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Legal Issues Associated with Preparing for a Nuclear Energy Programme

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1. The Need for, and the Basic Elements of, a Specific Legal Framework

Developing and implementing a national programme for the civilian use of nuclear energy means embarking on the use of a Janus-faced form of energy. We all know that nuclear energy implies both extraordinary benefits and extraordinary risks. This fact requires a legal framework appropriate to cope with both elements of nuclear power. Legislators and State authorities have to establish a sound balance between risks and benefits. That is not at all an easy task. While excluding or limiting risks requires severe legal control mechanisms, the benefits can only fully be enjoyed if the legal framework ensures freedom of research and of economic and industrial development including the guarantee of property ownership and of investments. Combining both opposite poles seems like trying to square the circle. In case of a conflict between promotion and protection, there is no doubt that the protection against nuclear risks has to prevail. Therefore this aspect of nuclear law will be mainly dealt with in this presentation. Establishing a legal framework to tame the hazards of nuclear energy is a much more challenging task for law-makers than providing a legal basis for promoting the use of nuclear energy. With regard to the promotion of nuclear energy, States enjoy a broad range of discretion and may use a great number of legal and non-legal instruments to support the development of a nuclear programme. From a legal point of view, promoting nuclear energy does not require a specific regime. However, it does require a specific regime to control the risks of nuclear energy.

States preparing for a nuclear energy programme have to be aware that the use of nuclear energy is not an exclusively national matter. In particular the risk associated with nuclear energy extends beyond national borders. Using the benefits also needs international cooperation in many fields including, *e.g.*, research or fuel supply. Today a network of multilateral and bilateral international treaties exists covering the prevention and mitigation of risk and damage as well as the promotion of nuclear energy. New nuclear States should be prepared to adhere to relevant international treaty regimes, as appropriate, and to implement them at national level. This issue will be dealt with in greater detail later in this presentation.

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In a democratic State under the rule of law people are, in principle, free to do what they like and to pursue any activity including any business. This general rule provides the basis for constructing and operating a nuclear power plant. However, if the envisaged activity involves potential hazards, as the use of nuclear energy does, the State has the genuine duty to protect its citizens and residents against those hazards. The duty to protect includes foreign States and their citizens because under public international law a State owes the duty to protect other States against activities in its territory which may have serious detrimental consequences in the territory of another State. Consequently, the State cannot leave the operation of a nuclear installation to the sole discretion of the operator but has to restrict the operator's freedom to the extent necessary for ensuring an effective protection against the risk. The most effective way of protection is the prohibition of any nuclear activity. But that is not a viable approach if a State wants to use the benefits of nuclear energy. A compromise between protection and promotion is required. The legal instrument to achieve protection without excluding promotion is to make the potentially hazardous activity subject to a prior approval or licence by a competent state authority. That means that the activity is prohibited unless it is permitted in defined general cases or in a defined individual case.

Thus, the first corollary of a State's political decision to develop a nuclear programme is a limitation of the freedom of those physical or legal persons who want to pursue activities in the nuclear field. This is not a unique approach. It is a well known and generally used legal technique to deal with activities that may have a detrimental impact on others. You are not allowed to drive a car unless you have a driver's licence.

In summary, the main and basic element of any nuclear legislation is the so-called permission principle: no nuclear activity without a prior permission (licence, authorisation, approval).

There is a twin sibling to the permission principle, namely the continuous control principle. Obviously, it has to be controlled on a regular basis whether the general legal framework of the permission is observed and whether its individual conditions and prerequisites are properly and permanently met by the persons making use of the permission granted. Since, however, even the best precautionary measures cannot with absolute certainty exclude the occurrence of accidents, a third basic element has to be introduced: the compensation principle. It means that the legal framework has to ensure adequate compensation if nuclear or radiation damage does occur.

Those three principles form the basic elements or basic structures of any nuclear legislation. They are designed to cover both risk and damage prevention and mitigation and compensation of damage suffered. There is an additional requirement: A permission to pursue a nuclear activity necessarily has an impact on third parties, in particular on the neighbours to the place of the activity. In order to protect their rights they have to be involved in permission granting, for example through public hearings, and shall get the right to object to the permission. One of the lessons taught by the Chernobyl accident is that nuclear safety can only be ensured if there is transparency of the control procedures. Transparency is also a key-element of promoting the benefits of nuclear energy. Only if the control regime is transparent and is not governed by secret and perhaps arbitrary decisions of the authorities, can nuclear energy be used in a commercially and economically sound way.

2. Implementing the Basic Elements of Nuclear Legislation

The three basic elements describe techniques the law makes available to regulate certain situations or activities. They are legal tools only which do not provide a substantial content. It is the task of the legislator and, in implementing respective legislation, of the regulatory body to design and apply the substance necessary to achieve the purpose of using these tools. Regarding the use of nuclear energy, the primary purpose of the principles is the protection against, and the mitigation of, the specific nuclear and radiation risks.

There are two types of risks to be addressed. Firstly, there is the risk that the use of nuclear energy and ionizing radiation causes damage to man, property and the environment. To exclude or mitigate that risk the highest degree of safety is required. Secondly, there is the risk that nuclear energy and ionizing radiation are diverted from legitimate uses and misused for criminal or for non-peaceful purposes. Here we need the highest degree of security and of safe-guarding to exclude or mitigate those risks. So there emerge three new principles of nuclear law, namely the safety principle, the security principle and the safeguards principle. These principles are often referred to as the “Three-S-Principles”. In terms of law-making, this means that the general legal framework and in particular an individual licence to use nuclear energy have to ensure appropriate safety, security and safe-guarding. In complementing these elements, the compensation principle has to provide a compensation regime which is specifically tailored to cope with the consequences of a nuclear or radiation incident.

The way of how the basic elements are to be inserted into a national legal order depends on the specifics of that order. Nuclear legislation is part of the law of the State concerned. The constitutional requirements, the general legal hierarchy, the general legal structure as well as legal traditions of a State have to be taken into account. Since nuclear legislation and law-making necessarily need to refer to provisions of other fields of the law of the State, as, *e.g.*, company law or property law, nuclear legislation has to be fully embedded into the national law and cannot simply be copied from another national law and imported as an alien piece of law. However, there are some general approaches which apply, *mutatis mutandis*, to all States.

At the top of a State’s legal hierarchy ranks the constitution. Some national constitutions regulate if nuclear energy may be used or not. Federal States determine in their constitutions legislative and administrative competences. Below the constitutional level, there are provisions which shall apply to, and have an impact on, everybody. They need to be enacted as formal laws (Acts of Parliament) or as government ordinances based on an explicit authorisation by the constitution or by a formal law (statutory level). The general legal framework for the use of nuclear energy ranks at the statutory level. It stipulates the principal decisions of the legislator such as the introduction and general implementation of the three basic elements described above including the Three-S-Principles. For this purpose, many States enacted a comprehensive “Atomic Energy Act” while others issued several Acts each of them covering a certain field, as, *e.g.*, a Nuclear Installations Act, a Nuclear Liability Act, and a Radiation Protection Act. Since nuclear energy is a complex technology, the concrete implementation of the basic elements and principles requires complex technical provisions, instructions and guidelines. They cannot be made part of statutes because they would overburden any generally applicable legal norm. As they are not directed to the general public

but to the stakeholders they form the level below the statutes: administrative decrees and acts make them binding upon those persons who pursue a nuclear activity. In general, those technical provisions should therefore be incorporated into the prerequisites and conditions of a licence or into an instruction by the regulatory body.

3. The Regulatory Body

The implementation and the enforcement of the duties established under the specific nuclear legal framework need a specialized State authority. States preparing for a nuclear energy programme have to establish or to designate a State body or bodies entrusted with the implementation of the legal framework. As the State, as pointed out above, has to ensure both the promotion and the control of nuclear energy there ought to be state authorities for both purposes. Promotion and control may conflict with each other. For that reason, it is an essential requirement of an effective control of the use of nuclear energy that the State body entrusted with the control functions is separate from, and independent of, that body which is competent for the promotion of nuclear energy. That so-called regulatory body shall also be independent of any other entity involved in the promotion of nuclear energy and it shall, regarding its control functions, enjoy independence from any hierarchic structures. This independence principle is the guarantor of adequate and impartial control and supervision.

The regulatory body has to be appropriately equipped to fulfil its functions. This particularly applies to financial and technical means and to expert manpower. The regulatory body also has to be granted the legal authority necessary to enforce the obligations under the respective legal framework.

4. The Substance of Assuring Safety, Security, Safe-Guarding and Compensation.

States having the technical and economic capacity to embark on a nuclear programme normally should also be qualified to cope with the nuclear and radiation risk. Those States, in principle, could rely on their own national expertise to handle the use of nuclear energy and ionizing radiation properly. Technical rules and standards on the use of nuclear energy may be developed at national level. National expertise is not entirely independent, though, but it only ranks at an appropriate level if it corresponds to the internationally acknowledged state-of-the-art. The challenges of the use of nuclear energy resulted in extremely intensive international efforts in developing a comprehensive technical, legal and political framework to assure safety, security, safe-guarding and compensation. Only if the implementation of national nuclear programmes complies with this comprehensive international corpus of technical and other rules, the international community acknowledges that a State handles nuclear energy and ionizing radiation properly.

In the context of this presentation before an expert audience, there is no need to elaborate in greater detail on the great number of technical guidelines, standards and other recommendations. The competent international organisations, including both non-governmental organisations and governmental organisations, play a leading role in developing the technical framework, namely the ICRP, the UN particularly through UNSCEAR, the IAEA, the WHO, the ILO, the IMO, the OECD/NEA, and, at regional level, the European

Communities. As examples, the great number of IAEA Safety Standards and the IAEA recommendations on physical protection shall be mentioned here.¹ Consequently, there is no lack of technical guidance for States preparing for a nuclear programme. The willing among those States certainly will make use of that guidance. But there may be States following other ideas, and so it is desirable to ensure compliance with the international technical standard. Which legal means are available to achieve this goal?

The competent international organisations only in exceptional cases and to a well defined limited extent are granted the statutory power to issue standards and other technical rules which are binding upon member States. This applies, *e.g.*, to EURATOM or to the IAEA for its own operations. In order to make binding upon States the means to assure safety, security, safe-guarding, and compensation, the conclusion of respective international agreements which contain binding obligations is required. Of course, no State can be forced to adhere to a certain international agreement. But in international life, political peer pressure mostly is effective, particularly because it may entail isolation and the risk of embargo measures. Here an additional principle of nuclear law may be identified: the international-cooperation principle.

In the following parts of this presentation the main international instruments to ensure the application of the principles designed to fight the nuclear risk shall be dealt with. States preparing for a nuclear programme should adhere to those instruments.

5. Assuring Nuclear and Radiation Safety

States have developed different approaches regarding the adoption and application of international technical safety standards. In the fields of general radiation protection and of the safety of the transport of radioactive material the international standards based on ICRP Recommendations² and particularly on IAEA Safety Standards³ are adopted by nearly all States. This fact is well known, and it does not need further elaboration.

With regard to the safety of nuclear installations the situation is different. States use national approaches to installation safety. They may or may not use the technical guidance offered in particular by the IAEA, namely such as summarized in the Agency's Fundamental Safety Principles⁴ and implemented through numerous codes and standards.⁵ An international instrument making that guidance mandatory does not exist.

Progress has, however, been achieved through the adoption and entry into force of the 1994 Convention on Nuclear Safety which, however, only covers land-based civil nuclear power

¹ See <http://www-ns.iaea.org/standards/>, and, *e. g.*, The Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Rev.4 (Corrected)).

² 1990 ICRP Recommendations (Publication No. 60); 2005 ICRP Recommendations (Publication No. 103).

³ IAEA 2003 International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (Safety Series 115); IAEA Regulations for the Safe Transport of Radioactive Material, 2005 Edition Safety Requirements (Safety Standards Series No. TS-R-1). The IAEA Transport Regulations are incorporated into the Agreements on the Transportation of Dangerous Goods which apply to the various types of carriage; they are thus made binding upon the parties to those agreements.

⁴ IAEA Safety Standards Series No. SF-1 (2006).

⁵ See the scheme on: <http://www-ns.iaea.org/standards/>.

plants.⁶ Although the Convention does not directly make international safety standards and codes binding upon its contracting parties, it introduces concepts which contribute to harmonizing the national safety approaches internationally. The Nuclear Safety Convention structures national law by requiring certain elements to be included and thus provides further unified elements of nuclear law. Of an outstanding importance in this context is the obligation of the parties to hold and to attend meetings of the parties to review the report of each party on the measures it has taken to implement each of the Convention's obligations (Articles 5, 20 – 28). This peer review concept supports and, if necessary, urges parties to apply the international safety codes and standards. – The 1997 Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management⁷ establishes for its scope of application (Article 3) a regime similar to that of the Nuclear Safety Convention.

Both Conventions are complemented by three additional conventions, namely the 1986 Conventions on Early Notification of a Nuclear Accident and on Assistance in the Case of a Nuclear Accident or Radiological Emergency⁸, and the 1980 Convention on the Physical Protection of Nuclear Material⁹. Altogether these Conventions form the so-called Family of Safety Conventions.

The international community expects States preparing for a nuclear programme to adhere to those conventions and to implement them properly. Those States are well advised if they closely follow the international progress in developing codes, standards and guidelines in the field of nuclear and radiation safety and apply them, as appropriate, even if they are not of a binding nature. Reference may particularly be made to the non-binding IAEA Codes of Conduct on the Safety of Research Reactors¹⁰ and on the Safety and Security of Radioactive Sources¹¹.

6. Assuring Nuclear Security

Assuring security against criminal uses of nuclear energy and ionizing radiation, *inter alia*, is a police matter which is not meant for public discussion. It is also a matter of international concern and therefore States have to give the international-cooperation principle a high degree of priority.

A key document in assuring security is the IAEA guidance document: “The Physical Protection of Nuclear Material and Nuclear Facilities”.¹² The document contains in eight chapters the elements of physical protection and their implementation. It is a recommendation only which is not binding upon States. A binding international instrument is the 1980 Convention on the Physical Protection of Nuclear Material¹³ which already was identified as part of the Nuclear Safety Conventions Family. The Convention is in force for 139

⁶ IAEA INFCIRC/ 449.

⁷ IAEA INFCIRC/546.

⁸ IAEA INFCIRC/335 and 336.

⁹ IAEA INFCIRC/274/Rev.1.

¹⁰ Annex to IAEA Doc. GC(48)7.

¹¹ Annex 1 to IAEA Doc. GOV/2004/62-GC(48)13.

¹² See footnote 1.

¹³ See footnote 9.

contracting parties.¹⁴ It was amended in 2005 and renamed to “Convention on the Physical Protection of Nuclear Material and Nuclear Facilities”¹⁵; the amendment is not yet in force. The change of the Convention’s name already indicates the extension of its scope of application to nuclear facilities. Moreover, the Amendment contains the obligation of parties to establish and implement a defined physical protection regime and, in doing so, to apply, insofar as reasonable and practicable, twelve so-called Fundamental Principles of Physical Protection (Article 2 A). The amended Physical Protection Convention provides major progress in developing effective nuclear security regimes at national and international level.

Adhering to the Amendment of the Physical Protection Convention and taking into account the IAEA guidance document INFCIRC/225/Rev.4 (Corrected) provide the basis for an internationally accepted national physical protection regime of States preparing for a nuclear energy programme.

7. Assuring Safe-Guarding

The prevention of the proliferation of nuclear weapons, the freezing of the *status quo ante*, and eventually the establishment of a nuclear-weapon-free world is a genuine international problem. It can only be tackled by making the international-cooperation-principle the leading principle in this field of nuclear law. The international fight against the spread of nuclear weapons is as old as the use of nuclear energy. Numerous relevant binding international instruments exist. The adoption of the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (NPT)¹⁶ marks a cornerstone of this development. The NPT entered into force in 1970, in 1995 its indefinite continuation was decided¹⁷, and it currently has 191 contracting parties.¹⁸ The almost universal adherence to the NPT indicates that a State preparing for a nuclear energy programme most probably is already a party to the NPT. There are even more States, namely 198, that concluded safeguards agreements with the IAEA¹⁹, and 131 of these States are also subject to the so-called strengthened safeguard system by adopting Additional Protocols²⁰. Currently there are only 27 non-nuclear-weapon-member-States to the NPT that have not yet brought into force an Additional Protocol.²¹

This situation provides an excellent basis for States’ efforts to assure safe-guarding. The basis, however, needs to be further implemented and ramified by additional measures at national level. In particular the foreign trade legislation has to be supplemented by establishing restrictions with the view to preventing nuclear weapons proliferation. Also in this field, international cooperation has a decisive impact, as, *e.g.*, through the IAEA Trigger List²² and the London Suppliers Group²³.

¹⁴ IAEA Registration No. 1553.

¹⁵ Attachment to IAEA Doc. GOV/INF/2005/10-GC(49)/INF/6; Registration No. N/A.

¹⁶ IAEA INFCIRC/140 = UNTS vol. 729 p. 161.

¹⁷ Doc. NPT/CONF.1995/32 (Part I), Annex. (http://www.un.org/disarmament/WMD/Nuclear/1995-NPT/pdf/NPT_CONF199503.pdf).

¹⁸ See: <http://disarmament2.un.org/TreatyStatus.nsf>.

¹⁹ See: http://www.iaea.org/OurWork/SV/Safeguards/sir_table.pdf.

²⁰ See: http://www.iaea.org/OurWork/SV/Safeguards/sg_protocol.html. See also: Model Protocol Additional to the Agreement(s) between State(s) and the IAEA for the Application of Safeguards (IAEA INFCIRC/540).

²¹ See: http://www.iaea.org/Publications/Factsheets/English/nptstatus_overview.html.

²² See. IAEA INFCIRC/254.

Since the non-proliferation of nuclear weapons is a matter of highest priority on the international agenda, the degree of international peer control is likewise at the highest level. The UN and the IAEA play leading roles in this field. That control most effectively supports and supplements existing treaty obligations of States preparing for a nuclear programme and provides further assurance that safe-guarding is duly considered when national nuclear legislation is enacted and implemented.

8. Assuring Compensation for Nuclear Damage

The transboundary nature of the nuclear risk also in the field of compensation for nuclear damage requires international cooperation. Merely national nuclear liability legislation cannot satisfactorily organize the bringing of claims and the enforcement of judgements in case of transboundary nuclear damage. Nuclear liability law is only deemed to be risk adequate if it is based on, and linked to, international treaty relations. That was recognized already in the early 1960s, and multilateral conventions on civil nuclear liability were adopted. Today the following conventions are in force, each of which provides for a basic civil nuclear liability regime:

- The 1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy as revised 1964 and 1982 (15 contracting parties);²⁴
- the 1963 Vienna Convention on Civil Liability for Nuclear Damage (35 contracting parties);²⁵
- the 1997 Vienna Convention on Civil Liability for Nuclear Damage (5 contracting parties).²⁶

The following international instruments are not yet in force:

- The 1997 Convention on Supplementary Compensation for Nuclear Damage;²⁷
- the 2004 Protocol to Amend the Paris Convention.²⁸

The liability regimes of the Conventions are based on common concepts which are deemed necessary and appropriate to cope with the specifics of the nuclear liability risk. Among those concepts are the principles of strict liability (liability without fault), exclusive liability of the operator of a nuclear installation (channelling of liability), the possibility to limit liability in amount, mandatory financial security to cover liability, equal treatment of all victims, exclusively competent court, and enforcement of judgements. Only if national nuclear liability legislation contains and implements these convention principles it is acknowledged as being appropriate.

Regarding their substance, the instruments listed are more or less identical. So States preparing for a nuclear energy programme have a choice among them. From a potential victim's point of view, it seems to be advisable to adhere to that instrument which the majority of States in the respective region is a party to. Nuclear industry may, however, rather

²³ See: <http://www.nuclearsuppliersgroup.org/public.htm>.

²⁴ http://www.nea.fr/html/law/nlparis_conv.html.

²⁵ IAEA INFCIRC/500.

²⁶ IAEA INFCIRC/566 Annex.

²⁷ IAEA INFCIRC/567.

²⁸ http://www.nea.fr/html/law/paris_convention.pdf.

opt for treaty relations with States which they supply to or receive supply from. Obviously, a globally harmonized nuclear liability regime should be aimed at but that is not easy to achieve.

9. Summary of Relevant Legislative Issues

The specific nature of nuclear energy and ionizing radiation requires States preparing for a nuclear energy programme to enact and implement a special legal framework appropriate to establish and maintain a sound balance between the benefits and the risks associated with this form of energy. The appropriateness of national legislation can be identified and confirmed if it is based on certain principal elements and basic principles: the permission principle, the permanent control principle, and the compensation principle. These principles offer classical legal techniques to deal with potentially hazardous activities. They are designed to prevent and mitigate damage without unduly and disproportionately hampering the use of the benefits of the activity. In particular the instrument of a prior licence provides the flexibility to impose on the applicant those conditions which are warranted in any individual case. It has also to be noted that a nuclear control regime which is transparent and is governed by the rule of law provides legal certainty for all stakeholders. It in particular forms a reliable and calculable framework for nuclear industry and facilitates investments. Thus the control regime contributes to promoting nuclear energy. However, insofar nuclear legislation is not of an extraordinary nature as compared to other legislations covering risk-prone activities. Legislators walk on familiar ground.

What is specific to nuclear legislation is another principle, namely the international-cooperation-principle. The complex nuclear technology needs international cooperation already with the view to using its benefits as effectively as possible. International cooperation is even more required with the view to controlling the use of nuclear energy. Since the use of nuclear energy started with the bomb and nuclear weapons continue remaining a threat to world peace, and since we, in the civilian sector, experienced the Chernobyl nuclear accident, the potential hazards of nuclear energy are all-pervasive. This awareness promoted close international cooperation to tame the risk and resulted in a comprehensive network of binding and non-binding instruments and other forms of international collaboration. The international risk awareness also entails that States with nuclear energy programmes and in particular newcomers are in the focus of a critical public including foreign governments. One of the aspects being under intensive international observation is the question if and to which extent the “Three-S-Principles” are being observed and implemented. Meeting the requirements of the “Three-S-Principles” means, as was stressed above, adopting and applying the numerous international instruments, codes and recommendations in the fields of safety, security, safeguarding. The field of nuclear liability is likewise governed by international input.

As a consequence, the international-cooperation principle is of an outstanding if not decisive importance. It is the international yardstick against which national nuclear legislation is measured: Does it comply with international standards? Does it properly implement respective treaty regimes? Governments are therefore recommended to cooperate internationally at all levels. They should seek guidance in the legislative procedure, as appropriate. In particular the IAEA is offering such guidance through seminars and the

drafting of model laws. In this connection the IAEA “Handbook on Nuclear Law” needs mentioning which is particularly designed to provide legislative assistance.²⁹

The first national nuclear legislations were enacted in the late 1940s by the early western nuclear weapon states. Ten years later, consequential to President Eisenhower’s Atoms-for-Peace-Speech of 1953³⁰, many States started civilian nuclear power programmes and issued legislation to govern the use of nuclear energy. From the very beginning, the impact on nuclear legislation by international cooperation, by international treaties and by international politics was considerable. Thus nuclear law already at an early stage became a “globalized” field of law. This development resulted in an extremely close intertwining of national law and of international law and renders nuclear law a most sensitive field of law which is a challenge for politicians and lawyers.

²⁹ Carlton Stoiber, Alec Baer, Norbert Pelzer, Wolfram Tonhauser, Handbook on Nuclear Law, Vienna: IAEA 2003, 168 pp. Volume 2, containing, *inter alia*, model legislation, currently is under preparation.

³⁰ UN GA 470th Plenary Meeting, 8 December 1953.

