

Reasonableness and Tolerability in the System of Radiological Protection: ICRP on-going Reflections

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Introduction

- Tolerability of risk and search for reasonableness already on the agenda in ICRP Publication 1 (1959):
 - “... the problem in practice is to limit the radiation dose to that which involves a risk that is **not unacceptable** to the individual and to the population at large.” (para. 30)
 - “...the Commission recommends that all doses **be kept as low as practicable**, and that any unnecessary exposure be avoided.” (para. 45)
- Model of reasonableness and tolerability of radiological risk:
 - A conceptual framework for implementation of ICRP principles
 - Applicable to all types of exposure situation (i.e. planned, emergency, existing)
- On-going discussions at national and international levels to clarify this framework and guide decision-making processes

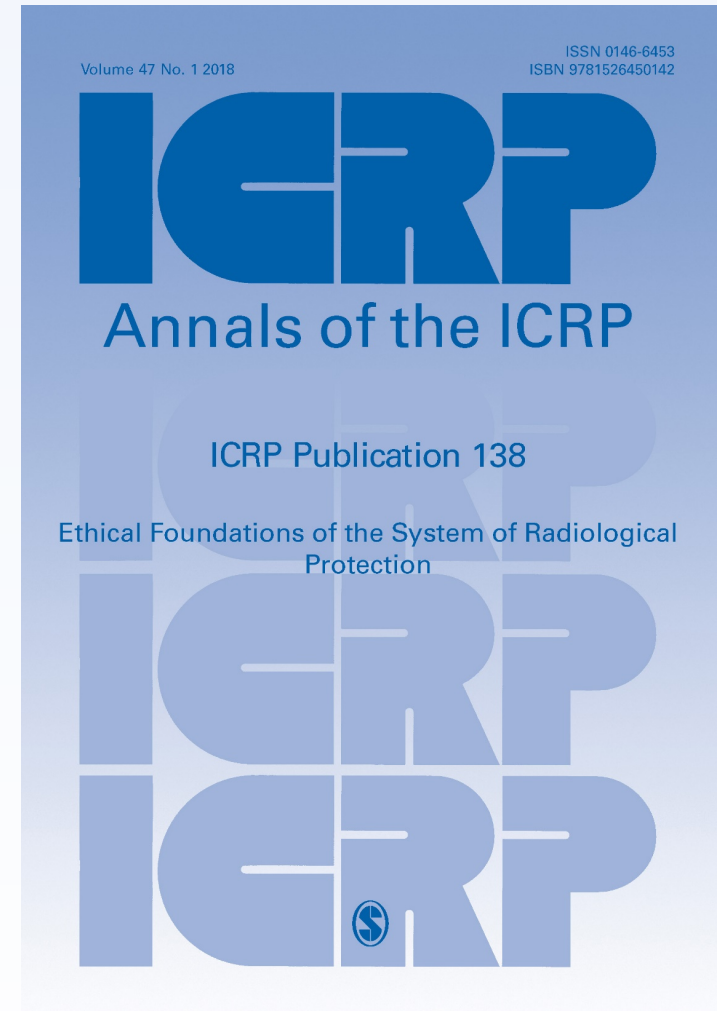
Task Group Objectives of the ICRP

In 2019, ICRP set up a dedicated Task Group aiming at:

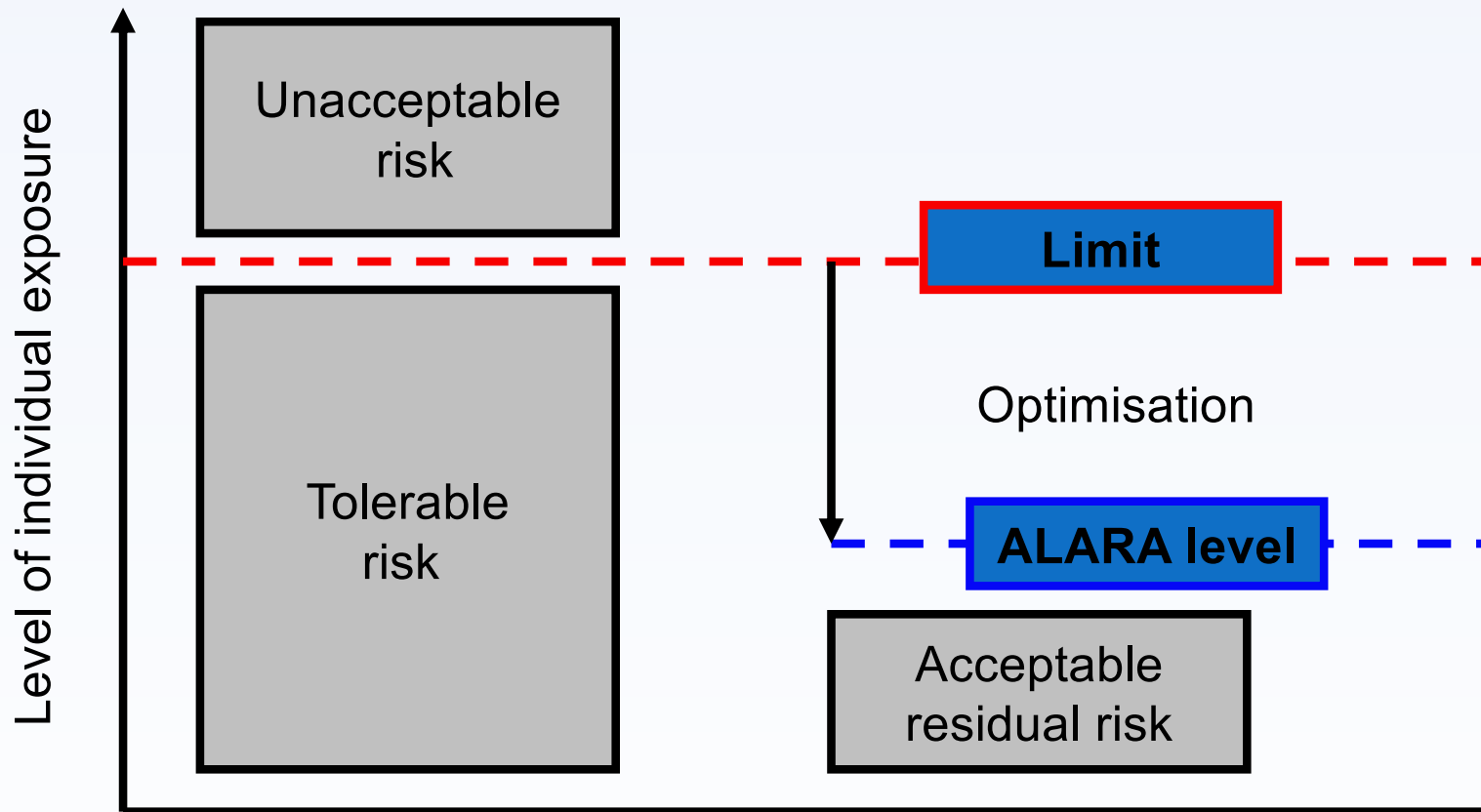
- Reviewing the historical and current perspectives on reasonableness and tolerability to consolidate and clarify Publication 103
- Preparing the considerations and basis needed for development of future recommendations
 - Considering the basis upon which decisions are made for different contributors to risk, to help inform radiological considerations
 - Examination of the approaches used in other fields, such as chemical risk
 - Provide information on the basis and rationale for selection of recommended ICRP values for various dose criteria

Relying on ethical values defined in ICRP Pub. 138

- **Tolerability**
 - The degree or extent to which something can be endured.
- **Reasonableness**
 - To make rational, informed, and impartial decisions that respect other views, goals, and conflicting interests.
- **Aim of protection and relationship with the core ethical values**
 - “... to do more good than harm, avoid unnecessary risk, establish a fair distribution of exposures, and treat people with respect... In this pursuit, the two concepts of reasonableness and tolerability, although supported by quantitative methods, definitively remain of a deliberative nature.” (Para. 65)



Tolerability of risk model for planned exposure situation as referred to ICRP Pub. 103

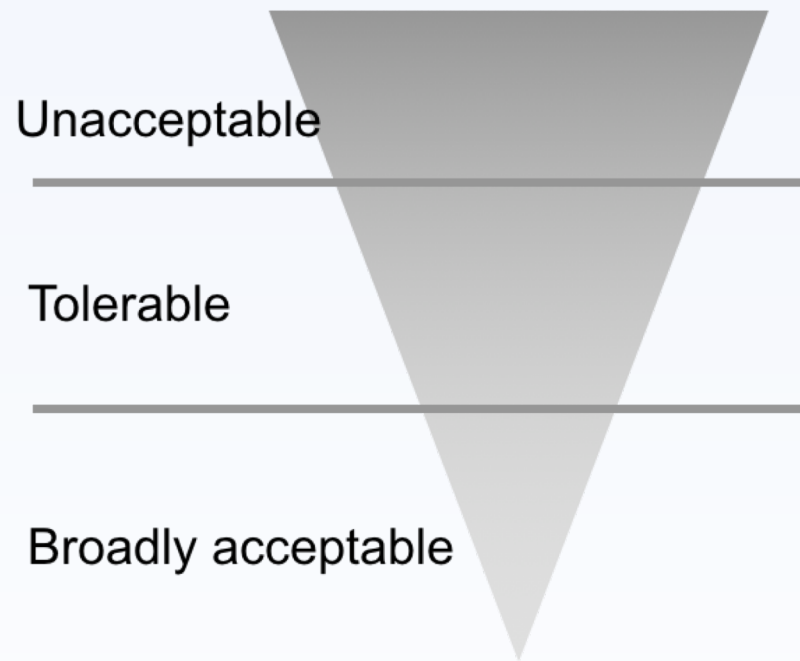


Model based on the report from the British Royal Society in 1983

How to apply the model for emergency and existing exposure situations?

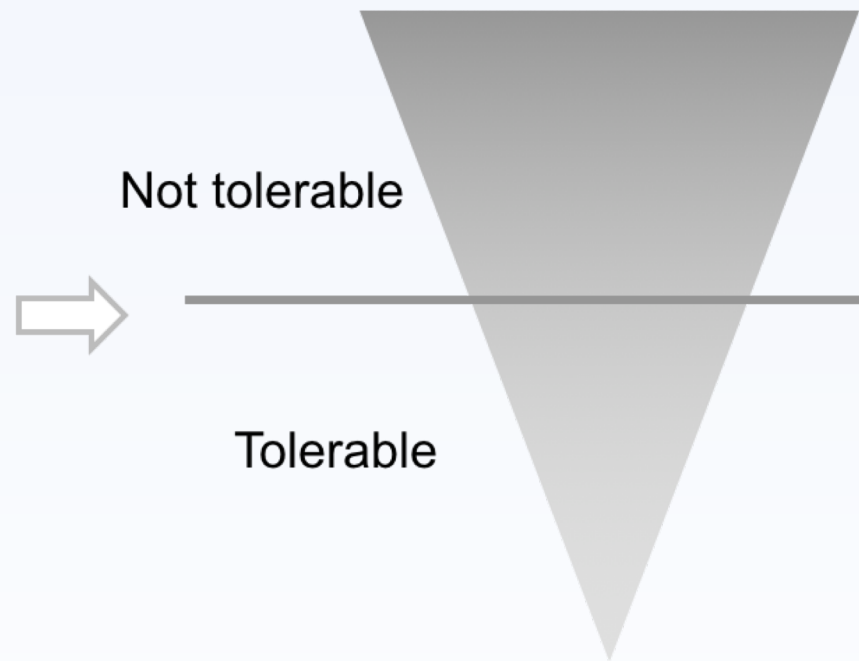
Consideration on the evolution of ISO framework

Ver. 1 (1990) / Ver. 2(1999)



ALARP Framework (as low as reasonably practicable)
UK, HSE, The tolerability of risk from nuclear power
stations (1987)

Ver. 3 (2014)



Tolerability framework

<https://www.iso.org/standard/53940.html>

A process for tolerability and reasonableness

- Focusing on the process and the approach rather than on the risk indicators
- Relying on the involvement of stakeholders
- Articulate tolerability with the ALARA approach in a step-wise process
- Integrate multi-disciplinary considerations in the process
 - Science, practice, societal, economic, environmental, ethical issues
- Further consider the similarities and differences according to cultural and historical contexts

Tolerable risk: Risk criteria - Bands/ranges of risk

- Meaning or usefulness to define ranges/bands of risk for tolerability of risk
- Risk comparison – all hazard approach notably for chemical risk or environmental issues
- Consideration of societal risk versus individual risk depending on the exposure situation as well as risk for future generations
- Risk consideration in the case of medical exposure
- Meaning of risk indicator for environmental protection

Further developments on tolerability of risk

- **Investigate the link of tolerability of risk with specific numerical dose or risk criteria**
 - Rationale for determining the criteria
 - Indicators: annual vs lifetime, individual vs collective risk...
 - Cope with specific situations
 - Multi-hazards situation and risk-comparison
- **Clarify the role of tolerability of risk with regard to regulatory control**
 - Is the risk not-tolerable above the dose limit (for occupational and public exposures)?
 - When the dose limit does not apply, can the reference level be a criterion for risk tolerability?
 - For medical exposure, how does the appropriateness of radiological procedure (medical needs) determine the tolerability of risk for patients?

Further development on the concept of reasonableness (1)

- Optimisation is a deliberative process to achieve a reasonable “compromise” with all (informed) stakeholders
- Reasonableness referring to: good judgement, fairness, practicability, moderateness, appropriateness
 - *Looking for appropriate level of protection for people and environment.*
 - *“Maximizing well-being” of everybody in the sense of developing a compromise*
 - *Integrating ethical issues: Beneficence, Prudence, Justice, Dignity, Accountability, transparency, inclusiveness*
 - *Considering risk perception: Voluntariness, Controllability, Social trust / confidence, Level of information / knowledge*

Further development on the concept of reasonableness (2)

- **Optimisation implies:**

- A clear identification of the actual challenges to achieve the best protection in prevailing circumstances
- Identification of the relevant stakeholders and decision-makers
- Relying on an holistic approach
- Ensuring or restoring trust between the parties
- A proactive process of involvement, awareness development, empowerment/training, promoting risk-informed decision making processes

Further development on the concept of reasonableness (3)

- Addressing reasonableness in the perspective of holistic approach with a focus on well-being
- Need to better characterize the criteria and the process allowing to evaluate the “well-being” and notably the component in terms of radiological exposure
- Assessing reasonableness relying on 3 Rs approach:
 - *Relationships: engage stakeholders, ensure transparency, and demonstrate empathy*
 - *Rationale: strong and well-communicated technical and ethical justification*
 - *Resources: responsible use of technology, time, and money*

Conclusion

- ICRP system has proven successful
- Need to reach a share understanding and to further refine the process(es) to better address tolerability and reasonableness in the different exposure situations
- Relying on workshops held in cooperation with several international organisations (IRPA, NEA, IAEA, WHO...) and national organisations (HPS, SSK, SFRP, JHPS...)

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