International convention on nuclear safety: A legal milestone

Governmental delegates adopt the first international legal instrument directly addressing the safety of nuclear power plants

By Odette Jankowitsch and Franz-Nikolaus Flakus

On 17 June 1994, representatives from 84 countries adopted without a vote the text of the Convention on Nuclear Safety. The action was taken at a Diplomatic Conference in Vienna which the Agency's Board of Governors had authorized the Director General to convene for 14-17 June 1994 at IAEA headquarters. Previously, in September 1993, the IAEA General Conference at its 37th regular session had expressed the desirability of convening a Diplomatic Conference as soon as possible to adopt the Convention. (resolution GC(XXXVII)/RES/615)

The Convention is the first international legal instrument which directly addresses the issue of safety of nuclear power plants.* In that sense, it represents "a milestone in the development of the international law of nuclear energy," in the view of Dr. Walter Hohlefelder of Germany, who was elected President of the Diplomatic Conference.

The Convention's scope of application (Article 3) provides that it "shall apply to the safety of nuclear installations". The Convention defines "nuclear installation" as "any land-based civil nuclear power plant...including such storage, handling, and treatment facilities for radioactive materials as are on the same site and are directly related to the operation of the nuclear power plant."

The issue of safety is addressed in a preventive and continuous manner comparable to some extent to agreements on safety of air or maritime transportation. The Convention, as stated in its Preamble, clearly reflects the importance to the international community "of ensuring that the use of nuclear energy is safe, well regulated and environmentally sound".

The safe use of nuclear, as of other forms of energy, remains, however, essentially a national responsibility. The Convention, in its Preamble, underlines the view that responsibility for nuclear safety rests with the respective State. Nevertheless, international efforts in the area of safety have come increasingly to recognize the interdependence of all participants in the nuclear fuel cycle. As IAEA Director General Hans Blix noted in his opening statement to the Diplomatic Conference, an accident anywhere has the potential for direct transboundary radiation consequences and has global ramifications in terms of public confidence in nuclear power as a major energy source. "Through this Convention," he said, "States will bind themselves to a number of important safety rules, and accept to participate in and report to periodic peer review meetings to verify implementation of the Convention's obligations."

Chronology and background

In September 1991, an International Conference on the "Safety of Nuclear Power: Strategy for the Future" convened by the IAEA declared that "safety should be primarily enforced at national levels, by conscientious application of existing safety principles, standards and good practices at each plant, and within each national regulatory body, making best use of national legal frameworks and working practices." The Conference, however, also saw "a

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*The two conventions adopted in 1986 — the *Convention on Early Notification of a Nuclear Accident* and the *Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency* — both apply "in the event of any accident..." The 1980 *Convention on the Physical Protection of Nuclear Material* applies to "nuclear material...while in international nuclear transport". The *Vienna Convention on Civil Liability for Nuclear Damage* is applicable to damages following incidents.

need to consider an integrated international approach to all aspects of nuclear safety including safety objectives for radioactive wastes — which would be adopted by all Governments." It requested the governing bodies of the IAEA to organize "the preparation of a proposal on the necessary elements of such a formalized international approach, examining the merits of various options and taking into account the activities and roles of relevant international and intergovernmental bodies and using the guidance and mechanisms already established in the IAEA."

Soon afterwards, the General Conference, supporting this idea, invited the Director General "to prepare, for the Board's consideration in February 1992, an outline of the possible elements of a nuclear safety convention, taking into account the activities and roles of relevant international and intergovernmental bodies and drawing on the advice of standing groups like INSAG (International Nuclear Safety Advisory Group), NUSSAG (Nuclear Safety Standards Advisory Group), and INWAC (International Waste Management Advisory Group), and also on expertise made available by Member States and competent international organizations". (GC(XXXV)/RES/553)

Pursuant to that resolution, the Director General convened a limited group of experts to advise on structure and contents of the possible elements of an international nuclear safety convention. The group met in December 1991, reconfirmed that there was a need for an international instrument on nuclear safety, and urged that preparatory work for the establishment of such an instrument begin as soon as possible. A decision on the structure of a convention would be taken after agreement had been reached on its scope and contents. It was considered that the convention should give emphasis to general principles and procedures rather than to technical details regarding nuclear safety.

In February 1992, the Board of Governors authorized the Director General to convene an open-ended group of legal and technical experts with the task of carrying out the necessary substantive preparations for a nuclear safety convention (the group soon came to be known as the "Group of Experts on a Nuclear Safety Convention").

The Group of Experts held its first meeting from 25 to 29 May 1992 and elected as its chairman Mr. Z. Domaratzki of Canada; 90 experts from 45 countries, the Commission of the European Communities (CEC), Nuclear Energy Agency of the Organization for Economic Cooperation and Development (NEA/OECD), and International Labour Organization (ILO) participated.

The experts agreed on a number of points, namely that:

- the main obligations of the parties to the envisaged convention would be based in large measure on the principles for the regulation and management of safety and the operation of nuclear installations contained in a draft NUSSAG document on safety fundamentals regarding the safety of nuclear installations. (The IAEA published the *Safety Fundamentals: The Safety of Nuclear Installations* in 1993 as Safety Series No. 110);
- the Convention would provide for an obligation of the Contracting Parties to report on its implementation, a review mechanism being established through a "meeting of the Parties"; and
- the IAEA would provide the meeting of the Parties with support services and technical expertise.

In September 1992, the General Conference took note of the work done by the Group of Experts for the drafting of a nuclear safety convention. It urged the Group to continue its work taking into account "the vital necessity of a continuing effort to raise the general level of nuclear safety worldwide". (GC(XXXVI/RES/582)

In October 1992, at the second meeting of the Group of Experts (attended by 100 experts from 43 countries, the CEC, NEA/OECD, and ILO), the experts agreed that the objective was to establish, at an early date, a convention with an "incentive character". In January 1993, the Group (123 experts from 53 countries, the CEC, and NEA/OECD) reviewed further draft texts with comments and annotations prepared by the IAEA Secretariat. At its fourth meeting in May 1993 (114 experts from 50 countries, the CEC, and NEA/OECD), the Group resolved the main outstanding issues, thus facilitating the drafting process and the establishment of a single text.

On the issue of scope of application, the experts agreed that the Convention should be limited to civil nuclear power plants, with the understanding that a concomitant political commitment would be made to initiate negotiations on an international instrument on the safety of waste management. The experts agreed that the Convention should also address the issue of so-called "existing situations", i.e. installations not in line with the obligations of the Convention.

At its June 1993 session, the IAEA Board invited the Director General to request Chairman Domaratzki to prepare, after such consultations as he thought necessary, a comprehensive reference text for discussion at the next meeting of the Group, in October 1993. In his statement at the 37th session of the General Conference, the Director General reported that a consensus about structure and contents of the Convention had

Selected obligations of States under the Convention on Nuclear Safety

States that become parties to the Convention on Nuclear Safety undertake important obligations. Among them are those pertaining to:

Reporting: "Each Contracting Party shall submit for review...a report on the measures it has taken to implement each of the obligations of this Convention." *(Article 5)* "The Contracting Parties shall hold meetings...for the purpose of reviewing the reports submitted..." *(Article 20.1)*

Existing nuclear installations: "Each Contracting Party shall take the appropriate steps to ensure that the safety of nuclear installations existing at the time the Convention enters into force for that Contracting Party is reviewed as soon as possible. When necessary in the context of this Convention, the Contracting Party shall ensure that all reasonably practicable improvements are made as a matter of urgency to upgrade the safety of the nuclear installation. If such upgrading cannot be achieved, plans should be implemented to shut down the nuclear installation as soon as practically possible. The timing of the shutdown may take into account the whole energy context and possible alternatives as well as the social, environmental, and economic impact." *(Article 6)*

Legislative and regulatory framework. "Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of nuclear installations. The legislative and regulatory framework shall provide for (i) the establishment of applicable national safety requirements and regulations; (ii) a system of licensing with regard to nuclear installations and the prohibition of the operation of a nuclear installation without a license; (iii) a system of regulatory inspection and assessment of nuclear installations to ascertain compliance with applicable regulations and the terms of the licenses; (iv) the enforcement of applicable regulations and of the terms of licenses, including suspension, modification, or revocation. *(Article 7)*

Assessment and verification of safety: "Each Contracting Party shall take the appropriate steps to ensure that (i) comprehensive and systematic safety assessments are carried out before the construction and commissioning of a nuclear installation and throughout its life. Such assessments shall be well documented, subsequently updated in the light of operating experience and significant new safety information, and reviewed under the authority of the regulatory body; (ii) verification by analysis, surveillance, testing and inspection is carried out to ensure that the physical state and the operation of a nuclear installation continue to be in accordance with its design, applicable national safety requirements, and operational limits and conditions." *(Article 14)*

Emergency preparedness: "Each Contracting Party shall take the appropriate steps to ensure that there are on-site and off-site emergency plans that are routinely tested for nuclear installations and cover the activities to be carried out in the event of an emergency. For any new nuclear installation, such plans shall be prepared and tested before it commences operation above a low power level agreed by the regulatory body. Each Contracting Party shall take the appropriate steps to ensure that, insofar as they are likely to be affected by a radiological emergency, its own population and the competent authorities of the States in the vicinity of the nuclear installation are provided with appropriate information for emergency planning and response." *(Article 16.1 and 16.2)*

Operation: Each Contracting Party shall take the appropriate steps to ensure that: (i) the initial authorization to operate a nuclear installation is based upon an appropriate safety analysis and a commissioning programme demonstrating that the installation, as constructed, is consistent with design and safety requirements; (ii) operational limits and conditions derived from the safety analysis, tests and operational experience are defined and revised as necessary for identifying safe boundaries for operation; (iii) operation, maintenance, inspection and testing of a nuclear installation are conducted in accordance with approved procedures; (iv) procedures are established for responding to anticipated operational occurrences and to accidents; (v) necessary engineering and technical support in all safety related fields is available throughout the lifetime of a nuclear installation; (vi) incidents significant to safety are reported in a timely manner by the holder of the relevant license to the regulatory body; (vii) programmes to collect and analyse operating experience are established, the results obtained and the conclusions drawn are acted upon and that existing mechanisms are used to share important experience with international bodies and with other operating organizations and regulatory bodies; (viii) the generation of radioactive waste resulting from the operation of a nuclear installation is kept to the minimum practicable for the process concerned, both in activity and in volume, and any necessary treatment and storage of spent fuel and waste directly related to the operation and on the same site as that of the nuclear installation take into consideration conditioning and disposal." *(Article 19)*

Governmental delegates at the Diplomatic Conference. *Above from left:* Dr. Morris Rosen, IAEA Assistant Director General for Nuclear Safety; IAEA Director General Hans Blix; Dr. Walter Hohlefelder, elected the Conference President; and Dr. Lars Högberg, Chairman of the Committee of the Whole.
(Credit: F.-N. Flakus, IAEA)

emerged: the Convention would be limited in scope to nuclear power reactors; it would oblige the Contracting Parties to comply with fundamental safety principles based on NUSSAG's nuclear safety fundamentals document; an important feature would be an obligation of the parties to report at agreed intervals to meetings of the Contracting Parties on the implementation of the obligations laid down in the Convention; reporting by the Contracting Parties would be linked to a system of international peer review; and the IAEA would function as the Secretariat of the Convention and might be asked to assist Contracting Parties in the review process.

In October and December 1993, at its fifth and sixth meetings (attended by 120 experts from 50 countries, the CEC, and NEA/OECD), the Group reviewed the draft text prepared by the Chairman. The seventh and final meeting of the Group was held from 31 January to 4 February 1994 and approved the draft text of a Convention, thereby concluding its work.

In February 1994, the IAEA Board of Governors authorized the convening of the Diplomatic Conference, and it was held 14-17 June at the IAEA. In addition to electing Dr. Hohlefelder as President, the Conference elected Mr. Lars Högberg of Sweden as Chairman of the Committee of the Whole; Mrs. Thereza Maria Machado Quintella of Brazil as Vice-Chairperson; and Mr. A. Gopalakrishnan of India as Chairman of the Drafting Committee. The text of the adopted Convention is available in six languages: Arabic, Chinese, English, French, Russian, and Spanish. (INFCIRC/449)

Structure and content

The Convention on Nuclear Safety is structured as follows:

Preamble; Chapter 1 — Objectives, Definitions and Scope; Chapter 2 — Obligations: (a) General Provisions, (b) Legislation and Regulation, (c) General Safety Considerations, (d) Safety of Installations; Chapter 3 — Meetings of the Contracting Parties; and Chapter 4 — Final Clauses and Other Provisions. The Convention has no annexes.

The Convention applies to "nuclear installations", defined as "land based civil nuclear power plants". The obligations are based to a large extent on principles which present an international consensus on the basic concepts for the regulation, the management of safety, and the operation of nuclear installations. They include in par-

ticular the obligation of Contracting Parties to establish and maintain a legislative and regulatory framework for nuclear installations and the obligation to implement a number of measures based on general safety considerations regarding, for example, the availability of financial and human resources, the assessment and verification of safety, quality assurance, and emergency preparedness. Other obligations concern technical aspects of the safety of nuclear installations, including siting, design, construction and operation.

A principal feature of the Convention is the obligation of the Contracting Parties to submit reports on the implementation of the Convention for consideration at meetings of the Parties to be held at regular — approximately 3-year — intervals. In addition, the Convention provides that the Agency shall be the Secretariat of the Convention and the Director General its Depositary.

Implementation and peer review process

Generally, the Convention stipulates obligations for States Parties to take national measures and to report on the measures taken to implement each of the obligations.

After entry into force, implementation of the Convention will formally be pursued in setting up a peer review process. The form and scope of the peer review is the prerogative of the Contracting Parties, and definitive provisions for implementing the peer review system need to be elaborated in detail. Within 6 months of entry into force, a preparatory meeting of the Contracting Parties is to be convened to lay out the structure of the required national reports and the mechanism for the peer review. The peer review process will need to show a number of desirable features: it will have to be efficient, involve reasonable costs, and not place an undue burden on national reporting; it also has to be effective and transparent, demonstrating compliance with the Convention and informing how a Contracting Party has met its obligations. The process will have to function in an incentive manner, thereby triggering a learning and self-educating mechanism. The formal review is the culmination of a process, rather than a detailed review of national nuclear safety programmes.

Each Contracting Party will have to submit a concise national report for the purpose of informing how it has complied with the obligations stipulated in the Convention, and will have the opportunity to discuss and seek clarification of any report submitted by another Party.

Topics and issues to be addressed in the national report are to some extent of a general nature (relating to obligations under general safety considerations such as priority to safety, financial and human resources, human factors), but also cover more specific thematic areas (government organization and legislation; design; construction and siting; operation, including operational experiences).

As stipulated by the Convention, a concluding report, compiled by the Contracting Parties and adopted by consensus, will serve to communicate the final statements of the Meeting of the Contracting Parties to the public.

From the very beginning, the Convention had been envisaged as a catalyst, an incentive for countries to promote continuing progress in nuclear safety. Its implementation will foster — and intensify over time — the collective international involvement and commitment to nuclear safety, and thus steadily promote nuclear safety worldwide.

Also the need was affirmed — and included in the Preamble to the Convention — to develop as soon as possible an international convention on the safety of radioactive waste management. Progress made in developing safety fundamentals for nuclear waste management would pave the way for the early establishment of such a convention following the good example set by the work on the nuclear safety convention.

Outlook

The Convention will be open for signature on 20 September 1994 at IAEA headquarters in Vienna, in conjunction with the 38th regular session of the General Conference. It will enter into force after the deposit with the IAEA Director General of "the twenty-second instrument of ratification, including the instruments of seventeen States, each having at least one nuclear installation which has achieved criticality in a reactor core". (Article 31)

It is hoped that the ratification process will benefit from the same political will that made it possible for States to negotiate and adopt the Convention in such a short time and that the Convention will therefore enter into force in the near future.

As Dr. Blix stated in his concluding remarks to the Conference, "The promotion of safety in nuclear installations is an important national and international objective. This Convention will give many well-known principles the force of law. It will also establish innovative mechanisms to help us ensure that the letters of this law translate into safe nuclear reality". ❐