

Legal framework and regulatory provisions for nuclear activities

by Ha-Vinh Phuong*

In the public interest, early attention in planning a programme of peaceful nuclear applications should be given to the elaboration of legislation providing for effective control and supervision. Legislation may already exist to regulate activities of a hazardous nature with respect to such aspects as occupational safety, health or environmental protection. Such legislation also applies to activities involving radioactive materials or nuclear installations, to the extent relevant. However, the more stringent safety conditions and protective measures required by the special nature of nuclear energy add new dimensions to traditional systems of regulatory control, for which adequate authority and specialized institutions may be, and generally are, needed.

Legislation to govern nuclear activities for peaceful purposes is thus of particular importance. Its purview is basically:

- to provide a legislative framework for regulating the safe development and use of nuclear energy in the national interest, taking into account related undertakings accepted by the State through conventions or treaties;
- to set out accordingly the guiding principles and implementing conditions, leaving detailed requirements and procedures to be determined by regulations for specific areas as the need arises;
- to establish a regulatory structure vested with sufficient authority to ensure effective control and supervision of authorized activities; and
- to provide for adequate financial protection against nuclear damage in the event of a nuclear accident.

The main components of nuclear legislation can be broadly identified as dealing with the following topics:

- radiation protection and regulatory control of radioactive materials and other sources of ionizing radiation, including environmental protection;
- nuclear safety and regulatory control of nuclear installations, including radioactive waste management;
- safe transport of radioactive materials;

- physical protection of nuclear materials and installations;
- materials accounting and control system; and
- third-party liability for nuclear damage.

Regulatory approach

From the outset of preparatory work in any of the subject areas covered by nuclear law, it may be useful to take cognizance of the regulatory practices and experience of other countries – and it is important to refer to principles, standards or recommendations of international significance insofar as they are relevant to the regulatory requirements of a national nuclear programme. In particular, attention should be paid to the State's international obligations under conventions or treaties.

It is further necessary to secure the co-operation of various national institutions and specialized organizations in the law-making process and in the planning and carrying out of regulatory activities. Such a concerted approach would lead to proper understanding by all concerned – both within and outside the governmental structure – of the issues which need to be regulated and of the philosophy and purview of contemplated legislation and implementing regulations. This could help to expedite the preparatory work required and, subsequently, facilitate the enforcement of applicable laws and regulations.

IAEA assistance

One of the main statutory functions of the IAEA consists in promoting and assisting the safe use of nuclear energy for peaceful purposes. Accordingly, the IAEA has increasingly helped developing countries in their approach to nuclear legislation and regulatory matters. This type of assistance usually comprises:

- the training of selected individuals in the Secretariat under the supervision of the Agency's Legal Division; or their placement for training with a national atomic energy authority, under the Agency's Fellowships Programme or other arrangements, the purpose of which is primarily to help trainees to get acquainted with the scope and components of

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nuclear law, materials of relevance to its elaboration, the regulatory work needed for its implementation, and activities of a regulatory nature in an international or a national organization;

- the provision of advisory services to national authorities, upon request, in the framing of legislation and regulations and on implementation questions, which has been extended to many developing countries in different parts of the world under the Agency's Technical Co-operation programme or within the framework of the Agency's Legal Services; and
- the holding of meetings of a didactic nature in the area of nuclear law and regulation, for the benefit of developing countries.

The first Training Course on the Legal Aspects of the Peaceful Uses of Atomic Energy was organized by the Agency in Vienna in April 1968. It attracted participants from 32 Member States, and the lectures given at the course by the Agency staff members and outside specialists were subsequently published in the Agency's Legal Series, No. 5, under the title "Nuclear Law for a Developing World".

In later years, a number of training courses, study groups, and seminars dealing with developments in nuclear law were organized by the Agency on an inter-regional or regional basis:

- Seminar in Bangkok, Thailand, in April 1970, for Member States in South East Asia and the Far East;
- Inter-regional Training Course in Athens, Greece, in December 1970;
- Seminar in Rio de Janeiro, Brazil, in June 1973, for Member States in Latin America;
- Inter-regional Study Group in Athens, Greece, in December 1974;
- Workshop in Rio de Janeiro, Brazil, in June 1977, organized in conjunction with a post-graduate course in nuclear law, held at the State University of Rio de Janeiro in 1977-78 with the financial support of the Brazilian Government;
- Inter-regional Seminar in Istanbul, Turkey, in September 1979, for Member States in Africa and the Middle East.

The materials presented at some of these meetings have been published in the Agency's Legal Series, under the titles "Experience and Trends in Nuclear Law", IAEA Legal Series No. 8, 1972; and "Licensing and Regulatory Control of Nuclear Installations", IAEA Legal Series No. 10, 1975.

Through the holding of such training courses and seminars at intervals of a few years, opportunities have been provided for periodic reviews of major legislative and regulatory developments in the nuclear field, including developments relating to treaties, conventions, and international standards and recommendations relevant to the implementation of a nuclear research and development programme. The exchange of views on

specific requirements of countries which participated in such gatherings, and the contributions of experts and practitioners in nuclear regulation to this flow of information, were generally valued as providing incentives for increased attention to the need for:

- establishing a focal point of responsibility for the regulation of activities involving radioactive materials and nuclear installations in the national interest; and
- planning a regulatory process that ensures effective control and supervision of such activities, in which from the outset a reasoned dialogue between regulators and those affected by their actions is essential to facilitate enforcement and compliance.

Through their attendance at such meetings, the participants – who came from different governmental bodies and agencies, universities, research and development institutions, public undertakings and private organizations – also obtained, cost-free, a large amount of documentation and reference materials which, otherwise, could not reach them directly and which could be of practical help in their approach to nuclear regulation. Thus, each party would be in a position to comprehend the issues at stake and to do its respective job and, in so doing, to serve the national interest.

In the wake of the seminars and training courses on nuclear law which have been held during the past fifteen years, developing countries have increasingly requested and been provided with advisory services by the Agency in the elaboration of legislation for nuclear activities and in the establishment of an implementing regulatory structure. Such assistance has been extended to about 30 Member States, and has covered various components of nuclear legislation. Because of the need felt for qualified advice during preparatory work so as to keep pace with developments of international significance in this area, national authorities generally view this type of assistance as a practical contribution to the law or regulation-making process in the context of specific requirements for the development and implementation of a peaceful nuclear programme.

1983 Nuclear Law Seminar

Electricity consumption in Morocco is expected to have increased by 80% in 1990 and by more than three times at the turn of the century. According to official estimates, even if by then the country had in operation 30 more hydro-electric stations in addition to a gas/coal/shale-oil power plant of 1000 MW, more than half of its energy needs could not be met. Given the high cost of importing oil or coal for increasing the production of electricity, and as Morocco has important uranium resources associated with phosphate deposits, the Government has given the nuclear power option special attention. Starting in 1977, the Agency has provided a number of advisory missions in preparation

for the implementation of a nuclear power programme with regard to such aspects as pre-siting investigations, manpower training and development, control legislation, and regulatory structure.

In conjunction with these preparations, the Moroccan Government co-operated with the Agency in organizing a Seminar on Nuclear Law and Safety Regulations in Rabat from 30 May to 4 June 1983. As the National Electricity Office – the State corporation responsible for the production and distribution of electricity – was about to embark on a technical and economic feasibility study for a first 600 MW nuclear power plant, planned for operation by 1994-95, the Seminar offered a timely opportunity to consider the regulatory issues and preparatory work involved in the planning and implementation of a nuclear power programme.

This was the first seminar conducted in French for French-speaking countries in Africa. More than 100 participants took part in the Seminar, which was opened by the Minister of Energy and Mines and was given broad coverage by the media. In addition to those who came from neighbouring countries (Algeria and Tunisia), the Moroccan participants came from several ministries and a dozen public institutions and private organizations in various sectors. On the basis of papers presented by Agency staff members and specialists provided cost-free by the Governments of France and Spain, the Nuclear Energy Agency of the OECD (NEA) and the French nuclear insurance pool, the Seminar dealt with legal provisions for nuclear control; radiation protection requirements and organization; safety and licensing of nuclear installations; functions of a nuclear regulatory authority; site selection and environmental impact assessment for nuclear installations; licensing procedures and practices; international safeguards and nuclear materials control systems; and liability for nuclear damage and nuclear insurance.

It appeared from the discussions that the main purpose of the Seminar was met to the satisfaction of the participants: namely, it brought about increased awareness and helped to focus attention on a number of essential issues, in particular:

- the importance of a legislative framework for nuclear energy control and development: this should facilitate the mobilization of resources and set out the basis for adequate control;
- the rôle of a nuclear regulatory authority: the *determination or establishment* of such an authority at the governmental level with sufficient powers and functional autonomy would assure public opinion about the handling of the safety aspects of nuclear activities;
- the desirability of a concerted approach to nuclear regulation: the regulatory process is evolutionary and should make the fullest and optimum use of available skill in the country, during planning and implementation; action would be best co-ordinated

through an established structure that allows a meaningful dialogue among those who have the knowledge, responsibility, and experience for action in various specialized fields;

- the continuing process of assessing and ensuring the safety of activities involving radioactive materials and nuclear installations: available qualified manpower and continuous vigilance are conditions *sine qua non* to ensure enforcement and maintain safety at all stages of an authorized activity;
- the broad use that could be made of international standards, regulations, and recommendations of relevance to the development of nuclear legislation: this includes, in particular, the 1982 Basic Safety Standards for Radiation Protection [1], jointly adopted by the IAEA, the International Labour Organization (ILO), the NEA and the World Health Organization (WHO); the IAEA/ILO/WHO Code of Practice of 1983 on Radiation Protection of Workers in the Mining and Milling of Radioactive Ores [2]; the IAEA Regulations for the Safe Transport of Radioactive Materials [3]; the IAEA Recommendations on the Physical Protection of Nuclear Material [4]; and the numerous Codes of Practice and Safety Guides issued since 1978 under the Agency's programme of Nuclear Safety Standards for nuclear power plants (the NUSS programme) [5];
- the need for a special régime of third-party liability for nuclear damage, consistent with internationally accepted principles and rules embodied in existing international conventions (the Paris Convention of 1960 and the Vienna Convention of 1963) [6]: this would provide assurance to the public that adequate indemnification for nuclear damage would be available with the State's guarantee in the event of a nuclear accident; such a régime moreover would facilitate transactions with suppliers of nuclear systems and materials in channelling all liabilities to the operator of the nuclear installation liable for nuclear damage; in this connection, a survey was presented and information given on the nuclear insurance market, insurance and re-insurance arrangements related to nuclear installations, and liability for nuclear damage.

Action plan for 1984

In view of the interest raised by the programme of the Seminar, it is planned to publish the related papers in the Agency's Legal Series as a further collection of reference materials on approaches to nuclear law and regulatory issues.

Special interest in the Agency's assistance in this area led countries in Latin America to request the Agency to organize a training course in nuclear legislation for Member States in Latin America. In response to this request, the Agency is planning to hold such a regional training course later this year in Monte-

video, at the invitation of the National Atomic Energy Commission of Uruguay. For its part, the Inter-American Nuclear Energy Commission of the Organization of American States (IANEC/OAS), at its last regular meeting in Caracas, Venezuela, in January 1984, approved the organization of a Seminar on Legal System Governing Nuclear Activities in the Region, to be held in Caracas, Venezuela, in the first half of this year, and for which IANEC also asked for the Agency's support.

References

- [1] IAEA Safety Series, No.9, 1982 edition.
- [2] Ibid., No.26, 1983 edition.
- [3] Ibid., No.6, 1973 edition (as amended).
- [4] INFCIRC/225/Rev.1.
- [5] All the Codes of Practice and Safety Guides of the NUSS programme have been issued in the IAEA Safety Series under the generic number 50.
- [6] International Conventions on Civil Liability for Nuclear Damage, Revised 1976 Edition, IAEA Legal Series No.4.



Radiation protection in mining and milling of radioactive ores

by J.U. Ahmed*

Toward the end of last year the IAEA, the International Labour Organization (ILO), and the World Health Organization (WHO) organized jointly a Seminar on Radiation Protection in the Exploration, Mining and Milling of Radioactive Ores, for developing countries in Africa which have either potential or active programmes in these fields. The seminar was designed to generate awareness among the concerned countries in Africa of radiological problems and relevant control measures associated with the nuclear mining industry. The seminar was held from 14 to 20 November 1983 in Libreville, at the invitation of the Government of Gabon.

The uranium industry has been associated in the past with occupational illness, and in particular lung cancer. There is strong epidemiological evidence – from uranium mining in Colorado, USA, uranium and other metal mining in Newfoundland – that exposure to radon daughters in significant quantities can cause lung cancer. It has also been found that the incidence of excess lung cancer has been many-fold more among miners who smoke than among non-smoking miners. The characteristics of the uranium mining industry differ somewhat from those of other components of the nuclear fuel cycle, being influenced by radiation hazards such as radon and radon daughters, ore dust and yellowcake;

and large volumes of wastes including mill tailings which have environmental implications. However, continual improvements in mining methods, engineering and ventilation controls, and radiation protection (including the enforcement of lower limits for exposure to radon daughters) have improved working conditions greatly. The improvements which have been achieved suggest that uranium or thorium can be mined and processed safely, without undue risk to workers or to the public. However, meticulous care should always be taken to ensure safe working conditions for the workers, and efforts should always be directed to betterment. It needs to be emphasized that any country undertaking active exploration, or mining and milling of radioactive ores, should be aware of the radiation hazards involved in such operations, and should also know of regulatory and radiation control measures, if they are not to repeat past mistakes in the development of the uranium industries in developed countries.

In Africa, a good number of developing countries have potential for mining and milling of uranium. Some, such as Niger and Gabon, are already mining and milling uranium with the help of foreign uranium mining companies; others have been carrying out active exploration or prospecting for uranium or other radioactive ores. Many do not have their own means of ensuring adequate radiation protection in such activities, nor do they have regulatory controls designed exclusively for the mining

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