

NUCLEAR  
LAW  
Bulletin  
number 38

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*This Bulletin includes a supplement*

*December 1986*

Nuclear Energy Agency  
Organisation for Economic Co-operation and Development

Pursuant to article 1 of the Convention signed in Paris on 14th December 1960 and which came into force on 30th September, 1961, the Organisation for Economic Co-operation and Development (OECD) shall promote policies designed

- to achieve the highest sustainable economic growth and employment and a rising standard of living in Member countries, while maintaining financial stability and thus to contribute to the development of the world economy
- to contribute to sound economic expansion in Member as well as non-member countries in the process of economic development, and
- to contribute to the expansion of world trade on a multilateral non-discriminatory basis in accordance with international obligations

The original Member countries of the OECD are Austria, Belgium, Canada, Denmark, France, the Federal Republic of Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The following countries became Members subsequently through accession at the dates indicated hereafter: Japan (28th April 1964), Finland (28th January 1969), Australia (7th June, 1971) and New Zealand (29th May, 1973).

The Socialist Federal Republic of Yugoslavia takes part in some of the work of the OECD (agreement of 28th October, 1961)

*The OECD Nuclear Energy Agency (NEA) was established on 20th April 1972 replacing OECD's European Nuclear Energy Agency (ENEA) on the accession of Japan as a full Member*

*NEA now groups all the European Member countries of OECD and Australia, Canada, Japan, and the United States. The Commission of the European Communities takes part in the work of the Agency*

*The primary objectives of NEA are to promote co-operation between its Member governments on the safety and regulatory aspects of nuclear development and on assessing the future role of nuclear energy as a contributor to economic progress*

*This is achieved by*

- *encouraging harmonisation of governments' regulatory policies and practices in the nuclear field with particular reference to the safety of nuclear installations, protection of man against ionising radiation and preservation of the environment, radioactive waste management and nuclear third party liability and insurance*
- *keeping under review the technical and economic characteristics of nuclear power growth and of the nuclear fuel cycle and assessing demand and supply for the different phases of the nuclear fuel cycle and the potential future contribution of nuclear power to overall energy demand*
- *developing exchanges of scientific and technical information on nuclear energy particularly through participation in common services*
- *setting up international research and development programmes and undertakings jointly organised and operated by OECD countries*

*In these and related tasks NEA works in close collaboration with the International Atomic Energy Agency in Vienna with which it has concluded a Co-operation Agreement as well as with other international organisations in the nuclear field*

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# LEGISLATIVE AND REGULATORY ACTIVITIES

## • *Australia*

### NUCLEAR LEGISLATION

#### Atomic Energy Amendment Bill 1985

The Australian Government recently introduced before Parliament a series of Bills, including a Bill to amend the Atomic Energy Act 1953, to set up a uniform regulatory framework for Australia's nuclear activities (See Nuclear Law Bulletin No 28). These measures were taken in implementation of the national policy in the nuclear field, in particular, the orderly development of Australia's uranium resources for peaceful purposes, strengthening of the international non-proliferation regime and compliance with its obligations under international conventions.

The Atomic Energy Amendment Bill 1985, when adopted, will modify substantially the Atomic Energy Act 1953 as already amended (see Nuclear Law Bulletin No 23)

This legislation will repeal almost all of the existing Atomic Energy Act, including the provisions establishing the Australian Atomic Energy Commission and the security provisions. A new authority will be created under separate legislation to replace the Commission the Australian Nuclear Science and Technology Organisation (see under Organisation and Structure below)

The only parts of the Act which will remain will be the Sections covering

- the authorisation of the Ranger Project and Commonwealth title to uranium in the Northern Territory,

- the requirement for reporting of discoveries of prescribed substances (uranium, thorium, i.e. any substance which may be used for production of atomic energy) and information on their production, and
- certain definitions

The Bill provides that its provisions will enter into force on the same day as the Act setting up the Australian Nuclear Science and Technology Organisation. The definitions retained cover, inter alia, atomic energy, minerals, prescribed substances and the Ranger Project Area. In effect, the Act will be amended to limit to that Area, authority to mine prescribed substances on behalf of, or in association with, the Commonwealth.

In particular, the provisions concerning control of materials, power to enter on land, delivery or possession of prescribed substances will be repealed, and so will the provisions on penalties. A clause in the Bill specifically precludes the exercise of powers under the legislation in relation to defence purposes and other clauses deal with penalties for offences in connection with the Ranger Project and failure to disclose discovery of prescribed substances. The penalties for such offences take the form of fines ranging from 2,000 to 10,000 (Australian) dollars.

## ORGANISATION AND STRUCTURE

### Australian Nuclear Science and Technology Organisation Bill 1985

The purpose of the above Bill (ANSTO Bill) is to establish a successor to the existing Australian Atomic Energy Commission (AAEC) set up under the Atomic Energy Act 1953. The Minister for Resources and Energy will remain the competent authority as for the AAEC.

This legislation will provide for a new Organisation with functions which, according to Government policy, better reflect the directions in which Australia's principal research organisation should tend in that area, namely realignment of AAEC activities away from work on the nuclear fuel cycle, towards greater emphasis on applications of radioisotopes and radiation in medicine, industry, agriculture, science, commerce, etc. ANSTO will be prohibited from undertaking any R and D into the design and production of nuclear weapons or nuclear explosive devices.

This means in effect that the existing AAEC functions under the Atomic Energy Act 1953 relating to mining, treatment, purchase, sale, etc of uranium and construction and operation of plant and equipment for nuclear power purposes will disappear.

Provision is made for the establishment of a governing Executive comprising up to seven members which will be responsible, in particular, for determining the policy of the Organisation. A Chief Executive Officer, under the Executive, will manage the day to day business of the Organisation.



An Advisory Council will be set up to advise the Minister and the Executive on matters within the competence of ANSTO. The Regulatory Bureau, established by the AAEC, will be given statutory recognition and be known as the Nuclear Safety Bureau. It will be responsible to the Minister for monitoring and reviewing the safety of any nuclear plant operated by the Organisation. In addition, a Safety Review Committee will be established, in particular, to review and assess the effectiveness of the standards, practices and procedures adopted by the Organisation to ensure the safety of its operations and to advise the Minister on such questions.

#### Australian Nuclear Science and Technology Organisation (Transitional Provisions) Bill 1985

The above Bill is for an Act to implement certain transitional provisions consequent to the enactment of the ANSTO Act 1985.

The legislation will provide for the continuation of the body corporate from its present form as the Australian Atomic Energy Commission (AAEC) to the new body corporate, the Australian Nuclear Science and Technology Organisation (ANSTO).

This will ensure that property, liabilities, finances, staff, etc of the AAEC are transferred to ANSTO. Commission members will however cease to hold office from commencement of the ANSTO Act.

#### REGIME OF RADIOACTIVE MATERIALS

##### Nuclear Non-Proliferation (Safeguards) Bill 1986

This Bill aims at giving domestic legislative effect to Australia's international non-proliferation obligations and will establish controls over the possession and transport of nuclear materials and equipment by a system of permits to be issued by the competent Minister, namely, the Minister for Resources and Energy.

The above-mentioned obligations arise under the 1968 Treaty on the Non-Proliferation of Nuclear Weapons, Australia's Safeguards Agreement of 1974 with the International Atomic Energy Agency (IAEA), its bilateral agreements with other countries and Euratom (so-called nuclear safeguards agreements) covering transfers of nuclear materials and finally, the 1980 Convention on the Physical Protection of Nuclear Material which is to be ratified by Australia.

The Bill provides that its provisions shall apply to nuclear material (as defined in Article XX of the IAEA Statute) and associated items which include associated material, equipment or technology, clearly defined in the Bill to ensure that the necessary items are brought within its coverage.

The Australian Safeguards Office is the body responsible for the national system of accounting and control required under Australia's Non-Proliferation Treaty (NPT) safeguards agreement with the IAEA. The Bill now establishes it by statute.

The Director of Safeguards, who will be responsible for the Safeguards Office, shall ensure the effective operation of the safeguards system, carry out Australia's obligations under the Agreement with IAEA and other international agreements, in particular, in respect of reporting on the operation of the national safeguards system. He will also monitor other parties' compliance with the provisions of international agreements concluded by Australia. In addition, he will advise the Minister for Resources and Energy on matters relating to operation of the national safeguards system.

The Director, who will be appointed for a period not exceeding five years may be re-appointed. In the performance of his tasks he shall comply with any directives given by the above Minister and submit to him a yearly report on safeguards operations. The Minister, in turn, will report accordingly to Parliament.

A system of permits has been established to ensure proper control of nuclear material and associated items. Applications for permits shall be lodged with the Director of Safeguards on an approved form. Following consideration of the application and related information, the Director shall send a written report on the application to the Minister for Energy and Resources.

The Minister will not grant a permit unless the Director states in his report.

- regarding nuclear material, etc, in a nuclear facility that he is satisfied, in particular, that appropriate procedures for safeguards can be applied;
- regarding nuclear material, etc, to be held outside a nuclear facility that he is satisfied he has been provided with all the information he requires relating to the application.

The permit shall be granted subject to such restrictions and conditions contained therein. These will concern, in particular, the duration of the permit, specification of the nuclear material etc, use and location, record-keeping and accounting and inspections by IAEA inspectors.

When the Minister will grant, amend or revoke a permit, a notice to that effect will be published in the Commonwealth of Australia Gazette.

A special transport permit granted by the Minister will also be required for transporting nuclear material or associated items from a specified location to another specified location. This permit too will be granted subject to certain restrictions and conditions, in particular, concerning its duration, the means and route by which such material and items are to be transported, records, reporting and accounting procedures, etc.

A Register of Permit and Authority Holders will be kept by the Director of Safeguards.

As regards safeguards inspections, inspectors designated to Australia by the IAEA, will inspect nuclear facilities, material and associated items.

They shall be empowered, amongst other things, to examine records and documents, take samples and measurements of nuclear material and associated items. They may, in accordance with an agreement between the Director and the owner concerned or pursuant to a warrant, enter premises, vessels, aircraft or vehicles in the discharge of their duties.

It is provided in the Bill that the Minister for Resources and Energy may declare that certain nuclear material is exempted from the scope of the Act if such material is considered exempt material by the IAEA and if this declaration is not inconsistent with Australia's obligations under an international agreement, this also applies for associated items.

When a person has possession of nuclear material or an associated item which Australia, under an international agreement, must return or transfer to the country concerned, the Director of Safeguards shall be empowered to seize or give an inspector authority to seize the material or item to comply with the provisions of the agreement.

When a person has possession of nuclear material or an associated item without a permit he shall be liable to a fine not exceeding 10,000 dollars or imprisonment for a term not exceeding five years or both if he is a natural person, a body corporate shall be liable to a fine not exceeding 50,000 dollars. This will also apply for such offences on an Australian ship or aircraft or in the course of a journey to and from Australia.

A person breaching the conditions of a permit or authorisation shall be liable to a fine not exceeding 5,000 dollars or imprisonment for a term not exceeding two years or both if he is a natural person, a body corporate shall be liable to a fine not exceeding 25,000 dollars. This will also apply for such offences outside Australia.

The Bill also provides that the Minister may revoke a permit or authority when the holder violates a condition of such permit or authorisation or a direction of the Minister. This will also apply to violations outside Australia.

As regards unauthorised communication of information on technology in the context of an associated item, the offender, if he is a natural person shall be liable to a fine not exceeding 5,000 dollars or imprisonment for a term not exceeding two years, a body corporate shall be liable to a fine not exceeding 25,000 dollars.

The Bill contains provisions relating to the 1980 Convention on the Physical Protection of Nuclear Material. These provisions deal with offences committed in respect of nuclear materials and shall be brought into force simultaneously with ratification of the Convention by Australia.

Any person committing such offences, namely stealing, demanding by threats, threatening to use or using nuclear material and causing personal injury or property damage shall be liable to a fine of 20,000 dollars or imprisonment for ten years or both. These sanctions shall extend to offences committed outside Australia.

## Draft Nuclear Non-Proliferation (Safeguards) Regulations (1986)

The above draft Regulations were prepared in furtherance of the Nuclear Safeguards Bill 1986 and prescribe conditions in relation to permits and authorisations for nuclear material.

The Regulations specify the nuclear material which is exempted from control under the Nuclear Safeguards Bill. Such exemption covers in particular, nuclear material exempted from safeguards by the IAEA (i.e. nuclear material in heart pacemakers) and depleted uranium in aircraft and keels of ships in transit through Australia.

Also, the Regulations set out the particulars to be given in notices to be published in the Commonwealth Gazette when the Minister for Resources and Energy will grant, vary or revoke a permit or authorisation under the Nuclear Safeguards Bill. These particulars will include, inter alia, the name and address of the person concerned, the number, nature and date of the permit or authorisation, its period of validity and, for variations and revocations, the date on which they become effective.

Also, carriers of nuclear material may transport nuclear material or an associated item without a permit on behalf of another person provided such operation involves depleted uranium (not exceeding 250 kg), uranium ore concentrates (not exceeding 50 kg element weight of uranium), source material (not exceeding 5 kg element weight of uranium or thorium) and special fissionable material used as a sensing component in instruments (not exceeding 1 gram).

## • *Belgium*

### REGIME OF RADIOACTIVE MATERIALS

#### 1986 Act on Implementation of the Convention on the Physical Protection of Nuclear Material

This Act of 17th April 1986 was published in the Official Gazette (Moniteur belge) of 14th August 1986. Its purpose is to implement in domestic legislation Articles 7 and 8 of the Convention on the Physical Protection of Nuclear Material, signed by Belgium on 13th June 1980 (see Nuclear Law Bulletin No. 24).

Article 7 of the Convention lays down that States Parties must provide for penalties for a number of serious offences with respect to nuclear material. Article 8 specifies the cases in which measures must be taken by States Parties to establish their jurisdiction over such offences.

In implementation of Article 7 of the Convention, the Act of 17th April 1986 prescribes that provisions on sanctions to be applied for the following offences must be inserted in the Penal Code

- threatening to use or to steal nuclear material is punishable by imprisonment,
- theft of nuclear material is punishable by imprisonment,
- theft or extortion of nuclear material by violence or threats is punishable by forced labour ranging from ten to fifteen years, the offender may be sentenced to forced labour for life if, for example, such theft or extortion is committed with weapons or similar articles,
- any person who intentionally, without approval by the competent authority or in non-observance of the conditions of approval, obtains, holds, uses, transports or disperses nuclear material is punishable by imprisonment ranging from ten to fifteen years, in particular, when such offence has resulted in giving a third party an incurable disease, and fifteen to twenty years if the offence committed unintentionally has nevertheless caused death

A definition of nuclear material is also to be inserted in the Penal Code Nuclear material means plutonium (except that with isotopic concentration exceeding 80 per cent in plutonium-238), uranium-233, uranium enriched in uranium-235 or 233, uranium containing the mixture of isotopes occurring in nature other than in minerals or their residues, and any material containing one or more of the above isotopes

As regards implementation of Article 8 of the Convention, provisions must be included in the Penal Code specifying that courts in Belgium are competent to deal with the above offences committed in the territory of States Parties to the Conventions or on board a vessel or aircraft registered in one of those States, if the presumed perpetrator of the offence is in the national territory and the Government of Belgium has made no arrangements with the State concerned regarding extradition

### THIRD PARTY LIABILITY

#### 1986 Royal Order determining the financial security certificate for transport of nuclear substances

This Royal Order of 28th April 1986 was published in the Official Gazette (Moniteur belge) of 16th May 1986 The purpose of the Order is to ensure that financial security certificates given by the nuclear operators liable to carriers of nuclear substances conform to the conditions set out in Article 4(c) of the Paris Convention on Third Party Liability in the Field of Nuclear Energy This is a requirement under the Belgian Act of 22nd July 1985 on Third Party Liability in the Field of Nuclear Energy (see Supplement to Nuclear Law Bulletin No 37)

The Annex to the Order contains a model certificate reproducing the type of information required in accordance with the Paris Convention, namely, the name and address of the operator, amount, type and duration of security, nuclear substances and carriage covered, and finally, the name and address of the insurer or guarantor (see Nuclear Law Bulletin No 2 for model certificate)

## • *Brazil*

### ORGANISATION AND STRUCTURE

#### 1986 Decree on the National Nuclear Energy Commission

The National Nuclear Energy Commission (CNEN) is a federal agency set up by Act No 4 118 of 27th August 1962 which was, until recently, placed under the supervisory authority of the Minister for Mines and Energy. It is now directly attached to the Presidency of the Republic in an advisory capacity. This transfer does not affect the personnel, the facilities or the finances of the Commission. The Decree effecting such transfer entered into force on 7th August 1986, the date of its publication in the Official Gazette.

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In accordance with the regulatory powers he was granted by Act No 6 189 of 16th December 1974 (see Nuclear Law Bulletin No.23), the Executive Director of the CNEN adopted in 1985 and 1986 several Resolutions of an experimental nature on the following subjects.

### RADIATION PROTECTION

Resolution No. 13/85 on licensing of industrial radiography equipment  
This Resolution, adopted on 1st November 1985, deals in particular with the licensing procedure for the use of equipment containing radiation sources (Published in the Official Gazette of 13th November 1985)

### REGIME OF NUCLEAR INSTALLATIONS

Resolution No. 09/85 on preventive maintenance of nuclear plants  
This Resolution, adopted on 27th August 1985, aims to ensure that material,

equipment and procedures used in maintenance operations are appropriate and efficient (Published in the Official Gazette of 4th September 1985.)

Resolution No 10/85 on the aptitude and approval of personnel for non-destructive tests on components of nuclear facilities This Resolution also adopted on 27th August 1985, regulates the activities of the independent Technical Control Agency (OSTI) which is responsible for supervising the operation of nuclear power plants. (Published in the Official Gazette of 4th September 1985 )

Resolution No 11/85 on computer programmes for analysing loss-of-coolant accidents in pressurised water reactors, adopted on 31st October 1985 This Resolution concerns the certification of those programmes which are used in the licensing procedure for nuclear power plants (Published in the Official Gazette of 11th November 1985 )

Resolution No 12/85 on approval of emergency core cooling systems, adopted on 31st October 1985 The Resolution sets out the procedure for approval of light water reactor emergency core cooling systems (Published on 11th November 1985 )

Resolution No 16/85 on approval of independent technical control agencies, adopted on 14th November 1985 This Resolution fixes the conditions to be complied with by these agencies which are responsible, in particular, for checking quality assurance in nuclear facilities (Published in the Official Gazette of 2nd December 1985 )

Resolution No 3/86 on independent technical controls for quality assurance in nuclear power plants, adopted on 15th August 1986 This Resolution fixes in detail the conditions of the quality assurance programme to be carried out by OSTI (Published in the Official Gazette of 8th September 1986.)

## RADIOACTIVE WASTE MANAGEMENT

Resolution No. 19/85 on radioactive waste management This Resolution, adopted on 27th November 1985 contains detailed technical provisions regarding the management and control of radioactive waste (Published on 17th December 1985 )

## • *Finland*

### RADIATION PROTECTION

#### 1985 Decree on control of laser equipment

This Decree (No 472/85) of 6th June 1985 was published in the Finnish Official Gazette of 19th June 1985. The Decree defines the type of lasers covered by its provisions (lasers with wavelengths longer than 200 nm but less than 1 mm). It divides lasers into classes according to the degree of hazard they represent, and lays down technical safety conditions for their use and also prescribes the protective equipment required for such use

The Occupational Health and Safety Directorate may grant exemptions to the provisions of the Decree, provided that safety conditions are met

## • *France*

### RADIATION PROTECTION

#### 1985 Decree to amend the Labour Code and defining the health and safety conditions for gamma-ray industrial radiography equipment

The above Decree No 85.968 of 27th August 1985 was published in the Official Gazette of 14th September 1985 and entered into force on 1st June 1986

This text, amending Article R 233-83 of the Labour Code, applies to gamma-ray industrial radiography equipment whether mobile or fixed. It contains specific technical conditions concerning the equipment, in particular, safety devices located at the entry and exit points of the source's shield. The equipment must carry a notice mentioning "Radioactive" prepared by the constructor or the importer of the source, which explains the conditions for handling, setting-up, use and maintenance of the source, including the frequency of revisions

#### 1986 Decree on artificial radioisotopes, amending the Public Health Code

Decree No 86 80 of 13th January 1986 on artificial radioisotopes, amending the Public Health Code was published in the Official Gazette of 18th January 1986



It amends and supplements a Decree of 3rd May 1954 made in implementation of the Act of 19th July 1952 fixing the principles applicable to importation, manufacture, use and transfers of artificial radioisotopes

Under that Act, whose provisions are contained in the Public Health Code (Articles L631 to L640), only the Atomic Energy Commission (Commissariat à l'énergie atomique - CEA) may manufacture, import or use artificial radioisotopes without a licence which is issued by the Minister for Health, following the advice of the Interministerial Committee for Artificial Radioisotopes (CIREA). The opinion of CIREA is also sought for transfers of radioisotopes

The Decree of 3rd May 1954 whose provisions were contained in Articles R 5230 to R 5238 of the Public Health Code specified the licensing conditions for artificial radioisotopes

This new text amends and supplements the provisions of the 1954 Decree to take into account experience in the operation of CIREA and the evolution of regulations particularly in the biomedical field

As regards the use of artificial radioisotopes in therapy and medical biology (Articles R 5234, R 5234 1 to R 5234 6), this Decree lists the operations subject to licensing, namely the distribution, transfer, sale, use etc of artificial radioisotopes

The licensing system for artificial radioisotopes not intended for use in medicine or human biology is set out in Articles R 5235, R 5235 1 to R 5235 3. Licences are granted for a maximum of five years. The file accompanying the licence must contain detailed information, in particular, on the nature of the operations foreseen and the conditions under which they are to be carried out

The Decree also amends and supplements the previous Decree as regards the provisions common to both types of use (medical and non-medical) of artificial radioisotopes (Article R 5237, R 5237 1 to R 5237 4). The licences are granted on an individual basis and may not be transferred, they may be revoked or suspended by the authorities in case of non-compliance with their provisions. The Decree provides that a special form is required for imports and exports and prescribes that establishments holding radioisotopes must keep records of purchases and transfers. Finally, loss or theft of radioisotopes must be declared to the authorities

#### 1986 Decree on protection of workers against the hazards of ionizing radiation

The above Decree (No 86-1103) of 2nd October 1986 was published in the Official Gazette of 12th October 1986. It repeals and replaces the Decree of 15th March 1967 on protection of workers against the hazards of ionizing radiation (see Nuclear Law Bulletin Nos 1 and 9). Repeal of the 1967 Decree and entry into force of the 1986 Decree will become effective on 1st October 1987, with the exception of the provisions on industrial radiology X-ray generating equipment which will enter into force on 1st October 1988

Like the 1967 Decree, this Decree does not apply to major nuclear installations, including those classified as secret. These installations con-

tinue to be covered by the Decree of 28th April 1975 on protection of workers in major nuclear installations (see Nuclear Law Bulletin Nos 9 and 16)

The purpose of the 1986 Decree is to implement in domestic legislation the Euratom Directive of 15th July 1980, amended by the Directive of 3rd September 1984 (see Nuclear Law Bulletin Nos 26 and 34), to take into account developments in labour laws - in particular as regards the role of committees responsible for health, safety and working conditions and technology. Finally, it covers all work involving ionizing radiation, including agricultural activities.

As regards classification of workers and occupational exposure limits the main amendments as compared to the previous Decree are the following

- workers are divided into two categories A and B corresponding respectively to directly assigned and indirectly assigned to work involving radiation,
- quarterly and annual dose limits are laid down,
- the concept of critical organ no longer exists,
- new units are adopted (becquerel and sievert),
- the classification table for radioisotopes has been revised,
- the concepts of external irradiation and internal contamination are replaced by those of external and internal exposure,
- dose limits are fixed for women of reproductive capacity, pregnant women and workers below the age of 18 who may be exposed under certain conditions;
- apart from the cases of exposure under normal working conditions and planned special exposures the Decree defines emergency exposures (replacing the concept of unplanned special exposures) and accidental exposures the latter being those which exceed ten times the dose limit. Only volunteer workers included in a list may be subjected to an emergency exposure.

At technical level the Decree provides for individual dosimetry for workers in Categories A and B

At medical level the measures cover both categories with more frequent controls for category A workers who must have a special medical file and an individual medical follow-up card

Finally, the tasks of the Central Service for Protection Against Ionizing Radiation (SCPRI) are laid down in specific provisions. The SCPRI is the national radiation protection agency and collects, in particular, the results of workers' radiation exposure monitoring

## TRANSPORT OF RADIOACTIVE MATERIALS

### 1986 Order amending 1982 Order on protection and control of nuclear materials in course of carriage

The Order of 12th June 1986 was published in the Official Gazette of 6th July 1986. Its purpose is to amend the above Order of 26th March 1982 (see Nuclear Law Bulletin No. 29) by including specific provisions on sub-contracting the transport of spent fuel and nuclear materials in Category III. This category is the one requiring the less stringent controls as defined in the Decree of 12th May 1981 on protection and control of nuclear materials from the viewpoint of physical protection (see Nuclear Law Bulletin No. 28).

Carriers of fuel and materials in that category may sub-contract their transport, provided that the sub-contractors concerned are approved by the Minister for Industry.

When transport operations are sub-contracted, the original carrier must still comply with certain requirements, in particular, he must inform the sub-contractors of the regulations on protection and control and ensure that they are properly applied, namely, as regards the obligations to inform the authorities in case of an occurrence or incident likely to delay or jeopardise the transport operation concerned.

In addition, carriers must mention in the notification or application for a special licence the names of the different sub-contractors taking part in the operation as well as the conditions of transfer of the nuclear materials.

Sub-contractors must provide the carriers with all the information required to exercise control over nuclear materials. This concerns in particular any change in the conditions of transport and any occurrence or incident likely to delay or jeopardise the operation. Sub-contractors may not delegate any part of the transport operation.

### 1986 Order on protection and control of Category III irradiated fuel and nuclear materials carried by rail

The above Order also of 12th June 1986 was published in the Official Gazette of 6th July 1986. It specifically regulates the transport of Category III spent fuel and nuclear materials within the meaning of the Decree of 12th May 1981 and supplements the regulations already in force applicable to transport of dangerous goods, including nuclear materials.

The Order details the conditions to be complied with by the carrier, whether foreign or French, holder of a licence in accordance with the Act of 25th July 1980 on protection and control of nuclear materials (see Nuclear Law Bulletin No. 26).

Other provisions prescribe the conditions for transporting the fuel and materials covered by the Order, the protective devices to be installed during transport and the conditions to be observed by the national railway company (SNCF) in case of an accident.

The Order specifies that a licensed carrier may sub contract transport operations and refers to the conditions laid down by the above-mentioned Order of 12th June 1986 in this respect. The SNCF is authorised to be a sub contractor

## FOOD IRRADIATION

### 1986 Order on the treatment by ionizing radiation of material and articles in contact with foods and beverages

This Order of 12th August 1986 was published in the Official Gazette of 20th August 1986. It applies to packaging material and articles in contact with foods and beverages, when they are treated by the following radiation sources

- cobalt 60 or caesium 137 gamma rays,
- accelerated electrons of the energy lower than or equal to 10 MeV,
- X rays of the energy lower than or equal to 10 MeV

Under the Order, undertakings which manufacture or import material or articles to be treated by ionizing radiation exceeding 10 kGy must obtain a licence from the General Directorate for consumer goods and repression of fraudulent practices in the Ministry for Economy and Finance

Material and articles to be treated by ionizing radiation at doses lower than or equal to 10 kGy must be notified to the above General Directorate

The files on applications for licences and notifications must include in particular the following information: the name and address of the manufacturer and those of the firm proceeding with the treatment, its technical specifications as well as the composition of the material or article

The firm responsible for such treatment must keep dosimetry control records, to be made available to the General Directorate and the Central Service for Protection against Ionizing Radiation (SCPRI) for a period of five years

## • *F.R. of Germany*

### ORGANISATION AND STRUCTURE

#### Setting up of a new Ministry of Environmental Affairs (1986)

By enactment of 5th June 1986, the Federal Chancellor created a new Ministry of Environmental Affairs, Nature Conservation and Reactor Safety (Bundesgesetzblatt 1986, I, p 864) This Ministry is now competent for nuclear safety and radiation protection in accordance with the Atomic Energy Act, it is vested with the responsibilities previously assigned to the Ministry of the Interior and, in regard to radiation hygiene, to the Ministry of Health

### THIRD PARTY LIABILITY

#### Compensation for damage caused by the Chernobyl accident under the Atomic Energy Act (1986)

The nuclear accident in Chernobyl (USSR) of 26th April 1986, caused considerable damage in the territory of the Federal Republic of Germany. The widespread radioactive contamination of the air, water and soil entailed direct damage to spring vegetables, milk-producing cattle had to be kept from grazing, the consumption of milk and other foodstuffs had to be supervised, import restrictions became necessary, the fixing of state intervention levels led to a change in consumers' eating and buying habits, travel agencies and transport undertakings specialised in Eastern Europe business lost their clientele, and finally, seasonal workers in agriculture lost their jobs.

Since the USSR is neither a party to the Paris Convention nor to the Vienna Convention, proceedings for compensation for damage from Chernobyl would have to be brought under general private international law. As there is no agreement on the enforcement of judgments between the USSR and the Federal Republic of Germany the judgment of a German court cannot be enforced in the USSR. Victims, therefore, could only claim before the competent Soviet court. Considering, however, the uncertainties of a lawsuit in the Soviet Union and taking into account that the operator of the Chernobyl reactor is a state organisation, thus raising problems of state immunity, it appeared from the start that private proceedings would have little chance of success.

The German Atomic Energy Act (Section 38 paragraph 2) provides for compensation from German public funds for such cases (see text of Act in Supplement to Nuclear Law Bulletin No. 36). Provided damage caused by a foreign nuclear installation and suffered in the territory of the Federal Republic of Germany, and provided the victim - according to the foreign law applicable can only obtain compensation which falls considerably short of the compensation available under German law, the Bund (Federal State) shall pay compensation up

to the maximum amount of 1 billion DM Such a claim is to be brought before the Bundesverwaltungsamt (Federal Agency for Administration)

Therefore, in implementation of the Atomic Energy Act, the Federal Government issued a Guideline of 21st May 1986 concerning the settlement of claims for compensation after the reactor accident at Chernobyl (Bundesanzeiger of 27th May 1986, no 95, p. 6417) The Guideline describes the extent of damage to be compensated damage to property and prejudice to similar rights caused directly by the accident, i e destruction of products, seizure of products, restrictions concerning the use of milk, direct damage to enterprises within the meaning of section 823 paragraph 1 of the Civil Code The Guideline provides for a standardised procedure and for a lump sum compensation to enable the Federal Agency for Administration to make quick payments without heavy administrative procedures

In addition to these claims for public compensation, further State compensation was granted "ex aequo et bono" (adherence to equity) in cases of damage outside the scope of application of Section 38 of the Atomic Energy Act This compensation is an ex gratia compensation which does not give right to any claim Two so-called Equity Guidelines were issued

According to the Equity Guidelines for "Vegetables" of 2nd June 1986 (Bundesanzeiger of 12th June 1986, No 105, p 7237) the Bund shall pay compensation for damage due to official intervention levels concerning certain kinds of spring vegetables, provided the damage was suffered by 31st May 1986

On the grounds of an administrative agreement between the Bund and Länder, a General Equity Guideline was issued on 24th July 1986 (Bundesanzeiger of 2nd August 1986, No 140, p 10388) According to these provisions the Bund and Länder pay compensation jointly (Bund: two-thirds, Länder one-third) in cases of insolvency or impending insolvency due to Chernobyl, limited to a certain period of time and to certain fields of business (production of, and trade in vegetables, importers and exporters of fresh vegetables, transport enterprises, travel agencies specialised in Eastern Europe business, enterprises having suffered similar losses, dairies, seasonal workers in agriculture and in food industries) This total amount of compensation to be paid in accordance with the Atomic Energy Act (Section 38) and the Equity Guidelines is estimated at more than DM 500 million (Note from our correspondent in the Federal Republic of Germany )

## • *Italy*

### ORGANISATION AND STRUCTURE

#### 1986 Act setting up the Ministry for the Environment

Act No 349 of 8th July (1986) (published in the Official Gazette of 15th July 1986) sets up a Ministry for the Environment. This Act does not cover specifically nuclear activities and radiation protection, however, it prescribes that this new Ministry will be responsible for air pollution matters, jointly with the Ministry for Health.

The Act also sets up a National Environment Council, whose members include the National Commission for Research and Development of Nuclear and Alternative Energy Sources (ENEA).

#### 1986 Decree setting up a Commission to study problems arising from emergency situations

The above Decree of 2nd July 1986 (published in the Official Gazette of 29th July 1986) sets up a pluridisciplinary Commission which will advise the Minister for Protection of the Public (Ministro della protezione civile) in case of emergency situations in certain fields requiring public protection measures.

The risks covered are the following: seismic, nuclear, volcanic, hydrological, chemical/industrial and ecological and finally, risks which may arise during transport.

The members of the Commission were designated in view of their competence in the areas covered.

## • *Japan*

### NUCLEAR LEGISLATION

#### 1986 Law amending the Law for the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors

This Law (Law No 73) partly amending the Law for the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (Law No 166,

10th June 1957) was published in the Official Gazette of 27th May 1986. The Law came into force on 26th November 1986.

The amendments concern mainly clarification of responsibility for final storage of low-level radioactive waste, which has been given to a private company, and transfer of responsibility for inspecting welded parts of nuclear facilities to authorised private inspection organisations. This latter work had previously been carried out by government institutions.

The other, minor, amendments concern sanctions for violation of the Law and in particular increased fines.

## RADIATION PROTECTION

### 1981 amendment to the Regulations on the prevention of ionizing radiation hazards

The Regulations on the prevention of ionizing radiation hazards (Ordinance of the Ministry of Labour No. 41 of 30th September 1972) were established in accordance with the Labour Safety and Hygiene Act (No 57, 8th June 1972) and the Ordinance for the Enforcement of the Labour Safety and Hygiene Act (Cabinet Order No 318, 1972). These Regulations have been amended by Ordinance No 35 of 17th October 1981.

It is specified as the basic principle for preventing hazards from ionizing radiation that the enterprises concerned should make efforts to reduce, as far as possible, employee exposure to ionizing radiation.

The Regulations contain in particular provisions concerning controlled areas and limitations on exposure doses, protection from external radiation, prevention of contamination and medical examinations.

## REGIME OF NUCLEAR INSTALLATIONS

### 1981 amendment to the Regulations for installation and operation of experimental research reactors

The Regulations for installation and operation of experimental research reactors (Ordinance of the Prime Minister's Office No 38 of 9th December 1957) were amended by Ordinance No 43 of 3rd August 1981. The Regulations were established in accordance with the provisions of the Law for Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (Law No 166, 10th June 1957 as amended).

The Regulations apply to reactors mentioned in the Regulation Law, namely nuclear reactors for purposes of testing and research and nuclear reactors specified by Cabinet Order as reactors at the research and development stage.



The provisions include application procedures for permits to install reactors and alter facilities, for approval of design and construction methods, pre-service inspection of reactors, standards for reactor performance technology, reactor operating plans and record-keeping. These provisions also cover limitations on access to radiation controlled areas, measures concerning radiation exposure doses, operation of reactors, as well as on-site transport, storage, etc of nuclear fuel materials and radioactive waste. Finally, the Regulations contain safety provisions as well.

#### 1981 amendment to the Ministerial Ordinance determining technical standards for nuclear power plants

The Ministerial Ordinance determining technical standards for nuclear power-generating facilities (Ordinance of the Ministry of International Trade and Industry No 62 of 15th June 1965) was amended by Ordinance No 52 of 20th August 1981. It was established in accordance with the provisions of the Electric Utility Industry Law (Law No 170 of 11th July 1964).

The Ordinance lays down technical standards, in particular, for the following: fire protection, aseismatic design, reactor installation, materials and structures, safety valves, pressure resistance tests, reactor cores, radiation shields, reactor cooling, emergency core cooling systems, alarm systems, reactor control systems, fuel storage facilities, fuel handling facilities, radioactive waste management facilities, ventilation equipment, prevention of radioactive contamination etc.

#### 1981 amendment to the Regulations concerning installation and operation of reactors for power generation

The Regulations concerning installation and operation of reactors for power generation (Ordinance of the Ministry of International Trade and Industry No 77 of 28th December 1978) were amended by Ordinance No 53 of 20th August 1981. They were established in accordance with the provisions governing installation, operation, etc, of commercial power reactors in the Law for the Regulation of Nuclear Source Material, Nuclear Fuel Materials and Reactors (Law No 166, 1957) and the Enforcement Ordinance for the Law (Cabinet Order No 324, 1957).

The Regulations cover application procedures for approval of reactor design and construction methods for permits to install reactors and alter facilities, limitations on access to radiation controlled areas, measures concerning radiation exposure doses, reactor operation, on-site transport and storage of nuclear fuel materials and radioactive waste, security regulations.

#### 1983 amendment to the Regulations for delivery of subsidies for urgent safety measures for atomic power generating facilities

The Regulations for delivery of subsidies for urgent safety measures for atomic power generating facilities (Notification of the Science and Technology Agency and the Ministry of International Trade and Industry No 3 of 13th December 1980) were amended by Notification No 2 of 13th May 1983. They provide for subsidising the measures to be taken in advance for the purpose of

securing the safety of inhabitants in areas in the vicinity of atomic power generating facilities should a nuclear accident occur

These measures include amongst others an emergency communication network, emergency medical care and a disaster prevention training project

## • *Mexico*

### RADIATION PROTECTION

#### 1984 radiological safety Regulations

The National Institute of Nuclear Research (ININ), originally established by the 1978 Statutory Law on Nuclear Energy (see Nuclear Law Bulletin No 23), and maintained by the 1984 Act which cancelled and replaced the 1978 Act (see Nuclear Law Bulletin No. 35) has published the Radiological Safety Regulations, Revision 1, with effect from 17th July 1984. The Radiological Safety Regulations were first published in March 1982. The final dispositions of the Regulations provide that they should be revised and updated at least every two years. All comments on the Regulations should be channelled through the Gerencia de Seguridad Radiologica (The Radiological Safety Bureau). The Regulations are divided into six chapters dealing respectively with the system of dose limitation, nuclear installations and working conditions, radiological safety precautions, control of radioactive material, waste management, and radiological emergencies. The Annexes set down the annual limits on intake (ALI) and derived air concentrations of radionuclides (Annex I), the acceptable limits of surface contamination (Annex II), a classification of radionuclides by toxicity (Annex III), activity limits in installations (Annex IV), and definitions (Annex V).

The general objective of the Regulations, which take account of the recommendations of different international organisations in this field, is to establish norms for the protection of workers, the population and the environment from dangers associated with the use of ionizing radiations. Specifically, the Regulations set out the criteria and norms for radiation protection and the methods of surveillance, control and registration of exposure levels for personnel. They also regulate the handling, moving and storage of ionizing radiation sources and material.

The reduction of exposure to ionizing radiation to the lowest reasonable level, taking account of economic, technological and social factors, is the underlying basis of these Regulations. Chapter 1 sets out the system of dose limitation which comprises both general criteria and, more specifically, the limits and reference levels for exposure. These limits are the primary dose equivalent limits, the secondary limits and the derived limits, as these terms are understood in relevant international regulations. The reference levels

- recording, investigation and intervention are used to determine a particular course of action on the part of the corresponding authority.

The annual effective dose equivalent levels for workers (uniform exposure to entire body) and members of the public are the same as those set in the IAEA Radiation Protection Standards (ie 5 rems and 0.5 rem respectively) No separate provisions are made in the Regulations for women of reproductive capacity except that any necessary exposure should be as uniformly distributed with time as practicable. Pregnant women may only work under situations classified as working conditions B (see below)

Planned special exposure for workers is justified in those exceptional cases during normal operations when alternative technical procedures avoiding overexposure are impractical or not available. In such situations, the limit for external or internal irradiation (or the sum of both) is five times the annual equivalent dose limit for workers in a lifetime. For any single event, this limit shall not exceed twice the annual equivalent dose for workers. The sum of these events shall not exceed 25 rems during the lifetime of any one person in question. In order to carry out a planned special exposure, authorisation must be obtained from the Gerencia de Seguridad Radiologica. Dose equivalents or the committed dose equivalent resulting from planned special exposure shall be reported to the worker and to the authorised medical practitioner.

The conditions of work in nuclear and radioactive installations (a distinction between the two being made in the Regulations) are contained in chapter 2, including design and construction recommendations. These recommendations deal with such things as the type of barriers necessary in different areas, the good working order of equipment and security systems, ventilation and lighting, the suitability of wall, floor, ceiling coverings, furniture, the identification of areas set aside for particular uses, systems for the disposal of liquid effluents. Emergency provisions contain recommendations with regard to emergency exits, decontamination equipment and their location, and radiation measuring devices.

For the purpose of radiological protection, working conditions under which workers are exposed are divided into two classes: working condition A (conditions where annual exposures might exceed three-tenths of the dose equivalent limits), and working condition B (conditions where annual exposures should not in principle exceed three-tenths of dose equivalent limits).

The classification of areas of work are broken down into three zones: restricted, controlled and non-controlled. Restricted areas are those corresponding to working conditions A while controlled areas correspond to working conditions B. Non-controlled areas are those where only natural radiation exists. Access to these areas is controlled in accordance with its designation. Recommendations concerning warning signs and appropriate markings are also contained in this chapter.

As regards radiological surveillance, chapter 3 provides that the Department of Operating Radiological Safety is responsible for ensuring compliance with the norms and dispositions contained in the Regulations. In particular, routine monitoring of the levels of radioactivity and contamination will be carried out to ensure that the relevant limits are not exceeded. All installations where radioactive or nuclear material is used must carry out inspections, monitoring, and verification of existing conditions.

All work involving radioactive material should be subjected to prior testing and should be approved by the appropriate authorities, who should take account of the techniques which present lesser risk of irradiation and/or contamination, those which avoid as much as possible dispersion of radioactive substances, and the physical and chemical properties of the radioactive substances. The Gerencia de Seguridad Radiologica is responsible for establishing a programme monitoring ambient radiological conditions in all installations where open sources of radioactivity are handled or where other conditions so warrant. In particular the Gerencia will carry out, in predetermined zones both within and outside installations, periodic surveillance with the objective of determining ambient conditions. For this purpose, tests will be carried out on air, water, pasture land, milk, seeds and food samples as required.

This chapter also provides recommendations for dosimetric and medical surveillance. It lays down a system of dosimetric surveillance of workers to monitor doses received from external sources of radiation as well as from radionuclides assimilated by whatever means by the organism. A register of doses received by workers is required to be kept and any excess detected by the Department of Dosimetry is to be reported immediately to the head of radiological safety of the installation and to the Gerencia de Seguridad Radiologica.

The purpose of medical surveillance of workers is to assess the health of the workers, help ensure compatibility between the health of workers and the conditions of work and to provide information useful in case of accidental exposures or occupational related disease or death. The Office of Occupational Medicine is responsible for conducting examinations, keeping records, applying necessary treatment in case of contamination, and providing workers with certificates of health and aptitude and other documents relating to radiation protection.

Chapter 4 of the Regulations deals with the control of radioactive material. It describes the physical containments appropriate to either sealed or unsealed radioactive sources. For other sources of ionizing radiation, the applicable norms of these Regulations as well as dispositions applying to a particular installation shall be decided by the Gerencia de Seguridad Radiologica, which shall also maintain an inventory of sealed radioactive sources and nuclear materials used in installations of ININ.

The chapter also specifies the conditions under which the storage of radioactive material may take place as well as recommendations for storage of material in transit. The Gerencia de Seguridad Radiologica may, in addition, establish special instructions. General dispositions are provided for the transport or movements of radioactive material with the objective of preventing or limiting the risk of irradiation and/or contamination of persons, property or the environment. Packaging, ticketing and marking requirements for transportation by rail, sea or air are also set out in this chapter.

Procedures, in case of contamination exceeding limits set down in Table 4.1 and Annex II, of the Regulations, are the responsibility of the Gerencia de Seguridad Radiologica. The Regulations give general indication as to measures to be taken immediately for decontaminating persons, areas, material and equipment.

The management of radioactive waste is the subject of chapter 5 which classifies, for the purposes of the Regulations, radioactive waste in three categories liquids, solids and gaseous. For all three categories, storage and collection dispositions are provided. For the transport of all types of waste, the norms specified in Chapter 4 are applicable.

The treatment of liquid and gaseous radioactive effluents is subject to authorisation of the Gerencia de Seguridad Radiologica. The authorisations should ensure that the annual limits on intakes (as given in Annex I of the Regulations) are respected. Those wastes which cannot be released into the environment should be collected by the Gerencia de Seguridad Radiologica.

Chapter 6 sets forth the general considerations with regard to radiological emergencies. Each installation is responsible for developing an emergency plan, based on a risk analysis, which is approved by the Office of General Coordination on Safety and by the Committee on Emergencies established by these Regulations.

The emergency plan should set out a hierarchical structure with corresponding responsibilities. For every emergency situation, actions to be taken should be specified, allowing however for flexibility to adapt to each situation. Actions which can be taken by personnel to limit risks during an emergency should be explained beforehand by the authority responsible for the installation. During any emergency, the Emergency Office [designated according to whether it is an external emergency, or an internal emergency Type A or Type B (see below)] is responsible for gathering all information which may be required by the Committee on Emergencies. In any emergency situation only the Director General of ININ is authorised to release information to the outside.

Emergencies are classified as either external or internal, and internal emergencies are further broken down into Type A and Type B emergencies. External emergencies are those which could affect persons, goods or the environment outside of the installation. A Type A emergency is that which represents risk to persons or property greater than the dose limits laid down in the Regulations. Type B emergencies do not represent this level of risk but nevertheless can reach those annual dose equivalent limits for stochastic effects and/or derived air concentration limits of radionuclides given in Annex I, or the acceptable levels of surface contamination given in Annex II.

This chapter also sets out the levels of responsibility for all emergencies beginning with the Director General of ININ, the Committee on Emergencies, the Emergency Officer, personnel of ININ (and the Gerencia de Seguridad Radiologica in cases where an emergency was not taken account of by the risk analysis). It also establishes certain actions to be taken during the initial, principal and post-emergency situation. The Committee on Emergencies is responsible for completing an investigation to determine origin and causes of the emergency and establishing the necessary means to avoid a repetition of the incident.

## • *Norway*

### RADIATION PROTECTION

#### 1985 Regulations on work involving exposure to radiation

The above Regulations No. 1157 of 14th June 1985 were made in implementation of the Act of 4th February 1977 on the protection of workers and their working environment and repeal the Regulations of 31st March 1978 dealing with the same question (see Nuclear Law Bulletin No 24)

The Regulations, which are administered by the Labour Inspectorate, provide that employees may not be assigned to work involving ionizing radiation where the effective dose equivalent exceeds 50 mSv over a period of twelve months. For adolescents between sixteen and eighteen years of age, the limit is set at 5 mSv for that same period. Pregnant women and children under sixteen may not be exposed to radiation. Finally, all persons exposed to radiation in the course of their work must have such exposure continuously monitored, by personal dosimeters or by other means.

Other provisions of the Regulations define the duties of employers: they must arrange for medical examinations of workers at least every three years, keep records of individual exposures etc.

### REGIME OF RADIOACTIVE MATERIALS

#### 1985 Act amending the Penal Code to include provisions with reference to physical protection of nuclear materials

Norway ratified the 1980 Convention on the Physical Protection of Nuclear Material on 15th August 1985 (see Nuclear Law Bulletin No 36). In order to comply with the obligations incumbent on Contracting Parties to the Convention, a number of amendments were made to the Penal Code, and adopted by Act No. 54 of 7th June 1985.

The major amendment (Section 152a) concerns sanctions with respect to nuclear materials. It is provided that any person who, without lawful authority, receives, possesses, uses, transfers, disposes of etc nuclear materials, thereby affecting the life, health or property of persons or the environment is liable to a fine or to a term of imprisonment not exceeding four years. Furthermore, any person creating such danger, which may result in loss of life or extensive damage to any other person's property, is liable to a severe penalty under the Code (Section 148). Accessories to such acts are liable to the same penalty.

## 1986 Regulations on the use of radioactive sources on drilling platforms

The Regulations on the use of radioactive sources on Norwegian drilling platforms and other mobile drilling units were made by the Norwegian Maritime Directorate on 13th January 1986, pursuant to Act No. 7 of 9th June 1903 relating to public control of the seaworthiness of ships etc. The Regulations entered into force on 15th February 1986.

Permits are required from the Maritime Directorate for the transport, storage and use of radioactive sources. Applications must be filed at the latest four weeks before the operation is to take place. A general plan showing the storage location and a detailed plan for the transport, storage and use of the radioactive equipment, together with a description of the safety measures must be attached to the application.

When the radioactive source is carried by ship to the platforms, the operation is governed by the Regulations of 30th November 1979 on carriage by ships of special or dangerous cargo. They provide that the State Institute of Radiation Hygiene must be consulted prior to the transport of radioactive substances (Class 7). The transport containers must comply with IAEA safety requirements. Transport by helicopter is effected in compliance with the Civil Aviation Administration Regulations of 15th May 1979, as amended on 23rd October 1984, with reference to air transport of dangerous goods.

The storage room for the radioactive equipment must be marked with an appropriate warning sign and text and the distances between the room and other areas must comply with the relevant provisions of the IMO International Maritime Dangerous Goods Code. A guard remains on duty and some form of barrier is installed to keep unauthorised persons away from the radiation area.

As regards radiation protection of personnel, a person, with the necessary knowledge, is appointed to supervise all uses of radioactive sources, in compliance with any conditions stipulated by the Maritime Directorate. Personnel must be trained for work with radioactive sources and must wear dosimeters during this work. In addition, protective measures must be taken to prevent any harmful effects from radiation to such personnel and to the general crew on board the platform.

The Directorate must be immediately informed of the loss of any source or dispersal of radioactivity. Finally, if the provisions of the Regulations are violated, the Directorate may withdraw the permit.

## THIRD PARTY LIABILITY

### 1985 Act to amend the 1972 Act Concerning Nuclear Energy Activities

Act No 103 of 20th December 1985 amended the 1972 Act Concerning Nuclear Energy Activities (see Nuclear Law Bulletin Nos 11 and 12) to take account of the ratification by Norway of the Protocols of 1982 to amend the Paris Convention on Third Party Liability in the Field of Nuclear Energy and the Brussels Supplementary Convention respectively (see Nuclear Law Bulletin No 37).

The amendments bring the third party liability provisions of the Act in line with the Conventions as amended by the Protocols. The modifications concern, inter alia, certain definitions, conversion of the unit of account into the Special Drawing Right (SDR) of the International Monetary Fund and increases in the amount of liability assigned at State level by a factor of approximately 2.5.

#### 1985 Regulations on exclusion of certain kinds or quantities of nuclear substances

Regulations to exclude certain kinds or quantities of nuclear substances from the liability of the nuclear operator were adopted on 15th November 1985.

These Regulations were made in conformity with two Decisions of 27th October 1977 of the OECD Steering Committee for Nuclear Energy excluding such kinds and quantities of nuclear substances from the scope of the Paris Convention in view of the low risk they represent (see Nuclear Law Bulletin No. 21).

The Decision referring to certain quantities of nuclear substances excludes, during transport, certain limited quantities of such substances provided they comply with quantitative limits and other requirements set out in the IAEA Regulations for the Safe Transport of Radioactive Materials.

The Decision referring to certain kinds of nuclear substances excludes those substances which, from a practical viewpoint, present no greater risk than natural or depleted uranium, namely reprocessed uranium within acceptable limits of residual contamination and with a specified content of uranium 235.

The 1985 Regulations are a translation of the Decisions.

## • *Spain*

### THIRD PARTY LIABILITY

#### Increase in amount of the nuclear operator's liability - 1986

Section 57 of Act No. 25 on Nuclear Energy of 29th April 1964 provides that the liability in amount of nuclear operators should be increased where necessary, to prevent it from being lower than the amount fixed by international Conventions ratified by Spain (namely the 1960 Paris Convention and the 1963 Brussels Supplementary Convention). In accordance with this provision, the previous sum of 350 million pesetas has been increased to 850 million pesetas which corresponds, in national currency in round figures, to 5 million Special Drawing Rights as prescribed by the Paris Convention.



## • *Sweden*

### THIRD PARTY LIABILITY

#### Bill for economic compensation following the Chernobyl accident (1986)

A Government Bill was introduced before Parliament in early October 1986. Apart from various measures regarding emergency systems, this Bill also contains proposals for compensation to victims suffering economic damage as a result of radioactive fallout from the Chernobyl accident in April 1986.

The latter proposals concern the allocation of funds 250 million Swedish crowns (SEK) to cover economic losses on milk, meat, vegetables and other nutrients.

Preliminary rules for eligibility to receive compensation had earlier been decided by regional authorities. The Bill now proposes that these rules be implemented by all authorities responsible for the processing of claims for compensation. These rules in essence provide for payment of compensation for the following:

- the rise in costs due to postponement of the time for letting livestock out to graze, as well as for lost milk production as a result of this postponement,
- discarded milk (due to excess levels of radiation according to established standards),
- discarded animal carcasses,
- rise in costs and losses of income on animal production, due to necessary slaughter of animals out of season,
- discarded feed,
- rehabilitation of grazing areas,
- vegetable products subject to sales prohibition,
- certain discarded vegetable products,
- costs and losses for the rehabilitation of gardening areas and for substitution of new plant material,
- for reindeer, those which have been slaughtered at designated slaughterhouses, regardless of their caesium content,
- for elk and moose, a lump sum of SEK 2 200 per grown animal and SEK 1 100 per calf, with a radioactive content in excess of established standards (this compensation was introduced to encourage the

- necessary controlled hunting of these animals which are abundant in Sweden).

Further economic losses suffered are anticipated (e.g. fisheries, restaurant owners, retail grocers and others). The Bill proposes that any claims for compensation be decided essentially along the lines referred to above

## • *Switzerland*

### NUCLEAR LEGISLATION

#### Revision of the 1959 Federal Act on the peaceful uses of atomic energy and protection against radiation - import and export of nuclear articles and technology (1986)

On proposal of the Federal Council (the Government), the Swiss parliament adopted on 9th October 1986, a partial revision of the Federal Act of 23rd December 1959 on the peaceful uses of atomic energy and protection against radiation (Atomic Energy Act), which should fill the gap in Swiss legislation on international nuclear co-operation. Swiss nationals and the Cantons have a ninety day period to ask that it be submitted to the popular vote. Following this it will enter into force on the date fixed by the Federal Council.

In 1977, Switzerland ratified the 1968 Treaty on the non-proliferation of nuclear weapons and in the same year it joined the "London Club" which groups the main nuclear exporting countries. Since 1978, an Ordinance on definitions and licenses in the atomic energy field (revised in 1984) provides that the export of nuclear articles is subject to licensing in accordance with the London Club Guidelines (see Nuclear Law Bulletin Nos 22, 24 and 33)

However until now there was no legal basis for exercising control, as provided in the London Club Guidelines, on technological exports (unpublished technical data on uranium enrichment, nuclear fuel reprocessing or heavy water production). Henceforth the Government will be in a position to subject the export of technology to the granting of a licence which means that the London Club Guidelines will be applied in full.

Another new condition concerns the competence of the Federal Council regarding inclusion of all bilateral agreements on import or export of nuclear articles. This power will be set out expressly in the Act and will also extend to agreements that the Government is not able to conclude in present legislation. In effect, due to domestic legislation, the Council has been unable until now to assume the obligations resulting from acquisition of nuclear articles with the exception of the few isolated cases, because it is up to parliament to decide in general on such imports. To simplify matters, it was important to delegate this power to the Federal Council.

Finally, for purposes of clarity, "non proliferation of nuclear weapons" will be mentioned expressly among the licensing criteria fixed by the Act for import and export of nuclear articles

## • *Tunisia*

### RADIATION PROTECTION

#### 1986 Decree on protection against ionizing radiation

This Decree (No. 86-433) of 28th March 1986 (published in the Official Gazette of 11th April 1986) was made in implementation of Act No 81-51 of 18th June 1981 on protection against sources of ionizing radiation (see Nuclear Law Bulletin No. 31)

The Decree fixes the general protection principles against hazards from ionizing radiation and the conditions to be complied with in all activities implying exposure to such radiation. Activities mean, in particular, possession, use, conversion, storage, trade in, transport and disposal of all sources of ionizing radiation and radioactive substances

Such activities are subject to prior licensing, apart from certain exemptions which may be granted given the minimal risks involved. Licences are granted by order of the Minister for Public Health, on the proposal of the National Radiation Protection Centre

Certain prohibitions are laid down, namely the use of radioactive substances in toys, foodstuffs or cosmetics etc.

A National Radiation Protection Commission has been set up by the Decree, under the Minister for Public Health. At the Minister's request, or that of other Ministers competent in areas concerned by the Decree, the Commission gives its advice on radiological protection matters and on measures for implementing national regulations in this field. It is also responsible for providing for and preparing preventive measures in case of radiation hazards due to an abnormal occurrence and for intervening and giving assistance in such cases.

The Commission, which is chaired by the Minister for Public Health, includes persons designated by the Ministers concerned, the National Radiation Protection Centre acts as its secretariat

The Decree also contains provisions on dose limits for planned exposures to radiation and instructions on measures to be taken in case of accidental exposures in emergency situations. Finally, it specifies the fundamental principles for the health protection of workers and the public, including medical exposures to radiation and fixes the conditions for control of radioactive sources, substances and devices

## • *United Kingdom*

### REGIME OF RADIOACTIVE MATERIALS

#### The Radioactive Substances (Substances of Low Activity) Exemption Order 1986

This Order (SI 1986 No 1002) of 12th June 1986 came into operation on 14th July 1986 and applies to England, Wales and Scotland. It is concerned with exemptions and exclusions under the Radioactive Substances Act 1960 regarding certain substances of low radioactivity. The 1960 Act regulates the keeping and use of radioactive material and lays down general provisions for registration of users of radioactive material.

The keeping and use of such substances are now exempted from registration as provided by the Act. In connection with control of disposal of radioactive waste, the disposal of

- solid waste other than sealed sources in which the activity does not exceed 0.4 becquerel per gram,
- organic liquid waste whose only radioactive content is carbon 14 or tritium, or both, in which the activity does not exceed 0.4 becquerel per millilitre, and
- gases with a half-life not exceeding 100 seconds

are exempted from the requirements under the Act.

## • *United States*

### RADIATION PROTECTION

#### Final standards for radon-222 emissions from mill tailings (1986)

On 24th September 1986, the US Environmental Protection Agency published a final rule establishing work practices that apply to tailings at licensed uranium mill sites. The work practices are designed to limit the emissions of radon-222 from tailings in order to protect public health. They require that new tailings be disposed of either in impoundments that are no larger than forty acres or by the use of continuous disposal in which no more than ten acres of tailings are exposed at any one time.

There is also a provision for phasing in the new work practices at

existing mills Existing piles are not subject to the new requirements, but disposal of tailings at existing impoundments must cease within six years

### REGIME OF RADIOACTIVE MATERIALS

#### Final rule to amend NRC Regulations governing the export of nuclear equipment and material (1986)

On 14th April 1986 the NRC published a final rule amending its regulations governing the export of nuclear equipment and material (51 FR 12598). One provision of the final rule requires certain holders of export licences to notify the Commission in writing at least forty days prior to exporting Canadian-origin nuclear material or equipment. This change implements part of the US/Canada Agreement for Co-operation which requires the consent of Canadian authorities before Canadian-origin nuclear material and equipment may be exported from the United States. In most cases, Canadian authorities have given their prior consent for retransfer at the time the material is imported into the United States. In other cases, where the country of origin is not known at the time the NRC issues the licence, the licence holder or applicant must notify the NRC prior to the proposed export and obtain US Government authorisation if the material or equipment is determined to be of Canadian origin. The NRC will consult with the Executive Branch to obtain Canadian consent for the shipment. Consultations normally will be completed well within forty days.

Another provision of the final rule expands the general licence for by-product material to cover the export of americium-241 contained in industrial process control equipment. This provision corrects an oversight in the Regulations to allow exports of americium-241 for legitimate commercial use. Previously, the Regulations prohibited the export of americium-241 exceeding one curie per shipment or 100 curies per year to countries listed in Section 110.29 unless the material was contained in petroleum exploration equipment.

Finally, the rule revises Section 110.29 of the Code of Federal Regulations, which contains the list of restricted destinations for exporting nuclear materials and equipment under general licences. The revisions delete seven countries which are recent adherents to the Treaty on the Non-Proliferation of Nuclear Weapons, thereby continuing the United States Government policy of facilitating nuclear co-operation with countries sharing US non-proliferation goals.

In a separate action on 4th August 1986, the NRC published a final rule amending its licensing requirements for the export of tritium under a general licence (51 FR 27825). The revised Regulations impose more restrictive limits on the amount of dispersed tritium that may be contained in luminescent light sources and other items. They preclude the export of large tritium light sources under a general licence unless the light source is installed in an aircraft as a safety device. This action was necessary to address Executive Branch and other government concerns that the former Regulations could present a potential proliferation risk. The final rule also defines tritium in order to clarify the term for exporters and to bring NRC Regulations in line with international guidelines.

## RADIOACTIVE WASTE MANAGEMENT

### Proposed licensing requirements for the independent storage of spent nuclear fuel and high-level radioactive waste (1986)

On 27th May 1986, the NRC published proposed licensing requirements for the independent storage of spent nuclear fuel and high-level radioactive waste (51 FR 19106). The proposed rule is primarily intended to ensure that the Commission will have regulations in place, if needed, to govern the storage of spent nuclear fuel and high-level radioactive waste in a monitored retrievable storage facility, or MRS. Pursuant to Section 141 of the Nuclear Waste Policy Act, Congress would have to approve the construction of one or more such facilities before the Commission could license them. The Commission's existing Regulations in 10 CFR Part 72 govern the storage of spent nuclear fuel in installations that are independent of nuclear reactors. The proposed revisions would expand those Regulations to include storage of spent fuel and high-level waste in an MRS. The proposed rule is based on a technical finding that storage of solidified high-level waste is not significantly different from storage of spent nuclear fuel and that, therefore, the existing Regulations can be adapted to cover the licensing and operation of an MRS, if authorized.

## FOOD IRRADIATION

### Final rule on irradiation in the production, processing, and handling of food (1986)

On 18th April 1986 the US Food and Drug Administration (FDA) published a final rule amending its Regulations to permit additional uses of ionizing radiation for the treatment of food (51 FR 13376). The Regulations permit manufacturers to use irradiation at doses not to exceed 1 kiloGray (kGy) to inhibit the growth and maturation of fresh foods and to disinfect foods of arthropod pests. They also permit manufacturers to use irradiation at doses not to exceed 30 kGy to disinfect dry or dehydrated aromatic vegetable substances (such as spices and herbs) of microorganisms. They require that irradiated foods be labelled to show this fact both at the wholesale and at the retail level. Finally, they require that manufacturers maintain process records of irradiation for a specified period and make such records available for FDA inspection.

## • *Yugoslavia*

### RADIATION PROTECTION

#### 1986 Regulation on monitoring of radioactive contamination in the vicinity of nuclear facilities

This Regulation was issued by the Federal Committee of Labour, Health and Social Welfare and published in the Federal Official Gazette No 51/86. It was made in implementation of the 1984 Act on Radiation Protection and Safe Use of Nuclear Energy (see Nuclear Law Bulletin No 36).

The Regulation covers monitoring of radioactive contamination in both normal and accident conditions. Radiation monitoring includes measurements of emission values at the plant and in the environment. The goals of both are defined according to the IAEA guides on environmental monitoring, but also include the requirement for public information. The main development compared to previous practice in environmental monitoring is that the new Regulation requires that the results should also include assessment of the doses received by the population.

The Regulation encompasses all types of nuclear facilities. For representative facilities presently in use in Yugoslavia, elements for monitoring programmes are given in accompanying tables.

# CASE LAW AND ADMINISTRATIVE DECISIONS

## CASE LAW

### • *Brazil*

#### UNCONSTITUTIONALITY OF AN AMENDMENT TO THE CONSTITUTION OF THE RIO GRANDE DO SUL STATE (1984)

By Decision of 26th September 1984 the Federal Supreme Court declared that amendment No. 16 of 6th November 1980 to the Constitution of the State of Rio Grande do Sul was contrary to the Federal Constitution of Brazil

The purpose of the amendment was to submit to that State's legislative assembly and to popular vote the setting up in its territory of electricity-generating plants and facilities for the production or processing of radio active materials

The Court decided that this provision ran counter to the Federal Constitution, in particular Article 13 (III) thereof, on the grounds that the States of the Federative Republic cannot amend legislative rules fixed in accordance with Articles 46 to 59 of the Federal Constitution.

Furthermore, the amendment concerned contradicts Article 8 (VIII) of the Constitution which states that only the Federal Executive is empowered to legislate in energy matters. Consequently, site selection and licensing of nuclear power plants and other nuclear facilities come exclusively within the competence of the federal authorities



## • *France*

### 1986 DECISIONS OF ADMINISTRATIVE TRIBUNAL OF STRASBOURG REFUSING A STAY OF EXECUTION AGAINST AUTHORISATIONS FOR DISPOSAL OF RADIOACTIVE EFFLUENTS FROM THE CATTENOM POWER PLANT

At present, France is constructing on the banks of the Moselle river the Cattenom nuclear power plant (4 PWR units of 1300 MWe each). The site is approximately 10 km from the border with Luxembourg and is also not far from that with the Federal Republic of Germany. The first unit should enter into operation soon.

The granting, by two interministerial decrees of 21st February 1986, of licences for the disposal of radioactive liquid and gaseous effluents from the Cattenom nuclear power station has raised a number of judicial actions. Such actions have been brought by the Land of Sarre and several West German cities, by the city of Luxembourg and other Grand Duché communities and by associations, against the French ministers who have signed the decrees. These actions demand:

- the annulment, on the one hand, of these decrees on the grounds of an abuse of power, and
- on the other hand, a stay of execution

By two Decisions of 8th September 1986, the administrative tribunal of Strasbourg pronounced itself only as regards the demand for a stay of execution which it refused.

Within a limited framework, these Decisions appear classic. For reasons deriving from the history of French law (separation of administrative actions and administrative jurisdiction) an administrative decision is automatically executionable and the judge exercises only a posteriori control. The stay of execution, halting the implementation of an administrative decision before it has been declared nul, would be exceptional. Except in a case of limited practical scope (absence of impact studies), even if the legal conditions for a stay of execution have been met, it is up to the administrative judge to evaluate, "taking account of the particular circumstances and the interests involved", whether or not to grant a stay of execution.

It should be noted, however, that in the grounds for its Decisions, the tribunal acknowledges as serious and possibly as warranting annulment of the decrees certain of the arguments put forward by the claimants:

- violation of Article 37 of the Euratom Treaty (perusal by a Community expert group of e.g. radioactive effluent release plans),
- illegality of decrees authorising creation of the Cattenom nuclear power plant,

- irregularities in the designation of the investigating commission involved in French internal procedures for licensing of liquid radioactive effluent releases

The justification of such arguments will therefore be examined when the decision will be made on the demand for annulment presented by the plaintiffs already mentioned, as well as by other German or Luxembourg public concerns and associations which had not requested a stay of execution. This case remains to be followed.

## • *United States*

### SETTLEMENT REACHED IN SILKWOOD LITIGATION (1986)

In late August 1986, Kerr-McGee Corporation agreed to pay the estate of Karen Silkwood \$1.38 million in settlement of its radiation contamination claim against the Company (see article on this case in Nuclear Law Bulletin No. 37). Following approval of the proposed settlement, the case, which was scheduled for retrial in the US District Court for the Western District of Oklahoma, was dismissed. The settlement provides approximately \$500,000 to be divided among Silkwood's three children and \$70,000 to be paid to her father as administrator of her estate. The remainder will pay attorney fees and expenses related to the litigation.

## ADMINISTRATIVE DECISIONS

## • *Switzerland*

### LICENSING OF A URANIUM STORAGE FACILITY AT WÜRENLINGEN (1985-1986)

On 22nd May 1985 the Federal Council (the Government) had granted the Federal Institute for Reactor Research (IFR) at Würenlingen a general licence

for the storage of enriched uranium belonging to the Kaiseraugst Nuclear Power Plant Company Limited (see Nuclear Law Bulletin No.36). In accordance with the Federal Order of 6th October 1978 concerning the Atomic Energy Act a decision to grant such a licence must be approved by Parliament (see Nuclear Law Bulletin No 23) Both Chambers having granted their approval on 19th December 1985 and 30th September 1986, the licence has become effective

As the uranium is to be stored in an unused building of the IFR no construction licence is required The following stage will therefore be the granting of an operating licence The IFR has a three-year period to apply for this licence.

It should be noted that, since the entry into force of the 1978 Federal Order, this procedure is the first procedure instituted for a general licence (not a simplified one, as was the case of the Kaiseraugst nuclear power plant project - see Nuclear Law Bulletins mentioned above) which is now coming to a conclusion

# INTERNATIONAL ORGANISATIONS AND AGREEMENTS

## INTERNATIONAL ORGANISATIONS

- *The OECD Nuclear Energy Agency*

REPORT FROM THE STEERING COMMITTEE FOR NUCLEAR ENERGY TO THE COUNCIL ON  
INTERNATIONAL CO-OPERATION OBJECTIVES WITHIN OECD COUNTRIES IN THE LIGHT OF THE  
CHERNOBYL ACCIDENT - THE ROLE OF NEA

At its 73rd Session held on 18th-19th September 1986, the OECD Steering Committee for Nuclear Energy considered the implications for the NEA's work of the accident which occurred at the Chernobyl nuclear power reactor in late April 1986. In this connection, the Committee examined a range of suggestions for further work in a number of areas in which the Agency has already been active. These include notably nuclear reactor safety, radiation protection, nuclear third party liability and insurance, and public information.

The Steering Committee identified areas for further action by NEA. The Chernobyl accident itself will be the subject of studies to determine the relevance of the accident to the safety of nuclear reactors in the OECD area. Specific areas of interest include reactor operation, human factors and the management of accident situations. The Agency will also initiate an examination of the desirable future evolution of reactor safety R & D. Finally, measures should be established to ensure an efficient indemnification for victims of nuclear accidents, and the ways and means of providing appropriate information to the public in the event of an accident should also be studied.

Given the range and importance of the suggestions discussed at this meeting, the Steering Committee found it appropriate to inform the OECD Council of its conclusions, accordingly, the Committee presented a Report to the Council at its meeting on 24th September 1986.

The text of the Report is the following

1 At its meeting on 18th-19th September 1986, the Steering Committee for Nuclear Energy discussed the implications for the NEA's work of the accident which occurred at the Chernobyl nuclear power reactor in the USSR in late April 1986

2 The Steering Committee noted that this nuclear accident, being the most serious to date, has caused great concern and attracted attention to nuclear reactor safety worldwide

3 The Committee noted with great satisfaction that the intimate co-operation established within the framework of NEA among national experts and authorities in the field of nuclear safety and radiation protection for many years, has enabled the Agency to quickly assess the immediate impact of the Chernobyl accident in the OECD area

4 The Committee first noted the conclusion reached so far by the Committee on the Safety of Nuclear Installations (CSNI) according to which no immediate action was required in relation to the design and operation of nuclear power plants in the OECD area. In particular, and also on the basis of information provided by the USSR Delegation at the post-accident review meeting of IAEA at the end of August 1986, it noted that the design and safety features of the Chernobyl reactor type differ fundamentally from those of reactors licensed in Member countries. Secondly, it was noted that according to the preliminary assessment by the Committee on Radiation Protection and Public Health (CRPPH), the radiological consequences on individual members of the public in Member countries have been minor. In some countries, there are economic costs of the accident due to preventive measures including agricultural trade restrictions

5 The Steering Committee further noted the impact which the accident had had in public discussions and its effects on the development of nuclear power programmes in several OECD countries. In this respect, it wished to recall that nuclear energy is considered by a number of OECD countries to be an important source of electricity supply with economic and environmental advantages over other energy sources. To meet their energy needs, these countries intend to maintain for the future the availability of the nuclear energy option under the highest safety regulations

6 The Steering Committee re-emphasised the need for international co-operation on the widest possible basis to contribute to the prevention of accidents, to minimize their potential effects and to ameliorate their after effects, should they occur. It will continue to contribute to the initiatives taken by the International Atomic Energy Agency (IAEA) which has the major role to play, with the hope that significant progress could be achieved promptly with respect to the evaluation of the Chernobyl accident, the organisation of early dissemination of information amongst interested countries in case of accidents, the reinforcement of mutual assistance in emergency situations and the review of safety norms. It expressed great satisfaction for the spirit of co-operation which had already prevailed with the IAEA and other international organisations such as the Commission of the European Communities (CEC) and the World Health Organisation (WHO)

7 The Steering Committee is convinced that the co-operation within NEA has contributed to high standards of reactor safety and radiation protection in the OECD area which have continuously been maintained. This is confirmed by the excellent safety record in the operation of nuclear power plants in OECD countries. However, there may be lessons to be drawn from the Chernobyl accident for OECD countries in the prevention and management of severe accidents

8. In this respect, the Steering Committee identified, at this stage, a number of areas for further action by NEA which would be useful to its Member countries and broader international co-operative objectives. In line with the on-going NEA programme in the field of nuclear safety and radiation protection, these are the following

- i) The study of the relevance of the Chernobyl accident to the safety of nuclear reactors in the OECD area, notably with respect to operation, human factors and management of accident situations,
- ii) The examination of the desirable future evolution of reactor safety R&D,
- iii) The strengthening of the NEA Incident Reporting System, notably by deepening its analysis of incidents which could be precursors of severe accidents,
- iv) The widening of its studies on severe accidents, including containment,
- v) The achievement of more effective harmonisation and the coherent implementation of protection measures against radiation exposure and radioactive contamination in accident situations,
- vi) The study of public information issues raised in the event of a nuclear accident and the more general problem of information communication in the nuclear field;
- vii) The development of more comprehensive and more efficient international provisions to cope with problems of nuclear third party liability and compensation of victims.

9 The Steering Committee requested the Secretariat to prepare detailed proposals on the basis of these ideas, with a corresponding time-schedule and estimates of the resources required. The Steering Committee decided to consider these proposals in the near future in the light of the results of discussions held, and agreements reached, in other international organisations, in particular, the IAEA.

10 Finally, the Steering Committee emphasised the determination of the authorities of NEA Member countries to maintain at the highest possible level the safety of the nuclear industry."

## • *International Atomic Energy Agency*

### ADVISORY SERVICES IN NUCLEAR LEGISLATION AND SAFETY REGULATIONS

Under the IAEA Technical Co-operation Programme, expert services in nuclear legislation and safety regulations were provided in October 1986 to Algeria, and in November 1986 to Tunisia and Morocco respectively. These advisory services were carried out by a senior legal officer from the IAEA Secretariat, in follow-up to earlier assignments performed in those Member States on a multi-year basis.

In Algeria, a presidential Decree of 27th May 1986 establishing radiation protection rules based on the dose limitation system as set out in the Joint IAEA/ILO/OECD-NEA/WHO Basic Safety Standards for Radiation Protection (IAEA Safety Series No 9, 1982 edition - see Nuclear Law Bulletin No. 28). For the implementation of that Decree, several ministerial orders are required, which have been prepared by the Algerian authorities. The purpose of the IAEA expert's services was to jointly review with the authorities the contents of such implementing orders, prior to their adoption, and further to advise the Centre for the Development of Radiation Protection and Nuclear Safety Techniques on the framing of regulations in such other areas as physical protection of nuclear materials, safe transport of radioactive materials, licensing and control of nuclear installations. The Centre, established in 1982, has been, inter alia, vested with the responsibilities of proposing regulations and technical standards relating to the operation of ionizing radiation and nuclear installations, and of ensuring regulatory control and the security of nuclear materials. The Centre is placed under the authority of the High Commission of Research, established by a Decree of 8th April 1986 and headed by a High Commissioner who reports directly to the President of the Republic.

The IAEA's assistance to the Centre also consisted of the provision of technical expert services, the supply of equipment for dosimetry, spectrometry and waste management laboratories, and the training of manpower for such supporting facilities as well as for control activities in radiation protection.

In Tunisia, as a result of advisory services provided by the IAEA in 1983 and 1984, a Presidential Decree was issued on 28th March 1986 for the implementation of the Law of 18th June 1981 relating to protection against the risks of ionizing radiation sources. The Decree (an analysis of which is provided in this issue of the Bulletin) closely follows the structure and contents of the Basic Safety Standards for Radiation Protection, 1982. Under the authority of the Minister of Public Health, the National Centre of Radiation Protection, established by a Decree of 27th October 1982, is responsible for regulatory control over all activities involving radioactive materials or ionizing radiation sources. With the technical assistance received from the IAEA in expert services, equipment and manpower training on a multi-year basis, the Centre is operating a dosimetry laboratory and is completing the construction of a spectrometry laboratory for environmental studies. It is at present providing dosimetry services to the whole country. Further advisory services have been provided by the IAEA to the Centre in November 1986 for the preparation of implementing orders of a technical nature, in conjunction with the provision of

preliminary services to the Ministry of Energy and Mines and the Tunisian Electricity and Gas Corporation in the framing of a legislative framework and regulatory structure for the introduction of nuclear power as an alternative energy source by the turn of the century

In Morocco, such expert services were started over three years ago. With the IAEA's technical assistance, the construction of a nuclear research centre equipped with a TRIGA reactor is scheduled to start in 1987, and feasibility studies for the implementation of a first nuclear power project are expected to be completed in the near future. Concurrent preparatory works carried out in the legislative and regulatory areas have led to the completion of a number of final drafts. They include

- a radiation protection decree similar in its purview to the corresponding Tunisian Decree of 28th March 1986,
- a decree on licensing and control of nuclear installations reflecting the IAEA nuclear safety standards, and
- a bill on nuclear third party liability based on the Vienna Convention, to which Morocco acceded on 30th November 1984

The further advisory services provided by the IAEA to the Moroccan Government in November 1986 focussed on the process of ratification of the Vienna Convention and the Convention on the Physical Protection of Nuclear Material (the latter had been signed by Morocco on 25th July 1980), and on the framing of physical protection regulations for the application of the latter Convention. The elaboration of regulations governing the transport of radioactive materials, based on the IAEA Transport Regulations, 1985, has also been initiated with a view to completion in 1987

## • *Commission of the European Communities*

### 1986 AIDE-MEMOIRE ON THE FOLLOW-UP TO THE CHERNOBYL NUCLEAR ACCIDENT

The CEC's Economic and Social Committee's sub-committee on the consequences of the Chernobyl nuclear incident has published (29th October 1986, CES 859/86) an aide-mémoire on the follow-up to Chernobyl. This aide-mémoire is a chronological compilation of decisions, regulations, and recommendations taken by the Commission following the events at Chernobyl, providing as well a short summary of the action taken and references to the Official Journal of the CEC



Included in this list is the Commission Regulation of 12th May 1986 suspending, until 31st May 1986, the import of certain agricultural products originating in certain third countries, as well as the more far-reaching Regulation of 30th May 1986 which lays down maximum permitted radioactivity levels. At the same time, the Council of the European Communities adopted a declaration whereby the Member States undertake not to apply, in the case of processed agricultural products intended for human consumption and originating in the other Member States, maximum tolerance which are more stringent than those applicable to the same products originating in third countries. On 30th September 1986, the Council extended for period of five months, until 28th February 1987, this Regulation of 30th May (see Texts Chapter in this issue of the Bulletin). The decision to extend was accompanied by an undertaking by the Commission to submit before 1st December 1986 a proposal amplifying the standards for the protection of the health of the general public against the dangers arising from ionizing radiations, either directly or indirectly, through the ingestion of foodstuffs.

On 30th July 1986, the CEC adopted a communication on "the Development of Community Measures for the Application of Chapter III of the Euratom Treaty - Health and Safety". The Commission proposed the implementation of various measures and actions to improve Community provisions in this regard. As a first stage, the Commission proposed the development of a Community system of rapid exchange of information in cases of unusually high levels of radioactivity or of a nuclear accident.

#### ADOPTION BY PORTUGAL OF THE DECLARATION OF COMMON POLICY BY THE MEMBER STATES OF THE EUROPEAN COMMUNITY

On 27th March 1985, the IAEA received a communication from the resident representatives of Italy transmitting the Common Policy Declaration adopted on 20th November 1984 by the then ten Member States of the Community concerning guidelines for transfers of nuclear materials, equipment and technology among themselves (see text of Declaration in Nuclear Law Bulletin No 35).

In a statement to the IAEA dated 18th June 1986, Portugal declared that it had also adopted this Declaration.

#### • *INLA*

#### REGIONAL CONFERENCE OF THE GERMAN SECTION

The first regional Conference of the German Section of the International Nuclear Law Association (INLA) was held in Regensburg from 22nd to

23rd September 1986. Some 120 participants from Austria, Belgium, the Federal Republic of Germany, Luxembourg, the Netherlands and Switzerland attended the Conference

The general theme of the Conference "Peaceful uses of nuclear energy and national borders in central Europe - Legal problems of transfrontier effects of nuclear energy" was treated in three working sessions

The first working session dealt with the problem of nuclear installations close to borders. Topics addressed by the speakers concerned legal problems of land-use planning procedures having transnational impacts, the legal position of neighbouring states and their citizens in relation to the construction and operation of nuclear installations, radioactive waste disposal sites close to borders, emergency assistance and international obligations of the licensing state in case of nuclear incidents. The latter subject provided an opportunity to critically review the two draft conventions which were adopted shortly afterwards by the special session of the IAEA General Conference (see under IAEA)

The second working session was devoted to transfrontier aspects of radiological protection with particular emphasis on international dose limits in case of reactor accidents as well as national and international regulations on the protection of inland waters, the Baltic and the North Sea

Civil liability in case of transborder effects of nuclear accidents was the topic of the third working session. The papers discussed concerned international aspects of suppliers' liability and insurance in case of transit of nuclear materials as well as the relationship between Contracting Parties of the Paris and Vienna Nuclear Liability Conventions. The latter subject had also been discussed by a joint IAEA/NEA informal meeting of experts held in Vienna from 8th to 10th September 1986 and will further be studied in the framework of those two agencies

The Conference closed with a round table discussion which provided an opportunity for operators of nuclear installations as well as representatives of the licensing authorities and ministries competent in the field of nuclear energy to discuss the general theme of the Conference. Although the Conference had been planned long before the Chernobyl accident, the latter evidently played an important role in the discussions. But this accident was not the only case of actual concern, the problems of neighbouring states were equally evoked with respect to the Cattenom nuclear power reactors and the reprocessing plant planned in Wackersdorf (Bavaria). The Proceedings of the Conference will be published in early 1987

## AGREEMENTS

### • *Argentina-Brazil*

#### PROTOCOL OF CO-OPERATION CONCERNING PROMPT NOTIFICATION AND MUTUAL ASSISTANCE IN THE EVENT OF NUCLEAR ACCIDENTS AND RADIOLOGICAL EMERGENCIES (1986)

Argentina and Brazil signed the above Protocol on 29th July 1986. It was concluded in furtherance of the Agreement of 17th May 1980 between both countries on co-operation in the development of the peaceful uses of nuclear energy (see Nuclear Law Bulletin No 27) and their joint nuclear policy statement of 30th November 1985 (see Nuclear Law Bulletin No 37).

The Protocol provides that Argentina and Brazil, in the event of a nuclear accident or radiological emergency, undertake to establish a system of prompt notification and mutual assistance. To this effect, technical information will be exchanged to establish measures and procedures to help to prevent or mitigate the effects of damage which might result from such occurrences.

The National Atomic Energy Commission of Argentina and the National Nuclear Energy Commission of Brazil are designated respectively as the bodies responsible for co-ordinating and executing the Protocol. Both Commissions must establish the procedures required for its implementation before 30th January 1987.

The Protocol is based to a certain extent on the two IAEA Conventions on the same subject, adopted in Vienna on 26th September 1986 (the texts of the Conventions are reproduced in the Supplement to this issue of the Bulletin).

### • *Argentina-People's Republic of China*

#### 1985 AGREEMENT FOR CO-OPERATION IN THE PEACEFUL USES OF NUCLEAR ENERGY

On 15th April 1985 the Government of Argentina and the Government of the People's Republic of China concluded in Beijing a framework agreement setting out the type and fields of co-operation in the peaceful uses of nuclear energy. The Parties agree in particular to co-operate on reactor research, construction and design, nuclear fuel element manufacturing and supply, nuclear safety and radiation protection, and physical protection of nuclear material.

The content and scope as well as the practical arrangements for such co-operation will be the subject of special agreements to be concluded by the Parties

The Agreement specifies that co-operation shall be for exclusively peaceful purposes and that the security measures applied for the nuclear materials and equipment covered by the Agreement shall be those defined by the International Atomic Energy Agency (IAEA). In addition, any transfer to a third party of the above-mentioned materials, equipment and information may only be effected by mutual consent between the Parties

Finally, both Parties agree to take the necessary measures to provide adequate physical protection for the nuclear materials and equipment transferred pursuant to the Agreement. This categorisation conforms to the Guidelines for Nuclear Transfers circulated by the IAEA under reference INFCIRC/254

The Agreement entered into force for a period of fifteen years on the date of the mutual notifications by the Parties of the completion of the required legislative procedures. It may subsequently be extended for five-year periods successively

## • *Australia-United States*

### AGREEMENT ON THE APPLICATION OF THE AGREEMENT CONCERNING PEACEFUL USES OF NUCLEAR ENERGY (1985)

The above was concluded on 2nd August 1985 by an Exchange of Notes constituting an Agreement between the Governments of Australia and the United States. It concerns the application of different Articles in the Agreement of 5th July 1979 concerning peaceful uses of nuclear energy which entered into force on 16th January 1981.

This Agreement details each Party's responsibilities regarding safeguards, physical protection and retransfers of nuclear material. It entered into force on the day of its signature and will remain in force for as long as the Agreement between both countries concerning peaceful uses of nuclear energy

## • *Belgium-Eurochemic*

### AGREEMENT BETWEEN THE BELGIAN GOVERNMENT AND THE EUROCHEMIC COMPANY ON THE LUMP-SUM SETTLEMENT OF EUROCHEMIC'S FINANCIAL OBLIGATIONS RESULTING FROM THE CONVENTION CONCLUDED BETWEEN THE PARTIES IN 1978

According to the Second Protocol on the Conditions of Execution of the above Convention of 24th July 1978 (see Nuclear Law Bulletin Nos 22 and 32), the Belgian Government and Eurochemic undertook to open negotiations with a view to concluding an Agreement settling on a lump-sum basis, the expenses for which Eurochemic would remain liable after 31st December 1984

Negotiations were started in 1984 and finalized in 1985, after the Belgoprocess Company had been constituted and had taken over responsibility for Eurochemic's former industrial site as from 1st January 1985 Belgoprocess, a wholly-owned subsidiary of the Synatom Company, has been charged by the Belgian Government to terminate the waste management programme fixed by the 1978 Convention, in particular the vitrification of high-level liquid wastes resulting from the operation of Eurochemic's former reprocessing plant

The lump-sum Agreement was signed on 10th April 1986, after approval by the Eurochemic Board of Liquidators and by the Special Group of the OECD Steering Committee for Nuclear Energy. The Special Group is composed of government representatives of Eurochemic Member countries, i.e. Austria, Belgium, Denmark, the Federal Republic of Germany, France, Italy, Norway, Portugal, Spain, Sweden and Switzerland. It provides for the payment by Eurochemic of 3470 million Belgian francs as the total and final settlement of the Company's financial obligations resulting from the Convention. This amount (subject to revision according to an indexing formula) is to be paid in six instalments until the end of 1990 and will be financed by contributions from the governments of the eleven countries participating in Eurochemic. To this effect, the Special Group recommended that those governments make the necessary financial commitments according to the OECD scale. The Agreement entered into force on 1st October 1986, following their acceptance of this recommendation.

## • *Brazil-Colombia*

### AGREEMENT ON CO-OPERATION IN THE PEACEFUL USES OF NUCLEAR ENERGY (1981)

This Agreement concluded between Brazil and Colombia on 12th March 1981 was ratified by both Parties. It was promulgated by Decree No 92 501 of 26th March 1986 by the President of the Brazilian Republic and published in the

Official Gazette on 31st March 1986; the Agreement entered into force on the date of its publication

The Agreement is wide in scope and provides for co-operation in many areas in the nuclear field. It covers, inter alia, prospection for, extraction and processing of uranium ores, design, construction and operation of nuclear reactors and facilities, basic and applied nuclear research, training of personnel, nuclear safety and radiation protection, radioisotopes production and finally, physical protection of nuclear materials and nuclear law

The Agreement will remain in force for ten years and is to be extended automatically for two-year periods unless terminated by notification of either Party six months prior to expiry of the current period

## ● *CERN-France*

### 1986 DECREE ON THE REGIME APPLICABLE TO NUCLEAR MATERIALS HELD BY CERN ON FRENCH TERRITORY

Decree No 86-1137 of 17th October 1986 was published in the French Official Gazette of 24th October 1986 and reproduces the Agreement concluded by an exchange of letters of 25th July 1985 and 16th August 1985 between the French Government and the European Organisation for Nuclear Research (CERN). The Agreement concerns the legal position regarding nuclear materials held by CERN on that part of its premises on French territory. It is recalled that CERN, which is based in Switzerland close to the French border, has extended its premises onto French territory by agreement with France (see Nuclear Law Bulletin Nos. 11 and 37)

This new Agreement provides that nuclear materials held by CERN on French territory are governed by French law, in compliance with that Organisation's international statute. Accordingly, the import, possession, transfer, use and transport of such materials are subject to licensing and control by the French authorities. They are also subject to international controls applicable in France.

## • *Euratom-United States*

### MEMORANDUM OF UNDERSTANDING CONCERNING RESEARCH ON THE HEALTH AND ENVIRONMENTAL EFFECTS OF RADIATION (1986)

On 7th July 1986, the US Department of Energy and Euratom - represented by the Commission of the European Communities signed a Memorandum of Understanding on the health and environmental effects of radiation

The United States and Euratom, in line with their own needs, presently carry out separate research programmes, many elements of which are similar. This Memorandum of Understanding establishes a framework for co-operation between both Parties for the exchange of technical information on the effects of radiation on health and the environment, thus enabling them to share their knowledge

The topics covered are, inter alia, environmental processes and effects, and somatic and genetic health effects of radiation. The modalities of co-operation include the following

- exchange of current scientific and technical information, with the exception of proprietary information;
- organisation of seminars and exchange of scientists and engineers,
- joint research projects

The Memorandum of Understanding entered into force on the day of its signature for a period of five years

## • *France-Spain*

### TECHNICAL CO-OPERATION AGREEMENT ON RADIOACTIVE WASTE MANAGEMENT (1986)

On 13th May 1986 the French Atomic Energy Commission (CEA) and the National Radioactive Waste Management Agency (ANDRA) concluded an agreement on radioactive waste management with the Spanish nuclear research centre (JEN) and the National Enterprise for Radioactive Waste (Empresa Nacional de Residuos Radioactivos - ENRESA). The Agreement covers co-operation and technical assistance in that field

This framework Agreement provides for the possibility of collaboration between the CEA group of companies and the Spanish agencies on the execution of low and medium level radioactive waste storage projects in Spain. The Agree-

ment, which covers a five-year period, will enable the Spanish partners to learn from French experience in the field

Important technical assistance to Spanish agencies and companies will be provided in the early years and will decrease progressively. Such assistance will cover harmonization of criteria and standards for the waste produced in Spanish nuclear reactors, in view of the diversity of the nuclear power plants in that country. Also, approved technical specifications are to be established for storage of low and medium-level wastes, and for development of additional storage capacity in the already operating facility as well as for a second storage facility.

The Agreement covers several areas for collaboration and technical assistance, in particular, CEA/JEN collaboration on R and D in radioactive waste treatment and specifications as well as provision of technical assistance by ANDRA to ENRESA.

Joint working groups have been set up in France and in Spain to carry out the different tasks.

## • *Federal Republic of Germany-Republic of Korea*

### 1986 AGREEMENT ON CO-OPERATION IN THE PEACEFUL USES OF NUCLEAR ENERGY

The Federal Ministry of Research and Technology published the text of an Agreement of 11th April 1986, between the Government of the Federal Republic of Germany and the Government of the Republic of Korea on co-operation in the field of the peaceful use of nuclear energy (Bundesgesetzblatt 1986, II, p. 726). Under the Agreement the Contracting Parties will co-operate, in particular, in the following fields:

- planning, erection and operation of nuclear power plants and other nuclear installations,
- safety of nuclear installations and radiation protection,
- training of scientific and technical personnel;
- use of nuclear energy for other purposes than electricity generation (especially in the fields of medicine, biology and agriculture)

The Agreement states that such co-operation is only and exclusively intended for peaceful purposes. The co-operative activities are subject to IAEA safeguards, and physical protection measures are provided for in an Annex to the Agreement.

The Agreement entered into force on the day of its signature.



# MULTILATERAL AGREEMENTS

## CONVENTIONS ON EARLY NOTIFICATION OF A NUCLEAR ACCIDENT AND ASSISTANCE IN CASE OF A NUCLEAR ACCIDENT OR RADIOLOGICAL EMERGENCY

A total of fifty-eight States have signed the Convention on Early Notification of a Nuclear Accident which was opened for signature on 26th September 1986. Three States having signed this Convention without reservation as to ratification (Czechoslovakia, Denmark and Norway), it entered into force on 27th October of this year.

Fifty-seven States have signed the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency which was opened for signature at the same time. As in the case of the other Convention, this Convention will enter into force thirty days after three States have expressed their consent to be bound by its provisions.

The list of Signatories of both Conventions (as at 7th October 1986) is reproduced below. The texts of the Conventions are set out in the Supplement to this issue of the Bulletin.

### CONVENTION ON EARLY NOTIFICATION OF A NUCLEAR ACCIDENT

#### List of Signatories

<u>State/Organisation</u>	<u>Date of signature</u>
Afghanistan	26th September 1986
Australia	26th September 1986
Austria	26th September 1986
Belgium	26th September 1986
Brazil	26th September 1986
Bulgaria	26th September 1986
Byelorussian Soviet Socialist Republic	26th September 1986
Canada	26th September 1986
Chile	26th September 1986
China	26th September 1986
Costa Rica	26th September 1986
Côte d'Ivoire	26th September 1986
Cuba	26th September 1986
Czechoslovakia	26th September 1986
Denmark	26th September 1986
Egypt	26th September 1986

State/OrganisationDate of Signature

Finland	26th September 1986
France	26th September 1986
German Democratic Republic	26th September 1986
Germany, Federal Republic of	26th September 1986
Greece	26th September 1986
Guatemala	26th September 1986
Holy See	26th September 1986
Hungary	26th September 1986
Iceland	26th September 1986
India	29th September 1986
Indonesia	26th September 1986
Iran, Islamic Republic of	26th September 1986
Ireland	26th September 1986
Israel	26th September 1986
Italy	26th September 1986
Jordan	2nd October 1986
Democratic People's Republic of Korea	29th September 1986
Lebanon	26th September 1986
Liechtenstein	26th September 1986
Luxembourg	29th September 1986
Mali	2nd October 1986
Mexico	26th September 1986
Monaco	26th September 1986
Morocco	26th September 1986
Netherlands	26th September 1986
Niger	26th September 1986
Norway	26th September 1986
Panama	26th September 1986
Paraguay	2nd October 1986
Poland	26th September 1986
Portugal	26th September 1986
Spain	26th September 1986
Sudan	26th September 1986
Sweden	26th September 1986
Switzerland	26th September 1986
Turkey	26th September 1986
Ukrainian Soviet Socialist Republic	26th September 1986
Union of Soviet Socialist Republics	26th September 1986
United Kingdom of Great Britain and Northern Ireland	26th September 1986
United States of America	26th September 1986
Zaire	30th September 1986
Zimbabwe	26th September 1986

CONVENTION ON ASSISTANCE IN THE CASE OF A NUCLEAR ACCIDENT  
OR RADIOLOGICAL EMERGENCY

List of Signatories

<u>State/Organisation</u>	<u>Date of signature</u>
Afghanistan	26th September 1986
Australia	26th September 1986
Austria	26th September 1986
Belgium	26th September 1986
Brazil	26th September 1986
Bulgaria	26th September 1986
Byelorussian Soviet Socialist Republic	26th September 1986
Canada	26th September 1986
Chile	26th September 1986
China	26th September 1986
Costa Rica	26th September 1986
Côte d'Ivoire	26th September 1986
Cuba	26th September 1986
Czechoslovakia	26th September 1986
Denmark	26th September 1986
Egypt	26th September 1986
Finland	26th September 1986
France	26th September 1986
German Democratic Republic	26th September 1986
Germany, Federal Republic of	26th September 1986
Greece	26th September 1986
Guatemala	26th September 1986
Holy See	26th September 1986
Hungary	26th September 1986
Iceland	26th September 1986
India	29th September 1986
Indonesia	26th September 1986
Iran, Islamic Republic of	26th September 1986
Ireland	26th September 1986
Israel	26th September 1986
Italy	26th September 1986
Jordan	2nd October 1986
Democratic People's Republic of Korea	29th September 1986
Lebanon	26th September 1986
Liechtenstein	26th September 1986
Mali	2nd October 1986
Mexico	26th September 1986
Monaco	26th September 1986
Morocco	26th September 1986
Netherlands	26th September 1986
Niger	26th September 1986
Norway	26th September 1986

<u>State/Organisation</u>	<u>Date of Signature</u>
Panama	26th September 1986
Paraguay	2nd October 1986
Poland	26th September 1986
Portugal	26th September 1986
Spain	26th September 1986
Sudan	26th September 1986
Sweden	26th September 1986
Switzerland	26th September 1986
Turkey	26th September 1986
Ukrainian Soviet Socialist Republic	26th September 1986
Union of Soviet Socialist Republics	26th September 1986
United Kingdom of Great Britain and Northern Ireland	26th September 1986
United States of America	26th September 1986
Zaire	30th September 1986
Zimbabwe	26th September 1986

#### CONVENTION ON THE PHYSICAL PROTECTION OF NUCLEAR MATERIAL

The above Convention was signed by Ecuador on 26th June 1986, Mongolia and Indonesia ratified the Convention on 28th May 1986 and 5th November 1986 respectively, thus bringing to nineteen the number of ratifications

The Convention was adopted on 3rd March 1980 and will enter into force thirty days after the deposit of the twenty-first instrument of ratification, acceptance or approval with the Director General of IAEA, pursuant to its Article 19(1) (see Nuclear Law Bulletin Nos 35, 36 and 37 for status of signatures and ratifications).

#### 1986 IMPLEMENTING AGREEMENT ON CO-OPERATION AMONG THE THREE LARGE TOKAMAK FACILITIES (JET, JT-60 AND TFTR)

The European Atomic Energy Community (Euratom), the Japanese Atomic Energy Research Institute (JAERI) and the United States Department of Energy (US DOE) concluded the above Agreement on 15th January 1986 under the aegis of the International Energy Agency (OECD)

This Agreement links the large thermonuclear fusion energy projects of Europe, Japan and the United States. The purpose of the Agreement is to enhance the effectiveness and productivity of the research and development efforts related to the development of the Tokamak fusion concept by strengthening co-operation on the existing three large Tokamak Facilities

The Programme includes exchange of information between the Parties in defined areas (inter alia, studies in plasma equilibrium and stability, operat-

ing procedures, safety rules etc ), assignment of scientists, engineers and other technical experts to work at the facilities of the other Parties and finally, conduct of selected workshops in those defined areas of information exchange

Other OECD Member countries may accede to the Agreement with the unanimous consent of the Contracting Parties

The Agreement will remain in force for an initial period of five years and may be extended

#### TREATY ON THE NON-PROLIFERATION OF NUCLEAR WEAPONS

At present, there are 132 Contracting Parties to the Treaty on the Non Proliferation of Nuclear Weapons (NPT) The Treaty, which was adopted on 1st July 1968, entered into force on 5th March 1970 (see Nuclear Law Bulletin No 20) The following table gives a list, as at 10th May 1986, of the countries having ratified, acceded or succeeded to the NPT

CHRONOLOGY OF DEPOSITS OF RATIFICATIONS, ACCESSIONS AND SUCCESSIONS TO NPT

Non-nuclear weapon States

1. Ireland	1	7.1968	48	Maldives*	7	4	1970
2. Nigeria	27	9 1968	49	Ghana	5	5	1970
3. Denmark	3.	1.1969	50	Lesotho*	20	5	1970
4. Canada	8.	1.1969	51	Bolivia	26	5	1970
5. United Rep of Cameroon	8	1 1969	52.	Haiti	2	6	1970
6. Mexico	21	1 1969	53	Kenya	11	6	1970
7. Finland	5	2.1969	54.	Lebanon	15	7	1970
8. Norway	5	2 1969	55	Zaire	4	8	1970
9. Ecuador	7	3 1969	56.	San Marino*	10	8	1970
10. Mauritius	25.	4.1969	57.	Uruguay	31	8	1970
11. Botswana*	28	4 1969	58.	Guatamala	22	9	1970
12. Mongolia	14	5.1969	59.	Madagascar	8	10	1970
13. Hungary	27.	5.1969	60	Gen. African Rep*	25	10	1970 acc
14. Poland	12	6.1969	61.	Morocco	27	11	1970
15. Austria	27.	6.1969	62	Senegal	17	12	1970
16. Iceland	18	7 1969	63.	Holy See	25	2	1971 acc
17. CSSR	22.	7 1969	64	Chad*	10	3	1971
18. Bulgaria	5	9 1969	65	Burundi*	19	3	1971 acc
19. New Zealand	10	9 1969	66.	Tonga*	7	7	1971
20. Syrian Arab Rep.	24.	9.1969	67	Dominican Rep	24	7	1971
21. Iraq	29	10 1969	68.	Dem. Kampuchea	2	6	1972 acc
22. German Dem Rep	31	10 1969	69.	El Salvador	11	7	1972
23. Swaziland*	11.	12.1969	70	Fiji*	14	7	1972 acc
24. Nepal*	5	1 1970	71.	Philippines	5	10	1972
25. Sweden	9	1.1970	72	Benin*	31	10	1972
26. Taiwan, China*	27.	1.1970	73	Thailand	7	12	1972 acc
27. Iran	2	2 1970	74	Australia	23	1	1973
28. Afghanistan	4	2 1970	75	Nicaragua	6	3	1973
29. Romania	4	2.1970	76	Côte d'Ivoire	6	3	1973
30. Paraguay	4	2 1970	77	Honduras*	16	5	1973
31. Ethiopia	5	2 1970	78	Bahamas*	10	7	1973 acc
32. Malta*	6	2.1970	79	Sudan	31	10	1973
33. Cyprus	10	2 1970	80	Gabon	19	2	1974 acc
34. Mali, Rep of	10	2 1970	81.	Grenada*	19	8	1974 acc
35. Jordan	11	2.1970	82	Sierra Leone	26	2	1975 acc
36. Lao People's Rep	20.	2.1970	83	Western Samoa*	17	3	1975 acc
37. Togo*	26	2.1970	84	Korea, Rep of	23	4	1975
38. Tunisia	26	2.1970	85	Belgium	2	5	1975
39. Yugoslavia	3	3 1970	86.	Germany, F R of	2	5	1975
40. Burkina Faso*	3.	3.1970	87.	Italy	2	5	1975
41. Costa Rica	3	3 1970	88	Luxembourg	2	5	1975
42. Peru	3	3 1970	89.	Netherlands	2	5	1975
43. Malaysia	5.	3.1970	90	Gambia*	12	5	1975
44. Jamaica	5	3 1970	91	Rwanda*	20	5	1975 acc
45. Liberia	5	3 1970	92.	Libyan Arab Jama	26	5	1975
46. Somalia*	5	3.1970	93	Venezuela	26	9	1975
47. Greece	11	3.1970	94	Singapore	10	3	1976

\*Non-member of the IAEA

### Non-nuclear weapon States

95	Japan	8. 6 1976		114.	Antigua&Barbuda*	1 11.1981	succ.
96	Suriname*	30 6.1976	succ	115	Papua New Guinea*	25. 1 1982	acc.
97	Guinea Bissau*	20 8 1976	acc	116	Nauru*	7. 6 1982	acc
98	Panama	13 1 1977		117	Vietnam Soc Rep	14 6.1982	acc.
99	Switzerland	9 3 1977		118.	Uganda	20 10 1982	acc.
100	Portugal	15 12 1977	acc	119	Dominica*	10 8 1984	succ
101	Liechtenstein	20 4.1978	acc.	120	Equa Guinea*	1.11 1984	acc.
102	Congo*	23 10.1978	acc.	121.	St. Vincent&Grenad.*	6.11.1984	succ.
103	Tuvalu*	19 1 1979	succ	122.	Brunei Darussalam*	26 3.1985	acc.
104	Sri Lanka	5. 3 1979		123	Seychelles*	12 3 1985	acc.
105	Dem. Yemen*	1 6.1970		124	Bhutan*	23 5 1985	acc.
106.	Indonesia	12 7 1979		125	Kiribati*	18. 4 1985	succ
107	Bangladesh	27 10 1979	acc	126	Belize*	9 8.1985	succ.
108	Cape Verde*	24.10 1979	acc	127	Korea	12 12 1985	acc.
109	St Lucia*	28 12 1979	acc	128	Malawi*	18 2 1986	succ
110	Barbados*	21 2 1980		129	Colombia	8. 4 1986	
111	Turkey	17 4 1980					
112	Egypt	26 2 1981					
113	Solomon Isl *	17 6 1981	succ				

### Depositary Governments

1	UK	27.11 1968
2	USA	5 3.1970
3	USSR	5 3 1970

\*Non-member of the IAEA

## • *International Atomic Energy Agency*

### SPECIAL SESSION OF THE GENERAL CONFERENCE AND ADOPTION OF THE CONVENTIONS ON NOTIFICATION AND ASSISTANCE

During its first Special Session, held from 24th to 26th September 1986, the General Conference adopted a final document of the special session (GC(SPL I)/RES/1), a Resolution on measures to strengthen international co-operation in nuclear safety and radiological protection (GC(SPL I)/RES/2), the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (see under Multilateral Agreements and Supplement to this issue of the Bulletin)

The final document of the Special Session and the Resolution are reproduced below

#### I

### FINAL DOCUMENT OF THE SPECIAL SESSION OF THE GENERAL CONFERENCE

The General Conference, at its special session on nuclear safety and radiological protection

#### **Role of Nuclear Energy**

- Recognises that nuclear power will continue to be an important source of energy for social and economic development
- Emphasises that the highest level of nuclear safety will continue to be essential to the use of this energy source

#### **Responsibility of States**

- Reaffirms that each country engaged in nuclear energy activities is itself responsible for ensuring the nuclear and radiation safety, physical security and environmental compatibility of its nuclear facilities and activities.



## **International Co-operation**

- Appeals for a strengthening of international co-operation, at both the bilateral and the multilateral level, with regard to nuclear safety, radiological protection, physical security and environmental compatibility

## **Role of the IAEA**

- Reaffirms the central role of the Agency, under its Statute, in encouraging and facilitating international co-operation in the peaceful uses of nuclear energy, including nuclear safety and radiological protection
- Reaffirms the usefulness of the Agency's continuing programmes for enhanced nuclear safety and radiological protection, and urges all Members to co-operate fully in the implementation of these programmes
- Underlines the importance of and need for future increased efforts within the Agency, and in co-operation with other concerned international organisations, to promote the safe application of nuclear power

## **Post-Accident Review**

- Expresses its satisfaction with the post-accident review meeting conducted from 25th to 29th August 1986 under the auspices of the Agency
- Expresses its appreciation to the participating experts from the Soviet Union for providing, in the context of this meeting, valuable information for understanding the accident
- Takes note of the report on the post-accident review meeting and requests the Board of Governors to consider carefully any proposals for enhanced nuclear safety and radiological protection activities in its future review of the regular Agency programme, taking into consideration - inter alia the valuable information and recommendations resulting from that meeting

## **Conventions on Notification and Assistance**

- Adopts the texts of the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency [which are attached] and decides to open the Conventions for signature on 26th September 1986
- Takes note of the statements made by several States as to the need for early notification of all nuclear accidents with radiological safety significance and of the declarations made by several States on their readiness to notify also nuclear accidents other than those specified in Article 1 of the Convention on Early Notification

- Recognizes the role entrusted to the Agency in the implementation of the Conventions
- Appeals to all States to sign and become party to the Conventions as promptly as possible
- Appeals to all Signatory States for which the Conventions will not enter into force immediately to declare, whenever possible, that they will provisionally apply either or both of the Conventions pending their entry into force for such States

## II

### RESOLUTION ON MEASURES TO STRENGTHEN INTERNATIONAL CO-OPERATION IN NUCLEAR SAFETY AND RADIOLOGICAL PROTECTION

The General Conference,

- (a) Having adopted the texts of the Convention on Early Notification of a Nuclear Accident, the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, and the final document of this Special Session,
  - (b) Taking note of the statements and proposals made during this Special Session, and
  - (c) Convinced that the subject-matter of international co-operation in the field of nuclear safety has not yet been exhausted and that further consideration should be given to the above-mentioned statements and proposals,
- 1 Decides that all statements and proposals made during the general debate and in the Committee of the Whole which relate to the subject-matter shall be referred to the Board of Governors;
  - 2 Requests the Board of Governors to pursue the discussion of the above-mentioned statements and proposals, including the proposals submitted by Mexico on behalf of the Group of 77, by all interested Member States, and
  - 3 Requests the Board of Governors to submit to the General Conference at its 31st regular session a report on the implementation of the two above-mentioned Conventions and of this Resolution

• *Commission of the European Communities*

**COUNCIL REGULATION (EEC) NO. 1707/86  
OF 30TH MAY 1986  
ON THE CONDITIONS GOVERNING IMPORTS OF AGRICULTURAL PRODUCTS  
ORIGINATING IN THIRD COUNTRIES FOLLOWING THE ACCIDENT  
AT THE CHERNOBYL NUCLEAR POWER STATION**

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community,

Having regard to the proposal from the Commission,

Whereas following the accident at the Chernobyl nuclear power station on 26th April 1986, considerable quantities of radioactive elements were released into the atmosphere,

Whereas the provisional measures adopted by Regulation (EEC) No. 1388/86 should be replaced by an arrangement which enables imports to be reinstated, providing that maximum permitted levels are imposed, whereas, however, these levels applicable to third countries might need to be re-examined in the light of Community decisions regarding internal permitted contamination levels;

Whereas the Community must seek to ensure that agricultural products and processed agricultural products intended for human consumption and likely to be contaminated are introduced into the Community only according to common arrangements which safeguard the health of consumers, maintain without having unduly adverse effects on trade between the Community and third countries, the unified nature of the market and prevent deflections of trade;

Whereas the subject of minimum reference levels is still in need of more thorough scientific study it is nevertheless desirable that, for reasons of urgency and by means of an emergency procedure, interim maximum permitted levels should be established, with which imports of the products concerned must comply and in connection with which checks will be carried out by the Member States,

Whereas, since this Regulation covers all agricultural products and processed agricultural products intended for human consumption, there is no need, in the present case, to apply the procedure provided for in Article 29 of Directive 72/462/EEC,

Whereas compliance with the maximum permitted levels will have to be the subject of appropriate checks backed up by the possibility of prohibiting imports in cases of non-compliance,

Whereas, in order to supplement, clarify or adjust, as necessary, the measures provided for by this Regulation, a simplified procedure should be established,

Whereas adoption of this Regulation in its present form appears necessary in order to satisfy overriding and immediate requirements as mentioned in the third recital,

HAS ADOPTED THIS REGULATION:

#### Article 1

This Regulation shall apply to the products covered by Annex II to the Treaty and to the products covered by Regulations (EEC) No 2730/75, (EEC) No 2783/75, (EEC) No 3033/80 and (EEC) No 3035/80 originating in third countries, with the exception of the products referred to in the Annex to this Regulation

#### Article 2

Without prejudice to other provisions in force, the release for free circulation of the products referred to in Article 1 shall be subject to compliance with the maximum permitted levels laid down in Article 3

#### Article 3

The maximum permitted levels referred to in Article 2 shall be as follows

the accumulated maximum radioactive level in terms of caesium-134 and -137 shall be.

- 37.0 Bq/kg for milk falling within headings No 04 01 and No 04 02 of Common Customs Tariff and for foodstuffs intended for the special feeding of infants during the first four to six months of life, which meet, in themselves, the nutritional requirements of this category of person and are put up for retail sale in packages which are clearly identified and labelled "food preparation for infants",
- 600 Bq/kg for all other products concerned

#### Article 4

1. Member States shall check compliance with the maximum permitted levels set in Article 3 in respect of the products referred to in Article 1, taking into account contamination levels in the country of origin. Checking may also include the presentation of export certificates. Depending on the results of the checks carried out, Member States shall take the measures required for Article 2 to apply, including the prohibition of release for free circulation, taking each case individually or generally for a given product

2. Each Member State shall provide the Commission with all information concerning the application of this Regulation, notably cases of non-compliance with the maximum permitted levels. The Commission shall circulate such information to the other Member States

#### Article 5

Where cases of repeated non-compliance with the maximum permitted levels have been recorded, the necessary measures may be taken in accordance with the procedure referred to in Article 6. Such measures may even include the prohibition of the import of products originating in the third country concerned.

#### Article 6

1 The arrangements for applying this Regulation and any amendments to be made to the list of products unfit for human consumption, as listed in the Annex, shall be adopted in accordance with the procedure provided for in Article 30 of Regulation (EEC) No 804/68, which shall apply by analogy.

2 To this end an ad hoc committee shall be set up, composed of representatives from the Member States and chaired by a representative from the Commission.

Within the Committee the votes of the Member States shall be weighted in accordance with Article 148 (2) of the Treaty. The Chairman shall not vote.

#### Article 7

This Regulation shall expire on 30th September 1986 \*.

#### Article 8

Regulation (EEC) No 1388/86 is hereby repealed.

#### Article 9

This Regulation shall enter into force on the day of its publication in the Official Journal of the European Communities.

This Regulation shall be binding in its entirety and directly applicable  
in all Member States.

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\* The Council has since extended this Regulation until 28th February 1987.

# STUDIES AND ARTICLES

## ARTICLES

### PROOF OF DAMAGE FROM IONIZING RADIATION\*

Professor Berthold Moser  
Attorney in Salzburg

The validation of compensation for physical damage, particularly cancer, sustained by man and animals from ionizing radiation is understandably burdened by a particularly difficult position with regard to proof. Berthold Moser, a specialist in the law of atomic energy and radiation protection, in the following article deals first at length with the medical effects of radiation and with genetic damage. Then follows an examination of the legal position, in particular causation theories, gradations in the proof of causation, legal rules to ease the requirements of proof and questions of statutory limitation.

#### Contents

- I General
- II. The medical bases
  - A Non-stochastic and stochastic radiation effects
  - B. Early damage and delayed damage
- III The legal position
  - A Causation theories
  - B Legal means of easing the requirements of proof causation presumptions and joint liability
  - C. Gradations in the proof of causation certainty, probability, possibility
- IV. Statutory limitation
- V Conclusion

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## I. General

A condition of every claim for damage compensation is that the damage should have been caused by the event giving rise to an obligation to pay compensation. There must therefore be a causal relation between a particular event and a particular consequence (damage). But precisely, when a human being or an object, eg also an animal, has been exposed to ionizing radiation<sup>1</sup>, we are faced with particular difficulties in presenting proof of causation for a variety of reasons. For example, ionizing radiation cannot be demonstrated by means of the human senses, the same damage as that produced by ionizing radiation can also be attributable to other causes, eg chemical processes. Damage from ionizing radiation may have origins both in its artificial use and in its emission from building materials or in natural background radiation, but it may also have to do with a familial disposition. The same kind of damage may also be the effect of an unknown cause<sup>2</sup>. If however an effect (damage) can be attributable not only to a single cause but to several similar or different causes and even to unknown causes, a highly questionable position arises. In order to approach a solution to the problem, it is necessary to make certain fundamental distinctions of a medical nature, i e on the one hand between the stochastic and non-stochastic effects of radiation and on the other hand between early damage and delayed damage.

## II The medical bases

### A Non-stochastic and stochastic radiation effects

#### 1 Concepts

Within the meaning of the Recommendations of the ICRP<sup>3</sup>, a distinction must be made between the non-stochastic (deterministic) and stochastic (probabilistic) effects of radiation. The non-stochastic effects are those for which the degree of severity varies with the dose<sup>4</sup> and for which there may be a threshold value. The extent of the biological effect thus depends on the magnitude of the radiation dose. The stochastic effects are those for which the probability of their occurrence, but not their degree of severity, is regarded as a function of the dose without the existence of a threshold value. The biological effect is thus independent of the radiation dose received, nevertheless the probability of a radiation effect increases with the radiation dose received<sup>5</sup>.

Different parts of our body have different sensitivities to radiation. The exposure of parts of the body to radiation doses, which in whole-body irradiation would be absolutely lethal, may not be lethal, depending on the party of the body irradiated. Thus in radiation therapy for malignant tumours, local doses of 6000 to 8000 rad (= 60 to 80 Gy) are commonly administered. The size of the irradiated volume is not the sole determining factor here, but also its content. It is not only the product of dose and irradiated volume that counts but also, in specifically biological terms, the content of the irradiated volume.

## 2 Non stochastic radiation effects

The splitting of radiation effects into non-stochastic and stochastic effects is extremely important in practice, because the period of latency<sup>6</sup> in the case of non-stochastic effects is only a few weeks, when the radiation phenomenon resulted from one event or from several successive events occurring at short time intervals. At higher doses pathological symptoms may even appear within a few hours or days. This applies in particular when a person has suffered whole-body irradiation in a single radiation event or as a result of several radiation events in quick succession. In such a case it will not be difficult to attribute the illness to the influence of ionizing radiation. Some non-stochastic effects are specific to particular tissues. This applies for example to opacity in the lens of the eye, non-malignant changes in the skin, bone-marrow damage leading to haematological deficiencies and damage to the gametes resulting in fertility impairment. These effects also include damage to blood vessels or to the connective tissues which occur in most parts of the body. It is therefore necessary, as a precautionary measure, to establish a dose limit applicable to all body tissues. The intention here is to ensure that no non-stochastic effects occur in any of these tissues. In all these changes the degree of severity of the effect depends on the radiation dose received. Conversely there are threshold values below which no damaging effects have been observed<sup>7</sup>.

## 3 Stochastic effects of radiation

A different picture emerges where stochastic radiation damage is concerned<sup>8</sup>. As in this case the severity of consequent damage does not increase with increasing dose, although the frequency and probability of such damage do increase, the degree of severity of the damage is not dependent on the radiation dose received. It has been found by experience that the stochastic effects of radiation only occur after a long period of latency, which may be one not just of years but of decades. Moreover different persons who were exposed to the same type of radiation and to the same radiation dose may show quite different results where the effects are concerned. Some people fall ill, others do not. Estimates vary as to the ratio according to which the probability of illness increases with increasing dose. For example, some assume a linear relation, others a quadratic relation between dose and illness.

The stochastic effects may be of two types. Either they relate to the irradiated individual himself, they are then termed 'somatic effects'. Or they relate to the individual's descendants, they are then termed 'genetic effects'.

a) Under the heading of somatic effects the development of cancer is considered to be the most important radiation risk, even at low doses. The cancer risk thus constitutes the main problem of radiation protection. There are no forms of cancer which are typical of radiation effects. It is not therefore immediately apparent from a particular cancer illness whether it is attributable to radiation or to some other cause. It follows from this that radiation-induced cancer can only be presumed or statistically demonstrated on the basis of particular diseases which have occurred previously. This is done by comparing groups of people exposed to radiation with other groups who have not been exposed to such radiation. Also it cannot be said that the use of a radiological method on a particular organ is harmless because it has not been



possible to establish a single case of damage to that organ as a result of radiation exposure. This would be quite impossible, because nobody knows which cancers are attributable to radiation effects and which are due, for example, to carcinogenic chemical substances or other causes. For a case of cancer, the cause of which is in principle always open to question but for which radiation exposure must be considered as a possibility, it is as a rule only possible to indicate a degree of probability or improbability, corresponding to the level of exposure, that the disease is attributable to the radiation exposure. The higher the radiation dose, the greater the risk of illness through cancer and the easier it is to demonstrate a cancer-inducing (oncogenic) effect statistically by comparison with the spontaneous rate of incidence of malignant growths. However this also involves as precise as possible an examination of all oncogenic factors which may come into play. Of course tumours and mutations can only develop from a cancerous cell if the cell remains capable of more or less unrestricted division, in other words if it has survived the radiation. At very high radiation doses therefore a reduction in oncogenic effect may occur. In the case of radiation-induced cancer, a cell information deficit is at least to a large extent responsible for the damage. The diseased cells, which are not integrated into the social system of the organism, are not told that they must cease to divide.

b) Genetic radiation damage<sup>9</sup> is understood to mean all damage to succeeding generations due to radiation. Irradiation of the gonads does not affect the person who was exposed to radiation, but it may affect his descendants at some time in the future. When the gonads are irradiated, gene mutations and chromosome changes take place which give rise to the hereditary damage. This may manifest itself in severe health disturbances, including lethality and sterility. The radiation dose which has affected the gonads (gonad dose) is not the same as the dose which has probable genetic effects (genetically significant dose). This is obtained by multiplying the gonad dose by the probability of reproduction at the time of the exposure to radiation. The gonad dose to younger people is to a large extent converted into subsequent genetically related damage, whereas this occurs in older people to a much lesser extent. Experience has shown that irradiation at higher dose rates brings about greater genetic effects than irradiation at low dose rates. It is assumed that the damage in the first succeeding generation exceeds that in each subsequent generation, but that the total extent of the damage suffered by all subsequent generations by far exceeds that suffered by the first. The sex ratio in the first generation of the descendants of irradiated parents is also disturbed.

Now there are mutations which already manifest themselves in the phenomenological picture of the first generation and others which only make their appearance in later generations. Over 99% of these radiation-induced mutations can be regarded as biologically negative, i.e. they impair the ability of the individual to adapt to his environment.

The determination of genetic effects, however, is loaded with a considerable uncertainty factor. Thus it has not so far been possible to establish with certainty the presence of impairments in the descendants of survivors from Hiroshima and Nagasaki, even when the survivors had been exposed to a very high radiation dose as a result of the dropping of the atomic bomb.

## 8. Early damage and delayed damage

The non-stochastic effects of radiation, as has been shown above, usually manifest themselves a short time after the radiation event, if the total dose from the irradiation was above a certain threshold value. On the other hand a long period of latency is characteristic of stochastic effects, irrespective of whether the irradiation delivered a low dose or a high dose. Nevertheless non-stochastic and stochastic radiation damage cannot be equated with early and delayed damage, although non-stochastic damage for the most part corresponds to early damage and stochastic damage to delayed damage.

### 1 Early damage<sup>10</sup>

a) One of the main instances of early damage is acute radiation sickness. This may manifest itself in three symptom complexes which depend in their intensity on the radiation dose received. The first is the central nervous syndrome, which only occurs at very high radiation doses, eg several thousand rads. At high radiation doses death occurs within 1-2 days, sometimes even within a few minutes.

The gastrointestinal syndrome is also fatal at a slightly lower radiation exposure - between 1000 and 3000 rad (= 10-30 Gy). It manifests itself in nausea, vomiting, dizziness, circulatory disturbances and extreme fatigue. After a short remission of a few days the patient experiences acute diarrhoea, and death occurs after 6-10 days. These phenomena are a consequence of the great sensitivity to radiation of the intestinal lining which is deprived of its protective epithelial layer following the stagnation of cell regeneration in the inner wall of the intestine.

The haemopoietic syndrome also occurs at considerably lower radiation exposures - from dose levels of 50-100 rad (= 0.5-1 Gy) upwards. It may be that the patient does not even feel ill, although the blood count shows changes. Where noticeable pathological symptoms do manifest themselves in a patient, they take the form of nausea, vomiting, fever, but also hair loss and haemorrhaging.

b) The skin is also particularly sensitive to radiation. After whole-body irradiation at about 300 rad (= 3 Gy), initial erythraemia already occurs after 1-2 hours, while skin erythraemia and hair loss occur after 1-2 weeks. At higher doses of 600 rad (= 6 Gy), visible reddening of the skin also occurs.

c) The central nervous system is relatively insensitive to radiation. Only when radiation doses of over 1000 rad (= 10 Gy) are absorbed do changes start to occur after about 12 hours in brain tissue. Death occurs at increased doses.

d) In the autonomic nervous system doses of up to 100 rad (= 1 Gy) can cause reactions taking the form of vomiting, nausea and dizziness. These occur within periods ranging from 1 hour to 1 day but die away quickly, depending on the intensity of the radiation.

e) In the bone marrow the parent cells are much more sensitive to radiation than mature cells in the circulating blood, with the exception of the lymphocytes. Irradiation of the bone marrow has the effect of disturbing the

equilibrium prevailing in the blood forming system, which is characterised by a balanced ratio between cell production and cell destruction

f) The gonads also feature among the radiation-sensitive organs. Temporary sterility occurs in both sexes at a radiation dose of around 250 rad (= 2.5 Gy) and permanent sterility (radiological castration) at doses of over 500 rad (= 5 Gy)

The above considerations relate to whole-body irradiation. Partial irradiation, which does not affect the intestine and large parts of the bone marrow, can occur at dose levels which would be absolutely lethal in whole-body irradiation. The reason for this is that the highly radiation-sensitive intestine is spared and that the bone marrow continues to regenerate from the bone marrow contained in substantial areas of the skeleton.

Another factor to be taken into account is whether the individual irradiated was in good health, or whether he was suffering from particular illnesses, such as metabolic diseases, chronic infections or disturbances of the blood-clotting function. Where there are additional injuries, radiation sensitivity is also increased. And where there is a combined effect of ionizing radiation and lead or other chemical substances, again, radiation sensitivity is increased. This observation is of special importance since lead in particular, as environmental toxin, plays a major role<sup>11</sup>

In protracted or fractional irradiation<sup>12</sup>, higher doses of both homogeneous and non-homogeneous radiation are more readily tolerated than in exposure of relatively short duration. Here both the extent of the individual doses and the number of subdivisions and the time intervals between the individual exposures may vary. Comparisons have shown that in protracted or fractional radiation there is a distinctly smaller number of chromosome breaks than in short-lived radiation at the same dose. In addition the probability of recovery is greater where exposures are spread over a period than after single periods of concentrated irradiation. Also exposures of limited areas of the body, for example in tumour therapy, are much more readily tolerated than whole-body doses. This applies as well to part-body irradiation which would be absolutely lethal as whole-body doses. It can be said in general that, in the case of whole-body irradiation, survival of a radiation dose of 600 rad (= 6 Gy) or more is improbable, one of 200-600 rad (= 2-6 Gy) questionable, one between 50 and 200 rad (= 0.5-2 Gy) at least probable.

These considerations relate to the development of early damage. The possibility of somatic delayed damage (leukaemia and other carcinomas) or genetic damage is not covered here.

## 2 Delayed damage<sup>13</sup>

Delayed damage with a long period of latency is different to the kind of damage which is observable in the short term. Three groups of damage may be distinguished.

a) One group comprises cancers, including leukaemia. The degree to which periods of latency may vary has been shown by studies of survivors from Hiroshima and Nagasaki. Periods of latency of 2-5 years have been indicated for leukaemia and up to 16 years for liver cancer. Mammary carcinomas (breast

cancer) are to a large extent age-related. In women up to the age of 30 the period of latency may in some cases be as short as 5-10 years, while in women irradiated at a more advanced age the period of latency is longer. It is then between 10 and 19 years, though sometimes as long as 34 years. In the case of cancers of the stomach, liver and large intestine, the period of latency is between 10 and 15 years. In thyroid carcinomas, the period of latency seems to be longer in women than in men. Among the radiation-induced cancers, leukaemia shows the shortest period of latency. In some cases it already manifests itself after 5-10 years. In persons irradiated at an immature age, it usually manifests itself earlier. Other forms of cancer show even longer periods of latency, ranging up to nearly 40 years. All these radiation-related diseases fall into the category of stochastic effects. It should be noted in connection with radiogenic leukaemia that it is mainly the red bone marrow which is responsible for this disease. Other blood-forming tissues play a lesser role in its genesis.

In some cases a distinction also has to be made between the initiation and the promotion of a disease. Thus, for example, cancer may be caused by a particular event, but the damaged cells remain in a quiescent state. For the disease to become established, a further growth-promoting event is needed which only then causes the affected cells to develop in an uncontrolled manner. The action of two independent factors is thus necessary for the disease to develop. It is conceivable, however, that more than just two events may have caused the outbreak of the disease. This illustrates how difficult it can be to establish a link between cause and effect in the case of delayed damage.

b) The non-stochastic effects also include diseases which fall under the heading of delayed damage. Significant among these are the diseases which cause opacity in the lens of the eye (cataracts)<sup>14</sup>. The period of latency in these cases extends from several months to a few years. This applies in particular when the total dose necessary for the threshold value to be exceeded was not received in a single radiation event but over an extended period in fractional exposures. In the case of irradiation by X-rays or gamma rays, only doses in excess of 200 rad would have an effect.

c) Radiation-related developmental disturbances<sup>15</sup> form a further group. It was observed that several children who had been exposed to radiation from the atom bomb explosions in Hiroshima and Nagasaki were mentally retarded and that their cranial volume was below the average for their age (microcephaly). Radiation effects may also lead to premature ageing and to a shortening of life expectancy, to loss of elasticity and slackening of the skin, to hair greying, to loss of visual acuity and accommodation of the eye lenses, to arcus senilis in the eye, to hearing loss, to the impairment of neuromuscular functions, manifesting itself in excessive force in handshakes, to an alteration in blood pressure and to a rise in cholesterol and potassium levels in the blood. Other effects include a general radiation-related reduction in immunological capacity and a reduction in the reserves for antibody formation and deviations from the norm in blood cells, particularly lymphocytes.

### 3 Early and delayed damage

Those cases in which an individual is found to have sustained first early damage then delayed damage call for a special discussion. Since early

damage occurs within a very short period, often within hours, days or weeks, there is a fair degree of probability that delayed damage will be attributable to the same cause as the early damage. Medical records of the early damage are thus of great importance, since they may in some cases facilitate retrospective conclusions on the cause of the delayed damage. The detection of radiogenic cataracts is a particularly important diagnostic factor here<sup>16</sup>

### III. The legal position

#### A Causation theories

1 According to principles of logic the cause of an effect is the totality of all factors which contributed to its occurrence. It follows from this that, very often, an impossibly large number of causes has to be taken into account. These considerations form the basis of the theory of equivalence, according to which all factors are of equal value. The cause in that case is each factor without which the effect is inconceivable. Each factor is then a *conditio sine qua non* for the effect.

This theory is valid, according to the case law of the Austrian Supreme Court (Oberster Gerichtshof - OGH) and judgments of the former German Reich Supreme Court (Reichsgericht - RG) and present Federal High Court of Justice (Bundesgerichtshof - BGH) in criminal law<sup>17</sup>. Austrian case law for its part developed from Section 134 of the former Austrian Criminal Justice Act (Strafgesetz - StG). In several decisions the Supreme Court states that each of the factors contributing to an effect is interconnected<sup>18</sup>. In criminal law the theory of equivalence is justifiable because criminal responsibility presupposes fault. This doctrine has been retained unchanged in the case law of the Supreme Court within the context of the new Criminal Code (Strafgesetzbuch - StGB)<sup>19</sup>.

2 The position is quite different under civil law, according to which liability can arise without fault. For that reason the standard practice of the Supreme Court is to apply the theory of adequate causation. According to this, the factor taken as the cause is that which is typical for the incidence of the effect, in other words one which is susceptible of bringing about an effect of this kind in the usual course of events. The possibility of damage occurring must not be beyond the bounds of all probability. The possibility must not be so completely remote that it cannot be reasonably considered in the light of real-life experience. The criterion for the assessment of adequate causation here is not the awareness and foresight of the damaging party but the objectivity of recognizable facts. The case law of the former German Reich Supreme Court and the present Federal High Court of Justice in civil actions is based on this theory<sup>20</sup>.

It follows from this that the theory of adequate causation is not a doctrine of causation as such, but a rule of assessment. Its purpose is to set the bounds within which liability can still be attributed. Of course these bounds are not absolute. In recent decisions the German Federal High Court of Justice includes a very wide area, taking the view that the liability

of the damaging party can only be excluded in highly improbable instances of damage<sup>21</sup>.

Although criminal law and civil law proceed on the basis of different causation theories, it should not be overlooked that the theory of equivalence can also be relevant in civil law if contingent private claims under civil law are recognized in the course of a criminal action. The separation between criminal and civil law is thus not strictly applied throughout.

It should be borne clearly in mind in the application of the doctrine of adequate causation that it does not operate on the basis of certainties, but contents itself with degrees of probability derived from experience. What corresponds to the usual course of events, i.e. is typical, is accepted as certain, although it is quite possible that a particular case may deviate from the typical course of events. Of course in such a case, according to the prevailing case law, the burden of proof is reversed. Anyone who maintains that there is a deviation from the normal course of events must prove it. It is important to point out that the doctrine of adequate causation is only a probability hypothesis<sup>22</sup>.

The doctrine of the *conditio sine qua non* may lead to quite different results compared with the theory of adequate causation. Suppose that it can be shown that an illness is attributable to two different causes, one of which however would not be enough to trigger the illness of its own accord. According to the theory of adequate causation, a causal link with a particular causation factor would have to be rejected, whereas according to the *conditio sine qua non* doctrine it would have to be admitted.

It is thus possible to arrive at very different results, depending on the causation theory to which preference is given.

A precondition for a causal relation in the legal sense, however, is always the presence of a medical link between a particular event and the physical damage. If no such medical link exists, it is not possible for a legal link to be admitted. Reference is made to this principle in numerous decisions of the Higher Regional Court (Oberlandesgericht - OLG) of Vienna, which is the court of appeal for cases concerned with disputes over social insurance benefits. According to this principle, in those cases in which means for the relaxation of the requirements of proof are available to the claimant, a medical link between the relevant event and the physical damage must at least not be excluded<sup>23</sup>.

3 The theory of material contingency (*Theorie der wesentlichen Bedingung*) implies a limitation of the theory of equivalence. Special attention needs to be drawn to this doctrine here because it is uniformly applied in the case of law of social accident insurance both in Austria and in the Federal Republic of Germany<sup>24</sup>. Its purpose is to impose stricter limits on the area of risk of the social insurance institutions and to exclude an excessive range of liability. Only those causes are regarded as adequate, and hence as admissible in law, which because of their particular connection with the effect contributed significantly to its initiation. All other links in the chain of causation, which can be considered as causes from a purely philosophical point of view but not in a legal sense, must be excluded. If several facts contributed to an effect, they can only be regarded legally as contributory causes if they

are approximately equivalent in their importance and implications for the initiation of the effect. If one of these facts stands out from the others in its importance, that fact alone is the cause in the legal sense<sup>25</sup>

Of course an event also has to be viewed as a material cause if an existing pathological disposition was suddenly made to develop by the industrial accident in a way which had not been expected for the foreseeable future, or if an illness from which the individual was already suffering was significantly aggravated. The same applies if, without the participation of the event, the effect would not have occurred or would only have occurred at another time or to a considerably reduced extent<sup>26</sup>

4 With regard to the burden of proof there is the rule, in accordance with the general legal principles of compensation for damage, that the injured party has to prove both the objective and the subjective premises of his claim for damages. On the one hand therefore he must prove the causal link between a particular act or omission and the occurrence of the damage, on the other hand he must prove that the damaging party is at fault. Now these two things are not applicable without limitation. With regard to the proof of a causal link, various means of easing the requirements of proof are available in a number of cases

#### B Legal means of easing the requirements of proof causation presumptions and joint liability

In the area relevant to the effects of radiation events, it is not normally possible to provide conclusive proof. All that is possible is an assessment based on more or less well founded assumptions. There are no clearly drawn dividing lines between remote possibility and, to use the term normally found in case law, a degree of probability bordering on certainty. Between them is a broad band of the most varied nuances from minimal to moderate possibility and from minimal through moderate to high probability values. In many cases it will not be possible to furnish proof of a causal link between an illness and a particular radiation event, although certain indications point to the possibility that damage occurred as a result of that event. In order not to deprive injured parties of all prospects of results from the prosecution of their claims at the outset, the law has established presumptions for various case groups, intended to replace one or more links in the chain of causation. In many cases the principle of the joint liability of several persons is applied. Presumptions can to some extent be refuted, to some extent not. Conversely, in cases in which refutable presumptions have been asserted, and since such presumptions cannot usually be refuted with certainty, the law admits the demonstration of improbability. This also applies in cases of joint liability.

#### 1 Civil law

The legal basis for various presumptions and for joint liability is derived for the most part from the Nuclear Liability Act (Atomhaftpflichtgesetz - AtomHG, BGBl 1964/117) and in one case from the Water Pollution Act (WRG 1959/215). With regard to the scope of the Nuclear Liability Act, it should

be noted that it is applicable to the peaceful use of nuclear energy in all its forms. In accordance with this scope however, legal presumptions and joint liability only apply under the following conditions: the radiation must emanate from radioactive substances, these radiation sources must be situated on Austrian sovereign territory; the case must relate to uses of nuclear energy for peaceful purposes.

These presumptions and the principle of joint liability thus do not apply in particular when the radiation emanates from irradiation devices, eg X-ray devices, and accordingly also when both one or more radioactive substances and one or more irradiation devices have to be taken into account as radiation sources. Moreover the legal presumptions and joint liability also do not apply when one of the radiation sources in question is situated in a foreign country or when a radiation event is involved which was triggered by an act of war<sup>27</sup>. Where the law provides for the joint liability of several persons, the question of alternative causation invariably arises<sup>28</sup>. The following possibilities may arise:

a) The source of damage is clearly identified, but it cannot be established whether the radioactive properties or other properties of the substance were the cause of the damage. Section 1 paragraph 2 of the Nuclear Liability Act therefore provides that a nuclear event should also include processes which were caused by radioactivity in combination with other chemical, chemico-physical or physical properties of the substance in question.

b) If damage is caused by the combined effect of a nuclear event and another event and if the contributions of the two events to the damage cannot be determined with certainty, the damage caused by the other event counts as though it were caused by the nuclear event (Section 11 paragraph 2, AtomHG).

c) If several nuclear events cause damage only through their combined effect, each event alone not being damaging in itself, they count as a single nuclear event. Each keeper of a source of damage of this kind is liable for damage jointly and severally with all others, but each of them only in accordance with the provisions applicable to him and up to the maximum amount laid down for him by statute (Section 1 paragraph 3, AtomHG).

d) Several nuclear events are attributable to a common cause and are directly related to one another in time and space. In this case the events count as a single nuclear event (Section 1 paragraph 3, AtomHG).

e) Several events, which are attributable to a common cause and are directly related to one another in time and space, only cause damage through their combined effect. In this case all liable parties assume joint liability, but here too each party is only liable in accordance with the provisions applicable to him up to the maximum amount laid down for him by statute (Section 1 paragraph 3, AtomHG).

f) Several nuclear events, which proceed from different sources of damage, may be regarded as the cause of an instance of damage. In this case it is presumed that the damage was caused jointly by these events. This presumption can, however, be invalidated by demonstration of the improbability that the damage was caused by one or more of these events (Section 11 paragraph 1, AtomHG).



g) With regard to the offset claims of several liable parties among themselves, the principle applied is that the obligation of mutual compensation depends on the extent to which it is at least probable that the main responsibility for the damage is borne by one or another of the liable parties (Section 10 paragraph 1, AtomHG)

h) According to Section 26 of the 1959 Water Pollution Act it is presumed in the event of damage through water pollution that such damage was caused by the relevant local water consumers with reference to the nature of the effluent. In the case of damage compounded by deliberate intent or by gross negligence, the principle of joint liability is applied, otherwise liability is apportioned on a pro-rata basis.

## 2 Social accident insurance law

a) This field of law governs industrial accidents and various accidents regarded as equivalent to industrial accidents, such as road accidents, accidents in the course of rescue missions and other activities in the public interest, and occupational diseases. An industrial accident is understood to mean an accident which occurs in spatial, temporal and causal connection with the employment on which the insurance is based (Section 175 paragraph 1 of the General Social Insurance Act - Allgemeine Sozialversicherungsgesetz - ASVG). Although the individual concerned must have been exposed to the hazard which led to the injury in the course of his employment at a place of work, the accident need not be the consequence of an operational process<sup>29</sup>. The damaging effect must occur suddenly or at least within a short period, at most within a single turn of duty. An accumulation of smaller instances of damage within a short period may also count as an accident. Indeed continuous radiation effects sustained in the use of ionizing radiation over a period of several hours may be regarded as an accident. The same applies in respect of a person rendering assistance in rescue operations after a radiation accident.

An occupational disease must be distinguished from an accident. An occupational disease is normally distinguished from an accident by the fact that the characteristic of suddenness is missing. Disturbances to health caused by insect bites and stings, colds, wounds and other infections may thus also constitute an accident. The concept of an occupational disease on the other hand presupposes that an instance of damage to health is the consequence of longer-term damaging effects on health in the course of an occupational activity<sup>30</sup>.

In itself any illness might be an occupational disease arising as a consequence of effects attributable to work. But the law does not take such a broad concept as its point of reference. A distinction is merely made between "abstract" and "concrete" occupational diseases<sup>31</sup>. A list system is applied in respect of the abstract occupational diseases. Annex 1 to the General Social Insurance Act gives an exhaustive list of diseases which count as occupational diseases. This list is drawn up according to three criteria: firstly, the nature of the effect, eg harmful substances, noise, infection, vibration, 'harmful substances' also include ionizing radiation, secondly, the nature of the disease, eg diseases of particular parts of the body or general disorders, thirdly, the type of undertaking in which the affected person works in pursuit of his occupation. In the case of ionizing radiation,

no distinction is made between the different types of illness. The type of undertaking in which such radiation is used is also a matter of indifference, since all undertakings may be relevant<sup>32</sup>

From the point of view of the burden of proof, the list system constitutes the establishment of a refutable presumption. If a person subject to compulsory insurance had been employed in an undertaking in which he was concerned with ionizing radiation of whatever origin and if he has contracted a disease which may possibly be traced back to his occupational activity, it is presumed in the light of item no. 17 in the list referred to that the cause of his disease is to be found in his occupational activity and that it is therefore an occupational disease. It would only be possible to refute this presumption by demonstrating the probability that the illness has another cause<sup>33</sup>. The reason for this approach to the regulation of the question in law is that the legislator did not want to burden the accident insurance institutions with the uncertainties of medical evidence.

Nevertheless a disease not included in the list can also be recognised as an occupational disease in a concrete case. However this presupposes that the accident insurance institution acknowledges, on the basis of corroborated scientific evidence, that the disease in question was exclusively or mainly caused by the use of harmful substances or rays - hence also ionizing radiation in the course of an occupational activity pursued by the insured person. This acknowledgement in each case requires the approval of the Federal Ministry for Social Administration (Bundesministerium für Sozialverwaltung - BMS)<sup>34</sup>. However the burden of proof in these cases is on the claimant.

There is thus a mixed system in the field of occupational diseases which, while it consists mainly of means of easing the requirements of proof by the establishment of refutable presumptions, also admits the conventional principle of regulation by the burden of proof<sup>35</sup>.

b) The reason why only the General Social Insurance Act (ASVG) has been discussed so far, to the exclusion of other social insurance statutes, is either that these statutes refer directly to the ASVG or that their relevant conceptual provisions are largely based on those of the ASVG and that no problems therefore arise in this respect. This applies both to the Federal Act on medical and accident insurance for workers in the public sector (BKVUG) of 31st May 1967 (BGBl 200) and to the Federal Act on agricultural workers' social insurance (BSVG) of 11th October 1978 (BGBl 559) and the Federal Act on social insurance for independent workers in industry and crafts (GSVG) of 11th October 1978 (BGBl 560). The BKVUG, consistent with the matters regulated by it, uses the term 'Dienstunfall' (service accident) instead of 'Arbeitsunfall' (industrial accident), but defines it as being virtually synonymous with the latter. Where occupational diseases are concerned, the Act refers directly to the list contained in Annex 1 to the ASVG.

C Gradations in the proof of causation certainty, probability, possibility

1 Conclusive proof

Proving a causal link between a particular event and an effect normally presents less difficulty if the event can be perceived by the human senses. If the event is not amenable to sensory perception however, the material position is entirely different. Problems arise precisely in the action of ionizing radiation on the organism, the solution of which is often beset with great difficulties. Even in those cases in which radiation measuring devices take on the function for which the human senses are not adequate, it is not possible to establish a direct link between a radiation event and an instance of damage. Conclusions as to the effectiveness of the radiation can only be drawn directly from the nature, duration and intensity of the radiation. Such measurements can be carried out either at the radiation source itself or at the place of impact of the radiation. Even so, from experience going back over several decades, it is possible to deduce certain conclusions. No difficulties arise with regard to proof if it is known that only a short time interval elapsed between the delivery of a high radiation dose and the outbreak of a radiation-related illness of a mainly non-stochastic type. There can then be no doubt as to the cause of the illness. Apart from the military domain, such cases arise, for example, when radiation accidents occur in the operation of a nuclear power plant or in the transport of radioactive materials or when rescue operations have to be mounted as a result of such incidents. High radiation doses may also play a part in the context of medical treatments, though their consequences consist in transient non-stochastic illnesses.

2 Probability

The position is less straightforward however, if no direct observations and no exact measurements are available. All conclusions are then no more than more or less well founded assumptions. Demonstration of the certainty of a causal link is hardly possible in such cases, and demonstration of certainty must be replaced by the demonstration of probability.

Courts have long found it necessary to take decisions on cases in which sensory perceptions or measurements of the event giving rise to the effect were lacking. This applies, for example, to damage from chemical substances or to the transmission of infectious diseases. Such problems have arisen to a particularly marked extent in judicial rulings on matters relating to proof of paternity or the refutation of paternity presumptions. The original wording of Section 163 paragraph 2 of the General Civil Code (Allgemeines Bürgerliches Gesetzbuch - ABGB) imposed extremely strict requirements in respect of evidence ruling out paternity. Such evidence was accordingly only accepted in the case law of the Supreme Court if it was of a degree of probability approximating very closely to certainty. That was the case if, according to medical evidence, the degree of improbability of paternity was as high as 99.73%. Under an amendment to Section 163 paragraph 2 ABGB, the requirements in respect of improbability were less stringent. According to the new wording, the presumption of paternity can be invalidated by proof of a degree of improbability of the paternity which, taking all the circumstances into

account, argues against the assumption that a particular man fathered the child. The very high degree of probability thus no longer needs to be established, although case law does require proof of a high probability of paternity<sup>36</sup>

The legal position with regard to the requirements governing proof of causation in the assessment of the effects of ionizing radiation, however, is different to that pertaining to the strict requirements imposed in respect of proof of the improbability of paternity

In all cases in which the relevant civil laws - AtomMG and WRG 1959 establish presumptions which can be refuted by proving the improbability of the causation, there are no additional indications from which any conclusions whatsoever could be drawn regarding the degree of improbability. It can be said therefore, only in very general terms, that the considerations in support of the improbability must outweigh those arguing against it. Also the considerations leading to the assumption of the improbability of the causation need not be absolutely conclusive, so that other possibilities remain open

What is valid for the proof of improbability also applies mutatis mutandis in respect of the reverse case, that the probability, not the improbability, of a causal process has to be demonstrated

This approach, developed for the civil law, corresponds to the established case law in the field of social accident insurance law. In both German and Austrian court practice the basic principle is applied that a link between the accident and the insured activity (known as causation establishing liability) and between the accident and the physical damage (known as causation consolidating liability) must be probable. A precise demonstration of causation is not required<sup>37</sup>. Of course decisions regarding the question of the extent of probability do not systematically agree with one another. The decisions of the Higher Regional Court (Oberlandesgericht - OLG) of Vienna, the court of second and final instance in matters relating to disputes over social insurance benefits, tend to be somewhat stricter, whereas the decisions of the Administrative Court (Verwaltungsgerichtshof - VwGH) may be considered rather more generous

According to several decisions of the Higher Regional Court of Vienna the probability must be sufficiently high to justify the conclusion that the allegation of a link is true. The degree of probability must be such that a reasonable person aware of the realities of life would not doubt it<sup>38</sup>. Other contexts state that compelling reasons suffice and that the requirements of proof should not be overstressed<sup>39</sup>. Or it is considered sufficient that the probability of a causal link should be present to such a degree that the judge could be reasonably expected to be convinced of it<sup>40</sup>. Or it is stated that demonstration of compelling probability within the meaning of Section 273 of the Code of Civil Procedure (Zivilprozessordnung - ZPO) is sufficient<sup>41</sup>. Other decisions state quite simply that probability suffices<sup>42</sup>. The Administrative Court on the other hand consistently takes the view that the causal link must at least be supported by the establishment of probability<sup>43</sup>

### 3 Possibility

While there is not complete agreement in court decisions with regard to the degree of probability, the courts do agree that the mere possibility of a causal link is not enough<sup>44</sup>. An exception is only admitted in case law when, in the context of an industrial accident, a particularly dangerous situation existed at the place of work. The burden of proof of the absence of a causal link then passes to the insurer. He must prove that the accident which occurred is untypical and not attributable to the danger directly associated with the work<sup>45</sup>. This also means that the theory of adequate causation is applied, but with a reversal of the burden of proof.

While case law understandably does not consider demonstration of the mere possibility of a causal link to be sufficient - apart from the exception referred to, the legislator remains at liberty to take up the mere possibility of a causal link and to invest it with the significance of certainty, as has happened in the context of the legal presumptions set out above and the establishment of a list of abstract occupational diseases<sup>46</sup>.

## IV. Questions of statutory limitation

Causation takes on a fundamentally different significance in the medical and in the legal context with regard to the time at which statutory limitation puts an end to all further legal considerations. This only applies to the field of civil law, however, since there is no problem of statutory limitation in public law.

### A Civil law

1. Where there is a question of damage due to radiation from radioactive materials, the relevant provision is Section 34 paragraph 1 of the Nuclear Liability Act (AtomHG), the context of which largely corresponds to Section 1489 of the General Civil Code (ABGB). Here the (subjective) period of statutory limitation is three years, calculated from the day on which the person entitled to compensation became aware of the damage and brought it to the attention of the liable party. Notwithstanding this procedure, however, the (objective) period of statutory limitation is thirty years from the occurrence of the nuclear incident. Moreover, since Section 34 paragraph 2 of the Nuclear Liability Act refers to the provisions of general civil law, the terms governing the suspension and interruption of statutory limitation are substantially those of the General Civil Code. The Nuclear Liability Act is not applicable to damage resulting from ionizing radiation emanating from irradiation devices. Instead the statutory limitation provisions of the General Civil Code are applicable.

*Delayed radiation damage may sometimes only manifest itself when the objective period of statutory limitation has already elapsed. Yet, although it may be possible to establish a causal link, at least with probability, any claim to damages under civil law would have lapsed<sup>47</sup>.*

It would only be possible to prevent the effect of objective statutory limitation by introducing an action for declaratory judgment, because this interrupts statutory limitation. Such an action only has a real chance of success if early damage had already occurred as a result of a radiation incident. For it is entirely within the realm of possibility that early damage is followed after some considerable time by delayed damage. Entitlement to an action for declaratory judgment would be conceded in particular if it could be shown that a person has received a high radiation dose. For the higher the dose received, the greater is the probability that a stochastic illness will result, which would in most cases fall under the heading of delayed damage.

2 The question of statutory limitation is mainly relevant to somatic radiation damage, but it may also be relevant to genetic damage. Since somatic radiation effects are those which affect the irradiated individual himself, they count from the time of conception. It is a matter of indifference whether the radiation event affected the human individual in his mother's womb or after his birth.

On the other hand it is characteristic of genetic radiation effects that they caused damage to a human individual at a time before he even existed. But is it at all possible for such a person to claim compensation for damage resulting from an event which occurred even before he was conceived?

Opinions on this are divided<sup>48</sup>. A claim for damages in principle only subsists - apart from any question of fault when there is a link of causation and unlawfulness between an action and a consequence (damage). If that link is present, the answer to the question depends on whether an unlawful act is possible against a person not yet conceived. Assuming that this question could also be answered in the affirmative, it could hardly be of legal significance beyond the first generation, because the objective thirty-year period of statutory limitation has to be calculated from the time of the damaging event. The medical problem of causation, however, continues to exist beyond the expiry of the thirty-year period, because future generations may also be affected.

## B Social accident insurance law

The question of statutory limitation does not arise here because claims under public law, including claims under the General Social Insurance Act (ASVG) and other social insurance laws, only lapse when a law explicitly so provides. As there is no provision in the field of social insurance law for such exceptions in the validation of the claims of injured parties and their descendants, the statutory limitation provisions of the General Civil Code are not applicable here either directly or by analogy<sup>49</sup>.

The position is entirely different when it is a question of the transfer of claims for damages to the social insurance institution under the provisions for legal assignment of Section 332 et seq. of the General Social Insurance Act (ASVG). Here it is a question of purely civil claims on the damaging party, which the social insurance institution derives from the injured party and which are therefore subject to the statutory limitation provisions of civil law<sup>50</sup>.

## V Conclusion

If we wish to form an overall impression from the considerations set out above, we inevitably arrive at the conclusion that no generally applicable guidelines can be formulated. In those cases in which physical damage is attributable to non-stochastic radiation effects, radiation damage is usually not difficult to prove. Furthermore the legal position may in certain cases be more favourable to a victim of physical damage if the possibility of a stochastic radiation effect can be taken into consideration, because it was preceded by an illness related to a non-stochastic effect. The injured party is understandably in a very favourable legal position if a legal means of easing the requirements of proof is available to him. This applies both to non-stochastic and to stochastic radiation effects. In all cases in which the injured party has the burden of proof, however, the demonstration of simple probability of a causal link must be regarded as sufficient. To demand proof of certainty or of a high degree of probability would lead to unacceptable impediments. This applies to claims falling into the categories of both civil law and social law. In view of the fact that there is often a lack of clear scientific proof, efforts to remedy these deficiencies in various cases by legal means take on even greater significance.

### Notes

- 1 An ion is an atom or molecule which contains a greater or lesser number of electrons than is required for its neutralisation and which therefore carries a surplus negative or positive electrical charge. Ionization is the removal of electrons by the supply of energy, the electrons removed however attach themselves to neutral atoms or molecules, so that for every positive ion a negative ion is also formed.
- 2 The only exceptions are, in particular, a few forms of leukaemia which are attributable to virus infections, ie the disease known as Burkitt's lymphoma and a form of leukaemia caused by so-called retroviruses, see H. Lutz, Leukämie bei Haustieren (Leukaemia in domestic animals), Neue Zürcher Zeitung, 2.10.85.
- 3 The International Commission on Radiological Protection (ICRP) was founded in 1928 by the 2nd International Congress for Radiology and was given its present organisational form in 1950. It groups a maximum of thirteen eminent representatives from the disciplines of medical radiology, physics, biology, genetics, radiation protection etc and from time to time publishes recommendations on radiation protection, which form the basis in almost all countries of legal regulations, standards or guidelines in the field of radiation protection.
- 4 The term 'radiation dose' is understood to mean the radiation energy transferred to 1 gram or 1 kilogram of body mass. Radiation can be regarded as a large number of minute flying particles. These particles interact with the body by transferring their own kinetic energy to it, so that radiation effects are set up in the body. The unit of energy absorbed by the body is the rad (= radiation absorbed dose). 1 rad

(also abbreviated to rd) corresponds to an energy uptake of 100 erg per gram of body mass 1 erg is equal to 1 dyne per cm 1 dyne is the force imparted by an acceleration of 1 cm per second to a mass of 1 gram The delivery of 100 erg per gram of any substance produces 1 rad

In the new SI system of units the rad has been replaced by the unit J/kg (= joule per kilogram), which is known as the gray (symbol Gy) The ratio of these units to one another is 1 J/kg = 1 Gy = 100 rad

Since different types of radiation have different biological effects, the term 'equivalent dose' was introduced, the unit of which denotes the effectiveness of so-called hard gamma radiation In order to express the biological effectiveness of the different types of radiation, the energy dose (Gy) is multiplied by a quality factor (q) The quality factor accordingly indicates by how many times the radiation in question is more effective than the hard gamma radiation used as a magnitude of reference Thus, for example, the quality factor for alpha-rays is 20, for neutrons 10, for beta-rays and X-rays 1 If the quality factor is 1, the energy dose and equivalent dose are equal The unit for the equivalent dose is the rem (radiation equivalent man) The new unit for the equivalent dose according to the SI system is the sievert (symbol Sv) Its ratio with the other units is 1 Sv = 100 rad = 100 rem.

The dose rate is the energy dose (equivalent dose) absorbed per unit of time, the choice of time interval being optional, eg per second, minute, hour, year

- 5 ICRP Recommendations, Publication 26, G Fischer Verlag, Stuttgart-New York 1978, p 3, Radiologie und Strahlenschutz (Radiology and radiation protection), published by the Radiological Centre of the University of Heidelberg, 2nd ed, Springer-Verlag, Berlin-Heidelberg-New York 1976, p 19 et seq
- 6 The period of latency is the interval between the time of radiation and the occurrence of the radiation effect.
- 7 L Rausch, Mensch und Strahlenwirkung (Man and radiation effect), R Piper & Co Verlag, Munich-Zurich 1982, p 68 et seq, O Messerschmidt, Biologische Folgen von Kernexplosionen (Biological consequences of nuclear explosions), out of print Fachbuch Verlagsgesellschaft, Erlangen 1984, p 86 et seq.
- 8 L Rausch op cit p 77, p 199 et seq, O Messerschmidt op cit p 190, p 107 et seq, H Fritz-Niggli, Problematik von Risikoschätzungen Beispiel kleine Strahlendosen (Problems of risk assessment example of small radiation doses), information meeting of the Schweizerische Vereinigung für Atomenergie (SVA) "Thinking on safety and risk in the age of nuclear energy", November 1982, Zürich-Oerlikon
- 9 L Rausch op cit p 224, O Messerschmidt op cit p 213 et seq
- 10 Radiology and radiation protection, p 36, L Rausch op cit p 157, O Messerschmidt op cit p 126 et seq



- 11 D van Beuningen et al, Kombinationswirkungen von Blei und ionisierender Strahlung auf die Proliferation von Säugerzellen (Combined effects of lead and ionizing radiation on the proliferation of mammalian cells) in Risiken und Nutzen der Strahlentherapie bösartiger Tumoren (Risks and usefulness of radiation therapy for malignant tumours), G Thieme Verlag, Stuttgart 1978, p 116
- 12 'Protraction' means the application of a radiation dose over an extended period of irradiation, 'fractional' refers to the subdivision of the total radiation dose into several individual doses spread over a period of time
- 13 L Rausch op cit p 285, O Messerschmidt op cit p 115
- 14 ICRP Recommendations, Publication 8, Fischer-Verlag, Stuttgart-New York 1977, p 24, O Messerschmidt op cit p 188
- 15 ICRP Recommendations, Publication 8, p 20, O Messerschmidt op cit p 211
- 16 Radiation Protection Ordinance (Strahlenschutzverordnung - StrSchV) BGBI 1972/47 At several points this provision stipulates that certificates of relevant medical examinations and records of the application of X-ray and electron beam treatments and the administration of sealed and unsealed radioactive substances to patients be kept for a period of at least thirty years (Sections 20, 70, 72, 96 paragraph 7 and Section 112 paragraph 5) Regarding the importance of early damage in establishing the cause of late damage, see also Hébert, Comments on establishing a causal link between an "occurrence or succession of occurrences having the same origin" and "damage", required for implementing the Convention on Third Party Liability in the Field of Nuclear Energy, in IAEA/OECD-NEA Symposium on Nuclear Third Party Liability and Insurance, Munich 1984
- 17 Palandt, German Civil Code (BGB) 1985, prefatory comments on Section 249, 5, a, aa and bb
- 18 ZB KH 3201, 3819, SSt 17/87
- 19 ZB SZ 26/45; JB1 1969, 370; JB1 1966, 473 and 719, JB1 1971, 307, ZVR 1971/214, ZVR 1975/158 and others.
- 20 JB1 1954, 400 In contrast to the case law of the Supreme Court (OGH), preference is given in many leading works of civil law, e g Ehrenzweig II 1, p 39, Klang in Klang VI 8, to the theory of equivalence, with the comment that the law itself offers no basis for this theory
- 21 Palandt op cit 5 b, aa.
- 22 Palandt op cit 5 b, bb, and c, BSozG (Federal Social Insurance Tribunal) NJW 56, 119 and 63, 1963
- 23 SV-Slg 6/97, SSV 6679, 6697, 10 348, 10 804, 17.113 and others; Kaltenbrunner, Die Kausalität in der Sozialversicherung (Causation in

- social insurance), Schriftenreihe der Allgemeinen Unfallversicherungsanstalt, Vienna 1960, p 51 et seq
24. Palandt op cit 5 b, cc, OGH 4 5 52, 2 Ob 917 52, VwGH 8 7 53 P 173/53, SV-Slg 1/124, 1/125, 11/5, 16/95, SSV 10 347, 16 111, 19 870, 21 492, 21 493, 24.238
  25. SSV 4694
  26. SV-Slg 1/46, 1/124, 2/87, 2/127, 2/138, 4/94, 11/5, 16/95, SSV 4681, 9068, 16 109, 16.113, 18.078, 18.869
  27. Moser, Atomhaftpflichtgesetz (Nuclear Liability Act), Manz-Verlag, Vienna 1964, pp 20, 24, 28, 50; idem, Das Kausalitätsproblem im Atomhaftpflichtrecht (The causation problem in nuclear liability law), in Atomwirtschaft, Verlag Handelsblatt, Düsseldorf 1962, p 249 et seq
  28. Reischauer in Rummel, ABGB, 2nd Vol, Manz-Verlag, Vienna 1984, Section 1302 Rn 12
  29. Vw-Slg NF 964/A
  30. SV-Slg 18.084, Kaltenbrunner op cit 150, Tomandl, System des österreichischen Sozialversicherungsrechts (System of Austrian social insurance law), Manz-Verlag, Vienna 1980, 1.3 1, p 247, Brackmann, Handbuch der Sozialversicherung (Handbook of social insurance), Asgard-Verlag, Dr Werner Hippe, Sankt Augustin, Vol II, p 479 et seq
  31. Tomandl op cit p 251 et seq
  32. Tomandl op cit p. 251 et seq.
  33. The French Cour de Cassation imposes very strict requirements in respect of the refutation of the presumption that an illness appearing in the list of occupational diseases is not an occupational disease, see Hébert, Problèmes de causalité posés par les maladies professionnelles attribuées aux rayonnements ionisants, principalement dans la jurisprudence française (Causation problems raised by occupational diseases attributed to ionizing radiation, mainly in French case law), in Proceedings of Nuclear Inter Jura '73 Congress, Karlsruhe 1973, p 439 et seq
  34. OGH Vienna 31 R 71/80 and 31 R 244/80 The possibility of the recognition of diseases not appearing in the list as occupational diseases was first established by the 32nd amendment to the AVSG (General Social Insurance Act)
  35. The statutory provisions of several other European countries accommodate a mixed system of this kind. See Hébert op cit p 425 et seq
  36. EFSlg 24 305, 29 129
  37. Kaltenbrunner op cit pp 50, 83, Palandt op cit 5 a, aa, SV-Slg 7/112, SSV 11 784, 11 785, 13 597, 9063, Kralik, Die Beweiswürdigung im

zivilgerichtlichen Verfahren (The assessment of evidence in civil court proceedings), ÖJZ 1954, p. 157

38 SV-Slg 7/112, 9/76, SSV 11 784, 11 785, 13 597

39 SSV 9064

40 SSV 13 805

41 SSV 16 110.

42 SSV 9064, 18 043

43 VwSlg NF 1450/A, 1452/A, 20 1 64, P 253/52

44 In contrast to this interpretation are the views of many courts in the USA when it is a question of the assessment of damage from ionizing radiation. Here an assumed degree of probability of between about 1 per cent and about 35 per cent has in some cases been considered sufficient to award the claimant a very high sum of compensation. Court practice is of course very lacking in uniformity, and it is impossible to discern even an approximately clear line from decisions handed down to date. No fewer than about 5000 actions have so far been brought before the US courts. The number of decisions handed down to date on the other hand is very small, accounting for about one per cent of cases. About 4000 lawsuits concern claims for damages of private individuals against the United States on account of physical damage in which radioactive radiation caused by atom bomb tests in the South Pacific and in the Nevada Desert are alleged to have caused cancers. Close on 100 cases concern claims for damages by former members or employees of the Armed Forces who had performed duties in connection with the atom bomb tests. In slightly less than 500 other cases the cause of illness from cancer is alleged to be exposure to radiation to which the persons concerned had been exposed in the course of their employment in laboratories or nuclear reactor plants.

The same applies in respect of some 400 claims from miners who had been employed in uranium mining.

In the overwhelming majority of instances there are no measurement results of any kind and the cases are founded only on vague presumptions. Moreover most of the claims were filed more than thirty years after the alleged damaging event. The fact that some plaintiffs were successful in their civil law claims has much to do with the fact that the decisions were based on verdicts of juries, in which emotional aspects play a major role. The assumed degrees of probability were, as has been pointed out, well below 50 per cent in every instance, and the mere possibility - often quite a remote one - was considered sufficient, although there was no legal presumption of causation whatsoever.

See for further details in this connection D E Jose, US Court practice concerning compensation for alleged radiation injuries, in: Status, Prospects and Possibilities of International Harmonization in the Field of Nuclear Energy Law, Nomos Verlagsgesellschaft, Baden-Baden, 1985, p. 293, W Schaffer, Claims for injuries from

occupational radiation exposures in the United States, recent developments, paper presented at the IAEA/OECD-NEA Symposium in Munich 1984

- 45 SV-Slg 8/29, SSV 16 110, 18 027, 21 608, 25 526 and others
- 46 The principles applicable to the proof of a causal link apply mutatis mutandis to the proof of fault if, instead of liability in tort (Verschuldenshaftung) with the usual burden of proof, the law provides for consequential liability (Erfolgshaftung) or liability in tort with the burden of proof reversed
47. Klang in Klang VI Section 1489 III B in connection with FN 60
- 48 Moser, Die Europäische Menschenrechtskonvention und das bürgerliche Recht (The European Convention on Human Rights and Civil Law), Manz-Verlag, Vienna 1972, p. 127 et seq
- 49 VwSlg 16 830/A, VwSlg NF 3729/A, JB1 1971, 619, öJZ 1978, 380 and others.
50. JB1 1971, 36, RZ 1972/134, RZ 1973/140 and others, Feil, ABGB, Prugg-Verlag, Eisenstadt, 1978, Section 1489, p 267

#### Some abbreviations

ABGB	General Civil Code (Allgemeines Bürgerliches Gesetzbuch)
ASVG	General Social Insurance Act (Allgemeine Sozialversicherungsgesetz)
BGB	Civil Code (Bürgerliches Gesetzbuch)
BGB1	Federal Official Gazette (Bundesgesetzblatt)
BGH	Federal High Court of Justice (Bundesgerichtshof)
BKUVG	Federal Act on medical and accident insurance for workers in the public sector (Bundesgesetz über die Kranken- und Unfallversicherung öffentliche Bediensteter)
BSozG	Federal Social Insurance Tribunal (Bundessozialgericht)
BSVG	Federal Act on agricultural workers' social insurance of 11 10 1978, BGB1 559 (Bundesgesetz über die Sozialversicherung in der Land- und Forstwirtschaft stehender Erwerbstätiger)
EFSlg	Jurisprudence regarding matrimonial regimes and family law (Sammlung der ehe- und familienrechtlichen Entscheidungen)
FN	Financial News (Finanznachrichten)

GSVG	Federal Act on social insurance for self-employed workers in industry and crafts of 11.10 1978, BGBl 560 (Bundesgesetz über die Sozialversicherung in der Land-und Forstwirtschaft Selbständig Erwerbstätigen)
JBL	Justizblatt
NJW	Neue Juristische Wochenschrift
OGH	Austrian Supreme Court (Oberster Gerichtshof)
ÖJZ	Österreichische Juristen-Zeitung
OLG	Higher Regional Court (Oberlandesgericht)
RZ	Austrian Legal Gazette (Österreichische Richterzeitung)
SSt	Supreme Court penal jurisprudence (Sammlung der Entscheidungen des österreichischen obersten gerichtshofs in Strafsachen)
SSV	Social insurance jurisprudence - Vienna Court of the first instance (Sammlung der Entscheidungen des oberlandesgericht Wien in letzter instanz in Fragen der Sozialversicherung)
StGB	Criminal Code (Strafgesetzbuch)
SV-Slg	Social insurance jurisprudence (Sammlung der Sozialversicherungsrechtlichen entscheidungen)
VwGH	Administrative Court (Verwaltungsgerichtshof)
Vw-Slg	Administrative Court jurisprudence (new series) (Sammlung der Entscheidungen der Verwaltungsgerichtshofes)
WRG	Water Pollution Act (Wasserreinigungsgesetz)
ZB KH ZB SZ	Federal Republic of Germany Collection of Jurisprudence
ZPO	Code of Civil Procedure (Zivilprozeßordnung)

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Atomgesetz mit Pariser Atomhaftungs-Übereinkommen Das Deutsche Bundesrecht, Taschenkommentar, by Heinz Haedrich, Baden-Baden Nomos Verlagsgesellschaft 1986, 713 pages

This book is a handy section-by-section pocket commentary of the German Atomic Energy Act which also includes a commentary of the Paris Convention on Third Party Liability in the Field of Nuclear Energy. The author - a well-known nuclear lawyer offers an exhaustively documented interpretation of the Atomic Energy Act, thus providing lawyers dealing with German nuclear energy law with a very useful reference tool.

## • *Italy*

Diritto internazionale e non proliferazione nucleare by Mauro Politi, Studi e Pubblicazione della Rivista di diritto internazionale privato e processuale, Padova, 1984, 301 pages

This book reviews the international and national rules designed to prevent the possible growth in the number of "nuclear" States resulting from a diversion of nuclear energy from peaceful to military purposes. It provides the reader with a concise review of the historical developments leading to the adoption of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) as well as the events of the early 1970's which gave rise to the London Guidelines agreement among the major nuclear supplier States and the various proposals for the establishment of multinational fuel-cycle centres. It examines the different attitudes of American and European legal scholars towards the effectiveness of international non-proliferation guarantees but underlines nevertheless some progress in international acceptance of the principle of non-proliferation.

The book analyses the basic State obligations with regard to the control of nuclear proliferation and the instruments of verification and implementation of this control such as the NPT, IAEA Statute and safeguards agreements, Euratom Treaty and bilateral co-operation agreements and regional

agreements such as the Treaty of Tlatelolco. It also examines "loopholes" in the present system, in particular as concerns the possibility for States to withdraw from the agreements and other weaknesses inherent in the NPT.

The various means for ensuring compliance with States' obligations, including the mechanisms and regulations set forth by treaty law for the purpose of preventing state violation of non-proliferation duties are reviewed by the author who also analyses how international nuclear trade is regulated. In particular, he provides a description of the London Club Guidelines and how they intend to integrate non-proliferation mechanisms by means of a series of restrictions on free trade. The author devotes a chapter to the implications and effect of the US 1978 Nuclear Non-Proliferation Act, as well as the criteria set down by the Act for nuclear transfers.

Finally, the book looks at the problem of non-proliferation in the light of general international law and the absence, within existing customary international law, of a rule that prohibits States to possess and manufacture nuclear weapons. It focuses on the lack of a consensus among the international community on the complete prohibition of nuclear tests and the consequential inability of customary law to avoid nuclear proliferation.

The author concludes that the level of acceptance of the principle of non-proliferation is still inadequate and that prospects for a rapid and substantial increase in this acceptance is, also unfortunately, limited.

Il regime giuridico dell'impiego pacifico dell'energia nucleare, Vol I. Normativa nazionale, ENEA, Rome, June 1986, 428 pages

Since the sixties the CNEN (the National Nuclear Energy Commission) has been issuing publications containing the basic legislation governing nuclear activities in Italy (Volume I in the series) as well as international regulations and agreements in the nuclear field (Volume II), and these books are brought up to date regularly.

The two main nuclear laws are Act No 1860 of 31st December 1962 on the peaceful uses of nuclear energy which provides the basis for the regulation of nuclear activities and Presidential Decree No 185 of 13th February 1964 on the safety of nuclear installations and radiation protection of workers and the population, made under that Act. Most of the decrees and regulations in force reproduced in this Volume were made in implementation of the 1962 Act or the 1964 Decree.

This Volume I is in its seventh edition. The most notable addition since publication of the previous edition in 1981 is the amendment of Act No 1240 of 15th December 1971 restructuring the CNEN. The Act has been substantially modified by Act No 84 of 5th March 1982 to reorganise that agency as a new body with wider competence and new duties in the energy field (with the exception of hydrocarbons), in addition to its nuclear work. It has now been renamed the National Commission for Research and Development of Nuclear and Alternative Energy Sources (Comitato Nazionale per la ricerca e per lo sviluppo dell'energia nucleare e delle energie alternative - ENEA).

## • *Switzerland*

Das Recht der nuklearen Entsorgung in der Schweiz, Hansjörg Seiler, Bern, Stämpfli & Cie SA, 1986, Coll. "Abhandlungen zum schweizerischen Recht ASR", Vol. 502, 432 pages

Waste disposal has become a major issue in respect of the peaceful uses of nuclear energy at both political and legal levels. Mr. Seiler's thesis for a doctorate covers all the legal questions involved and provides the first comprehensive study of Swiss law on nuclear waste disposal. Although this work covers Swiss law, some of the questions broached are also of interest in an international context, in particular consideration of the significance of waste disposal in the long term, waste disposal in areas outside the jurisdiction of the States. This study will be a reference tool for many years to come.

Following a report on the present position, the legal provisions applicable and the "Garantie 1985" project, which the Swiss Government is considering in this latter part of 1986, the author analyses in depth the fundamental questions raised in public law by waste disposal, thus covering nuclear energy law in the light of constitutional principles, federalism and democracy. The author then raises international public law problems raised by waste disposal and also broaches the long term aspects of such disposal, in particular the question of knowing to what extent the legal regime in force may protect future generations against the effects of man's activities today. In this respect he has approached a subject largely unknown, in Switzerland at least, but whose significance in future will go beyond the framework of nuclear energy law.

The author next considers special questions related to waste disposal and treatment, namely conditioning, reprocessing, interim storage as well as the different waste disposal methods used or studied abroad (e.g. sea disposal of waste or the seabed process). However he concentrates first of all on dealing with the setting up in Switzerland of waste storage facilities including final waste storage facilities and the preparatory measures taken in their respect. Some of the questions raised are in principle interesting, for example, the chapter concerning the division of powers between the Confederation and the Cantons. In addition to questions specifically covered by nuclear law, the author analyses the legal problems which might be raised by the creation of final underground storage facilities, namely from the viewpoint of expropriation. These problems also apply in the context of the disposal of non-nuclear wastes.

Mr. Seiler concludes that, "de lege lata", nuclear waste disposal is not regulated satisfactorily at present. He makes a number of proposals which could be taken into account in the total revision of the Swiss Atomic Energy Act currently in progress, and he also highlights certain questions which will continue to be raised in future, such as protection of final storage facilities against intervention by man.



• *IAEA*

Réglementation des activités nucléaires, Legal Series No 13, IAEA, Vienna 1986, 333 pages

This publication, issued in French only, contains the texts of the papers presented to the Interregional Seminar on Nuclear Law and Nuclear Safety Regulation held at Rabat, Morocco from 30th May to 4th June 1983

This Seminar, organised by the IAEA for French-speaking countries in Africa gathered together some hundred or so participants. It aimed to give an overall view of nuclear regulations and how they evolved in the context of relevant standards, recommendations and conventions.

The papers cover various aspects of nuclear regulations, in particular, in the fields of radiation protection, nuclear third party liability, licensing of nuclear installations and control of nuclear materials

Also included are the texts of the Vienna Convention on Civil Liability for Nuclear Damage, the Convention on the Physical Protection of Nuclear Material and the Treaty on the Non-Proliferation of Nuclear Weapons, together with a series of IAEA documents concerning that Agency's safeguards system and the standards, safety measures and recommendations it has established.

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# NUCLEAR LAW

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December 1986



International Atomic Energy Agency

CONVENTION ON EARLY NOTIFICATION OF A NUCLEAR ACCIDENT\*

THE STATES PARTIES TO THIS CONVENTION,

AWARE that nuclear activities are being carried out in a number of States,

NOTING that comprehensive measures have been and are being taken to ensure a high level of safety in nuclear activities, aimed at preventing nuclear accidents and minimizing the consequences of any such accident, should it occur,

DESIRING to strengthen further international co-operation in the safe development and use of nuclear energy,

CONVINCED of the need for States to provide relevant information about nuclear accidents as early as possible in order that transboundary radiological consequences can be minimized,

NOTING the usefulness of bilateral and multilateral arrangements on information exchange in this area,

HAVE AGREED as follows:

Article 1

Scope of application

1. This Convention shall apply in the event of any accident involving facilities or activities of a State Party or of persons or legal entities under its jurisdiction or control, referred to in paragraph 2 below, from which a release of radioactive material occurs or is likely to occur and which has resulted or may result in an international transboundary release that would be of radiological safety significance for another State.

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\* The Convention entered into force on 27th October 1986.

2. The facilities and activities referred to in paragraph 1 are the following:

- (a) any nuclear reactor wherever located;
- (b) any nuclear fuel cycle facility;
- (c) any radioactive waste management facility;
- (d) the transport and storage of nuclear fuels or radioactive wastes;
- (e) the manufacture, use, storage, disposal and transport of radioisotopes for agricultural, industrial, medical and related scientific and research purposes; and
- (f) the use of radioisotopes for power generation in space objects.

## Article 2

### Notification and information

In the event of an accident specified in Article 1 (hereinafter referred to as a "nuclear accident"), the State Party referred to in that Article shall:

- (a) forthwith notify, directly or through the International Atomic Energy Agency (hereinafter referred to as the "Agency"), those States which are or may be physically affected as specified in Article 1 and the Agency of the nuclear accident, its nature, the time of its occurrence and its exact location where appropriate; and
- (b) promptly provide the States referred to in sub-paragraph (a), directly or through the Agency, and the Agency with such available information relevant to minimizing the radiological consequences in those States, as specified in Article 5.

## Article 3

### Other Nuclear Accidents

With a view to minimizing the radiological consequences, States Parties may notify in the event of nuclear accidents other than those specified in Article 1.



## Article 4

### Functions of the Agency

The Agency shall:

- (a) forthwith inform States Parties, Member States, other States which are or may be physically affected as specified in Article 1 and relevant international intergovernmental organisations (hereinafter referred to as "international organisations") of a notification received pursuant to sub-paragraph (a) of Article 2; and
- (b) promptly provide any State Party, Member State or relevant international organisation, upon request, with the information received pursuant to sub-paragraph (b) of Article 2.

## Article 5

### Information to be provided

1. The information to be provided pursuant to sub-paragraph (b) of Article 2 shall comprise the following data as then available to the notifying State Party:

- (a) the time, exact location where appropriate, and the nature of the nuclear accident;
- (b) the facility or activity involved;
- (c) the assumed or established cause and the foreseeable development of the nuclear accident relevant to the transboundary release of the radioactive materials;
- (d) the general characteristics of the radioactive release, including, as far as is practicable and appropriate, the nature, probable physical and chemical form and the quantity, composition and effective height of the radioactive release;
- (e) information on current and forecast meteorological and hydrological conditions, necessary for forecasting the transboundary release of the radioactive materials;
- (f) the results of environmental monitoring relevant to the transboundary release of the radioactive materials;
- (g) the off-site protective measures taken or planned;
- (h) the predicted behaviour over time of the radioactive release.

2. Such information shall be supplemented at appropriate intervals by further relevant information on the development of the emergency situation, including its foreseeable or actual termination.

3. Information received pursuant to sub-paragraph (b) of Article 2 may be used without restriction, except when such information is provided in confidence by the notifying State Party.

## Article 6

### Consultations

A State Party providing information pursuant to sub-paragraph (b) of Article 2 shall, as far as is reasonably practicable, respond promptly to a request for further information or consultations sought by an affected State Party with a view to minimizing the radiological consequences in that State.

## Article 7

### Competent authorities and points of contact

1. Each State Party shall make known to the Agency and to other States Parties, directly or through the Agency, its competent authorities and point of contact responsible for issuing and receiving the notification and information referred to in Article 2. Such points of contact and a focal point within the Agency shall be available continuously.

2. Each State Party shall promptly inform the Agency of any changes that may occur in the information referred to in paragraph 1.

3. The Agency shall maintain an up-to-date list of such national authorities and points of contact as well as points of contact of relevant international organisations and shall provide it to States Parties and Member States and to relevant international organisations.

## Article 8

### Assistance to States Parties

The Agency shall, in accordance with its Statute and upon a request of a State Party which does not have nuclear activities itself and borders on a State having an active nuclear programme but not Party, conduct investigations into the feasibility and establishment of an appropriate radiation monitoring system in order to facilitate the achievement of the objectives of this Convention.

## Article 9

### **Bilateral and multilateral arrangements**

In furtherance of their mutual interests, States Parties may consider, where deemed appropriate, the conclusion of bilateral or multilateral arrangements relating to the subject matter of this Convention.

## Article 10

### **Relationship to other international agreements**

This Convention shall not affect the reciprocal rights and obligations of States Parties under existing international agreements which relate to the matters covered by this Convention, or under future international agreements concluded in accordance with the object and purpose of this Convention.

## Article 11

### **Settlement of disputes**

1. In the event of a dispute between States Parties, or between a State Party and the Agency, concerning the interpretation or application of this Convention, the parties to the dispute shall consult with a view to the settlement of the dispute by negotiation or by any other peaceful means of settling disputes acceptable to them.

2. If a dispute of this character between States Parties cannot be settled within one year from the request for consultation pursuant to paragraph 1, it shall, at the request of any party to such dispute, be submitted to arbitration or referred to the International Court of Justice for decision. Where a dispute is submitted to arbitration, if, within six months from the date of the request, the parties to the dispute are unable to agree on the organisation of the arbitration, a party may request the President of the International Court of Justice or the Secretary-General of the United Nations to appoint one or more arbitrators. In cases of conflicting requests by the parties to the dispute, the request to the Secretary-General of the United Nations shall have priority.

3. When signing, ratifying, accepting, approving or acceding to this Convention, a State may declare that it does not consider itself bound by either or both of the dispute settlement procedures provided for in paragraph 2. The other States Parties shall not be bound by a dispute settlement procedure provided for in paragraph 2 with respect to a State Party for which such a declaration is in force.

4. A State Party which has made a declaration in accordance with paragraph 3 may at any time withdraw it by notification to the depositary.

## Article 12

### Entry into force

1. This Convention shall be open for signature by all States and Namibia, represented by the United Nations Council for Namibia, at the Headquarters of the International Atomic Energy Agency in Vienna and at the Headquarters of the United Nations in New York, from 26th September 1986 and 6th October 1986 respectively, until its entry into force or for twelve months, whichever period is longer.

2. A State and Namibia, represented by the United Nations Council for Namibia, may express its consent to be bound by this Convention either by signature, or by deposit of an instrument of ratification, acceptance or approval following signature made subject to ratification, acceptance or approval, or by deposit of an instrument of accession. The instruments of ratification, acceptance, approval or accession shall be deposited with the depositary.

3. This Convention shall enter into force thirty days after consent to be bound has been expressed by three States.

4. For each State expressing consent to be bound by this Convention after its entry into force, this Convention shall enter into force for that State thirty days after the date of expression of consent.

5. (a) This Convention shall be open for accession, as provided for in this Article, by international organisations and regional integration organisations constituted by sovereign States, which have competence in respect of the negotiation, conclusion and application of international agreements in matters covered by this Convention.

(b) In matters within their competence such organisations shall, on their own behalf, exercise the rights and fulfil the obligations which this Convention attributes to States Parties.

(c) When depositing its instrument of accession, such an organisation shall communicate to the depositary a declaration indicating the extent of its competence in respect of matters covered by this Convention.

(d) Such an organisation shall not hold any vote additional to those of its Member States.

### Article 13

#### Provisional application

A State may, upon signature or at any later date before this Convention enters into force for it, declare that it will apply this Convention provisionally.

### Article 14

#### Amendments

1. A State Party may propose amendments to this Convention. The proposed amendment shall be submitted to the depositary who shall circulate it immediately to all other States Parties.

2. If a majority of the States Parties request the depositary to convene a conference to consider the proposed amendments, the depositary shall invite all States Parties to attend such a conference to begin not sooner than thirty days after the invitations are issued. Any amendment adopted at the conference by a two-thirds majority of all States Parties shall be laid down in a Protocol which is open to signature in Vienna and New York by all States Parties.

3. The Protocol shall enter into force thirty days after consent to be bound has been expressed by three States. For each State expressing consent to be bound by the Protocol after its entry into force, the Protocol shall enter into force for that State thirty days after the date of expression of consent.

### Article 15

#### Denunciation

1. A State Party may denounce this Convention by written notification to the depositary.

2. Denunciation shall take effect one year following the date on which the notification is received by the depositary.

## Article 16

### **Depositary**

1. The Director General of the Agency shall be the depositary of this Convention.
2. The Director General of the Agency shall promptly notify States Parties and all other States of:
  - (a) each signature of this Convention or any protocol of amendment;
  - (b) each deposit of an instrument of ratification, acceptance, approval or accession concerning this Convention or any protocol of amendment;
  - (c) any declaration or withdrawal thereof in accordance with Article 11;
  - (d) any declaration of provisional application of this Convention in accordance with Article 13;
  - (e) the entry into force of this Convention and of any amendment thereto; and
  - (f) any denunciation made under Article 15.

## Article 17

### **Authentic texts and certified copies**

The original of this Convention, of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Director General of the International Atomic Energy Agency who shall send certified copies to States Parties and all other States.

CONVENTION ON ASSISTANCE IN THE CASE  
OF A NUCLEAR ACCIDENT OR RADIOLOGICAL EMERGENCY

THE STATES PARTIES TO THIS CONVENTION,

AWARE that nuclear activities are being carried out in a number of States,

NOTING that comprehensive measures have been and are being taken to ensure a high level of safety in nuclear activities, aimed at preventing nuclear accidents and minimizing the consequences of any such accident, should it occur,

DESIRING to strengthen further international co-operation in the safe development and use of nuclear energy,

CONVINCED of the need for an international framework which will facilitate the prompt provision of assistance in the event of a nuclear accident or radiological emergency to mitigate its consequences,

NOTING the usefulness of bilateral and multilateral arrangements on mutual assistance in this area,

NOTING the activities of the International Atomic Energy Agency in developing guidelines for mutual emergency assistance arrangements in connection with a nuclear accident or radiological emergency,

HAVE AGREED as follows:

Article 1

**General provisions**

1. The States Parties shall co-operate between themselves and with the International Atomic Energy Agency (hereinafter referred to as the "Agency") in accordance with the provisions of this Convention to facilitate prompt assistance in the event of a nuclear accident or radiological emergency to minimize its consequences and to protect life, property and the environment from the effects of radioactive releases.

2. To facilitate such co-operation States Parties may agree on bilateral or multilateral arrangements or, where appropriate, a combination of these, for preventing or minimizing injury and damage which may result in the event of a nuclear accident or radiological emergency.

3. The States Parties request the Agency, acting within the framework of its Statute, to use its best endeavours in accordance with the provisions of this Convention to promote, facilitate and support the co-operation between States Parties provided for in this Convention.

## Article 2

### Provision of assistance

1. If a State Party needs assistance in the event of a nuclear accident or radiological emergency, whether or not such accident or emergency originates within its territory, jurisdiction or control, it may call for such assistance from any other State Party, directly or through the Agency, and from the Agency, or, where appropriate, from other international intergovernmental organisations (hereinafter referred to as "international organisations").

2. A State Party requesting assistance shall specify the scope and types of assistance required and, where practicable, provide the assisting party with such information as may be necessary for that party to determine the extent to which it is able to meet the request. In the event that it is not practicable for the requesting State Party to specify the scope and type of assistance required, the requesting State Party and the assisting party shall, in consultation, decide upon the scope and type of assistance required.

3. Each State Party to which a request for such assistance is directed shall promptly decide and notify the requesting State Party, directly or through the Agency, whether it is in a position to render the assistance requested, and the scope and terms of the assistance that might be rendered.

4. States Parties shall, within the limits of their capabilities, identify and notify the Agency of experts, equipment and materials which could be made available for the provision of assistance to other States Parties in the event of a nuclear accident or radiological emergency as well as the terms, especially financial, under which such assistance could be provided.

5. Any State Party may request assistance relating to medical treatment or temporary relocation into the territory of another State Party of people involved in a nuclear accident or radiological emergency.

6. The Agency shall respond, in accordance with its Statute and as provided for in this Convention, to a requesting State Party's or a Member State's request for assistance in the event of a nuclear accident or radiological emergency by:

- (a) making available appropriate resources allocated for this purpose;
- (b) transmitting promptly the request to other States and international organisations which, according to the Agency's information, may possess the necessary resources; and



- (c) if so requested by the requesting State, co-ordinating the assistance at the international level which may thus become available.

### Article 3

#### Direction and control of assistance

Unless otherwise agreed:

- (a) the overall direction, control, co-ordination and supervision of the assistance shall be the responsibility within its territory of the requesting State. The assisting party should, where the assistance involves personnel, designate in consultation with the requesting State, the person who should be in charge of and retain operational supervision over the personnel and the equipment provided by it. The designated person should exercise such supervision in co-operation with the appropriate authorities of the requesting State;
- (b) the requesting State shall provide, to the extent of its capabilities, local facilities and services for the proper and effective administration of the assistance. It shall also ensure the protection of personnel, equipment and materials brought into its territory by or on behalf of the assisting party for such purpose;
- (c) ownership of equipment and materials provided by either party during the periods of assistance shall be unaffected, and their return shall be ensured;
- (d) a State Party providing assistance in response to a request under paragraph 5 of Article 2 shall co-ordinate that assistance within its territory.

### Article 4

#### Competent authorities and points of contact

1. Each State Party shall make known to the Agency and to other States Parties, directly or through the Agency, its competent authorities and point of contact authorized to make and receive requests for and to accept offers of assistance. Such points of contact and a focal point within the Agency shall be available continuously.

2. Each State Party shall promptly inform the Agency of any changes that may occur in the information referred to in paragraph 1.

3. The Agency shall regularly and expeditiously provide to States Parties, Member States and relevant international organisations the information referred to in paragraphs 1 and 2.

## Article 5

### Functions of the Agency

The States Parties request the Agency, in accordance with paragraph 3 of Article 1 and without prejudice to other provisions of this Convention, to:

- (a) collect and disseminate to States Parties and Member States information concerning:
  - (i) experts, equipment and materials which could be made available in the event of nuclear accidents or radiological emergencies;
  - (ii) methodologies, techniques and available results of research relating to response to nuclear accidents or radiological emergencies;
- (b) assist a State Party or a Member State when requested in any of the following or other appropriate matters:
  - (i) preparing both emergency plans in the case of nuclear accidents and radiological emergencies and the appropriate legislation;
  - (ii) developing appropriate training programmes for personnel to deal with nuclear accidents and radiological emergencies;
  - (iii) transmitting requests for assistance and relevant information in the event of a nuclear accident or radiological emergency;
  - (iv) developing appropriate radiation monitoring programmes, procedures and standards;
  - (v) conducting investigations into the feasibility of establishing appropriate radiation monitoring systems;
- (c) make available to a State Party or a Member State requesting assistance in the event of a nuclear accident or radiological emergency appropriate resources allocated for the purpose of conducting an initial assessment of the accident or emergency;
- (d) offer its good offices to the States Parties and Member States in the event of a nuclear accident or radiological emergency;

- (e) establish and maintain liaison with relevant international organisations for the purposes of obtaining and exchanging relevant information and data, and make a list of such organisations available to States Parties, Member States and the aforementioned organisations.

## Article 6

### Confidentiality and public statements

1. The requesting State and the assisting party shall protect the confidentiality of any confidential information that becomes available to either of them in connection with the assistance in the event of a nuclear accident or radiological emergency. Such information shall be used exclusively for the purpose of the assistance agreed upon.
2. The assisting party shall make every effort to co-ordinate with the requesting State before releasing information to the public on the assistance provided in connection with a nuclear accident or radiological emergency.

## Article 7

### Reimbursement of costs

1. An assisting party may offer assistance without costs to the requesting State. When considering whether to offer assistance on such a basis, the assisting party shall take into account:
  - (a) the nature of the nuclear accident or radiological emergency;
  - (b) the place of origin of the nuclear accident or radiological emergency;
  - (c) the needs of developing countries;
  - (d) the particular needs of countries without nuclear facilities; and
  - (e) any other relevant factors.
2. When assistance is provided wholly or partly on a reimbursement basis, the requesting State shall reimburse the assisting party for the costs incurred for the services rendered by persons or organisations acting on its behalf, and for all expenses in connection with the assistance to the extent that such expenses are not directly defrayed by the requesting State. Unless otherwise agreed, reimbursement shall be provided promptly after the assisting party has presented its request for reimbursement to the requesting State, and in respect of costs other than local costs, shall be freely transferrable.

3. Notwithstanding paragraph 2, the assisting party may at anytime waive, or agree to the postponement of, the reimbursement in whole or in party. In considering such waiver or postponement, assisting parties shall give due consideration to the needs of developing countries.

## Article 8

### Privileges, immunities and facilities

1. The requesting State shall afford to personnel of the assisting party and personnel acting on its behalf the necessary privileges, immunities and facilities for the performance of their assistance functions.

2. The requesting State shall afford the following privileges and immunities to personnel of the assisting party or personnel acting on its behalf who have been duly notified to and accepted by the requesting State:

- (a) immunity from arrest, detention and legal process, including criminal, civil and administrative jurisdiction, of the requesting State, in respect of acts or omissions in the performance of their duties; and
- (b) exemption from taxation, duties or other charges, except those which are normally incorporated in the price of goods or paid for services rendered, in respect of the performance of their assistance functions.

3. The requesting State shall:

- (a) afford the assisting party exemption from taxation, duties or other charges on the equipment and property brought into the territory of the requesting State by the assisting party for the purpose of the assistance; and
- (b) provide immunity from seizure, attachment or requisition of such equipment and property.

4. The requesting State shall ensure the return of such equipment and property. If requested by the assisting party, the requesting State shall arrange, to the extent it is able to do so, for the necessary decontamination of recoverable equipment involved in the assistance before its return.

5. The requesting State shall facilitate the entry into, stay in and departure from its national territory of personnel notified pursuant to paragraph 2 and of equipment and property involved in the assistance.

6. Nothing in this Article shall require the requesting State to provide its nationals or permanent residents with the privileges and immunities provided for in the foregoing paragraphs.

7. Without prejudice to the privileges and immunities, all beneficiaries enjoying such privileges and immunities under this Article have a duty to

respect the laws and regulations of the requesting State. They shall also have the duty not to interfere in the domestic affairs of the requesting State.

8. Nothing in this Article shall prejudice rights and obligations with respect to privileges and immunities afforded pursuant to other international agreements or the rules of customary international law.

9. When signing, ratifying, accepting, approving or acceding to this Convention, a State may declare that it does not consider itself bound in whole or in part by paragraphs 2 and 3.

10. A State Party which has made a declaration in accordance with paragraph 9 may at any time withdraw it by notification to the depositary.

### Article 9

#### Transit of personnel, equipment and property

Each State Party shall, at the request of the requesting State or the assisting Party, seek to facilitate the transit through its territory of duly notified personnel, equipment and property involved in the assistance to and from the requesting State.

### Article 10

#### Claims and compensation

1. The States Parties shall closely cooperate in order to facilitate the settlement of legal proceedings and claims under this Article.

2. Unless otherwise agreed, a requesting State shall in respect of death or of injury to persons, damage to or loss of property, or damage to the environment caused within its territory or other area under its jurisdiction or control in the course of providing the assistance requested:

- (a) not bring any legal proceedings against the assisting party or persons or other legal entities acting on its behalf;
- (b) assume responsibility for dealing with legal proceedings and claims brought by third parties against the assisting party or against persons or other legal entities acting on its behalf;
- (c) hold the assisting party or persons or other legal entities acting on its behalf harmless in respect of legal proceedings and claims referred to in sub-paragraph (b); and

- (d) compensate the assisting party or persons or other legal entities acting on its behalf for:
  - (i) death of or injury to personnel of the assisting party or persons acting on its behalf;
  - (ii) loss of or damage to non-consumable equipment or materials related to the assistance;

except in cases of wilful misconduct by the individuals who caused the death, injury, loss or damage.

3. This Article shall not prevent compensation or indemnity available under any applicable international agreement or national law of any State.

4. Nothing in this Article shall require the requesting State to apply paragraph 2 in whole or in part to its nationals or permanent residents.

5. When signing, ratifying, accepting or acceding to this Convention, a State may declare:

- (a) that it does not consider itself bound in whole or in part by paragraph 2;
- (b) that it will not apply paragraph 2 in whole or in part in cases of gross negligence by the individuals who caused the death, injury, loss or damage.

6. A State Party which has made a declaration in accordance with paragraph 5 may at any time withdraw it by notification to the depositary.

## Article 11

### Termination of assistance

The requesting State or the assisting party may at any time, after appropriate consultations and by notification in writing, request the termination of assistance received or provided under this Convention. Once such a request has been made, the parties involved shall consult with each other to make arrangements for the proper conclusion of the assistance.

## Article 12

### Relationship to other international agreements

This Convention shall not affect the reciprocal rights and obligations of States Parties under existing international agreements which relate to the matters covered by this Convention, or under future international agreements concluded in accordance with the object and purpose of this Convention.

## Article 13

### Settlement of disputes

1. In the event of a dispute between States Parties, or between a State Party and the Agency, concerning the interpretation or application of this Convention, the parties to the dispute shall consult with a view to the settlement of the dispute by negotiation or by any other peaceful means of settling disputes acceptable to them.

2. If a dispute of this character between States Parties cannot be settled within one year from the request for consultation pursuant to paragraph 1, it shall, at the request of any party to such dispute, be submitted to arbitration or referred to the International Court of Justice for decision. Where a dispute is submitted to arbitration, if, within six months from the date of the request, the parties to the dispute are unable to agree on the organisation of the arbitration, a party may request the President of the International Court of Justice or the Secretary-General of the United Nations to appoint one or more arbitrators. In cases of conflicting requests by the parties to the dispute, the request to the Secretary-General of the United Nations shall have priority.

3. When signing, ratifying, accepting, approving or acceding to this Convention, a State may declare that it does not consider itself bound by either or both of the dispute settlement procedures provided for in paragraph 2. The other States Parties shall not be bound by a dispute settlement procedure provided for in paragraph 2 with respect to a State Party for which such a declaration is in force.

4. A State Party which has made a declaration in accordance with paragraph 3 may at any time withdraw it by notification to the depositary.

## Article 14

### Entry into force

1. This Convention shall be open for signature by all States and Namibia, represented by the United Nations Council for Namibia, at the Headquarters of the International Atomic Energy Agency in Vienna and at the Headquarters of the United Nations in New York, from 26th September 1986 and 6th October 1986 respectively, until its entry into force or for twelve months, whichever period is longer.

2. A State and Namibia, represented by the United Nations Council for Namibia, may express its consent to be bound by this Convention either by signature, or by deposit of an instrument of ratification, acceptance or approval following signature made subject to ratification, acceptance or approval, or by deposit of an instrument of accession. The instruments of ratification, acceptance, approval or accession shall be deposited with the depositary.

3. This Convention shall enter into force thirty days after consent to be bound has been expressed by three States.
4. For each State expressing consent to be bound by this Convention after its entry into force, this Convention shall enter into force thirty days after the date of expression of consent.
5. (a) This Convention shall be open for accession, as provided for in this Article, by international organisations and regional integration organisations constituted by sovereign States, which have competence in respect of the negotiation, conclusion and application of international agreements in matters covered by this Convention.  
(b) In matters within their competence such organisations shall, on their own behalf, exercise the rights and fulfil the obligations which this Convention attributes to States Parties.  
(c) When depositing its instrument of accession, such an organisation shall communicate to the depositary a declaration indicating the extent of its competence in respect of matters covered by this Convention.  
(d) Such an organisation shall not hold any vote additional to those of its Member States.

## Article 15

### Provisional application

A state may, upon signature or at any later date before this Convention enters into force for it, declare that it will apply this Convention provisionally.

## Article 16

### Amendments

1. A State Party may propose amendments to this Convention. The proposed amendment shall be submitted to the depositary who shall circulate it immediately to all other States Parties.
2. If a majority of the States Parties request the depositary to convene a conference to consider the proposed amendments, the depositary shall invite all States Parties to attend such a conference to begin not sooner than thirty days after the invitations are issued. Any amendment adopted at the conference by a two-thirds majority of all States Parties shall be laid down in a Protocol which is open to signature in Vienna and New York by all States Parties.



3. The Protocol shall enter into force thirty days after consent to be bound has been expressed by three States. For each State expressing consent to be bound by the Protocol after its entry into force, the Protocol shall enter into force for that State thirty days after the date of expression of consent.

#### Article 17

##### Denunciation

1. A State Party may denounce this Convention by written notification to the depositary.
2. Denunciation shall take effect one year following the date on which the notification is received by the depositary.

#### Article 18

##### Depositary

1. The Director General of the Agency shall be the depositary of this Convention.
2. The Director General of the Agency shall promptly notify States Parties and all other States of:
  - (a) each signature of this Convention or any protocol of amendment;
  - (b) each deposit of an instrument of ratification, acceptance, approval or accession concerning this Convention or any protocol of amendment;
  - (c) any declaration or withdrawal thereof in accordance with Articles 8, 10 and 13;
  - (d) any declaration of provisional application of this Convention in accordance with Article 15;
  - (e) the entry into force of this Convention and of any amendment thereto; and
  - (f) any denunciation made under Article 17.

**Article 19**

**Authentic texts and certified copies**

The original of this Convention, of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Director General of the International Atomic Energy Agency who shall send certified copies to States Parties and all other States.