

THE NEW ICRP RECOMMENDATIONS: HOW WILL THEY BE TRANSLATED INTO PRACTICE?

O. Ilari, OECD/NEA; A. Gonzalez, IAEA; G. Hanson, WHO;
C. Borrás, PAHO; E. Boutrif, FAO

The novel conceptual developments put forward by the new ICRP recommendations need to be converted into terms that can facilitate their transfer into regulatory texts and operational practices at the national level. The main problems that we may face in this conversion, through the revision of the Basic Safety Standards for Radiation Protection, are briefly discussed in this paper.

INTRODUCTION

During the last few years, radiation protection went through a period of significant developments and achievements. The major event in this period was the revision of the basic ICRP recommendations. Although the new recommendations represent an evolution more than a revolution with respect to the 1977 recommendations, they have introduced some important developments and significant elements of novelty. The new ICRP recommendations have been deliberately drafted in general and scientific terms so that sufficient scope for interpretation and application is left to their users, particularly the national authorities. There is, now, a need for a conversion of the ICRP guidance into terms which are sufficiently practical and straightforward to facilitate their transfer into regulatory and operational practices at the national level.

Traditionally, this is the task of the international intergovernmental organisations, in particular through the Basic Safety Standards for Radiation Protection (BSS), jointly issued by the IAEA/NEA/WHO and ILO, and the Euratom Radiation Protection Directives, issued by the CEC. In the past, this international applicative guidance was largely traced on the texts issued by the ICRP. This time, however, the higher degree of generality and flexibility of the ICRP recommendations is suggesting a different strategy in preparing the revision of the BSS. There will be, in fact, the need to make a serious effort of interpretation of the ICRP concepts and intentions, which will require expansions and clarifications from the ICRP text.

TRANSLATION OF THE ICRP RECOMMENDATIONS INTO PRACTICAL GUIDANCE

The first concerted effort to provide unified radiation protection standards to contribute to an harmonised worldwide application of the basic ICRP recommendations was made at the beginning of the eighties by the IAEA, the NEA, the WHO and the ILO. The result was the publication of the BSS issued in 1982 as IAEA Safety Series No. 9.

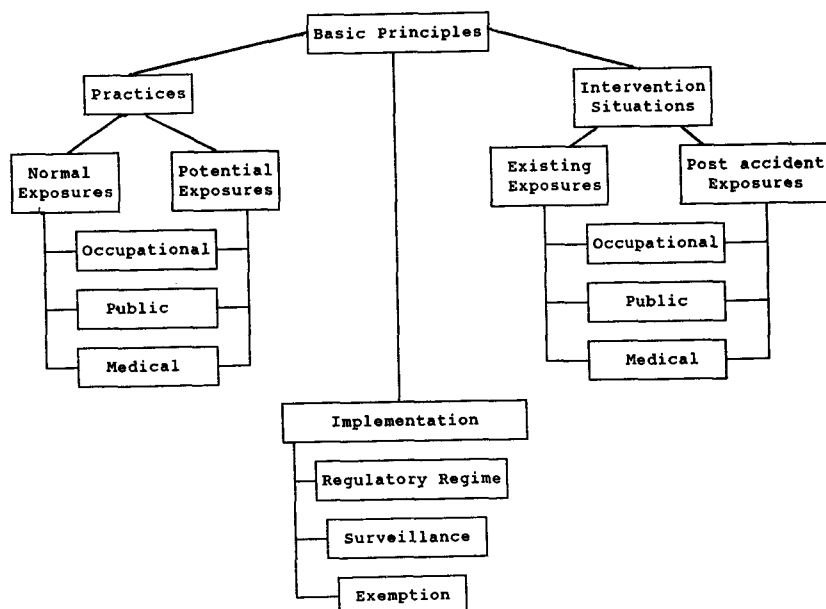
The work for the revision of the BSS was started at the beginning of 1991 with the constitution of a Joint International Secretariat among the four above-mentioned organisations, which were later joined by the Food and Agriculture Organization (FAO) and the Pan American Health Organization (PAHO), and the setting up of a Drafting Group in charge of the preparation of a draft text of the revised BSS to be submitted, in 1992, to international review and approval. It is interesting to note that this review will have a very transparent character in that not only

governmental, regulatory and professional groups, but also worker and employer organisations as well as other interest groups will be involved in the debate and give their contribution of ideas to the preparation of the new BSS.

Although a conclusive idea of the specific features of the new BSS can only be achieved when the international review process is completed, the Joint Secretariat has been able to establish a general strategy and agree on the main lines concerning this work. First of all, it was agreed that the BSS should be given the character of "Standards" that national authorities could use as a regulatory basis for the protection of workers and members of the public. This implies that the BSS should be written in a fully regulatory language; however, the Joint Secretariat quickly recognised that this may be difficult to achieve in practice, in view of the large variety of regulatory systems and associated legal languages used in Member countries. Therefore, it was agreed that, although the document should have a regulatory flavour and be, as far as possible, directly applicable in the preparation of national regulations, it should be kept at the technical level without attempting to be a "legal" text. Another important decision was that the document should be fully consistent with the new ICRP recommendations, unless there are in some points strong reasons which suggest variations in policy or interpretation.

SOME IMPORTANT ISSUES TO BE ADDRESSED IN THE NEW BSS

The guidance given by the previous ICRP recommendations and, subsequently, by the previous BSS was essentially focused on the control of "normal" exposures from what are now defined as "practices" involving artificial "sources". The merit of the new ICRP recommendations is to generalise its guidance to cover the whole network of possible exposure and control situations as it is summarised in the following scheme:



This scheme, in itself highly rational, creates problems of application due to the different degrees of controllability of the exposure which characterise the various situations. Some of the main issues to be addressed in the new BSS are highlighted in the following.

Individual Dose Limitation

Although optimisation of protection is confirmed as the main principle of a correct management of radiation exposures, the limitation of individual doses to workers continues to be the principal issue of concern to those who have the responsibility to implement radiation protection requirements in practice and it may be expected that a heated debate is raised on this issue during the preparation of the new BSS. In fact, several industrial and radiation protection operators have begun to express serious concerns on the feasibility of coping, at reasonable costs, with the new, reduced dose limits recommended by the ICRP. According to these critics, parts of the nuclear industry, and, perhaps, also other activities involving radiation might face major facility redesign and reorganisation of work practices, involving significant labour and cost increases, if this increase in the rigour of the international recommendations is followed by a similar stiffening of national regulatory requirements. Cases where these difficulties may arise include the maintenance of nuclear facilities, the operation of some underground uranium and other mines, some operations involving uranium and plutonium oxides, as well as some industrial applications and medical practices. These cases will have to be carefully examined to make sure that the requirements of the new BSS can be actually implemented.

Another issue which will have to be faced is the concept of flexibility proposed by the ICRP for the application of the dose limits. This concept, allowing a peak dose limit up to 50 mSv in one year against an average of 20 mSv per year over five years, is conceptually correct, but several regulators and operators have serious doubts on the concrete possibility to introduce it into laws and regulations, where only clear-cut rules and limits can fit with the required regulatory and legal language. One potential problem that could emerge with the introduction of a lower dose limit concerns those workers who have received so far doses in excess of 20 mSv per year. These workers and the trade unions might argue that they should now be guaranteed an annual dose limit lower than 20 mSv to compensate for what they could consider an unjustified past detriment. This is not a conceptual issue, nor is it of direct relevance to the text of the BSS, but its implications for the ensuing national regulations could not be overlooked.

All these considerations will have to be accommodated in the new BSS and the situation will be further complicated by the need to assign a place and a specific regulatory meaning to the new concept of source-related dose constraint introduced by the ICRP to limit the range of options considered in the procedure of optimisation of protection.

Exposure Situations not Fully Covered in Previous ICRP Recommendations

Historically, the ICRP recommendations mainly focused on the control of exposures that can be anticipated in advance and assumed to be delivered with virtual certainty and predictable magnitude. The new ICRP recommendations address two types of radiation-related activities not fully

covered by previous recommendations, namely the practices that may give rise to "potential exposures" and the "interventions". Not surprisingly, the available international guidance on radiation protection mainly concentrate on normal exposures. Apart from international standards for nuclear reactor safety, virtually no guidance exists for potential exposure situations and only general guidance is given internationally for intervention situations.

Clarification is, therefore, required of the role of the current principles of justification, optimisation and individual risk limitation in such situations. Any policy development should be tested against practical problems, such as specific requirements for the reliability of safety systems, the control of exposures due to radon in dwellings, and intervention levels for unanticipated situations. A particular and difficult problem to be dealt with in treating the question of potential exposures is that of solving the significant issues of interface with the philosophy and techniques used by the nuclear safety community in the safety analysis and prevention of nuclear accidents, which have been raised by these developments within the ICRP.

There are also problems in the area of interventions. For example, the new emphasis which is given nowadays to radon is not limited to the area of public exposure. The new ICRP recommendations suggest, in fact, to include exposure from natural sources as part of occupational exposure, but they do not provide unequivocal guidance on the choice of situations which should fall into this category. This will require interpretation and choice of options by those in charge of the preparation of the new BSS.

General Solutions: Standardization

A major shortcoming of the current radiation protection and safety policies is the lack of generic standardized objectives similar to those used in other safety disciplines. At a first sight, the rationale of ICRP requirements such as optimisation appears to be incompatible with generic solutions, because the requirements of optimisation seem to lead to case-by-case assessments. However, although there are specific problems for which only a case-by-case approach is feasible, it is worth questioning whether a more standardized approach could be possible for common, routine problems of protection and safety. Success in this endeavour would be very well received by designers and operators.

CONCLUSION

The issues highlighted in this paper are only some of the most important questions to be addressed in the implementation of the new ICRP recommendations. Several other problems of a more detailed nature can be raised by a reading of ICRP Publication 60, and a significant effort of interpretation and choice of options will have to be made in the transformation of the ICRP guidance into international recommendations liable to a concrete application. The new BSS will have to solve these questions in order to give an effective contribution to practical radiation protection in Member countries.