity that gives rise to radiation risks shall conduct an appropriate safety assessment of this facility or activity.
… The person or organization, or registrants and licensees, as appropriate, shall conduct a safety assessment that is either generic or specific to the practice or source for which they are responsible….
…. At different stages…
…. To determine the expected likelihood and magnitudes of exposures in normal operation and, to the extent reasonable and practicable, to make an assessment of potential exposures..
Planned exposure situations (III)

R15: Prevention and mitigation of accidents
Registrants and licensees shall apply good engineering practice and shall take all practicable measures to prevent accidents and to mitigate the consequences of those accidents that do occur.

Good engineering practice
Defence in depth
Accident prevention
Emergency preparedness and response.

R17: Radiation generators and radioactive sources
Registrants and licensees shall ensure the safety of radiation generators and radioactive sources.

.. When choosing a location to use or to store a radiation generator or radioactive source, registrants and licensees shall take into account:
(a) Factors that could affect the safe management of and control over the radiation generator or radioactive source;
(b) Factors that could affect occupational exposure and public exposure due to the radiation generator or radioactive source;
Planned exposure situations (IV)

R18: Human imaging using radiation for purposes other than medical diagnosis, medical treatment or biomedical research

The government shall ensure that the use of ionizing radiation for human imaging for purposes other than medical diagnosis, medical treatment or biomedical research is subject to the system of protection and safety.

• justification of practices; \( IF \) justified
• regulatory control

For human imaging using radiation, performed by medical personnel using medical radiological equipment

(a) dose constraints are established for such human imaging… used instead of diagnostic reference levels;
(b) optimization requirements for medical exposure are applied.

For inspection imaging devices to expose persons for the purpose of detection of concealed weapons, contraband or other objects on or within the body apply the requirements for public exposure in planned exposure situations; optimization of protection and safety is subject to any dose constraints for public exposure set by the government or the regulatory body.

ensure that all persons who are to undergo procedures with inspection imaging devices in which ionizing radiation is used are informed of the possibility of requesting the use of an alternative inspection technique that does not use ionizing radiation, where available.
Planned exposure situations (V)

**R29: Responsibilities of the government and the regulatory body specific to public exposure**
The government or the regulatory body shall establish the responsibilities of relevant parties that are specific to public exposure, shall establish and enforce requirements for optimization, and shall establish, and the regulatory body shall enforce compliance with, dose limits for public exposure.

**R30: Responsibilities of relevant parties specific to public exposure**
Relevant parties shall apply the system of protection and safety to protect members of the public against exposure.

- General considerations
- Visitors
- External exposure and contamination in areas accessible to members of the public

**R31: Radioactive waste and discharges**
Relevant parties shall ensure that radioactive waste and discharges of radioactive material to the environment are managed in accordance with the authorization.

**R32: Monitoring and reporting**
The regulatory body and relevant parties shall ensure that programmes for source monitoring and environmental monitoring are in place and that the results from the monitoring are recorded and are made available.

**R40: Release of patients after radionuclide therapy**
Registrants and licensees shall ensure that there are arrangements in place to ensure appropriate radiation protection for members of the public and for family members before a patient is released following radionuclide therapy.
Planned exposure situations (VI)

**Requirement 33: Consumer products**

Providers of consumer products shall ensure that consumer products are not made available to the public unless their use by members of the public has been justified, and either their use has been exempted or their provision to the public has been authorized.

**USE by members of the public must be**
- Justified
- exempted
- or authorized

Production, transportation and retail
- demonstrate compliance with the requirements;
- arrangements for the servicing, maintenance, recycling or disposal;
- design and manufacture of consumer products - subject to the optimization of protection and safety;
- labeling: product contains radioactive substances, radionuclides and activities; the provision has been authorized; required or recommended options for recycling or disposal;
- information and instructions: installation, use and maintenance; servicing and repair; radionuclides and their activities at a specified date; dose rates in normal operation and during servicing and repair; required or recommended options for recycling or disposal; transport and storage.
Existing exposure situations
Existing exposure situations (I)

**R47: Responsibilities of the government specific to existing exposure situations**

The government shall ensure that existing exposure situations that have been identified are evaluated to determine which occupational exposures and public exposures are of concern from the point of view of radiation protection.

- **The government:** to identify, assign responsibilities for protection and safety, establish reference levels, to include provisions in the legal and regulatory framework.
- **The regulatory body/relevant authority** shall ensure that it specifies objectives of the protection strategy and appropriate reference levels.
- **The regulatory body/relevant authority** shall implement the protection strategy, arrange for evaluation of the efficiency of the actions, ensure that information is available.

**R48: Justification for protective actions and optimization of protection and safety**

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

- Justification of protective actions and remedial actions
- Optimization of protection
- Reference levels typically expressed as annual effective dose to the representative person in range of 1-20 mSv

**R49: Responsibilities for remediation of areas with residual radioactive material**

The government shall ensure that provision is made for identifying those persons or organizations responsible for areas with residual radioactive material; for establishing and implementing remediation programmes and post-remediation control measures, if appropriate; and for putting in place an appropriate strategy for radioactive waste management.
Existing exposure situations (II)

R50: Public exposure due to radon indoors
The government shall provide information on levels of radon indoors and the associated health risks and, if appropriate, shall establish and implement an action plan for controlling public exposure due to radon indoors.
- Information on radon levels in dwellings and other buildings of high occupancy gathered made available for the public,
- Assign responsibility to a regulatory body/relevant authority, establish reference levels below 300 Bq/m³
- If significant radon levels, then national action plan

R51: Exposure due to radionuclides in commodities
The regulatory body or other relevant authority shall establish reference levels for exposure due to radionuclides in commodities.
- Establish specific reference levels for exposure to radionuclides in construction materials, food, feed, drinking water – reference level is not to exceed 1 mSv;
- Food traded internationally as a result of a nuclear or radiological emergency – FAO/WHO - Codex has published guideline values;
- Drinking water – WHO guidelines.

R52: Exposure in workplaces
The regulatory body shall establish and enforce requirements for the protection of workers in existing exposure situations.
The requirements in respect of public exposure shall be applied for protection and safety for workers in existing exposure situations, other than:
Remediation of areas with residual radioactive material - exposure of workers is planned exposure situation,
Exposure due to radon in workplaces - reference level for $^{222}\text{Rn}$ below 1000 Bq/m³
Safety Guides (examples)

Under revision

Radiation Safety of X-ray Generators and other Radiation Sources Used for Inspection Purposes and for Non-Medical Human Imaging

Radiation Safety in the Use of Sources in Research and Education

SR Design and Conduct of Indoor Radon Surveys

TECDOC Radiation protection against indoor radon and building material – remediation and prevention
Safety Guides (examples)
Thank you!