

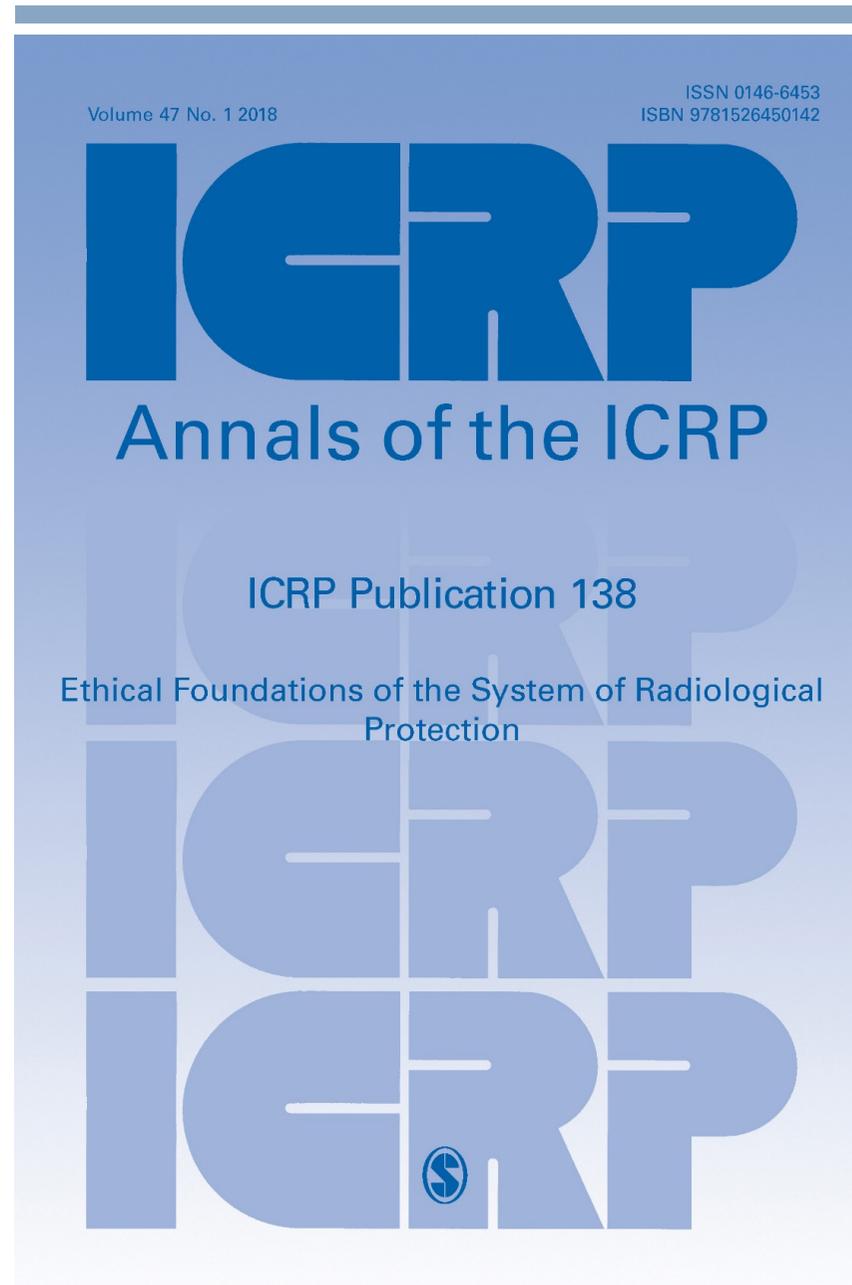
# Radiation protection today and onward: ICRP Publication 138

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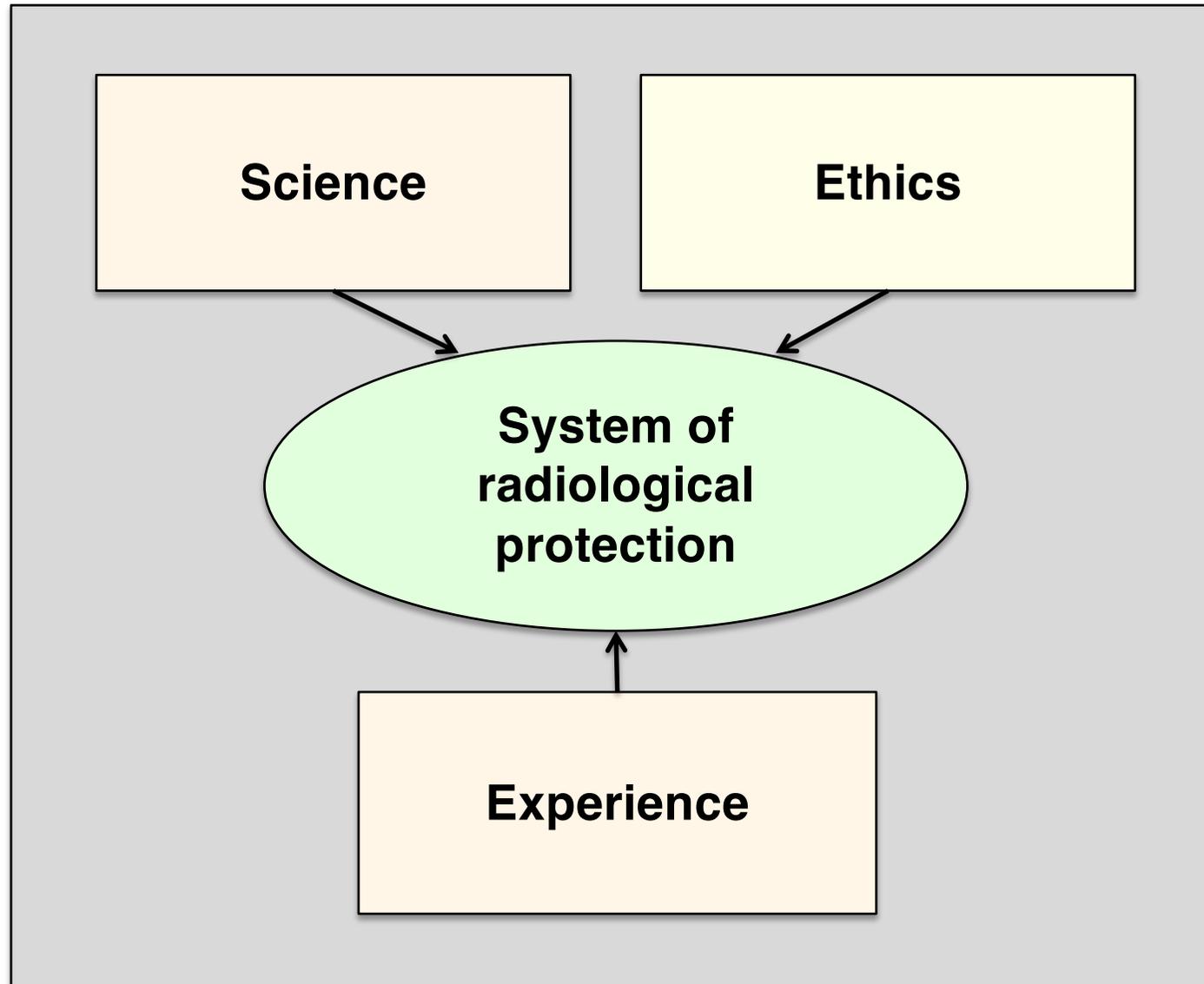
***Thierry SCHNEIDER***  
***16 November 2020***

***Symposium on “Ethics in Radiation Safety – Now and the Future”***  
***Society for radiation safety research***  
***at The Royal Swedish Academy of Sciences (RSAS)***

- A long recognition that **radiological protection is not only a matter of science, but also ‘philosophy and morality’ (L. Taylor)**
- Ethical foundations of the RP system rarely explicitly addressed in ICRP publications
- An ICRP **Task Group** created in 2013 with the purpose of **improving the understanding of the system, providing a basis for communication on radiation risk, and finally consolidating the Commission’s recommendations**
- Close cooperation with international organisations (IRPA, NEA, WHO,...)



## The 3 pillars of the RP system



## Content of the presentation

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- Presentation of the Core ethical values adopted by ICRP
- Presentation of the procedural ethical values adopted by ICRP
- Some main challenges for the application of the ethical values in:
  - Nuclear sector
  - Medical sector
  - Emergency
  - Post-accidental situation and recovery
  - Radon exposure
- Concluding remarks

## Approach adopted in Pub. 138

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- Selection of 4 core ethical values
  - No hierarchy between the values
  - Avoiding the adoption of a “shopping list”
  - No completeness but willingness to encompass the main ethical issues
- Selection of 3 key procedural ethical values underlying the requirements for the practical implementation of the system
- Favour the values underpinning the principles of radiological protection
- Promoting their application for guiding the implementation of the radiological protection system

## The ethical values adopted in Pub. 138

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### ■ Core values

- **Beneficence/non-maleficence:** doing good and avoiding harm
- **Prudence:** in the face of uncertainty, avoid unwarranted risks
- **Justice:** fair sharing of benefits and risks
- **Dignity:** respect of individual autonomy

### ■ Procedural values

- **Accountability:** to be responsible for one's own action
- **Transparency:** to share available information
- **Inclusiveness:** stakeholder participation

# Beneficence / Non-maleficence (1)

- **Beneficence/non-maleficence:** doing or promoting good / avoiding causing harm
  - Largely developed in biomedical ethics (Belmont report – 1979; Beauchamp and Childress – 1979)
- By developing recommendations **seeking to protect people against the harmful effects of radiation**, the Commission undoubtedly contributes to serving the best interest of individuals and indirectly the quality of social life. (para. 38)
- In practice: ensuring that **deterministic effects are avoided and the likelihood of stochastic effects is reduced** as far as achievable given the prevailing circumstances



*La Danse*  
Henri Matisse

## Beneficence / Non-maleficence (2)

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- **Non-maleficence:** closely related to **prevention**
- Final aim: **Promoting well-being**
- **A key challenge** for beneficence and non-maleficence: how to measure the benefits, harms and risks:
  - Require considerations on individual and societal aspects
  - Adopting a public health approach
  - Integrating multi-hazard assessment
  - Considering a variety of social, psychological, and cultural aspects
  - Discussing how to value and weight these factors
- “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (WHO, 1948)
- Special considerations to be devoted to the evaluation of potential harms and benefits for future generations and the environment

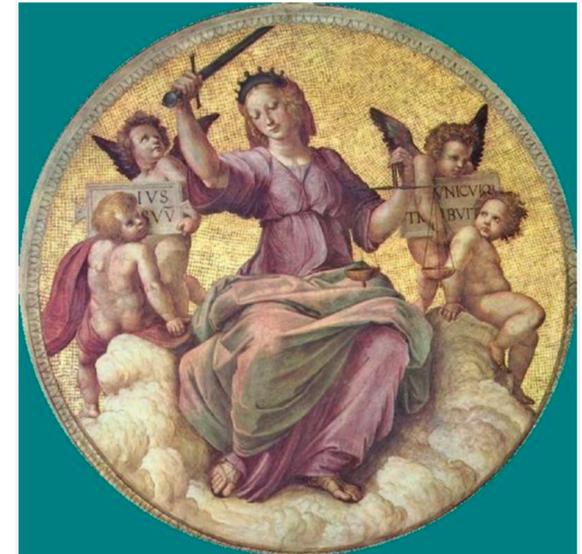
- **Prudence:** in the face of uncertainty, avoid unwarranted risks
- **Ability to make informed and carefully considered choices without the full knowledge of the scope and consequences of actions.** (Para. 42)
- Ability to choose and act on what is in our power to do and not to do.
- Refer to practical wisdom: quality of having knowledge, experience, and good judgement to take reasonable decisions and to act accordingly (Para 43)
- More recently reference to the “precautionary principle” (UNCED, 1992)



*Prudence*  
*Saint Thomas d'Aquin*

- Solid **scientific evidence** for the foundation of the system of radiological protection
- **Remaining uncertainties** at low levels of exposure requiring value judgements
- Prudence not to be taken to be synonymous with conservatism or never taking risks
- Prudence adopted in connection with the different types of effects:
  - **Deterministic** effects - “It is **prudent to take uncertainties** in the current estimates of thresholds for deterministic effects into account.”
  - **Stochastic** effects in general - “the LNT model **remains a prudent basis** for radiological protection at low doses and low dose rate.”
  - For **heritable** effects in particular - “**prudently continues to include** the risk of heritable effects in its system of radiological protection.”

- **Justice**: fair sharing of benefits and risks
  - Fairness in the distribution of advantages and disadvantages among groups of people (**distributive justice**),
  - Fairness in compensation for losses (**restorative justice**),
  - Fairness in the rules and procedures in the processes of decision making (**procedural justice**). (Para. 51)
- Idea of limiting individual exposures in order to correct possible disparities in the distribution of health risks due to radiation among exposed populations (**inequity** introduced in Pub 26).
- ICRP system aims to ensure that the distribution of exposures in the society meets the **two principles of equity and equal rights**.



*Justice  
Raphaël*

- Adoption of **dose constraints** and **reference levels** to reduce inequities in the distribution of individual exposures
- **Dose limits** aims to ensure that all members of the public, and all occupationally exposed workers, do not exceed the level of risk deemed tolerable by society and recognized in law in the case of planned exposure situations
- Procedural justice: recognition of the **right of citizens to participate** in decision-making processes (link to Aarhus convention - 2001)
- Key issue for **intergenerational** distributive justice for the management of radioactive waste with preservation of health and environment for future generations (Pub. 122 – 2013) with **transfer of knowledge and resources** to ensure the protection.

- **Dignity**: respect of individual autonomy
  - **An attribute of the human condition**: the idea that something is due to a person because she/he is human.
  - Every individual deserves **unconditional respect**, whatever age, sex, health, social condition, ethnic origin and religion. (Para. 59)
- Reference to the Universal Declaration of Human Rights (United Nations, 1948).
- **Personal autonomy** is a corollary of human dignity: individuals have the **capacity to act freely** i.e. to make uncoerced and informed decisions



*Statue of Liberty  
Auguste Bartholdi*

- Respect for human dignity promoted in radiological protection with regard to the principle of “**informed consent**” and “**right to know**”
- **Promotion of autonomy** through **stakeholder involvement** and **empowerment of individuals** to make informed decisions.
- **Respect of dignity** and **promotion of autonomy** of people facing radioactivity in their **daily lives**

## Relationship between the core ethical values and the fundamental principles

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- **Justification:** any decision that alters a radiation exposure situation should do more good than harm – *Beneficence/Non-maleficence*
- **Optimisation:** all exposures should be kept as low as reasonably achievable (ALARA) with restrictions on individual exposures to limit inequity between individuals and the need to account for the views and concerns of stakeholders – *Prudence, justice, dignity*
- **Limitation:** the individual dose of any individual should not exceed the level of exposure considered tolerable for the exposure situation under consideration – *Beneficence/non-maleficence, justice, dignity*

- **Accountability:** to be responsible for one's own action
  - The obligation of individuals or organisations who are in charge of decision making to answer for their actions to all those who are likely to be affected
  - Reporting on their activities, accepting responsibility, and accounting for actions taken and the consequences, if necessary

- **Transparency:** to share available information
  - ‘Openness about decisions and activities that affect society, the economy and the environment, and willingness to communicate these in a clear, accurate, timely, honest and complete manner’ (ISO, 2010)
  - Accessibility of information about the deliberations and decisions concerning potential or on-going activities
  - Honesty with which this information is transmitted

- **Inclusiveness:** stakeholder participation
  - The participation of all relevant parties in the decision-making processes related to radiological protection. (IRPA 2008)
  - Also referred to as ‘stakeholder involvement’ or ‘stakeholder engagement’
  - Introduce as a requisite in Pub. 103 for implementation of the optimisation principle

# Tolerability and reasonableness

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- **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.” (Pub 138. Para. 65)

# Ethical issues associated with exposure in the nuclear sector

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- Beneficence-Non-maleficence: well-being including the multi-hazards approach and environmental protection
- Prudence: Promoting ALARA approach and integrating a “graded approach” in maintenance activities
- Justice:
  - Individual dose distribution notably among workers for maintenance of nuclear installations
  - Use of individual dose constraints
  - Transfer of risk/exposure: among workers and workers versus public
- Dignity:
  - Informed consent from workers / RP culture
  - Consideration of future generations

# Ethical issues associated with medical exposure

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- **Beneficence/non-maleficence:**
  - Valuing well-being and introducing weighting factors between benefits and harm
  - Individual versus public health issues
- **Prudence:** key concern on secondary effects for some treatments
- **Justice:** equity and choice for treatment, consideration of vulnerable individuals and social determinants
- **Dignity:**
  - key role of informed consent in medical ethics
  - Ethical challenge with the current development on radio-sensitivity and radio-susceptibility
- *Current reflection: ICRP TG109 and Medical ethics*

# Ethical issues associated with emergency situation

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- **Beneficence/non-maleficence:**
  - Evaluation of benefit and harm for early protective measures such as evacuation and thyroid monitoring
  - Special ethical issues to be addressed for vulnerable populations
- **Prudence:**
  - Uncertainties on exposure and potential effects
  - Due consideration for non-radiological effects
- **Justice:** Adopt equitable and proportionate measures
- **Dignity:**
  - Informed consent to be specifically considered
  - Compensation issues and medical surveillance
- *See SHAMISEN project (ISGlobal website)*

## Ethical issues associated with post-accidental situation – recovery (1)

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- Main objective: restoring decent living and working conditions for affected populations (resilience and sustainable development)
- Beneficence/Non-Maleficence:
  - Provide good level of protection: *How to (and Who) assess the level of well-being and the protection of the environment?*
- Prudence: Organise the vigilance on the long-term consequences of the accident (including co-expertise processes)
- Justice : Consider vulnerable populations and ensuring equitable distribution of means and resources (notably key issues on compensation)

## Ethical issues associated with post-accidental situation – recovery (2)

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- Respect dignity and autonomy of citizens
  - Support citizen initiatives (co-expertise processes, self-help protective actions, local projects...)
  - Respect individual decisions
- Establish appropriate mechanisms to ensure legitimacy, transparency and fairness of the decision-making process
- *New ICRP Publication 146 in press*

# Ethical issues associated with radon exposure in dwelling

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- **Beneficence:**
  - Taking into account all facets of risk - well-being (promotion of indoor air quality approach)
  - Focus on collective risk or individual risk for radon in dwelling
- **Prudence:** difficulty to address low dose radiation induced health effects with exposed group
- **Justice:** supporting equitably all groups of people
- **Dignity:**
  - Informed consent for residents to be engaged in measurement campaigns and remediation actions
  - Provide sufficient support for remediation actions
  - Rely on participatory process

- The ICRP system is founded on the core ethical values of **beneficence/non-maleficence, prudence, justice, and dignity**
- The aim is:
  - “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.” (Pub. 138 - Para. 65)
- Just as science, ethics alone unable to provide a definitive solution to the questions and dilemmas generated by the use or presence of radiation
- Ethics certainly can **provide useful insights** on the principles and philosophy of radiological protection and thus **help the dialogue between experts and citizens**

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*Thank you  
for your attention*