

PEACEFUL USES OF NUCLEAR ENERGY

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Today, with varying degrees of urgency, both developed and developing countries are faced with major energy choices to meet the needs of their economies.

I. NUCLEAR ENERGY – TO THE BENEFIT OF MANKIND

As mankind faces new challenges such as global environmental issues and sustainable development, the importance of nuclear power as an energy resource will not diminish, but increase, as it has such advantages as: 1. stable supply; 2. low environmental impact².

Due to population growth, the improvement of living standards and other factors, the world energy demand is forecast to continue to increase. Under this circumstances, the international community has a duty to ensure “sustainable development while economizing the use of fossile fuels, in view of their limited supply and impact on global environment”³. Nuclear technology has the potential “to make substantial contributions in areas as varied as the eradication of pests in Africa, geothermal energy development in Latin-America, child nutrition in

Asia and water resources management in the Middle East”⁴.

Such nuclear activities should be given the full attention they deserve being in the benefit of mankind.

There are many reasons to choose the nuclear power option: a. proven technology; b. cost factor; c. environmental considerations; d. national security of supply⁵. For such reasons, national authorities and energy investors choose the nuclear power option. They have objective comparative assessment between nuclear and other sources of energy. These comparisons include energy demand and supply options; economic analysis, the health and environmental impacts; the risks of energy systems; sustainable energy development⁶.

§1. Contribution to national electricity production

During last years, global electricity demand is growing, driven mainly by developing countries with expanding population.

In several countries, energy markets are being deregulated and privatized to create more competitive energy supply market. Power plant operators are searching for greater efficiency from existing plants and greater economy by reducing costs.

Only in one year, 1997, world energy consumption rose some 3%; nuclear energy continued to contribute about 17% to the world consumption. At the end of 1997, 437 nuclear reactors operating in 31 countries: 152 reactors were in Western Europe; 69 in Eastern Europe; 123 in North America; 5 in Latin America; 11 in Middle East and South Asia; 2 in Africa; 75 in the Far East⁷.

¹ Professor Dumitru MAZILU, in his capacity as ambassador, Resident Representative of Romania to the International Atomic Energy Agency, was elected, by consensus, in 1996, as Chairman of the Working Group on the 40th Anniversary of the IAEA.

On the basis of the Annual Report of the IAEA⁸, the largest contributor to the world installed nuclear capacity was the United States, with 28%. Next are France with 18% and Japan with 12%; Germany with 6%, Russian Federation with 5.6%; Ukraine with about 4%; United Kingdom with 3.7%; Canada with 3.4%; Sweden and Republic of Korea with about 3%.

§2. *Water resources development*

a. It is known that, in particular, in Africa several countries are currently facing acute water shortages that threaten public health and impede social and economic development. In these circumstances, the United Nations included water among the set of priorities in Africa with the aim of ensuring sustainable freshwater resources. In order to support national programmes in this field, the IAEA established in 1995 a large technical co-operation regional Model project which seeks to apply isotope hydrology in the development of ground-water resources and significant resources were already identified.

b. In last years, new efforts focused on seawater desalination using nuclear energy, and it was concluded that nuclear desalination is technically feasible and highlighted priority¹⁰.

§ 3. *Human health*

a. Particularly in last decades, new related methods and treatments were concentrated in human health. New and interesting developments were registered in nuclear medicine¹⁴; molecular biology employing radioactive isotopes¹⁵; in radiation therapy; nutritional and health related environment.

b. Different methods were tested on increasing the effect of radiotherapy on tumours. These methods include the addition of heat to the tumour area and giving the patient medication as a chemical sensitizer of radiation¹⁶.

c. Taking into account that hundreds of millions of people, particularly in developing countries, continue to be affected by nutritional deficiencies of energy, protein, vitamins and minerals, the programmes were directed to the use of isotopic techniques to identify populations at risk, and to monitor and improve the effectiveness of dietary intervention.

It has to be noted that nuclear power's contribution to national electricity production was remarkable: in Lithuania 80% of electricity was produced by nuclear; in France 78%; in Belgium approximately 60%; in Ukraine 47%; in Sweden 46%; in Bulgaria 45%; in Slovak Republic 44%; in Switzerland and Slovenia 40%. At the same time, we have to underline that in seven other countries, more than 25% of the electricity was produced by nuclear power⁹.

e. Adequate supplies of water and nutrients are important inputs in sustainable crop production. It is remarkable that neutron moisture probe¹¹ is finding expanding application in the quest for more efficient use of scarce water resources. The studies have shown that the amount of irrigation water applied to wheat could be reduced by up to 30% compared with conventional practices¹².

Through a technical Model Project, the feasibility of using saline groundwater in arid and semi-arid environmental to irrigate salt tolerant plant species¹³ has been tested in seven countries.

d. It has to be underlined that efforts were made to determine the presence of radionuclides in the environment focused on the completion of a radiological study on terrestrial samples collected at Mururoa and Fangataufa Atolls in the South Pacific where nuclear weapon testing took place.

The sediments and biota samples, collected during the 1996 expedition to the Mururoa and Fangataufa Atolls were analysed and another expedition to the atolls carried out underground sampling of water from cavities and monitoring wells.

It has to be pointed out that seawater samples collected during the 1996 expedition in Caspian Sea were analysed. At the same time, a Global Marine Radioactive Database was developed and data on radionuclide concentrations in seawater, sediment and biota of the Arctic Sea and the North Pacific Ocean were evaluated¹⁷.

The analysis made in the last annual reports (1994-1997) of the International Atomic Energy Agency shown that the benefits of atomic energy are not limited solely to energy production, but also include improvements to **human health and welfare**¹⁸.

Over the past years has developed co-operation among nations to help increase the availability of radioisotopes for medical purposes. It was proved that by applying the energy of the atom to the medical sciences, we

are able to reduce the cost and intrusiveness of treatments. As was announced by the Delegation of the United States¹⁹ "the Department of Energy, working with Belgium and Finland, will supply the IAEA with surplus radioisotopes for the production of isotope generators"²⁰. Such an effort is a part of the IAEA's Coordinated Research Programme involving experts from 14 nations who are working on the treatment of heart disease, cancer and the relief of borne pain²¹.

II. THE LEGAL FRAMEWORK FOR NUCLEAR SAFETY

Member States underlined anytime that a precise legal framework for nuclear safety²² is absolutely necessary. The experience showed that "the safe use of nuclear power requires **high standards** of management systems and personnel qualifications"²³. It was pointed out that every Member State and International Community as a whole should ensure that radiation – producing devices **used for peaceful purpose** are handled and disposed on safety.

Multilateral, legally binding agreements, became increasingly important mechanisms for

improving nuclear, radiation and waste safety around the world²⁴.

Nuclear safety is a **national responsibility**, but at the same time it is a **global public concern**. Having in mind these major coordinates, Member States have developed a comprehensive nuclear safety regime by adopting: **a.** international agreements; **b.** Safety standards; **c.** the necessary measures to provide for the application of those agreements and standards²⁵.

§1. *International agreements*

Over the years, the International Community has negotiated and adopted important international legal instruments through which to **achieve and to maintain** a consistently high level of safety at nuclear power plants around the world and, in general, to guarantee that radiation – producing devices, **used for peaceful purposes are handled and disposed on safety**. All together, some 30 global legal instruments and some 35 regional legal instruments which are referring to the safety use of nuclear energy and constitute a **comprehensive nuclear safety regime** were negotiated and adopted. In this study we would like to refer to some of them in chronological order of their adoption:

a. Convention concerning the Protection of Workers against Ionizing Radiations²⁶. This Convention applies to all activities involving exposure of workers to ionizing radiation in the course of their work.

b. Convention on Civil Liability for Nuclear Damage²⁷. This Convention – following

the regional Paris Convention – establishes special private law rules that hold the operator of a nuclear installation strictly and exclusively liable for nuclear damage²⁸.

c. Convention Relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material²⁹. This Convention seeks to exonerate persons liable for nuclear damage by virtue of an international Convention or national law applicable in the field of transport in those cases where of a operator of a nuclear installation is liable for such damage under the Paris Convention, the Vienna Convention or national law if it is in all respects as favourable to persons who may suffer damage as either the Paris Convention or Vienna Convention. As a result, in those cases where liability is redirected pursuant to this Convention to an operator liable under either Paris Convention or Vienna Convention, their respective provisions regarding liability during the transport will come into play³⁰.

d. Convention on the Physical Protection of Nuclear Material³¹. Recognizing the right of all States: to develop and apply nuclear energy for **peaceful purposes** and their legitimate interest in the potential benefits to be derived from the **peaceful application of nuclear energy** and convinced of the need for facilitating international co-operation in the peaceful application of nuclear energy, States Party stressed the importance of the physical protection of nuclear material in domestic use, storage and transport. In this Convention nuclear material is defined as "plutonium except that with isotopic concentration exceeding 80% in plutonium – 238; uranium enriched in the isotope 235 or 233; uranium contained the mixture of isotopes as occurring in nature other than in the form of ore or ore-residue; any material containing one or more of the foregoing"³². Under the provisions of this Convention, the intentional commission of a. an act without lawful authority which constitutes the receipt, possession, use, transfer, alteration, disposal or dispersal of nuclear material and which causes or is likely to cause death or serious injury to any person or substantial damage to property; b. a theft or robbery of nuclear material; c. an embezzlement or fraudulent obtaining of nuclear material; d. an act constituting a demand for nuclear material by threat or use of force or by any other form of intimidation; e. a threat to use nuclear material to cause death or serious injury to any person or substantial property damage or to commit an offence in order to compel a natural or legal person, international organization or State to do or to refrain from doing any act, an attempt to commit such an offence and an act which constitutes a participation in any such an offence "shall be make a punishable offence by each State Party under its national law"³³. The Convention establishes that "each State Party shall make the offences described above punishable by appropriate penalties which take into account their grave nature"³⁴. More than that, the Convention "does not exclude any criminal jurisdiction exercised in accordance with national law"³⁵.

Such rules and regulations had an important contribution for physical protection of nuclear material in that complex process of its **peaceful uses**.

e. Convention of Early Notification of a Nuclear Accident³⁶. This Convention applies to any accident involving facilities or activities of a State Party or of persons or legal entities under its jurisdiction or control, 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 could be of radiological safety significance for another State. This legal instrument establishes that facilities and activities include those relating to the transport and storage of nuclear fuels or radioactive wastes and the manufacture, use, storage, disposal and transport of radioisotopes for agricultural, industrial, medical and related scientific and research purposes³⁷. In that circumstances in which an accident took place, the Contracting Parties have to immediately notify, directly or through the IAEA, those States which are or may be physically affected and the IAEA of the accident, its nature, the time of its occurrence and its exact location where appropriate³⁸.

f. Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency³⁹. This Convention establishes an international framework which facilitates the prompt provisions of assistance in the event of a nuclear accident or radiological emergency, in order to mitigate its consequences. In accordance with its rules, the States Parties are required to co-operate between themselves and with IAEA to facilitate prompt assistance to minimize the consequences of a nuclear accident or radiological emergency and to protect life, property and the environment from the effects of radioactive releases⁴⁰.

g. Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention⁴¹. This Protocol establishes a link between the Vienna Convention and the Paris Convention, combining them into **one expanded liability regime**. Parties to the Joint Protocol are treated as though they were Parties to both Conventions and a choice of law rule is provided to determine which of the two Conventions should apply to the exclusion of the other in respect to the same nuclear incident.

h. Convention of the Control of Transboundary Movements of Hazardous

Wastes and their Disposal⁴². The main objectives of this Convention is the **protection of human health and the environment** against the adverse effects which may result from the generation, transboundary movement and management of hazardous wastes and to help reduce the transboundary movements and amounts of hazardous wastes to minimum⁴³. Under this Convention a broad set of rules are devoted to co-operation between parties⁴⁴.

i. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management⁴⁵. This Convention applies to spent fuel and radioactive waste resulting from civilian nuclear reactors and applications and to spent fuel and radioactive waste from military or defence programs if and when such material are transferred permanently to and managed within exclusively civilian programmes⁴⁶. In accordance with the provisions of this Convention, the Contracting Parties are obliged to establish and maintain a legislative and regulatory framework to govern the safety of spent fuel and radioactive waste management and to ensure that individuals, society and the environment are adequately protected against radiological and other hazards, inter alia, by appropriate siting, design and construction of facilities and by making provisions for ensuring the safety of facilities both during their operation and other their closure.

j. Convention on Supplementary Compensation for Nuclear Damage⁴⁷. This Convention is free-standing legal instrument, which may be adhered to by all States irrespective of their participation in the Vienna Convention or in the Paris Convention. Its main objectives is to generate the compensation of nuclear damage in addition to that available under the national legislation implementing the Vienna Convention or the Paris Convention, or under the national legislation consistent with the principles of these two conventions⁴⁸.

k. Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage⁴⁹. This legal instrument provides, inter

alia, for: **a.** the coverage of nuclear damage suffered in a Non-Contracting State⁵⁰; **b.** an enhanced definition of nuclear damage which covers costs of reinstatement of damaged environment; costs of preventive measures; **c.** substantially higher minimum liability limit⁵¹; **d.** an extension of the period for submission of claims for loss of life and personal injury⁵². The Protocol has preserved the fundamental principles of the Vienna Convention⁵³.

At the same time, the Protocol provides for broader scope⁵⁴ / increased amount of liability⁵⁵; enhanced means for security adequate and equitable compensation⁵⁶.

Also, were negotiated and adopted some **35 regional legal instruments** which are referring to the safety use of nuclear energy. Between them are the following: **a.** Treaty establishing the European Atomic Energy Community⁵⁷. Under the authority of this Treaty, The European Atomic Energy Community has issued some binding instruments in this field⁵⁸; **b.** Convention on Third Party Liability in the Field of Nuclear Energy of 29th July 1960 as Amended by the Additional Protocol of 28th January 1964 and by the Protocol of 16th November 1982⁵⁹; **c.** Nordic Mutual Emergency Assistance Agreement in Connection with Radiation Accidents⁶⁰; **d.** Convention on Civil Liability for Damage Resulting from Activities Dangerous for the Environment⁶¹; **e.** Energy Charter Treaty and one Protocol⁶². This Treaty establishes a legal framework in order to promote long-term co-operation in the energy field; **f.** Convention on the Ban of the Import of Hazardous Wastes into Africa and on the control of their Transboundary Movements within Africa⁶³; **g.** The African Nuclear-Weapon – Free Zone Treaty (the Treaty of Pelindaba) and Protocols⁶⁴; **h.** Treaty of the Prohibition of Nuclear Weapons in the Latin America and the Caribbean (the Treaty of Tlatelolco)⁶⁵; **i.** Treaty on the South-East Asia Nuclear Weapon – Free Zone and one Protocol⁶⁶.

§2. Safety standards

Peaceful use of nuclear energy requires, at the same time, **high standards of management** which cover the areas of nuclear, radiation, waste management and transport. Member States agreed on such standards acting for their implementation. During the regular sessions of the General Conference of the International Atomic Energy Agency was pointed out that

§3. The implementation of safety standards

After the elaboration and adoption the safety standards, it is necessary to be taken the appropriate measures to implement them⁶⁷. To fulfil this task it is important to use services offered by the IAEA, including several peer review services, information exchange, education and training, and co-ordination of safety related research and development⁶⁸. Such peer review

these standards should be: **a.** comprehensive; **b.** scientifically accurate and; **c.** current.

It has to be recognized the contribution of Member States, of advisory groups of experts and of the professional staff of the IAEA in the elaboration and adoption of high quality safety standards.

services can contribute to the improvement of operational safety and the development of safety culture and also the regulators and operators who provide the expertise for such services.

Through high level standards, a truly global safety culture is being effectively encouraged and an integrated strategy on nuclear safety infrastructure it is implemented⁶⁹.

III. THE NUCLEAR ACTIVITIES IN ROMANIA – IN CONFORMITY WITH THE INTERNATIONAL RULES, REGULATIONS AND STANDARDS

§1. The nuclear safety program

The National Agency for Atomic Energy was in charge with the elaboration of National R & D Nuclear Programme, called “Nuclear Safety”, based on IAEA and EURATOM recommendations. The main goals of this Programme, are: **a.** to elaborate, develop and use advance technologies in nuclear field; **b.** to ensure the safe operation of nuclear facilities; **c.** to estimate the radiological impact on public and environment⁷⁰.

The Program is structured in the following areas: 1. Nuclear reactors and nuclear fuel cycle;

2. Radioactive waste and spent fuel management and nuclear facilities decommissioning; 3. Nuclear safety, assessment and management of nuclear accident risks; 4. Assessment of nuclear activities impact on environment and environment restoration; 5. Application of nuclear techniques; 6. Support actions, international co-operation, informatics, manpower development, nuclear installations of national interest by starting and implementing the National Plan⁷¹.

§2. Nuclear activities control

In 1998 the Act on Safe deployment of nuclear activities was modified and completed in order to observe the requirements of the Nuclear Safety Convention. The main modifications of this Act are as follows: **a.** the National Authority for regulations, licensing and control in nuclear field in the National Commission for Nuclear Activities Control. This body became independent, being under direct authority of Government, after its separation from the Ministry of Waters, Forests and Environment Protection; **b.** the environment radiation monitoring network was transferred from that

Ministry under CNCAN's authority; **c.** the Regulatory Body has more prerogatives⁷².

More than 60% of the Regulatory Body's specialists are involved now in monitoring of radioactive activity, which created new opportunities for improving regulation, licensing and control activities⁷³.

In last period, new specialists in the field of nuclear power plant and nuclear facilities, such as research reactors; high capacity irradiators; common irradiation sources joined the Regulatory Body⁷⁴.

§3. Implementing the international rules, regulations and standards

The nuclear activities in Romania are developing in conformity with international rules, regulations and standards⁷⁵.

Safeguards agreements

a. Between Romania and the International Atomic Energy Agency was signed an **Agreement for the Application of Safeguards in connection with the Treaty on the Non-Proliferation of Nuclear Weapons**⁷⁶. In accordance with this Agreement, Romania undertakes – pursuant to paragraph 1 of Article III of the Treaty – to accept Safeguards on all source or special fissionable material **in all peaceful nuclear activities** within its territory, under its jurisdiction or carried out, under its control anywhere, for the exclusive purpose of verifying that such material is not diverted to nuclear weapons or other nuclear explosive devices⁷⁷.

On the basis of the Agreement, the Government of Romania and the Agency “shall co-operate to facilitate the implementation of the safeguards provided for in this Agreement”⁷⁸.

Through the Agreement, Romania established and maintain a system of accounting for and control of all nuclear material subject to safeguards under its provisions⁷⁹. At the same time, the IAEA applies safeguards “in such a manner as to enable it to verify, in ascertaining that there has been no diversion of nuclear material from **peaceful uses** to nuclear weapons or other nuclear explosive devices, findings of the system”⁸⁰.

Safeguards shall terminate on nuclear material upon determination by the Agency that the material has been consumed, or has been deluded in such a way that it is no longer usable for any nuclear activity relevant from the point of view of safeguards, or has become practically irrecoverable⁸¹.

b. On 30 March 1973, Romania signed an **Agreement for assistance by International Atomic Energy Agency to Romania**, in establishing a project consisting of the dual – core **TRIGA training and research reactor** at

the Institute of Nuclear Technology at Pitești and in securing the special fissionable material necessary therefor⁸².

Pursuant to the Supply Agreement, concluded on 30 March 1973, between the IAEA, Romania and the United States of America, as amended, supplies and enriched uranium were to be delivered to Romania in connection with the project⁸³.

c. On 15 July 1975, the IAEA and Romania concluded **the Second Supply Agreement** relating to an additional supply of approximately 16710 grams of uranium enriched to approximately 90 per cent by weight in the isotope uranium – 235 and of approximately 20 grams of uranium enriched to approximately 93 per cent by weight in the isotope uranium – 235⁸⁴.

d. On 15 June 1990, the IAEA, Romania and the United States concluded an exchange of letters constituting the **Third Supply Agreement** relating to an additional supply of enriched uranium for the reactor⁸⁵ and on the same date⁸⁶, the IAEA and Romania concluded an exchange of letters constituting an agreement amending the Project Agreement, through which Romania has requested the assistance from the Agency in securing from the United States the supply of low-enriched uranium in lieu of the 93 per cent enriched fuel material to be supplied under the Second Supply Agreement.

e. As a sequel to the assistance which the Agency has provided to Romania in connection with a research reactor project⁸⁷, the Agency and the Government of Romania and the United States concluded on 14 June 1991 the **Fourth Supply Agreement**, through which the Agency requests the United States to permit the transfer and export to Romania of approximately 102000 grams of uranium enriched to approximately 20 per cent by weight in the isotope uranium – 235⁸⁸.

Convention on Physical Protection of Nuclear Material

This Convention was opened for signature at Vienna and New York on 3 March 1980. Romania signed the Convention at Vienna, on 15 January 1981 and adhered to it in June 1993. Through this Convention, Romania applies,

within the framework of its national law the levels of physical protection during the storage incidental to international nuclear transport and during international transport, the specific measures for detection and prevention any

assault, unauthorized access or unauthorized removal of nuclear material⁸⁹. Also, Romania takes – in accordance with this Convention – appropriate steps “to ensure as far as practicable that, during international nuclear transport,

nuclear material within its territory, or on board of ship or aircraft under its jurisdiction in so far as such ship or aircraft is engaged in the transport to or from the State, is protected on the levels described in the Annex” to the Convention⁹⁰.

Convention on Early Notification of the Nuclear Accident

Romania signed this Convention on 26 September 1986. The Convention applies to any accident involving facilities or activities of a State Part or of persons or legal entities under its jurisdiction or control, 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 could of or radiological safety significance for another State.

Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency

Romania signed this Convention on 26 September 1986. The Convention aims at establishing an international framework which

will facilitate the prompt provision of assistance in the event of a nuclear accident or radiological emergency in order to mitigate its consequences.

Civil Liability for Nuclear Damage

a. Romania signed the Vienna Convention on Civil Liability for Nuclear Damage and acceded to this Convention on 29 December 1992.

b. Romania signed the Protocol to amend the Vienna Convention on Civil Liability for Nuclear Damage, on 29 September 1997.

c. On the same date – 29 September 1997 – Romania signed the Convention on Supplementary Compensation for Nuclear Damage.

Convention on Nuclear Safety

a. Romania signed the **Convention on Nuclear Safety** on 20 September 1994 and ratified the Convention on 1 June 1995. The basic concept of this Convention is the obligation of the Contracting Parties to apply widely recognized principles and tools for high quality safety management and to submit the **national implementation** of these principles to peer reviews with international participation.

b. On 29 September 1997, Romania signed the **Joint Convention on Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management**. Through this Convention, Contracting Parties are obliged to establish and maintain a legislative and regulatory framework to **govern the safety** of spent fuel and radioactive waste management and to ensure that

individuals, society and the environment are adequately protected against radiological and other hazards.

Romania took the necessary steps to fully implement these rules and regulations⁹¹. As was pointed by the delegation of Romania before the General Assembly of the United Nations “it is our duty to do everything in our power to guarantee full protection of the public from exposure to radioactive materials and to prevent every possible incident given rise to potential exposures”⁹².

The nuclear energy should be used for exclusively peaceful purposes⁹³, in the interest of the development and the progress of mankind⁹⁴.

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- 2 See the Message of Prime Minister of Japan to the Forty-First Regular Session of the General Conference of the IAEA, Vienna 21, September 1997.
 - 3 Statement of the Delegation of Japan to the Forty-First Regular Session of the General Conference of the IAEA, Vienna 21, September 1997.
 - 4 Message of the Secretary-General of the United Nations to the Forty-Second Regular Session of the IAEA, 21 September 1998.
 - 5 Statement of the Director-General of the IAEA to the Forty-Second Regular Session of the General Conference of the Agency, Vienna, 21 September 1998.

- 6 Ibid.
- 7 The Annual Report for 1997 of International Atomic Energy Agency, GC(42)/5.
- 8 In accordance with this Report, three nuclear plants were connected to electricity grids, two in France and one in the Republic of Korea, representing 3555 MW (e) of electricity capacity. Also, construction started on three plants in China and two in the Republic of Korea. (Nuclear energy and the Agency: The year in Review, p. 1).
- 9 Meeting Global energy needs sustainably, in "The Annual Report for 1997 of the IAEA", pp. 1-2.
- 10 Producing potable water, in "The Annual Report for 1997 of the IAEA", p. 2.
- 11 An instrument developed more than 40 years ago for measuring soil water content.
- 12 Optimal use of water also prevented water tables from rising and promoted the efficient use of nitrogen fertilizer by avoiding nitrate leaching, which causes environmental degradation through groundwater pollution and soil acidification.
- 13 Including food crops, forage and fuel woods. The proper management of saline irrigation water requires the monitoring of soil water and estimation of the water balance in order to avoid accumulation of salt in the soil profile.
- 14 One of the major tasks has been to re-examine the current prevalence of hepatitis B carries in 11 countries of the Asia-Pacific region using common immunoradiometric assay bulk reagents. The rates of prevalence ranged from 0.2 to 18% in blood donors and 0.4 to 10.6% in pregnant women.
- 15 This method was used for the diagnosis of infectious diseases.
- 16 Applied radiation biology and radiotherapy, in "The Annual Report for 1997 of the IAEA".
- 17 See the Annual Report for 1997 of the AIEA, pp. 29-30.
- 18 See the Annual Report..., pp. 1-38.
- 19 See the Statement of the United States Delegation to the Forty-Second Regular Session of the General Conference of the AIEA, Vienna, 21 September 1998.
- 20 Expand Nuclear Technical Co-operation, in "The Statement of the United States Delegation to the Forty-Second Regular Session...", p. 6.
- 21 In radiation therapy, there were renewed efforts to improve the quality control of cancer treatment. In the field of nutrition, agreement was reached with WHO on Coordinated Research Program on infant monitoring to define a new growth reference for breastfed babies.
- 22 See the Statement of the United States Delegation to the Forty-Second Regular Session of the General Conference of the IAEA, Vienna, September 1998; the Statement of the Russian Federation Delegation to the Forty-Second Regular Session...; the Statement of the Delegation of Romania to the Forty-Second Regular Session of the General Conference of the IAEA, Vienna, September 1998 etc.
- 23 Statement of the Delegation of Canada to the Forty-First Regular Session of the General Conference of the IAEA, Vienna, 30 September 1997.
- 24 See the Statement of the Director-General of the IAEA to the Forty-Second Regular Session of the General Conference of the IAEA, Vienna, 21 September 1998.
- 25 Ibid.
- 26 Geneva, 22 June 1960, International Labor Organization No. 115.
- 27 Vienna, 21 May 1963.
- 28 The Convention establishes, at the same time, a minimum amount of liability of the operator, which must be covered by some form of financial security, e.g. insurance. Also, this legal instrument has defined such terms as "operator"; "nuclear incident"; "nuclear damage"; "nuclear installation"; "nuclear material" etc.
- 29 Brussels, 17 December 1971.
- 30 Article II, Vienna Convention; Article 4, Paris Convention.
- 31 Vienna, 3 March 1980. The Convention was opened for signature at Vienna and New York on 3 March 1980.
- 32 Paragraph 1, article 1 of the Convention. At the same time, the Convention defined "uranium enriched in the isotope 235 or 233" as "uranium containing the isotope 235 or 233 or both in an amount such that the abundance ratio of the sum of these isotopes to isotope 238 is greater than ratio of the isotope 235 to the isotope 238 occurring in nature". (Paragraph 2, article 1 of the Convention.)
- 33 Paragraph 1, article 7 of the Convention.
- 34 Paragraph 2, article 7 of the Convention.
- 35 Paragraph 3, article 8 of the Convention.
- 36 Vienna, 26 September 1986.
- 37 Paragraph 2 (d), article 1 of the Convention.
- 38 The Convention establishes that the Contracting States should promptly provide additional information, when available, relevant to minimizing the radiological consequences in the States that may be affected.
- 39 Vienna, 26 September 1986.

- 40 The Convention will apply whether or not such accident or emergency originates within the territory of a State Party, under its jurisdiction or control.
- 41 Vienna, 21 September 1988.
- 42 Basel, 22 March 1989.
- 43 And to manage and dispose of these wastes in an environmentally sound manner.
- 44 Ranging from simple exchange of information to technical assistance. Convention does not address radioactive waste because the radioactive waste is subject to another international control system. The other control system need not necessarily be identical with that of the Basel Convention. (See Convention on Safety Fuel Management and on Safety of Radioactive waste Management, Vienna, 5 September 1997.)
- 45 Vienna, 5 September 1997.
- 46 The Convention also applies to planned and controlled releases into the environment of liquid or gaseous radioactive materials from regulated nuclear materials.
- 47 Vienna, 12 September 1997.
- 48 States which are not party either to the Vienna Convention or Paris Convention could join the Convention if they have in place legislation that is consistent with the provisions contained in the Annex to the Convention.
- 49 Vienna, 12 September 1997.
- 50 An exception is allowed if such a State has a nuclear installation and does not afford reciprocal benefits.
- 51 At least 300 million SDRs which may be divided between the liable operator and the Installation State.
- 52 A period to 30 years.
- 53 Such as no fault liability.
- 54 Article 2 of the Protocol.
- 55 Articles 6 and 7 of the Protocol.
- 56 Article 15 of the Protocol.
- 57 Rome, 25 March 1957.
- 58 See Council Directive 92/3/Euratom of 3 February 1992; Council Regulation (Euratom) No. 1493/93 of 8 June 1993; Commission Decision 93/552/Euratom of 1 October 1993.
- 59 Paris, 29 July 1960.
- 60 Vienna, 17 October 1963.
- 61 Lugano, 21 June 1993.
- 62 Lisbon, 17 December 1994.
- 63 Bamako, 30 January 1991.
- 64 Cairo, 11 April 1996.
- 65 Mexico, 14 February 1967.
- 66 Bangkok, 15 December 1995.
- 67 See the Statement of the Director-General of the IAEA to the Forty-Second Regular Session of the General Conference of the IAEA, Vienna, 21 September 1998.
- 68 See the Annual Report for 1997 of the IAEA, p. 6.
- 69 The application of safety standards is a priority matter. To fulfil in better way this task it would be necessary: **a.** to inform in due time Member States on the new standards; **b.** to develop documents providing guidance for the identification of Y2K problems, together with the necessary remedial action, and by offering a forum for information exchange.
- 70 Horia Ene, Statement to the Forty-Second Regular Session of the General Conference of the IAEA, Vienna, September 1998.
- 71 Ibid.
- 72 See Government Decision No. 28/27 May 1998.
- 73 Horia Ene, Statement to the Forty-Second Regular Session of the General Conference of the IAEA, September 1998.
- 74 Ibid.
- 75 Dumitru Mazuilu, Statement before the General Assembly of the United Nations on the Report of the IAEA, Doc. A/50 P.V. 47, 1 November 1995.
- 76 The Agreement entered into force on 27 October 1972, the date on which the Agency received the notification provided for in Article 25 of that Agreement (INFCIRC/180, 19 April 1973).
- 77 Article 2 of the Agreement.
- 78 Article 3 of the Agreement. The safeguards provided for in the Agreement shall be implemented: **a.** to avoid hampering the economic and technological development of Romania or international co-operation in the field of peaceful nuclear activities, including international exchange of nuclear material; **b.** to avoid undue interference in the peaceful nuclear activities of Romania and in particular in the operation of facilities, and **c.** to be consistent with prudent management practices required for the economic and safe conduct of nuclear activities. (Article 4 of the Agreement.)

- 79 Paragraph a, article 7 of the Agreement.
- 80 Paragraph b, article 7 of the Agreement.
- 81 Consumption or dilution of nuclear material, Article 11 of the Agreement.
- 82 Document INFCIRC/206/Part II.
- 83 The dual-core TRIGA training and research reactor project.
- 84 Reproduced in Document INFCIRC/206-Add. 1.
- 85 See Document INFCIRC/206/Add. 2.
- 86 15 June 1990.
- 87 See Documents INFCIRC/206; INFCIRC/206/Add. 1 and 2 and INFCIRC/206/Mod. 2. The Board of Governors of the International Atomic Energy Agency approved – on 14 June 1991 – the assistance requested by Romania for the project.
- 88 See Article 1 of the Fourth Supply Agreement.
- 89 See Levels of Physical to be Applied in International Transport of Nuclear Material, Annex I to the Convention.
- 90 In that Annex are described levels of physical protection for nuclear material during the storage incidental to international nuclear transport and of physical protection for nuclear material during international transport.
- 91 See Horia Ene, Statement to the Forty-Second Session of the General Conference of the IAEA, Vienna, September 1998.
- 92 Dumitru Mazilu, Statement before the General Assembly of the United Nations on the Report of the IAEA, Doc. A/50/P.V. 47.
- 93 Article III, Statute of the IAEA.
- 94 Paragraph 2, article III of the Statute of the IAEA.