

MOROCCO

Act No. 12-02 on Civil Liability for Nuclear Damage*

Promulgated on 7 January 2005

Chapter I

General Provisions

Section 1

This Act aims to ensure indemnification of damage caused by certain peaceful uses of nuclear energy pursuant to the provisions of the Vienna Convention on Civil Liability for Nuclear Damage.

Section 2

For the purposes of this Act:

- a) nuclear fuel means any material which is capable of producing energy by a self-sustaining chain process of nuclear fission;
- b) nuclear reactor means any structure containing nuclear fuel in such a configuration that a self-sustaining chain process of nuclear fission can occur therein without an additional source of neutrons;
- c) radioactive products or waste means any radioactive material produced in, or any material made radioactive by exposure to the radiation incidental to, the production or utilisation of nuclear fuel, but does not include radioisotopes which have reached the final stage of fabrication so as to be usable for any scientific, medical, agricultural, commercial or industrial purpose;
- d) nuclear material means:
 - nuclear fuel, other than natural uranium and depleted uranium, capable of producing energy by a self-sustaining chain process of nuclear fission outside a nuclear reactor, either alone or in combination with some other material; and
 - radioactive products or waste.
- e) nuclear installation means:

* Unofficial translation established by the OECD Secretariat.

- any nuclear reactor, including related installations necessary for its operation, other than one with which a means of sea or air transport is equipped for use as a source of power, whether for propulsion thereof or for any other purpose;
- any factory using nuclear fuel for the production of nuclear material, or any factory designed or adapted for the processing of nuclear material, including any factory for the reprocessing of irradiated nuclear fuel; and
- any facility where nuclear material is stored, other than storage incidental to the carriage of such material.

For the purpose of implementation of this Act, several nuclear installations of one operator located at the same site shall be considered as a single nuclear installation.

f) nuclear damage means:

- loss of life or any personal injury;
- any loss of, or damage to, property;

to the extent that the loss or damage arises out or results from ionising radiation emitted by any source of radiation inside a nuclear installation, or emitted from nuclear fuel or radioactive products or waste in, or of nuclear material coming from, originating in, or sent to, a nuclear installation, whether so arising from the radioactive properties of such matter, or from a combination of radioactive properties with toxic, explosive or other hazardous properties of such matter.

- g) nuclear incident means any occurrence or series of occurrences having the same origin which causes nuclear damage;
- h) operator means the person duly authorised pursuant to the regulations in force on licensing and control of nuclear installation;
- i) Special Drawing Rights (SDR) mean the unit of account defined by the International Monetary Fund and used by it for its own operations and transactions.

Chapter II

Nature of Liability

Section 3

Subject to the provisions of Chapter III of this Act, only the operator of a nuclear installation shall be liable for nuclear damage.

Section 4

The operator of a nuclear installation shall be liable for nuclear damage caused by a nuclear incident in his nuclear installation.

Section 5

The operator of a nuclear installation shall be liable for nuclear damage caused by a nuclear incident involving nuclear material coming from or originating in his nuclear installation and occurring:

- a) before liability with regard to nuclear incidents involving this material has been assumed, pursuant to the express terms of a contract in writing, by the operator of another nuclear installation;
- b) in the absence of such express terms, before the operator of another nuclear installation has taken charge of this material;
- c) where this material is intended to be used in a nuclear reactor with which a means of transport is equipped for use as a source of power, whether for propulsion thereof or for any other purpose, before the person duly authorised to operate such reactor has taken charge of the nuclear material; or
- d) where this material has been sent to a person within the territory of a State which is not a Contracting Party to the Vienna Convention, before it has been unloaded from the means of transport by which it has arrived in the territory of that non-Contracting State.

Section 6

The operator of a nuclear installation shall be liable for nuclear damage caused by a nuclear incident involving nuclear material sent to his nuclear installation and occurring:

- a) after liability with regard to nuclear incidents involving this material has been assumed by him, pursuant to the express terms of a contract in writing, from the operator of another nuclear installation;
- b) in the absence of such expressed terms, after he has taken charge of this material;
- c) where the nuclear material has, with the written consent of the operator, been sent from a person within the territory of a State which is not a Contracting Party to the Vienna Convention, only after it has been loaded on the means of transport by which it is to be carried from the territory of that State;
- d) after the operator has taken charge of the nuclear material from a person operating a nuclear reactor with which a means of transport is equipped for use as a source of power, whether for propulsion thereof or for any other purpose.

Section 7

If nuclear damage is caused by a nuclear incident occurring in a nuclear installation and involving nuclear material stored therein incidentally to the carriage of such material, the provisions of Section 4 shall not apply where another operator or person is solely liable pursuant to the provisions of Sections 5 or 6 of this Act.

Section 8

Where nuclear damage engages the liability of more than one operator of a nuclear installation, the operators involved shall, in so far as the damage attributable to each operator is not reasonably

separable, be jointly and severally liable, each of them up to the amount applicable with respect to him pursuant to Section 22 of this Act.

Section 9

Where a nuclear incident occurs in the course of carriage of nuclear material, either in one and the same means of transport, or, in the case of storage incidental to the carriage, in one and the same nuclear installation, and causes nuclear damage which engages the liability of more than one operator, the total liability shall not exceed the highest amount applicable with respect to any one of them pursuant to Section 22 of this Act.

Section 10

In neither of the cases referred to in Sections 8 and 9 shall the amount of liability of any one operator exceed the amount applicable with respect to him pursuant to Section 22 of this Act.

Section 11

Subject to the provisions of Sections 8, 9 and 10, where several nuclear installations of one and the same operator are involved in one nuclear incident, such operator shall be liable in respect of each nuclear installation involved up to the amount applicable with respect to him pursuant to Section 22 of this Act.

Section 12

Whenever both nuclear damage and damage other than nuclear damage have been caused by a nuclear incident or jointly by a nuclear incident and one or more other occurrences, such other damage shall, to the extent that it is not reasonably separable from the nuclear damage, be deemed to be nuclear damage caused by that nuclear incident.

Section 13

Liability for nuclear damage caused by a nuclear incident involving nuclear material which was stolen, lost, jettisoned or abandoned lies with the operator of the nuclear installation who was the last owner of this nuclear material.

Section 14

A carrier of nuclear material or a person handling radioactive waste may, at his request and with the consent of the operator concerned, be designated or recognised as operator in the place of that operator upon authorisation of the administrative authority and in compliance with provisions of Section 19.

In this event such carrier or person shall be considered, for all the purposes of this Act, as an operator of a nuclear installation.

Chapter III

Exceptions to Civil Liability

Section 15

No liability under this Act shall attach to an operator for nuclear damage caused by a nuclear incident directly due to an act of armed conflict, hostilities, civil war or insurrection.

Section 16

The operator of a nuclear installation shall not be liable for nuclear damage:

- a) to the nuclear installation itself or any other nuclear installation, including a nuclear installation under construction, on the site where that installation is located;
- b) to any property on that same site which is used or to be used in connection with any such installation.

Section 17

If the operator of a nuclear installation proves that the nuclear damage resulted wholly or partly either from the gross negligence of the person suffering the damage or from an act or omission of such person done with the intent to cause damage, the competent court may relieve the operator wholly or partly from his obligation to pay compensation in respect of the damage suffered by such person.

Section 18

Nothing in this Act shall affect the liability of any individual for nuclear damage for which the operator, by virtue of Sections 15 and 16 of this Act, is not liable and which that individual caused by an act or an omission done with the intent to cause damage.

Chapter IV

Security for Civil Liability

Section 19

The operator of a nuclear installation shall be required to have and maintain insurance or other financial security covering his liability up to the amount, per accident, provided in Section 22 of this Act.

Section 20

The operator of a nuclear installation shall submit for approval to the administrative authorities the conditions of financial security through insurance or other financial security.

Section 21

The operator of a nuclear installation, in order to obtain the licence for commissioning testing as provided under Section 10 of Decree No. 2-94-666 of 4 *reheb* 1415 (7 December 1994) on the licensing and control of nuclear installations, shall provide the proof of his coverage of liability for nuclear damage as provided under Section 19 of this Act.

Section 22

The amount of liability of the operator of a nuclear installation for nuclear damage caused by one single nuclear incident is set at 100 million SDRs.

However, the administrative authorities, having regard to the nature of the nuclear installation or the nuclear material involved and to the likely consequences of an accident originating therefrom, may establish a lower amount of financial security of the operator, provided that in no event shall any amount so established be less than 5 million SDRs.

This amount will be automatically indexed in percentage according to fluctuations in the value of the SDR of the International Monetary Fund between the date of entry into force of this Act and that of the nuclear incident.

Section 23

The State shall ensure the payment of claims for compensation for nuclear damage which have been established against the operator to the extent that the yield of the insurance or financial security of the operator is inadequate to satisfy such claims, but not in excess of the amount of the financial security to be provided under Section 22 of this Act.

Section 24

Where the amount of insurance or financial security of the operator is insufficient to fully compensate all nuclear damage the State may provide supplementary funds up to the amount provided under Section 22 of this Act.

Section 25

No insurer or other financial guarantor shall suspend or cancel the insurance or other financial security provided pursuant to Section 19 of this Act, without giving notice in writing of at least three months. This notice shall be sent by recorded delivery with acknowledgement of receipt to the operator of the nuclear installation whose civil liability is insured or guaranteed.

A copy of this notice in writing shall be addressed in the same time frame to the administrative authorities.

Section 26

For the implementation of this Chapter, the funds provided shall be exclusively available for compensation of nuclear damage covered by this Act and shall not include any interest or costs awarded by a court.

Section 27

The operator liable in accordance with this Act shall provide the carrier of nuclear materials with a certificate issued by or on behalf of the insurer or other financial guarantor furnishing the financial security stating the name and address of that operator and the amount, type and duration of the insurance or the financial security as well as the nuclear material in respect of which the insurance or security applies. The certificate shall include a statement by the administrative authority that the person named is an operator within the meaning of this Act.

Chapter V

Recourse and Actions for Compensation

Section 28

If a person, other than the liable operator, has paid compensation for nuclear damage, such person shall, up to the amount which he has paid, acquire by subrogation the rights under this Act of the person so compensated.

No rights shall be so acquired by any person to the extent that the operator has a right of recourse against such person under this Act.

Section 29

The operator of a nuclear installation shall have a right of recourse only:

- a) if this is expressly provided for by a contract in writing; or
- b) if the nuclear incident results from an act or omission done with intent to cause damage, against the individual who has acted or omitted to act with such intent.

Section 30

Any person who has a right of compensation for nuclear damage pursuant to this Act shall bring an action for compensation against the liable operator, or directly against the insurer or against any other person providing financial security pursuant to Section 19.

Section 31

Rights of compensation for nuclear damage under this Act shall be extinguished if an action is not brought:

- a) with respect to loss of life or personal injury (including direct genetic repercussions), thirty years from the date of the nuclear incident;
- b) with respect to any other nuclear damage, ten years from the date of the nuclear incident.

However, and provided that the periods established pursuant to sub-paragraph 1 shall not be exceeded, the prescription period shall be three years from the date on which the person suffering damage had knowledge or ought to have had knowledge of the damage and of the operator liable for the damage.

Any person who claims to have suffered nuclear damage and who has brought an action for compensation within the period applicable pursuant to this section may amend his claim to take into account any aggravation of the damage, even after the expiry of that period, provided that final judgement has not been entered.

Section 32

Payment for compensation of nuclear damage caused by a nuclear incident shall be done in the following order:

- a) priority shall be given to the compensation of any loss of life or personal injury;
- b) second, any loss or damage to property shall be compensated once the claims for the above damages are satisfied.

Section 33

The Court of First Instance of Rabat shall be the only court which has jurisdiction to examine claims for compensation of nuclear damage caused by a nuclear incident occurring in the territory of Morocco or within its exclusive economic zone and which are brought according to the provisions of this Act.

If, in implementation of the Vienna Convention, a Moroccan court has jurisdiction, such jurisdiction shall lie only with the Court of First Instance of Rabat.

Chapter VI

Penal Provisions

Section 34

If it is officially noted in a report that the operator or the carrier cannot provide proof of insurance or financial security as provided under Section 19, the administrative authorities may suspend the operation of the installation or performance of the transport until provision of the proof required.

If operation of the installation or performance of the transport has been suspended, the administrative authority may take any measures to ensure the safety of persons and property at the expense of the operator or the carrier.

Section 35

Failure to comply with the obligation to have and maintain insurance or other financial security as provided under Section 19 above shall make the offender liable to imprisonment from six months to five years or to a fine of 10 000 to 1 000 000 dirhams or to both.

Failure to furnish the certificate as provided under Section 27 above, shall make the offender liable to imprisonment from two months to one year or to a fine of 5 000 to 100 000 dirhams or to both.

In the event of subsequent offence, the maximum of these sentences will be doubled.

IAEA

Code of Conduct on the Safety of Research Reactors

As adopted by the IAEA Board of Governors, 8 March 2004

Preamble

The IAEA's Member States

Aware that research reactors provide important benefits throughout the world, including research, education, radioisotope production, fuel and materials testing and medical and industrial applications,

Aware of the importance of ensuring that the use of research reactors is safe, well regulated and environmentally sound,

Noting that the International Nuclear Safety Advisory Group (INSAG) has identified the need for action to address safety issues that may arise in research reactors and that subsequently the IAEA General Conference approved a research reactor safety enhancement plan that included the preparation of a Code of Conduct for the Safety of Research Reactors (GC(45)/RES/10),

Desiring to promote an effective nuclear safety culture,

Affirming the importance of international cooperation for the enhancement of nuclear safety,

Affirming the importance of the IAEA's safety standards relevant to research reactors that provide an extensive basis for ensuring their safety,

Noting the finalization of the work by the Open-ended Group of Legal and Technical Experts convened by the Director General to prepare a draft amendment of the Convention on the Physical Protection of Nuclear Material aimed at extending the scope of that convention to cover, inter alia, the physical protection of nuclear material and nuclear facilities, including research reactors, against sabotage,

Keeping in mind that the Convention on Nuclear Safety (1996) establishes the fundamental safety principles for achieving and maintaining a high level of nuclear safety worldwide through the enhancement of national measures and international co-operation for nuclear power reactors, but that it does not apply to research reactors, and

Taking account of the provisions of the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management, in particular those provisions that apply to spent fuel and radioactive waste arising from the operation and decommissioning of research reactors,

Decide that the following Code of Conduct should serve as guidance to States for, inter alia, the development and harmonization of policies, laws and regulations on the safety of research reactors.

I. Scope

1. This Code applies to the safety of research reactors as defined by this Code, at all stages of their lives from siting to decommissioning.
2. This Code does not apply to the physical protection of research reactors.
3. This Code does not apply to research reactors within military or defence programmes.

II. Objective

4. The objective of this Code is to achieve and maintain a high level of safety in research reactors worldwide through the enhancement of national measures and international co-operation including, where appropriate, safety related technical co-operation. This objective is achieved by proper operating conditions, the prevention of accidents and, should accidents occur, the mitigation of the radiological consequences, in order to protect workers, members of the public and the environment against radiation hazards.

III. Application of the Guidance in the Code

5. Application of this Code is accomplished through national safety regulations pertaining to all stages in the life of research reactors. In doing so, States are encouraged to make appropriate use of IAEA safety standards relevant to research reactors and those relating to the legal and governmental infrastructure for nuclear, radiation, radioactive waste and transport safety.
6. Noting that there are many different research reactor designs and power levels resulting in a wide range of hazard potential, the State should adopt a graded approach to application of the guidance in this Code commensurate with the hazard potential, while maintaining a strong nuclear safety culture.
7. If the State faces difficulties in application of this Code, it should communicate the difficulties and any assistance it may require to the Agency.

IV. Definitions

8. For the purposes of this Code:
 - a) “associated experimental facilities” means any equipment and apparatus for utilization of the neutrons and other ionising radiation produced by the research reactor that have the potential to affect its safe operation.
 - b) “extended shutdown” means the state in which the reactor has been shutdown and for which there are no approved plans and committed resources in place to resume operation or enter decommissioning.
 - c) “modification” means a deliberate change in or an addition to the existing reactor configuration, with potential safety implications, intended for the continued operation of the reactor. It may involve safety systems, or safety related items or systems, procedures, documentation or operating conditions.
 - d) “operating organization” means the organization which undertakes one or more of the siting, design, construction, commissioning, operation, modification, and decommissioning of a research reactor and is authorized (or is seeking authorization) by the regulatory body.

- e) “regulatory body” means an authority or system of authorities designated by the government of a State as having legal authority for conducting the regulatory process, including issuing authorizations, and thereby regulating nuclear, radiation, radioactive waste and transport safety.
- f) “research reactor” means a nuclear reactor used mainly for the generation and utilization of neutron flux and ionising radiation for research and other purposes, including experimental facilities associated with the reactor and storage, handling and treatment facilities for radioactive materials on the same site that are directly related to safe operation of the research reactor. Facilities commonly known as critical assemblies are included.
- g) “worker” means a person who works in a research reactor and who has recognized rights and duties in relation to occupational radiation protection, including employees of the operating organization, experimenters and other users of the research reactor.

V. Role of the State

9. The State should establish and maintain a legislative and regulatory framework to govern the safety of research reactors. The framework should place the prime responsibility for the safety of research reactors on the operating organization and should provide for:
 - a) the establishment of applicable national safety requirements and regulations;
 - b) a system of authorization for research reactors and the prohibition of the operation of a research reactor without an authorization;
 - c) a system of regulatory inspection and assessment of research reactors to ascertain compliance with applicable regulations and the terms of authorizations; and
 - d) the enforcement of applicable regulations and the terms of authorizations, including suspension, modification or revocation of the authorization.
10. The State should have a regulatory body charged with regulatory control of research reactors based on the national legal structure. The regulatory body should be able to conduct authorization, regulatory review and assessment, inspection and enforcement, and should establish safety principles, criteria, regulations and guides. The regulatory body should be effectively independent from organizations or bodies charged with promotion of nuclear technologies or with operation of research reactors. Before the State authorizes building or importing a research reactor, a functioning regulatory body should be in place. If necessary, assistance in developing the necessary human, technical and regulatory capabilities should be obtained through international cooperation.
11. The State should provide the regulatory body with the necessary authority and adequate resources to ensure that it can discharge its assigned responsibilities. No other responsibility should be assigned to the regulatory body that may jeopardize or conflict with its responsibility for regulating safety and protecting the environment from radiation hazards.
12. The State should, if it deems necessary, define how the public and other bodies are involved in the regulatory process.

13. The State should ensure that the operating organization has a system for financing the safe operation of the research reactor, for maintaining the research reactor in a safe shutdown state for extended periods if this becomes necessary, and for its decommissioning.
14. The State should establish an effective system of governmental emergency response and intervention capabilities relating to research reactors.
15. The State should make adequate legal and infrastructural arrangements for decommissioning of research reactors.
16. The State should take the appropriate steps to ensure that the safety of all operating research reactors and research reactors in extended shutdown is reviewed. When necessary in the context of this Code, the State should ensure that all reasonably practicable improvements are made to upgrade the safety of the research reactors. If such upgrading cannot be achieved, appropriate provisions should be made to shut down and then decommission the research reactors. The timing of the shut-down of the research reactors, if safety allows it, may take into account the contributions of each research reactor's utilization programme to society and the possible alternatives as well as other social, environmental and economic impacts.
17. In circumstances where a research reactor is in extended shutdown and there is no longer any effective operating organization, the State should make arrangements for the safe management of the research reactor.
18. The State should take appropriate steps to ensure that arrangements are put in place to inform neighbouring States in the vicinity of a planned research reactor, insofar as they are likely to be affected by the research reactor, and upon request, provide sufficient information to such States to enable them to evaluate and make their own assessment of the likely safety impact of the research reactor on their own territory for emergency planning and response.

VI. Role of the Regulatory Body

19. The regulatory body should:
 - a) implement a process of issuing authorizations with regard to all stages in the life of a research reactor;
 - b) undertake regulatory inspections and assessments of research reactors to ascertain compliance with applicable regulations and authorizations;
 - c) enforce the applicable regulations and the authorization, including suspension, modification or revocation of the authorization;
 - d) review and assess submissions on safety from the operating organization both prior to authorization and periodically during the life of the research reactor as appropriate, including in relation to modifications, changes in utilization and experimental activities important to safety; and
 - e) make available, as appropriate, its regulatory requirements and decisions and their basis, particularly with respect to matters under Paragraph 19(c), above.
20. The regulations and guidance established by the State or the regulatory body according to national arrangements should:
 - a) require clear arrangements for the management of safety by the operating organization, reflecting safety as the highest priority and encouraging the development of a strong nuclear safety culture in the operating organization;

Assessment and verification of safety

- b) require the operating organization to prepare and maintain a safety analysis report and to obtain an authorization for siting, construction, commissioning, operation, modifications important to safety, extended shutdown and decommissioning;
- c) require the operating organization to undertake periodic safety reviews at intervals determined by the regulatory body and to make proposals for upgrading and refurbishment arising from such reviews as necessary;

Financial and human resources

- d) require the operating organization to demonstrate that it has sufficient financial and human resources to support safe operation of the research reactor;
- e) require those personnel who operate the research reactor and for experimenters who use associated experimental facilities to be appropriately trained;

Quality assurance

- f) require the operating organization to put in place effective quality assurance programmes at the different stages of the life of the research reactor;

Human factors

- g) require the operating organization to take human factors into account throughout the life of the research reactor;

Radiation protection

- h) require that radiation doses to workers and the public, including doses from releases to the environment, be within prescribed national dose limits and be as low as reasonably achievable, social and economic factors being taken into account;
- i) provide guidance, as international consensus develops, on the protection of the environment from the harmful effects of ionising radiation;

Emergency preparedness

- j) establish criteria for intervention in emergencies, and require that adequate emergency plans be in place;

Siting

- k) establish criteria for the siting for research reactors;

Design, construction and commissioning

- l) require that the design provide for defence in depth and diversity and redundancy in safety systems, so that if failures were to occur, they would be detected and compensated for or corrected by appropriate means;
- m) require that construction be carried out in accordance with applicable codes, standards, specifications and criteria;
- n) require that a commissioning program be carried out by the operating organization to ensure that the reactor meets design requirements;

Operation, maintenance, modification and utilization

- o) require the operating organization to establish operational limits and conditions for the research reactor, with the regulatory body to assess and approve the limits and conditions and changes to them;
- p) require the operating organization to report the occurrence of events significant to safety in accordance with criteria established by the regulatory body;
- q) require the operating organization to classify modifications according to their safety significance, establish suitable internal review procedures, and keep up to date records of modifications and changes to the research reactor, including temporary modifications arising from experiments;
- r) require access for the regulatory body to the research reactor for the purposes of inspection to verify compliance with regulatory requirements, such inspections to be followed with reports provided to the operating organization for assessment and response;
- s) establish requirements for management of radioactive waste arising from the research reactor ;

Extended shutdown

- t) where necessary in national circumstances, establish criteria for the safety of research reactors in extended shutdown; and

Decommissioning

- u) establish criteria for the release from regulatory control of decommissioned research reactors.

VII. Role of the Operating Organization

21. The operating organization should establish its own policies in accordance with State requirements that give safety matters the highest priority, that promote a strong nuclear safety culture and are implemented within a management structure having clearly defined divisions of responsibility and lines of communication.

VII.A General Recommendations

Assessment and verification of safety

22. The operating organization should:
 - a) carry out a comprehensive and systematic safety assessment and prepare a safety analysis report before the construction and commissioning of a research reactor, and carry out safety reviews at appropriate intervals throughout its life, including in relation to modifications, changes in utilization and significant experimental activities and the management of ageing. The safety assessments and periodic safety reviews should include all technical, operational, personnel and administrative aspects of safety related operations. The assessments and reviews should be well documented, subsequently updated in light of operating experience and significant new safety information and reviewed under the authority of the regulatory body; and
 - b) verify by analysis, surveillance, testing and inspection that the physical state and the operation of a research reactor continues to be in accordance with its design, safety analysis, applicable national safety requirements, and operational limits and conditions for the lifetime of the research reactor.

Financial and human resources

23. The operating organization should ensure that there is an overall effective system for the financing of the safe operation of the research reactor, including for any extended shutdown state, and for decommissioning.
24. The operating organization should make available sufficient numbers of staff qualified through appropriate education and training (initial and ongoing) for all safety related activities throughout the life of the research reactor. Appropriate training should be provided for experimenters that will use associated experimental facilities.

Quality assurance

25. The operating organization should establish and implement effective quality assurance programmes with a view to providing confidence that specified requirements for all activities important to nuclear safety are satisfied throughout the life of the research reactor. Experimenters using associated experimental facilities should be required to work within the relevant quality assurance programme and with safety arrangements established by the operating organization.

Human factors

26. The operating organization should take into account the capabilities and limitations of human performance throughout the life of the research reactor for operational states and in accident conditions, also taking into account human factors relating to experiments.

Radiation protection

27. The operating organization should in all operational states keep the radiation exposure from the research reactor to the workers and members of the public as low as reasonably achievable, social and economic factors being taken into account, and should ensure that no individual incurs a radiation dose which exceeds prescribed national dose limits.
28. The operating organization should also respond to any guidance that is provided by the regulatory body in relation to the protection of the environment from the harmful effects of ionizing radiation.

Emergency preparedness

29. The operating organization should establish, and maintain by training and exercises, appropriate emergency plans in accordance with established criteria of the regulatory body, and in co-operation with other appropriate bodies, to provide an effective response to emergencies.

VII.B Safety of Research Reactors

Siting

30. The operating organization should establish, implement and maintain appropriate procedures for:
 - a) evaluating all relevant site-related factors likely to affect the safety of the research reactor over its projected lifetime;
 - b) evaluating the potential safety impact of a planned research reactor on the public and the environment; and
 - c) re-evaluating the two preceding issues at appropriate times so as to ensure the continued safety acceptability of the research reactor.

Design, construction and commissioning

31. The operating organization should ensure that:
 - a) the design and construction of the research reactor provides for several reliable levels and methods of protection (defence in depth) against the release of radioactive materials, with a view to preventing the occurrence of accidents and to mitigating their radiological consequences should they occur;
 - b) the design of the research reactor allows for reliable, stable and easily manageable operation, with specific consideration of human factors and the man-machine interface;
 - c) the construction of the research reactor is in accordance with the approved design (and any approved modifications to the design);

- d) the technologies incorporated in the design and construction of the research reactor are proven by experience, testing or analysis; and
- e) the commissioning programme demonstrates that the design objectives and performance criteria of the research reactor structures, systems and components important to safety have been achieved.

Operation, maintenance, modification and utilization

32. The operating organization should:

- a) establish and revise as necessary operational limits and conditions derived from the safety analysis, tests, commissioning programme and operational experience to identify the limiting conditions for safe operation;
- b) conduct operation, utilization, modification, maintenance, inspection and testing activities important to the safety of the research reactor in accordance with approved procedures and regulations;
- c) establish procedures for responding to anticipated operational occurrences and to accidents;
- d) make available the necessary engineering and technical support in all safety-related fields throughout the lifetime of the research reactor, including through international cooperation;
- e) report events significant to safety to the regulatory body, analyse the events and act upon the findings to improve safety in a timely manner;
- f) subject modifications to the research reactor over its lifetime to the design, construction and commissioning provisions described in this Code;
- g) assess appropriately modifications proposed to perform experiments;
- h) establish a safety review committee, as part of the operating organization, but reporting independently from the reactor management, to advise it on safety matters;
- i) subject each utilization project having safety significance, including any modification of the research reactor, new construction or experimental device, to an appropriate level of safety assessment and approval;
- j) keep the generation of radioactive waste resulting from the operation and utilization of the research reactor to the minimum practicable for the process concerned, both in activity and in volume, and ensure that there are effective arrangements for the safe management of such waste at the site of the research reactor;
- k) maintain documentation in a secure and organized manner throughout the life of the research reactor to assist in its safe operation and ultimate decommissioning. The documentation should include updated technical information and drawings of the facility and experimental devices, and records of operation and events.

VII.C Extended Shutdown

33. If unusual and compelling circumstances make it necessary for a research reactor to enter into or to continue in a state of extended shutdown, the operating organization should, as appropriate,

prepare and implement a technical preservation programme to maintain the safety of the reactor and the reactor fuel, to be approved by the regulatory body. The programme should include:

- a) arrangements for ensuring that the reactor core remains subcritical, noting that if appropriate arrangements exist for storing the fuel safely, it is preferable to unload the core;
- b) procedures and measures to disconnect, dismantle and preserve the systems that are to be taken out of operation or temporarily dismantled;
- c) modifications of the safety analysis report and the operational limits and conditions;
- d) arrangements for dealing with the fuel and radioactive waste in the research reactor;
- e) regular surveillance and periodic inspection, testing and maintenance activities to ensure that the safety performance of structures, systems and components does not degrade;
- f) revised emergency planning arrangements; and
- g) staffing requirements to undertake the tasks necessary to keep the research reactor in a safe condition and to maintain knowledge about the research reactor.

VII.D Decommissioning

34. The operating organization should ensure that siting, design, construction, operation, maintenance, and utilization of the research reactor are carried out keeping in view the ultimate decommissioning of the installation.
35. The operating organization should prepare a comprehensive decommissioning plan and assessment of environmental impact for review and approval by the regulatory body prior to commencing decommissioning activities. The elements of the plan should include:
 - a) the broad decommissioning option to be pursued and the justification for choosing that option;
 - b) the decontamination and dismantling techniques to be applied so as to minimise waste generation and airborne contamination;
 - c) arrangements for dealing with the fuel and radioactive waste arising from the research reactor;
 - d) arrangements for radiation protection during the decommissioning process; and
 - e) a description of the volumes, activities and types of waste to be generated in the decommissioning and the means proposed to manage these wastes safely.

VIII. Role of the IAEA

36. The IAEA Secretariat should:
 - a) disseminate this Code and related information widely;
 - b) assist States, upon their own request, in application of this Code;
 - c) continue to collect and disseminate information relating to the safety of research reactors, provide safety review services, develop and establish relevant technical standards and provide for the application of these standards at the request of any State by advising and assisting on all aspects of the safe management of research reactors.

UNITED NATIONS

UN Security Council Resolution 1540 (2004)

Adopted by the Security Council at its 4956th meeting, on 28 April 2004

The Security Council,

Affirming that proliferation of nuclear, chemical and biological weapons, as well as their means of delivery,* constitutes a threat to international peace and security,

Reaffirming, in this context, the Statement of its President adopted at the Council's meeting at the level of Heads of State and Government on 31 January 1992 (S/23500), including the need for all Member States to fulfil their obligations in relation to arms control and disarmament and to prevent proliferation in all its aspects of all weapons of mass destruction,

Recalling also that the Statement underlined the need for all Member States to resolve peacefully in accordance with the Charter any problems in that context threatening or disrupting the maintenance of regional and global stability,

Affirming its resolve to take appropriate and effective actions against any threat to international peace and security caused by the proliferation of nuclear, chemical and biological weapons and their means of delivery, in conformity with its primary responsibilities, as provided for in the United Nations Charter,

Affirming its support for the multilateral treaties whose aim is to eliminate or prevent the proliferation of nuclear, chemical or biological weapons and the importance for all States parties to these treaties to implement them fully in order to promote international stability,

Welcoming efforts in this context by multilateral arrangements which contribute to non-proliferation,

Affirming that prevention of proliferation of nuclear, chemical and biological weapons should not hamper international cooperation in materials, equipment and technology for peaceful purposes while goals of peaceful utilization should not be used as a cover for proliferation,

* Definitions for the purpose of this resolution only:

- Means of delivery: missiles, rockets and other unmanned systems capable of delivering nuclear, chemical, or biological weapons, that are specially designed for such use.
- Non-State actor: individual or entity, not acting under the lawful authority of any State in conducting activities which come within the scope of this resolution.
- Related materials: materials, equipment and technology covered by relevant multilateral treaties and arrangements, or included on national control lists, which could be used for the design, development, production or use of nuclear, chemical and biological weapons and their means of delivery.

Gravely concerned by the threat of terrorism and the risk that non-State actors* such as those identified in the United Nations list established and maintained by the Committee established under Security Council resolution 1267 and those to whom resolution 1373 applies, may acquire, develop, traffic in or use nuclear, chemical and biological weapons and their means of delivery,

Gravely concerned by the threat of illicit trafficking in nuclear, chemical, or biological weapons and their means of delivery, and related materials*, which adds a new dimension to the issue of proliferation of such weapons and also poses a threat to international peace and security,

Recognizing the need to enhance coordination of efforts on national, subregional, regional and international levels in order to strengthen a global response to this serious challenge and threat to international security,

Recognizing that most States have undertaken binding legal obligations under treaties to which they are parties, or have made other commitments aimed at preventing the proliferation of nuclear, chemical or biological weapons, and have taken effective measures to account for, secure and physically protect sensitive materials, such as those required by the Convention on the Physical Protection of Nuclear Material and those recommended by the IAEA Code of Conduct on the Safety and Security of Radioactive Sources,

Recognizing further the urgent need for all States to take additional effective measures to prevent the proliferation of nuclear, chemical or biological weapons and their means of delivery,

Encouraging all Member States to implement fully the disarmament treaties and agreements to which they are party,

Reaffirming the need to combat by all means, in accordance with the Charter of the United Nations, threats to international peace and security caused by terrorist acts,

Determined to facilitate henceforth an effective response to global threats in the area of non-proliferation,

Acting under Chapter VII of the Charter of the United Nations,

1. **Decides that** all States shall refrain from providing any form of support to non-State actors that attempt to develop, acquire, manufacture, possess, transport, transfer or use nuclear, chemical or biological weapons and their means of delivery;
2. **Decides also** that all States, in accordance with their national procedures, shall adopt and enforce appropriate effective laws which prohibit any non-State actor to manufacture, acquire, possess, develop, transport, transfer or use nuclear, chemical or biological weapons and their means of delivery, in particular for terrorist purposes, as well as attempts to engage in any of the foregoing activities, participate in them as an accomplice, assist or finance them;
3. **Decides also** that all States shall take and enforce effective measures to establish domestic controls to prevent the proliferation of nuclear, chemical, or biological weapons and their means of delivery, including by establishing appropriate controls over related materials and to this end shall:
 - a) Develop and maintain appropriate effective measures to account for and secure such items in production, use, storage or transport;

- b) Develop and maintain appropriate effective physical protection measures;
 - c) Develop and maintain appropriate effective border controls and law enforcement efforts to detect, deter, prevent and combat, including through international cooperation when necessary, the illicit trafficking and brokering in such items in accordance with their national legal authorities and legislation and consistent with international law;
 - d) Establish, develop, review and maintain appropriate effective national export and trans-shipment controls over such items, including appropriate laws and regulations to control export, transit, trans-shipment and re-export and controls on providing funds and services related to such export and trans-shipment such as financing, and transporting that would contribute to proliferation, as well as establishing end-user controls; and establishing and enforcing appropriate criminal or civil penalties for violations of such export control laws and regulations;
4. **Decides** to establish, in accordance with rule 28 of its provisional rules of procedure, for a period of no longer than two years, a Committee of the Security Council, consisting of all members of the Council, which will, calling as appropriate on other expertise, report to the Security Council for its examination, on the implementation of this resolution, and to this end calls upon States to present a first report no later than six months from the adoption of this resolution to the Committee on steps they have taken or intend to take to implement this resolution;
 5. **Decides** that none of the obligations set forth in this resolution shall be interpreted so as to conflict with or alter the rights and obligations of State Parties to the Nuclear Non-Proliferation Treaty, the Chemical Weapons Convention and the Biological and Toxin Weapons Convention or alter the responsibilities of the International Atomic Energy Agency or the Organization for the Prohibition of Chemical Weapons;
 6. **Recognizes** the utility in implementing this resolution of effective national control lists and calls upon all Member States, when necessary, to pursue at the earliest opportunity the development of such lists;
 7. **Recognizes** that some States may require assistance in implementing the provisions of this resolution within their territories and invites States in a position to do so to offer assistance as appropriate in response to specific requests to the States lacking the legal and regulatory infrastructure, implementation experience and/or resources for fulfilling the above provisions;
 8. **Calls upon** all States:
 - a) To promote the universal adoption and full implementation, and, where necessary, strengthening of multilateral treaties to which they are parties, whose aim is to prevent the proliferation of nuclear, biological or chemical weapons;
 - b) To adopt national rules and regulations, where it has not yet been done, to ensure compliance with their commitments under the key multilateral non-proliferation treaties;
 - c) To renew and fulfil their commitment to multilateral cooperation, in particular within the framework of the International Atomic Energy Agency, the Organization for the Prohibition of Chemical Weapons and the Biological and Toxin Weapons Convention, as

important means of pursuing and achieving their common objectives in the area of non-proliferation and of promoting international cooperation for peaceful purposes;

- d) To develop appropriate ways to work with and inform industry and the public regarding their obligations under such laws;
9. **Calls upon** all States to promote dialogue and cooperation on non-proliferation so as to address the threat posed by proliferation of nuclear, chemical, or biological weapons, and their means of delivery;
 10. Further to counter that threat, **calls upon** all States, in accordance with their national legal authorities and legislation and consistent with international law, to take cooperative action to prevent illicit trafficking in nuclear, chemical or biological weapons, their means of delivery, and related materials;
 11. **Expresses** its intention to monitor closely the implementation of this resolution and, at the appropriate level, to take further decisions which may be required to this end;
 12. **Decides** to remain seized of the matter.