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## THE AGENCY'S HEALTH AND SAFETY MEASURES

The Agency's health and safety measures as approved by the Board of Governors on 31 March 1960 in implementation of Articles III. A. 6 and XII of the Statute of the Agency are reproduced in this document for the information of all Members.

THE AGENCY'S HEALTH AND SAFETY MEASURES  
(Approved by the Board of Governors on 31 March 1960)

I. DEFINITIONS

1. "Safety standards" shall mean norms, regulations or recommendations established to protect health and minimize danger to life and property.
2. Agency safety standards shall mean safety standards promulgated by the Agency under the authority of the Board of Governors. These standards shall in so far as is possible harmonize with standards published by international organizations of recognized competence in the matter and be designed to invite international acceptance. Such standards shall include:
  - (a) The Agency's basic safety standards[ 1] - standards prescribing maximum permissible levels of exposure to radiation and fundamental operational principles; and
  - (b) The Agency's detailed operational standards - standards complementary to the Agency's basic safety standards, i. e. :
    - (i) The Agency's specialized regulations - safety prescriptions relating to particular fields of operation; and
    - (ii) The Agency's codes of practice - guidance on safety practices relevant to particular fields of operation.
3. "Safety measure" shall mean any action, procedure or condition to ensure observance of safety standards. [ 2]
4. "State" shall mean a State or a group of States.
5. "Assisted operation" shall mean an operation undertaken by a State to which assistance is given by or through the Agency in the form of materials, services, equipment, facilities or information pursuant to an agreement between the Agency and that State.
6. "Radioactive material" shall mean any material which spontaneously emits ionizing radiation and of which the radioactivity per gramme is greater than 0.002 microcuries.
7. "Radiation source" shall mean any radioactive material or any device producing ionizing radiation, except where respectively the quantities or radiation levels involved are below those indicated in paragraph 18(a) below.
8. "Incident" shall mean any occurrence or condition that results in the exposure of any person to ionizing radiation in excess of safety standards or that indicates a defect or failure of equipment or planning which may result in such an exposure.
9. "Major incident" shall mean any occurrence or condition that results in the exposure of any person to ionizing radiation in excess of 12 rem or indicates a defect or failure of equipment or planning which may result in such an exposure.
10. "To apply safety standards" shall mean to make an operation subject to Agency safety standards or other safety standards approved by the Agency.

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[ 1] The Agency's basic safety standards will be drawn up in accordance with the provisions of Article III. A. 6 of the Statute and will be based, to the extent possible, on the recommendations of the International Commission on Radiological Protection (ICRP).

[ 2] Such measures may include providing adequate equipment and facilities, applying effective operating rules, instructions and administrative controls and ensuring that the personnel performing the operation in question are sufficiently trained and experienced.

## II. GENERAL

11. The safe operation of nuclear facilities is of primary interest to all persons connected therewith, to the State that authorizes such operation and to other persons and States that might be adversely affected by unsafe operation thereof. In establishing safety standards and prescribing safety measures, the Agency's principal aim is to render valuable assistance and useful support to its Members. Safety standards must be effective and safety measures must be adequate to control the potential safety hazard. Great latitude will be left to a State to apply its own system of safety standards and measures if it has been determined by the Agency that the system in question is adequate to achieve this purpose.

12. Prior examination of the plans of the operation, and of the safety measures to be applied to it, is necessary to evaluate the adequacy of these measures; the evaluation of the efficiency of such measures is further accomplished by examination of pertinent records and reports, and by inspections of the operation.

13. Under its Statute the Agency is authorized to establish or adopt standards of safety for the protection of life and property and to provide for their application to operations to which assistance is rendered by the Agency or at its request. The Agency may also, if so requested by a State, provide for the application of these standards to operations under bilateral or multilateral arrangements or to a State's own activities in the field of atomic energy. [3] To enable the Agency to undertake these duties the Statute provides that it shall have certain rights and responsibilities with respect to any project to which it gives assistance, or for any arrangement or activity where it is requested to apply safety standards, to the extent relevant to the project or arrangement. [4]

14. The procedures for applying safety standards set forth herein, as well as the safety measures and inspections provided for, will give effect to the relevant provisions of the Statute. They will also:

- (a) Enable a State requesting assistance by or through the Agency to consider in advance the scope of the appropriate safety measures, having regard to the form, scope and amount of assistance supplied by the Agency;
- (b) Enable States party to a bilateral or multilateral arrangement, or a State for its own activities, to determine what safety standards might be applied and what safety measures might be provided for such arrangement or activities, if they so request; and
- (c) Enable the Board of Governors to determine the relevant safety standards and measures for the purposes of sub-paragraphs (a) and (b) above.

15. If States party to a bilateral or multilateral arrangement, or if a State for its own activities, request the Agency to apply safety standards to and to determine the safety measures for such arrangement or activities, such application or determination shall be made in an agreement between the Agency and the State or States concerned. Such an agreement should have regard to the desirability of achieving the greatest possible consistency between the safety standards and measures applied under the agreement and those applied to Agency projects.

## III. INFORMATION TO BE PROVIDED UPON REQUEST FOR ASSISTANCE

16. When requesting assistance by or through the Agency, a State shall provide the Agency with:[5]

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[3] Article III. A. 6.

[4] Article XII. A.

[5] Additional information may be required under the provisions of paragraph 32.

- (a) A brief description of the operation for which assistance is requested, giving such details as may be necessary to allow implementation of paragraphs 19, 20 and 28 below; and where appropriate,
- (b) A statement of the safety standards that it proposes the Agency should apply to the operation.

#### IV. APPLICATION OF SAFETY STANDARDS

##### A. Conditions of application

17. Safety standards shall be applied to any assisted operation which may lead to a radiation hazard.
18. Safety standards shall not be applied to an assisted operation:
- (a) When the operation will not involve the use, storage or processing of radioactive material in quantities in excess of the minimum significant quantities indicated in Table II of the Appendix and/or will not produce external radiation levels which could deliver to a major portion of the body of a person, a daily dose such that in any seven consecutive days the cumulative dose is more than 10 millirems;<sup>[6]</sup> or
  - (b) When the assistance will not, in the opinion of the Board of Governors, substantially assist in the construction or operation or constitute a substantive component of any device that produces ionizing radiation; or
  - (c) Unless otherwise provided by agreement between the Agency and the State concerned, when the operation involves the use of radioactive material produced through an operation to which such standards are applied, as long as such material is removed from and is outside the facility in which it was produced.
19. Based upon the information provided in accordance with paragraph 16 above, the Agency shall determine whether safety standards shall be applied to an assisted operation.

##### B. Adequacy of the safety standards

20. Safety standards applied to an assisted operation shall be the Agency's safety standards<sup>[7]</sup> or other safety standards consistent therewith that are equally effective. The Agency shall determine whether the safety standards proposed by the State satisfy these requirements. If necessary, the Agency shall indicate whatever changes in the proposed safety standards are needed to enable those requirements to be satisfied.
21. The agreement between the Agency and the State shall include an undertaking that the State either will comply with the Agency's basic safety standards and the Agency's specialized regulations to the extent relevant and will endeavour to ensure safety conditions as recommended in the relevant parts of the Agency's codes of practice, or will comply with other safety standards approved by the Agency.

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[6] "Rem" - the absorbed dose of any ionizing radiation which has the same biological effectiveness as one "Rad" of x-radiation with average specific ionization of 100 ion pairs per micron of water, in terms of its air equivalent, in the same region. One millirem equals  $10^{-3}$  rem.

"Rad" - the unit of absorbed dose: 1 rad equals 100 ergs per gramme of irradiated material in the locus of interest.

[7] Pending the issuance by the Agency of such standards, the adequacy of standards proposed by the State will be judged by taking into account the applicable safety standards published at that time by the competent organs of the United Nations and the specialized agencies concerned (such as the "Model Code of Safety Regulations for Industrial Establishments" published by the International Labour Office) and by ICRP.

C. Termination of application

22. The application of safety standards shall terminate with respect to an operation to which they are applied after the Agency has determined that the potential radiation hazard connected with that operation has been eliminated. [8]

V. SAFETY MEASURES

23. The agreement between the Agency and the State shall include provisions for safety measures as set forth in paragraphs 24 to 30 hereafter.

A. General provisions

24. The responsibility for safety measures shall be assumed by the State and the Agency shall have no liability whatsoever.

25. The State shall submit to the Agency, within twelve months after the date safety standards are applied to an assisted operation and annually thereafter, a report with respect to that operation containing the following information:

- (a) A list of the radiation exposures in excess of the applied safety standards, received by persons during the year covered by the report; and
- (b) A statement of the types and amounts of radioactive materials disposed of as waste or released to the environment during that year, and, if disposed of as waste, a statement of the mode of disposal.

26. The State shall notify the Agency as early as possible and in any case not later than 48 hours after the detection of a major incident in connexion with an assisted operation to which safety standards are applied, and shall submit a detailed technical report of such major incident as soon as possible. Interim reports shall be submitted to the Agency within six months after detection of the major incident and at intervals of six months thereafter, until such technical report is submitted.

27. If a State causes supervisory examinations to be made of any assisted operation to which safety standards are applied for the purpose of determining whether safety standards are being complied with and whether safety measures are effective, copies of reports of such examinations shall be submitted to the Agency. [9]

B. Special provisions

28. Based on information provided in accordance with paragraph 16 above, the Agency shall evaluate an operation to which safety standards are applied to determine whether it involves the use, storage or processing of quantities of radioactive materials in excess of those indicated in Table II of the Appendix for type B working places, appropriately modified by the relevant factor as shown in paragraph 3.1.12 thereof, and/or the existence of external radiation levels such that a major portion of the body of a person could receive more than 3 rems in 13 consecutive weeks.

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[8] This may occur, for example, in the case of radioactive decay, transfer or disposal as waste of radioactive material.

[9] The information as to individual over-exposures referred to in paragraph 25(a) above should be supplemented by a report of the total number of persons exposed and the number of persons exposed to radiation in excess of one third of the safety standards applied.

29. If the result of a determination made in accordance with the preceding paragraph is positive, the Agency may require the State to submit to the Agency:

- (a) All facts necessary to evaluate the potential radiation hazard, and in particular:
  - (i) A description of the operations;
  - (ii) A description of the radioactive sources involved, including, if relevant, the quantity, chemical and physical form of the radioactive materials;
  - (iii) A description of the equipment and facilities to be employed;
  - (iv) A statement of the training and experience of the operating personnel, and, where pertinent,
  - (v) A description of the site and surroundings of the installation;
- (b) Details of the design of equipment and facilities, the operating procedures, the method of waste disposal and the planned safety precautions; and
- (c) The administrative system which the State proposes to employ to ensure and to evaluate the effectiveness of safety measures, including details of the records to be maintained, the reporting procedures and the programme of supervisory examinations.

30. The safety measures proposed by a State shall be judged by the Agency on their ability to ensure effectively the observation of safety standards applied. The Agency may require any other safety measures to that effect.

#### VI. INSPECTION BY THE AGENCY

31. If the result of a determination made in accordance with paragraph 28 above is positive, the Agency shall be authorized to carry out not more than two inspections of the relevant operation each year. If the result is negative, the Agency shall not inspect the operation. The Agency shall not inspect operations to which the provisions of Section IV do not apply and which consequently are not subject to any determination referred to in paragraph 28.

32. Notwithstanding the provisions of the preceding paragraph, the Agency shall also be authorized to carry out inspections of all operations to which safety standards are applied, under the following circumstances:

- (a) Upon a report by the State of a major incident; or
- (b) On specific instruction of the Board of Governors.

33. Arrangements for inspections by the Agency shall be made by the Director General with the State concerned.

34. Inspections by the Agency shall be carried out in accordance with relevant provisions of the Statute and may necessitate:

- (a) Tests of radiation sources, of radiation detection and monitoring instruments and of other equipment or devices in connexion with the use, storage, transportation, or disposal as waste of radiation sources;
- (b) Examination of facilities wherein radiation sources are used or stored, of waste disposal facilities and of all records on which reports to the Agency are based;
- (c) Examinations related to the evaluation of the radiation exposure of persons who have been or may have been overexposed.

The State shall perform, in a manner prescribed by the Agency, or arrange for the Agency to perform those tests and examinations deemed necessary by the Agency.

35. The arrangements for inspection provided for in paragraphs 31 to 34 above will be embodied in the agreement between the State and the Agency for the provision of assistance.

#### VII. CHANGE OF SAFETY STANDARDS AND MEASURES

36. The Agency intends to continue to sponsor and conduct research to improve safety standards and measures. As improved methods and procedures are developed in the future, the Agency safety standards and measures may also need to be modified from time to time.

37. Any proposal to modify the Agency safety standards will be subject to consultations with the main organizations concerned and will be submitted to the Board of Governors for its approval.

38. If the Agency should adopt other or change existing Agency safety standards relevant to an operation or, if due to new scientific evaluation the Agency should consider the safety standards or measures of a State, which were originally approved by the Agency, to be inadequate, the Agency shall consult the State concerned with a view to making appropriate additions or changes in the above standards or measures, unless the relevant agreement contains a waiver of such consultation by the State.

39. If the State proposes to change the safety standards and measures approved by the Agency with respect to a specific operation, it shall notify the Agency of such proposed changes. The Agency will review and approve any changes in the light of the provisions of sections IV and V above.

40. The present document shall be resubmitted to the Board of Governors not later than in January 1962, incorporating all appropriate changes and improvements based upon accumulated experience and possibly increased knowledge. It shall be reviewed by the Board of Governors biennially thereafter.

APPENDIX <sup>1/</sup>

Excerpt from the Agency's Manual on Safe Handling of Radioisotopes <sup>2/</sup>

TABLE I  
CLASSIFICATION OF ISOTOPES ACCORDING TO RELATIVE  
RADIOTOXICITY PER UNIT ACTIVITY

(The isotopes in each class are listed in order of  
increasing atomic number)

*Class 1*

(very high toxicity)

Sr-90 + Y-90, \*Pb-210 + Bi-210 (Ra D + E),  
Po-210, At-211, Ra-226 + 55 per cent \*daughter  
products, Ac-227, \*U-233, Pu-239, \*Am-241,  
Cm-242.

*Class 2*

(high toxicity)

Ca-45, \*Fe-59, Sr-89, Y-91, Ru-106 + \*Rh-106,  
\*I-131, \*Ba-140 + La-140, Ce-144 + \*Pr-144,  
Sm-151, \*Eu-154, \*Tm-170, \*Th-234 + \*Pa-234,  
\*natural uranium.

*Class 3*

(moderate toxicity)

\*Na-22, \*Na-24, P-32, S-35, Cl-36, \*K-42,  
\*Sc-46, Sc-47, \*Sc-48, \*V-48, \*Mn-52, \*Mn-54,  
\*Mn-56, Fe-55, \*Co-58, \*Co-60, Ni-59, \*Cu-64,  
\*Zn-65, \*Ga-72, \*As-74, \*As-76, \*Br-82, \*Rb-86,  
\*Zr-95 + \*Nb-95, \*Nb-95, \*Mo-99, Tc-98,  
\*Rh-105, Pd-103 + Rh-103, \*Ag-105, Ag-111,  
Cd-109 + \*Ag-109, \*Sn-113, \*Te-127, \*Te-129,  
\*I-132, Cs-137 + \*Ba-137, \*La-140, Pr-143,  
Pm-147, \*Ho-166, \*Lu-177, \*Ta-182, \*W-181,  
\*Re-183, \*Ir-190, \*Ir-192, Pt-191, \*Pt-193,  
\*Au-196, \*Au-198, \*Au-199, Tl-200, Tl-202,  
Tl-204, \*Pb-203.

*Class 4*

(slight toxicity)

H-3, \*Be-7, C-14, F-18, \*Cr-51, Ge-71, \*Tl-201.

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\* Gamma-emitters.

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<sup>1/</sup> The contents of this Appendix may be revised by the Director General  
in the light of any further recommendations of ICRP.

<sup>2/</sup> STI/PUB. No. 1

3.1.11. The various types of laboratories or working places required are indicated in the following table:

TABLE II

Radio toxicity of isotopes	Minimum significant quantity	Type of laboratory or working place required		
		Type C Good Chemical Laboratory	Type B Radioisotope Laboratory	Type A High Level Laboratory
Very high	0.1 $\mu\text{c}$	10 $\mu\text{c}$ or less	10 $\mu\text{c}$ — 10 mc	10 mc or more
High	1.0 $\mu\text{c}$	100 $\mu\text{c}$ or less	100 $\mu\text{c}$ — 100 mc	100 mc or more
Moderate	10 $\mu\text{c}$	1 mc or less	1 mc — 1 c	1 c or more
Slight	100 $\mu\text{c}$	10 mc or less	10 mc — 10 c	10 c or more

3.1.12. Modifying factors should be applied to the quantities indicated in the last 3 columns of Table II, according to the complexity of the procedures to be followed. The following factors are suggested but due regard should be paid to the circumstances affecting individual cases.

<i>Procedure</i>	<i>Modifying factor</i>
Storage (stock solutions) . . . . .	x 100
Very simple wet operations . . . . .	x 10
Normal chemical operations . . . . .	x 1
Complex wet operations with risk of spills	} 0.1
Simple dry operations . . . . .	
Dry and dusty operations . . . . .	x 0.01