



Considerations on the concept of reasonableness in the ICRP system and ethical issues

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Outline

- **The Quest for ‘Reasonableness’
: Historical Perspective through ICRP Publications**
- **Ethical Considerations about ‘Reasonableness’**
- **Summary**



This presentation has neither been approved nor endorsed by the Main Commission of ICRP.

Prudence

- Recognition of stochastic effect: **Concept of reducing exposure**
- The limit is not anymore a guarantee of the absence of risk.
- Adoption of **a prudent attitude** and recommendation “that every effort be made to **reduce** exposures to all types of ionizing radiations **to the lowest possible level**” (ICRP 1950 Recommendations, 1951)
- “This position facilitated the Commission’s introduction of the optimisation principle two decades later.” (ICRP 101b, 2006).

Harm vs Avoiding Harm

- In a context of **uncertainty** taking a risk is justified only if there is a benefit in return. If there is a benefit, **how far to reduce the risk** without endanger the activity?
- “exposure to radiation be kept **at the lowest practicable level** in all cases” (ICRP 1954 Recommendations, 1955)
- In ICRP Publication 1 (1959) it is already stated that faced with “the existing **uncertainty** as to the dose-effect relationships for somatic effects” the Commission recommends “that all doses be kept **as low as practicable**”.
- A compromise between potential deleterious effects and social benefits.

Economic and Social Considerations

- The reduction of risk must be compared with the effort to achieve it.
- “all doses be kept **as low as is readily achievable**, **economic and social considerations** being taken into account” (ICRP 9, 1966)
- “the resulting doses are **as low as is reasonably achievable**, **economic and social considerations** being taken into account” (ICRP 22, 1973)
- Need of quantification for practical application

Balancing Costs and Benefits

- “It is then helpful to express the population dose not only in man-rems, but also in **social and economic terms**, for example, in terms of **detriment or monetary units**, so that **the advantage of a reduction in collective dose** can be **compared directly with the detriment or cost** of achieving this reduction.” (ICRP 22, 1973)
- Introduction of the methodology of **cost-benefit analysis**: a leading role for structuring the practical implementation of the principle i.e.: **to balance the risk associated with exposure with the benefit** provided by the activities or the situation

Beyond the Original Cost-Benefit Model

- Attempt to **integrate risk aversion** by taking into account the level of individual dose in the quantitative framework of the cost-benefit analysis (ICRP 37, 1983)
- Recommendation to also use **decision-aiding techniques** based on the scoring and ranking of multiple factors to compare protection options and to adopt **a structured approach** (the so-called optimisation procedure) for the practical implementation of ALARA (ICRP 55, 1988)
- Consideration about **equity in the dose distribution** and tolerability of the risk in relation with the optimisation principle (ICRP 60, 1990)

Direct Involvement of Concerned Parties

- Despite all efforts to anchor the optimisation of protection in the rationality of classical economics, the process to maintain levels of exposure ALARA remains essentially **a matter of judgment mixing quantitative and qualitative criteria** and field experience.
- From the late 1990s, **the search for reasonableness** was enhanced with **stakeholder involvement** approaches to better cope with the specificities of each exposure situation and to select protective actions.
- “The decision-making process may include the **participation of relevant stakeholders** rather than radiological protection specialists alone” (ICRP 82, 1999)

Optimisation - Broadening the Process

- “However, the way in which the optimisation process should be implemented **is now viewed more broadly** to reflect the **increasing role of individual equity, safety culture, and stakeholder involvement** in our modern societies.” (ICRP 101b, 2006)
- One of the key challenges: To develop evaluation procedures for deliberation among stakeholders on **what is reasonable.**

The Quest for 'Reasonableness'

to reduce exposures	to the lowest	possible level		(ICRP, 1951)
to keep exposures	at the lowest	practicable level		(ICRP, 1955)
to keep exposures	as low as	practicable		(ICRP 1, 1959)
to keep exposures	as low as	readily achievable	economic and social considerations being taken into account	(ICRP 9, 1966)
to keep exposures	as low as	reasonably achievable	economic and social considerations being taken into account	(ICRP 22, 1973)
to keep exposures	as low as	reasonably achievable	economic and social factors being taken into account	(ICRP 26, 1977)
to keep exposures	as low as	reasonably achievable	economic and societal factors being taken into account	(ICRP 103, 2007)

Ethical Considerations: ‘Reasonableness’

- “The fundamental constituents of **reasonableness** are: the willingness to use **rational methods of inquiry**, the regard for **considerations of equity**, the ability to view human actions and statements with **perspective and judgments**, the **impartiality** of approach to the means of adjudicating conflicting interests, the **esteem for the judgment of others** when based upon knowledge and experience, the **respect for the agreed goods and goals** of competent fellows.”

(Nicholas Rescher, 1954)

Wisdom

- **Reasonableness** is considered an expression of **wisdom**, defined as “the quality of having **experience, knowledge, and good judgement**” (Oxford Advanced Learner’s dictionary).
- As a virtue, **wisdom** is the disposition to behave and act with the highest degree of adequacy under any given circumstances. In its popular sense, **wisdom** is attributed to a person who takes **reasonable decisions** and acts accordingly.
- **Reasonableness** can also refer to **reciprocity** in the sense of a situation or a relationship in which two or more people or groups agree to do something similar for each other.

Prudence & Justice

- As far as ethics is concerned, the current system of radiological protection relies on four core ethical values: **beneficence/non-maleficence**, **prudence**, **justice** and **dignity**.
- **Reasonableness** is intimately linked to the optimisation principle, which reflects the core ethical values of **prudence and justice** in radiological protection.
- In practice, **searching for reasonableness** is a permanent questioning which depends on the prevailing circumstances in order to act wisely based on accumulated knowledge and experience i.e. with the desire to do more good than harm, **to avoid unnecessary risk, to seek a fair distribution of exposures** and to treat people with respect.

Summary

- It took several decades for the Commission to clarify what was meant by ‘**as low as reasonably achievable**’ and on which criteria to ground the decisions about these intentions.
- This recommendation remains the core of the system of radiological protection today and leads to a continuous posing of the following guiding question:

*‘Are all tolerable exposures **as low as reasonably achievable** under the prevailing circumstances?’*

For Your Information

- **TG 94** : “Ethical Foundations of the System of Radiological Protection”
 - Public consultation: First half of 2017
- C4 has suggested to the Main Commission that a future Task Group specifically consider “**Reasonableness**”.
- At this point we are looking for suggestions to help define what should be in a possible Terms of Reference.



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