SFRP
Société Française de Radioprotection

Summary of the third SFRP-IRPA workshop on the application of the concept of tolerability

J-F. Lecomte, T. Schneider, Y. Billarand , B. Le Guen, C. Schieber, L. Vaillant, S. Andresz, V. Chambrette

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Introduction

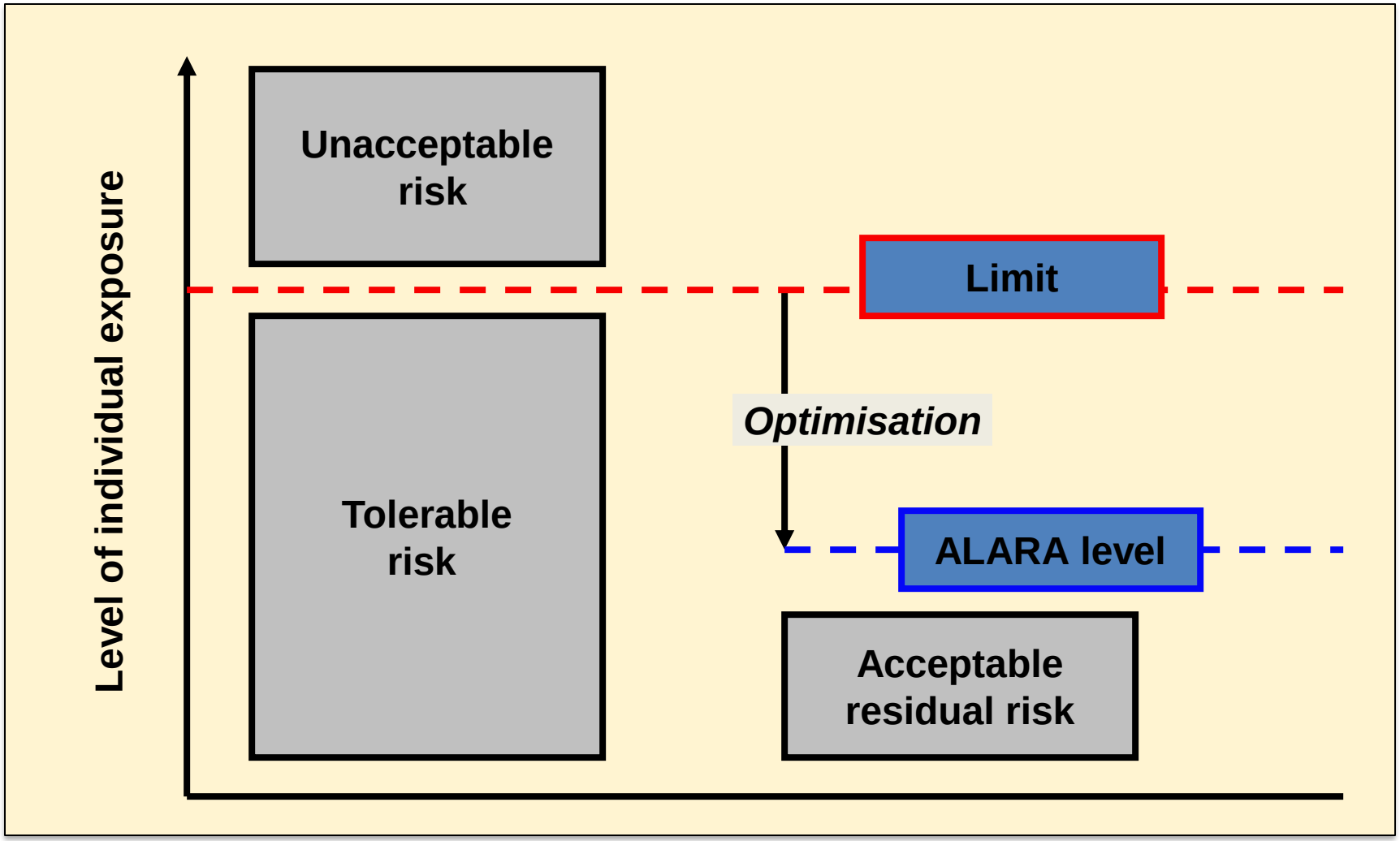
- Optimisation principle (ALARA) is the **cornerstone** of the RP System
- IRPA 14 (Cape town, 2016): need for a **greater visibility** of the decision making processes to reach a **reasonable** level of protection
- **SFRP initiative** about the search for reasonableness
- 2 workshops ALARA organised in Paris by SFRP and focused on **Reasonable** (Feb 2017 and Oct 2018)
- 3rd workshop ALARA virtual (May 2021) focused on **Tolerable**

3rd SFRP/IRPA workshop on Tolerability

- Virtual on May 4-5, 2021
- About 50 attendees from 15 countries
- Focused on the Tolerable (**boundary of unacceptable**) in RP
- Exploration of the reasonable/tolerable relationship
- Based on case-studies
- In 3 sectors: Radon, NORM, Dismantling
- Reflections in working groups

- **Radon** = existing exposure situation (ExES)
- **NORM** = ExES according to ICRP but authorities often apply DL
- **Dismantling** = planned ES although some challenges are similar to those in contaminated sites

Tolerability of risk model in Pub 60 (§150)



3rd workshop – Case-studies

- **Radon**
  - Norwegian experience of a locality affected by high outdoor and indoor concentrations
  - Swiss strategy for prioritizing radon remediation in existing buildings
  - House in Bessines sur Gartempes built on mining residues (Fr)
- **NORM**
  - Accumulation in a petrochemical plant in Netherland
  - Legacy of a fertilizer production plant in Spain (phosphogypsum in ponds)
  - Management of residues from coal-fired power plants in Spain
- **Dismantling**
  - Radium contaminated buildings at Safety Light Superfund (USA)
  - Tolerable and reasonable and the dismantling policy in UK
  - Dismantling of the Brennilis NPP in France

3rd workshop – Questions to WGs

- What could be the boundary between tolerable and unacceptable?
  - A dose limit? A reference level? Another criterion? By risk comparison? A combination of criteria (e.g. dose + time of exposure)? Other considerations than the risk?...
- What is the rationale of the considered criteria ?
  - What about the consistency with the management of other hazards?
- Who should set the criteria? How? When?
- What if the situation is not tolerable? What process should be implemented?
- If actions are implemented to improve the situation, what process or criteria should be used to determine that the situation became acceptable?

3rd workshop – WGs – Discussion (1)

- **Radon**
  - Difficult to establish the boundary between tolerable/unacceptable (dose, risk, tolerance level ?); does it exist?
  - 1 number is not sufficient. Intervals?
  - Concept of reference level is inappropriate to be the boundary
  - Case by case; qualitative criteria (children, anthropogenic radon…)
  - Process: function of time, resources, benefit; prevention/mitigation

- **NORM**
  - Radiological protection is generally not central
  - Need to adopt a simple but holistic model (multi-hazards, multi-criteria)
  - Boundary: dose limit is not always adapted; exceeding the reference level is not a failure; for some people, unacceptable = when they are not involved in the decision-making process
  - Qualitative criteria: comparison natural/artificial; human dimension…
  - Stakeholders are difficult to mobilize
  - Case by case, flexibility

3rd workshop – WGs – Discussion (2)

- **Dismantling**
  - Boundary: dose limits? Yes for the radiological risk during the dismantling operation. Combination of criteria for multi-hazards?
  - Not just one risk criterion. Don't add conservatism for compliance
  - Take into account the circumstances; need for consistency
  - The point of view of exposed people is crucial for tolerability
  - Issue of waste is important (production, transport, disposal)
  - Holistic approach (environmental impact)
  - Stakeholder involvement is needed
  - Iterative process, flexibility, sustainable decision
  - Who sets the criteria?: recommendations at the international level; decision by the authorities
  - Process: similarities with the safety demonstration
  - There is a link between tolerability and justification
  - Tolerability is not only individual, it is also societal
  - Need for compromises (protection, costs …)

3rd workshop – Conclusions (1)

- The concept of tolerable is **difficult to grasp**, in particular for ExES (what is the **boundary** of unacceptable when dose limits do not apply? Does it exist? Is it a number?)
- It depends on **several factors**, including qualitative ones
- The first one is the **level of risk** (to be situated on a scale) but it is not necessarily the same for all situations (**no magic number**)
- Tolerable has complementarities with reasonable but they should not be confused
- The existence of an area of **flexibility** between "acceptable" and "unacceptable" is very useful (unlike ISO approach)

3rd workshop – Conclusions (2)

- It is important to take into account all the hazards involved and to properly make a multi-criteria balance between the advantages and disadvantages of the situation (**holistic approach**)
- The **time dimension** plays an important role:
  - Often we have time to act
  - The situation must be sustainable
- In-depth **dialogue** with stakeholders is necessary, even if it is sometimes difficult
- In the end, a decision must be taken and **responsibilities** of everyone must be established.

- Way forward:
  - It is planned to write an article for "Radioprotection“
  - Sectors to be explored: medical, environment

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Thank you for your attention