
The New Recommendations from ICRP

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Abstract:

The system of radiological protection is mainly resulting from consensus reached at international level. The process involves several organisations such as UNSCEAR, ICRP, IAEA, OECD/NEA and Euratom, etc. Amongst them, ICRP publishes general recommendations which are followed by regulatory agencies (IAEA, Euratom) and then by national authorities. In March 2007, after 9 years of an open-process, ICRP adopted new recommendations which will supersede those in its Publication 60 (1991). The main innovation is the end of a two-speed system (practices versus intervention) to a single approach in all the exposure situations (planned, emergency and existing) based on the constrained optimisation. After ICRP, IAEA (jointly with other international bodies) and Euratom started a process to revise their own basic safety standards.

1 INTRODUCTION

International organisations play a key role in the elaboration of the system of radiological protection. Amongst them, the United Nation Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) periodically establishes reports on sources of ionizing radiation and their effects on human health, which are scientific references (last versions in 2000-01). The International Commission on Radiological Protection (ICRP), which is a non-governmental organisation, publishes regularly recommendations on the radiological risk and the way to manage it, taking into account scientific, economic and social considerations (last version published: ICRP 60 – 1991). Its recommendations are generally followed by other international regulatory agencies such as the International Atomic Energy Agency (IAEA) at international level and Euratom at regional level. IAEA establishes standards on nuclear safety and radiological protection (including waste and transport fields) and notably the Basic Safety Standards (BSS) for protection against ionizing radiation and for the safety of radiation sources (BSS 115 – 1996). These IAEA-BSS are jointly sponsored by the Food and Agriculture Organisation (FAO), the International Labour Organisation (ILO), the Nuclear Energy Agency (NEA) of the OECD and the Pan-American Health Organisation (PAHO). As far as European Union is concerned the Euratom community has adopted since 1989 a Council directive laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation (Directive 96/29/Euratom - 1996). Then, Radiological Protection is mainly an international issue. The great lines of the relevant system (quantities, units, basic concepts, weighting factors, dose-effect relationship, nominal risk coefficients, general principles as well as their application in the different types of exposures situations and categories of exposures) are resulting from scientific and regulatory consensus reached at international level.

2 NEW ICRP RECOMMENDATIONS

During its meeting held in Essen (Germany) in March 2007, the ICRP unanimously approved the final version of the draft on new general recommendations for the protection of mankind and the environment against ionizing radiation. This decision is the ultimate step of an open process (comprising 2 web-consultations and several meetings, workshops, seminars and conferences) initiated 9 years earlier. The reasons for change are of three types: integrate scientific progresses, incorporate the feedback from the current system application, and meet the society expectations with regard to environmental protection.

The main innovation is the end of a two-speed protection system: in one hand practices managed by applying optimisation below a maximum dose value, and in a second hand intervention managed through actions taken only when a minimum dose value (action or intervention level) is exceeded. From now, the first approach applies in all exposure situations (either planned, emergency or existing exposure situations), with reference values (dose constraints or reference levels depending on the case) selected in accordance with the situation characteristics and then initiation of an individual dose reduction process until an optimised level is reached.

The three general principles (justification, optimisation and dose limits) are kept. Justification and optimisation are source related (for a given source) while dose limits are individual related (taking into account all sources to which it is exposed). While justification (for which it is recognize that radiological protection is only an input) and dose limits (applicable only in planned exposure situations) are softened, optimisation appears to be in the core of the new system (with a process broadened to considerations on equity, dialogue and safety culture). The three exposure categories of exposure (occupational, medical and public) continue to be separately considered.

The new system is more an evolution than a revolution. Practical consequences are however expected in the management of emergency and existing exposure situations, which will be more stringent. In emergency situations, ICRP now recommends to set a reference level expressed in residual dose (≤ 100 mSv except for saving human lives) and to define a strategy combining all the protection measures to meet compliance with the reference level). In existing situations (natural or post-accident exposures), experience showed that a value around 10 mSv/a should rather be a maximum than a minimum level and that, in case of post-accident, gradual strategies should be implemented to recover exposure levels similar to those in normal situations.

Finally, ICRP also recommends assessing the impact of radioactive sources on the environment itself and not only through the human protection.

The new ICRP recommendations will be published in a few weeks. Their content as well as the scientific bases for them are summarized in the enclosed ICRP Newsletter n°14 (ICRP Newsletter is a leaflet regularly circulated in France by Annie Sugier, IRSN, member of the ICRP Main Commission).

3 A CONTINUING PROCESS

The new ICRP recommendations will probably be applied by other international bodies. IAEA started revising its own basic safety standards in radiological protection field (BSS 115) and the European Commission announced the beginning in 2008 of a process to revise the Euratom directive 96/29.