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MEASURES TO STRENGTHEN INTERNATIONAL CO-OPERATION IN MATTERS RELATING TO NUCLEAR SAFETY AND RADIOLOGICAL PROTECTION

(b) Implementation of resolution GC(XXXVI)/RES/583: The preparation of new Basic Safety Standards

1. Last year, in resolution GC(XXXVI)/RES/583, the General Conference, taking note of a report by the Board of Governors and the Director General on progress in the revision of the Basic Safety Standards for Radiation Protection (GC(XXXVI)/1008), requested the Board and the Director General to inform it - at its 1993 regular session - of further progress.
2. The attached report, prepared in response to that request, gives a brief account of how the Basic Safety Standards in their present form were developed and of the work done so far in preparing new Basic Safety Standards, including work done since the 1992 regular session of the General Conference. It was considered on 21 September 1993 by the Board of Governors, which authorized the Director General to transmit it to the General Conference.

PREPARATION OF NEW BASIC SAFETY STANDARDS

Introduction

1. The Board of Governors first approved Agency health and safety measures in March 1960.¹ The Board approved the first version of the Agency's Basic Safety Standards for Radiation Protection (BSS) in June 1962.² It approved a revised version of the BSS in September 1965.³

2. A further revised version of the BSS was sponsored by the International Labour Organisation (ILO), the World Health Organization (WHO), the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (NEA/OECD) and the Agency and was approved by the Board in September 1981. It was published in 1982⁴, and its publication was subsequently approved by the Governing Body of ILO; also, this revised version was noted in the records of WHO's Executive Board and adopted by the Steering Committee for Nuclear Energy of NEA/OECD.

ICRP recommendations as basis for the BSS

3. The above-mentioned Agency health and safety measures stated that "The Agency's basic safety standards ... will be based, to the extent possible, on the recommendations of the International Commission on Radiological Protection (ICRP)". In approving the BSS in September 1965, the Board authorized the Director General ", after obtaining the necessary advice and taking into account in particular the important work done in this field by the International Commission on Radiological Protection, to arrange for ... such changes of detail in the Standards ... as would be needed from time to time to keep the Standards

¹ The Agency's Health and Safety Measures were issued in document INFCIRC/18. They were revised in 1975, and - after approval by the Board in February 1976 - the revised measures were issued as the Agency's Safety Standards and Measures in document INFCIRC/18/Rev.1.

² Basic Safety Standards for Radiation Protection, 1962 Edition, Safety Series No. 9, IAEA, Vienna (1962).

³ Basic Safety Standards for Radiation Protection, 1967 Edition, Safety Series No. 9, IAEA, Vienna (1967).

⁴ Basic Safety Standards for Radiation Protection, 1982 Edition, Safety Series No.9, IAEA, Vienna, (1982).

technically up to date ...". Thus, the philosophy behind all editions of the BSS has been based on the latest recommendations of the ICRP.

4. The ICRP issued new recommendations in 1990.⁵ The organizations that had sponsored the BSS agreed that a revision process should be initiated in order to take the new recommendations into account.⁶

The Inter-Agency Committee on Radiation Safety

5. In order that there might be a mechanism for consultation and collaboration in radiation safety matters with the competent organs of the United Nations and with the specialized agencies (as envisaged in Article III.A.6 of the Statute), the Secretariat promoted the formation of an Inter-Agency Committee on Radiation Safety (IACRS), which was constituted early in 1990. The IACRS aims - inter alia - to encourage the co-ordination of policies and consistency in radiation safety principles and standards. The current members are the Food and Agriculture Organization of the United Nations (FAO), ILO, NEA/OECD, the Pan American Health Organization (PAHO), the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), WHO, the Agency and the Commission of the European Communities (CEC); the ICRP, the International Commission on Radiation Units and Measurements (ICRU), the International Electrotechnical Commission (IEC), the International Radiation Protection Association (IRPA) and the International Standards Organization (ISO) have observer status.

The Joint Secretariat

6. Within the framework of the IACRS, a Joint Secretariat was formed which includes representatives of the four international organizations which sponsored the current edition of

⁵ In ICRP Publication 60, Annals of the ICRP, Vol. 21, No.1-3, ISSN 0146-6453.

⁶ The main focus of the Basic Radiation Safety Policy sub-programme of the Agency's Programme and Budget for 1993 and 1994 is the revision of the BSS in the light of the ICRP recommendations - see document GC(XXXVI)/1006, paragraph H/5.

the BSS (ILO, NEA/OECD, WHO and the Agency) and two other organizations - FAO and PAHO.⁷ The work of the Joint Secretariat is co-ordinated by the Agency's Secretariat.

Policy for preparing new BSS

7. At its first meeting, the Joint Secretariat established the following policy for preparing new BSS:

- (i) The new BSS should not be inconsistent with the new ICRP recommendations.
- (ii) The BSS should, as far as possible, be written in regulatory language - i.e. as concise statements of regulatory requirements which could be applied more or less directly in the preparation of national regulations. Any explanatory material necessary for clarifying the intent of the statements should be separate.
- (iii) The new BSS should
 - o take account of recent developments in scientific knowledge and recent orientations in radiation protection principles and concepts as expressed in the new ICRP recommendations;
 - o give guidance to national authorities on translating the principles and concepts into regulatory requirements and guidelines;
 - o indicate the radiation protection requirements for Agency operations or operations undertaken by Agency Member States with the assistance of the Agency or the other international organizations involved, or under their control or supervision, or, at the request of a member State of any of those organizations, for any of that State's activities in the field of atomic energy.
- (iv) The new BSS should give guidance as regards
 - o the features of regulatory regimes for radiation protection;
 - o the radiation protection standards to be applied when introducing and following any practice which might increase the radiation risk of people, either by increasing actual exposures or by increasing the potential for receiving an exposure;

⁷ Although the CEC decided not to be represented in the Joint Secretariat, it is expected that compatibility of the new BSS with the CEC's Directives on Radiation Protection provided for in Article 31 of the Euratom Treaty will be assured through the IACRS, of which - as stated in paragraph 5 - the CEC is a member. A CEC liaison group is participating in the work of preparing new BSS. In addition, an ICRP liaison group is helping the Joint Secretariat to interpret the new ICRP recommendations and advising on the consistency of the new BSS with these recommendations.

- o the radiation protection standards to be applied when intervention is required in order to reduce existing exposures of people.
- (v) The guidance should be addressed primarily to national authorities responsible for radiation protection, but also to radiation protection specialists and others with responsibilities for radiation protection in their own operations.

Drafting procedure

8. The Joint Secretariat established a group of consultants to prepare, under its guidance, draft BSS for its internal use. The group was seen as a "core" which might call on other experts when that was necessary in order to fill gaps or for reasons of balance.

9. An extended outline for the first internal draft was approved by the Joint Secretariat in April 1991, and this draft was completed by the consultants at the end of June 1991.

10. The first internal draft was reviewed by the Joint Secretariat and by the ICRP and CEC liaison groups referred to above in footnote 7. In the light of their observations, the consultants prepared a second internal draft, which was submitted for comment to the organizations represented in the IACRS. The comments of these organizations were reviewed at a meeting of the Joint Secretariat with the group of consultants and the ICRP and CEC liaison groups in December 1991.

11. The organizations represented in the Joint Secretariat approached the revision of the various internal drafts from different perspectives - for example, WHO and PAHO focused on radiation protection in the medical uses of radiation; ILO focused on the protection of workers against ionizing radiation and on the importance of involving employers' and workers' representatives and of ensuring consistency between the BSS and the relevant ILO conventions; FAO was particularly interested in intervention measures relating to food and agriculture; and NEA/OECD was particularly interested in the practical implications for nuclear power. NEA/OECD involved its Committee on Radiation Protection and Public Health and its Core Task Group on ICRP matters, which includes representatives of its Committee on Nuclear Regulatory Activities and its Committee on the Safety of Nuclear Installations; the Radioactive Waste Management Committee of NEA/OECD was also involved as appropriate.

The "Preliminary Draft of the Basic Safety Standards"

12. The second internal draft text served as a working paper for the December 1991 meeting referred to above in paragraph 10. Following that meeting, the Joint Secretariat - with the help of consultants - produced a third internal draft. This draft was an expanded one, covering not only requirements regarding protection against ionizing radiation exposures

assumed to occur with certainty, but also requirements regarding the safety of radiation sources, which involve the potential for accidental exposures.

13. The expanded draft was reviewed at an Agency-convened meeting held in February 1992 and attended by experts from nine countries, an ILO expert, representatives of the ICRP, the CEC and the Agency's Standing Advisory Group on the Safe Transport of Radioactive Materials (SAGSTRAM), representatives and consultants of the Joint Secretariat and a number of observers. There was general agreement at the meeting that it was right to expand the BSS in order to cover requirements regarding the safety of radiation sources. There was also a general agreement on a new sub-title: "International Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources".

14. The resulting draft was sent to those who had attended the February 1992 meeting. Taking into account their observations, the Joint Secretariat then prepared a **"Preliminary Draft of the Basic Safety Standards"**.

Consultations with States and organizations

15. On behalf of the Joint Secretariat, the Agency distributed the Preliminary Draft to all member States of the organizations represented in the Joint Secretariat (FAO, ILO, NEA/OECD, PAHO, WHO and the Agency), to the member organizations of the IACRS and to other relevant international organizations.

16. The Preliminary Draft was thus distributed to 173 States and 54 organizations, which were requested to comment on it and also to nominate participants and observers for a Technical Committee meeting to be held in December 1992 for the purpose of reviewing the Preliminary Draft and the comments made.

17. The approximately 180 communications with comments received by the Joint Secretariat were collated by the Agency's Secretariat (acting as co-ordinator for the Joint Secretariat) and then reviewed by the Joint Secretariat and the liaison groups. A new (the second) draft was completed by the Joint Secretariat on 30 November 1992.

The December 1992 Technical Committee meeting

18. The Technical Committee met at the Agency's Headquarters from 14 to 18 December 1992. The meeting was attended by 95 participants from 38 countries, 13 organizations and SAGSTRAM. The Committee reviewed the second draft and agreed on the elements of a third draft, to serve as a basis for the preparation by the Joint Secretariat of a fourth draft - for further consultation. It also agreed on what the main outstanding issues were and on procedures for reaching consensus on those issues.

19. In January 1993, the third draft was distributed by the Agency's Secretariat, on behalf of the Joint Secretariat, to all Technical Committee participants for comment.

20. The main outstanding issues identified by the Technical Committee were the following:

- (a) internationally agreed numerical values for exemptions;
- (b) risk constraints for potential exposure situations;
- (c) internationally agreed indicative numerical values of intervention levels; and
- (d) application of the dose limitation system in specific occupations such as the underground mining of radioactive ores.

Follow-up in 1993

21. With regard to the main outstanding issues:

- (a) the Agency and the CEC have consulted on exemption values and agreed on common numerical guidance that will make the new BSS consistent with the radiation protection provisions of the EURATOM Treaty;⁸
- (b) at an NEA/OECD expert meeting held from 8 to 10 March 1993 in order to resolve outstanding issues concerning application of the BSS requirements for the control of potential exposures, consensus was reached on a number of amendments to the third draft, which were then proposed to the Joint Secretariat;⁹

⁸ The numerical guidance is based on the principles for exemption from regulatory control established in 1988 (Safety Series No. 89), which have been slightly modified in order to include the consideration of localized skin exposure.

⁹ The principal amendments were the following:

- revision of the requirements in order to cover potential exposures associated with the long-term disposal of solid radioactive waste;
- revision of the requirements relating to safety assessments and of the guidance on probabilistic safety assessment in order to cover all radiation sources (apart from nuclear reactors) and radioactive waste repositories;
- replacement of the detailed numerical constraints on the probability of accident sequences or scenarios, which are not easily applicable to nuclear reactors and other complex nuclear installations, by an overall risk constraint (10^{-3} per annum for workers and 10^{-5} per annum for members of the public) consistent with the implied risk corresponding to the established dose constraints for the optimization of protection.

- (c) the Agency has produced a technical document (IAEA-TECDOC-698) with proposals regarding intervention levels which has been widely distributed as a basis for consultations; and
- (d) at an ILO working group held from 29 March to 1 April 1993 in order to consider the limitation of doses in specific occupations (including exposure to natural sources in mines and other workplaces), radiation protection for health personnel, and emergency exposures, consensus was reached on a number of proposals which were transmitted to the Joint Secretariat.¹⁰

22. Against this background, the Joint Secretariat and the ICRP liaison group met at PAHO's headquarters in Washington D.C. from 19 to 23 April 1993 and produced a fourth draft, which was distributed on 30 July 1993 for comments to all member States of the organizations represented in the Joint Secretariat under cover of a Note Verbale to which was attached an "Information sheet" briefly summarizing the discussion on the preparation of new BSS in the June session of the Board of Governors and requesting those States' views with regard to concerns expressed during that discussion. The views received will be examined by the Secretariat with a view to their being reflected in the fifth draft of the BSS, which will be submitted to a Technical Committee that will meet in December.

23. In addition, the Agency's Secretariat sought the views of INSAG on the current draft of the BSS. In July, INSAG established a group to review the draft in August. The group's conclusions will be discussed by INSAG in November, and it is expected that INSAG's views will be transmitted to the above-mentioned Technical Committee for consideration in December.

¹⁰ The proposals included:

- provision for extending the dose averaging period from 5 years to 10 years in exceptional circumstances;
- for very exceptional circumstances, a provision for applying the present annual limit of 50 mSv for up to 5 years without dose averaging, instead of the new annual limit of 20 mSv averaged over 5 years;
- an action level for intervention following exposure to radon of 1000 Bq per cubic metre of air for workplaces;
- for occupational exposure to natural sources, 1000 Bq of radon per cubic metre of workplace air as the criterion for applying the protection requirements of the BSS;
- replacement of the dose limit for occupational exposure of the abdomen of pregnant women by a statement that the foetus should be provided the same general degree of protection as the public, and the provision of alternative employment in low-exposure workplaces if necessary;
- emergency exposure limits of 500 mSv for life saving and 100 mSv for preventing catastrophic consequences.

