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NUCLEAR ENERGY AGENCY
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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Uranium mining and production: A legal perspective on regulating an important resource

By Lisa Thiele *

Overview

The importance of uranium can be examined from several perspectives. First, natural uranium is a strategic energy resource because it is a key ingredient for the generation of nuclear power and, therefore, it can affect the energy security of a state. Second, natural uranium is also a raw material in relative abundance throughout the world, which can, through certain steps, be transformed into nuclear explosive devices. Thus, there is both an interest in the trade of uranium resources and a need for their regulatory control. The importance of uranium to the worldwide civilian nuclear industry means that its extraction and processing – the so-called “front end” of the nuclear fuel cycle – is of regulatory interest. Like “ordinary” metal mining, which is generally regulated within a country, uranium mining must also be considered from the more particular perspective of regulation and control, as part of the international nuclear law regime that is applied to the entire nuclear fuel cycle.

The present overview of the regulatory role in overseeing and controlling uranium mining and production will outline the regulation of this resource from an international level, both from early days to the present day. Uranium mining is not regulated internationally; rather, it is a state responsibility. However, developments at the international level have, over time, led to better national regulation. One can note several changes in the approach to the uranium industry since the time that uranium was first mined on a significant scale, so that today the mining and trade of uranium is a well-established and regulated industry much less marked by secrecy and Cold War sentiment. At the same time, it is informed by international standards and conventions, proliferation concerns and a modern regard for environmental protection and the health and safety of workers and the public.

Introduction

Uranium is a commodity unlike any other. Its major civilian use is as a component of nuclear fuel for use in nuclear power reactors. Uranium has the “exceptional feature of a very constrained range of uses and users.”¹ The two concerns of energy security and climate change, inasmuch as they augur in favour of increasing civilian nuclear energy programmes, make uranium and its adequate

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1. Conde, M. and G. Kallis (2012), “The Global Uranium Rush and its Africa Frontier: Effects, Reactions and Social Movements in Namibia”, *Global Environmental Change*, Vol.22, Elsevier B.V., pp.596-610, at p.601.

regulation and international control all the more important for the future, when mining will take place in more varied locales.²

The regulation of uranium mining and production, with its consequent trade and control issues, is a matter that can be of strategic importance to a country: there are questions of natural resource exploitation, energy choices and even national security interests. As such, while in one sense uranium regulation would appear similar to the regulation of other kinds of mining that are of domestic interest and local concern – environmental stewardship and protection of worker health and safety, for example – there are also international implications relating to trade, non-proliferation, international relations, and a state's legal obligations when dealing with uranium.

As will be outlined below, the placement of uranium production within a national nuclear regulatory structure, itself within the sphere of the applicable international nuclear law instruments, is an appropriate framework from which to responsibly regulate this resource. This has not always been the case, as will be shown by a brief historical look at the beginnings of the uranium industry. However, over time, and with increasing scientific advances and developments in international law, the current state of such regulation reflects the application of modern legal principles and a responsible approach to resource development. At present, one may say that considering this crucial part of the nuclear fuel cycle as a matter of state nuclear regulatory oversight and international control accords well with the importance of uranium for the future of energy production and non-proliferation.

The first part of this article will provide an outline of the regulation of uranium mining, first from a historical perspective, and then from a more modern one under current standards and international norms of regulation. The second part of the article will provide a general overview of uranium trade issues, which necessarily involve a good deal of international control and co-ordination.

A note about the “uranium market”

This article is not an economic analysis of the uranium market. At the same time, any legal analysis of the uranium production industry must acknowledge that “[u]ranium seldom has been bought or sold in quite the same manner as anything else.”³ The peculiarities of a fissionable substance, its importance during the war years when the conditions of its trade were treated as state secrets, and its placement at the front end of a fairly complex fuel cycle characterised by different

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2. As noted in International Atomic Energy Agency (IAEA) (2005), “Multilateral Approaches to the Nuclear Fuel Cycle: Expert Group Report to the Director General of the IAEA”, INFCIRC/640, IAEA, Vienna, 22 February, p.22, “Rapidly growing global demand for electricity, the uncertainty of supply and the price of natural gas, soaring prices for oil, concerns about air pollution and the immense challenge of lowering greenhouse gas emissions, are all driving a fresh look at nuclear power... A greater number of States will consider developing their own fuel cycle facilities and nuclear know-how, and will seek assurances of supply in materials, services and technologies.”
 3. See Gray, E. (1982), *The Great Uranium Cartel*, McClelland and Stewart Ltd., Canada, p.34.

technologies and controls at each stage result in supply and demand pressures that are unique to the uranium mining industry.⁴

Part 1: Uranium Mining Regulation

Although uranium mining regulation is a matter for sovereign states, the influence of international developments, legal norms and principles that affect how states approach the management and oversight of uranium production can, nonetheless, be seen in the evolution of uranium mining regulation.

(a) History – uranium production: the war effort and the arms race

It is fairly well understood that the early years of uranium production related to military use,⁵ and were thus characterised by secrecy and state action, rather than focused on commercial operations or the regulation of an industrial pursuit. Wartime efforts by American scientists to be the first to achieve an atomic bomb through the Manhattan Project were carried out in secrecy with uranium that came from mines in the then Belgian Congo and northern Canada.⁶ The uranium industry originally developed, therefore, in response to military demand.

In such a climate, securing the supply of uranium was of utmost importance, and hence the significance of uranium as an important and strategic resource was born. For Canada, which is still one of the major uranium suppliers in the world, this was the beginning of its role as a uranium supplier. It was during the war that Canada nationalised the company that had mined uranium in the Canadian sub-Arctic, and it was this state-owned (Crown) company that sold uranium for the war effort.⁷

Control over uranium supply during the war was considered crucial by powers at the time. During this period of military and strategic operations relating to uranium supply and processing, it is not surprising that independent regulatory oversight of uranium mining and processing practices was not present and regulatory requirements were generally not imposed. The focus, instead, was on the acquisition of uranium.

After the war, efforts to control the world supply of uranium remained crucial as a matter of world geopolitics. What had been a race to have the atomic bomb – with the uranium required for it – turned into a race to control the needed materials to build up nuclear arms, after the failure of efforts to impose international controls on

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4. See Buckley, C., G. MacKerron and A. Surrey (1980), “The International Uranium Market”, *Energy Policy*, Vol.8, Issue 2, Elsevier B.V., pp.84-104. Since the mid-1960s, one has also been able to see an up-to-date analysis of the global uranium market information every two years in *Uranium: Resources, Production and Demand*, the so-called “Red Book” published jointly by the OECD Nuclear Energy Agency (NEA) and the IAEA. The latest volume is OECD/NEA, IAEA (2012), *Uranium 2011: Resources, Production and Demand*, OECD/NEA, Paris. The Red Book provides information on uranium resources, production and demand, and includes an estimate of the adequacy of uranium resources to meet current and projected demand.
 5. While it is true that before the “atomic age” many of what became the early uranium mines were related to the production of radium, which comes from the same ore as uranium, this fact is not pertinent to the present discussion.
 6. See Gray, E., *supra* note 4, especially Chapter 2.
 7. *Rio Algom v. Canada (Attorney General)*, [2012] ONSC 550, para.54. The decision provides an historical description of the context in which sales of Canadian uranium were made to the United States (US).

nuclear arms.⁸ The formation by the United States (US) and the United Kingdom (UK) of a Combined Development Agency to ensure adequate uranium supplies initiated a “broad-based programme of exploration incentives, financial support for investments and price guarantees” to encourage expansion of uranium production in the US, Canada, South Africa and Australia.⁹ With these incentives, over a fairly short time a uranium mining industry was able to expand and satisfy the American and British nuclear weapons programmes. France entered the nuclear arms race later and supplemented its domestic supply of uranium through production in Africa under French control.¹⁰ In fact, it has been said that “[i]n any given year of the Cold War, between a fifth and a half of the Western world’s uranium came from African places: Congo, Niger, South Africa, Gabon, Madagascar and Namibia.”¹¹ Soviet uranium supply was acquired in areas under its purview and in Eastern bloc countries, including the then Czechoslovakia¹² and East Germany.¹³

What emerges from this early history of the uranium production industry is a picture of powerful states seeking access to resources wherever they existed, in the interest of geopolitical might and, increasingly, industrial supremacy.

(b) Civilian nuclear power

In the post-war years, alongside the use of uranium as a necessary component of nuclear arms, the world was also examining the potential of this new atomic capability for civilian energy production. In 1953, the now-famous “Atoms for Peace” speech by US President Eisenhower ushered in an age of dissemination of civilian nuclear knowledge, and paved the way for the creation of the International Atomic Energy Agency (IAEA) to oversee the promotion of civilian nuclear technology.

The creation of national nuclear regulatory bodies in several states provided a way for states to govern the acquisition, trade and development of uranium resources, both for Cold War armament purposes and to support the nascent civilian nuclear energy programme in need of a steady supply of uranium. The US Atomic Energy Commission (AEC), for example, was created in 1946 to regulate the civilian development, use and control of nuclear energy, and in that context, the AEC imposed a licensing scheme on uranium milling – but not on mining – practices in the US. In Canada, the creation of the Atomic Energy Control Board (AECB) in 1946 oversaw the development of Canadian nuclear energy technology, and it was in that context that the AECB implemented regulations to control the mining and milling of uranium. The Canadian Parliament thus declared in legislation that uranium mines

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8. The Baruch Plan, presented to the United Nations (UN) Atomic Energy Commission (AEC) on 14 June 1946 on behalf of the US, with the support of the UK and Canadian governments, proposed an International Atomic Development Authority to control all civilian nuclear activities and materials. The plan was approved by the UN AEC but was subsequently opposed by the Soviet Union in the UN Security Council.
 9. Radetski, M. (1981), *Uranium: A Strategic Source of Energy*, Croom Helm Ltd., London, p.39.
 10. *Ibid.*, p.40.
 11. Hecht, G. (2012), *Being Nuclear: Africans and the Global Uranium Trade*, MIT Press, Cambridge, Massachusetts, US, p.3.
 12. As noted in Michel, Q. (ed.) (2011), *Sensitive Trade: The Perspective of European States*, P.I.E. Peter Lang, Germany, p.161, Jakub Handrlica comments that during the Cold War period, 110 000 tonnes of uranium from 64 deposits in the then Czechoslovakia were exported to the former Soviet Union.
 13. See Hagen, M. and A.T. Jakubick (2006), “Returning the WISMUT Legacy to Productive Use” in Merkel, J.B and Hasche-Berger, A. (eds.), *Uranium in the Environment, Mining Impact and Consequences*, Springer-Verlag, Berlin, p.12.

were works or undertakings that were “for the general advantage of Canada”¹⁴ and, therefore, were subject to control by the federal government, rather than by provincial governments, which is the case for other mineral resources in Canada. Similarly, the Australian Atomic Energy Commission (AAEC) was created in 1953.

Early regulatory bodies did not display what one would consider today to be the mandatory indicia of a nuclear regulatory body, including independence from the executive of the state and no role in promoting the nuclear industry it regulates.¹⁵ At the time, rather, it seems that such bodies were meant to broker on behalf of governments the necessary deals related to the development of the new industry. The AAEC of that time has been described as “both player and umpire of things nuclear in Australia.”¹⁶ In Canada too, where domestic nuclear technology was in its early stages of development, the regulator and other government entities were involved in the control over resources. Between 1954 and 1972, a Canadian mining company, Rio Algom, sold more than 65 million pounds of uranium oxide by contract to a Canadian government-owned (Crown) corporation, which in turn sold the uranium to the US AEC for American needs; these so-called “Cold War contracts” were meant to incentivise a fledgling uranium mining industry, and were largely successful in that regard.¹⁷ The industry was also instrumental in supplying the uranium needed for domestic Canadian reactors in development. Such government and regulatory involvement in the uranium markets, which facilitated civilian nuclear power, did not, however, create a competitive market for uranium, and the relative secrecy of the activities did not contribute to transparent processes.

The US had been the biggest purchaser of uranium during the 1940s and 1950s, but after having largely satisfied its military need for uranium resources in the 1960s, demand was waning. In relation to the burgeoning American civilian nuclear power industry, a desire to ensure a domestic uranium mining industry – security of supply as energy security – led to a ban on contracts for domestic use of imported uranium in the US. The resulting effect on the uranium mining industry outside of the US, and on the plummeting international price of uranium, was enormous. Ensuing efforts by uranium companies and the governments of at least four countries – Australia, Canada, France and South Africa – make for interesting historical reading about the so-called “uranium cartel”. This cartel did not have much of a chance to influence the international price of uranium, given rapid developments taking place in the 1970s, including the Australian nuclear debate, which led to the deferral of new mines; and the American long-term, fixed

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14. It remains the case in Canada that uranium mines are subject to exclusive federal jurisdiction, as a result of the Canadian Parliament having declared all such works to be for the general advantage of Canada. In Australia, uranium is also within the federal (Commonwealth) sphere.
 15. It is now a well-established principle of international nuclear law that a nuclear regulatory body must be “effectively independent in its safety related decision making and that is has functional separation from entities having responsibilities or interests that could unduly influence its decision making.” IAEA (2010), *Governmental, Legal and Regulatory Framework for Safety, General Safety Requirements Part 1, No.GS-R-1, Requirement 4*, IAEA, Vienna, p.6.
 16. Sorentino, C.M.R. (1990), “Uranium Mining Policy in Australia” in *Resources Policy*, Vol.16, Issue 1, March, Butterworths, pp.3-79, at p.5.
 17. *Rio Algom v. Canada (Attorney General)*, supra note 8. At paragraph 167, the court finds that “the business purpose or end to be achieved by the Cold War Contracts was that the US AEC would obtain uranium oxide at a fixed price and within a fixed time without Canada subsidising the Canadian mining companies that were being encouraged to take on the task and the risk of mining and milling the uranium oxide.”

commitment contracts for the enrichment of uranium, and the ensuing OPEC oil embargo and energy crisis, which drove up the price of uranium.¹⁸

(c) Current regulation of uranium mining – economic, social and environmental performance, safe operation and sustainable development

(i) Legacy sites

Today, the regulatory oversight of uranium mining and ore processing activities is very different from what it was in the past. Indeed, many states, which undertook uranium mining and processing activities, are now, with modern standards and a modern understanding of environmental stewardship, dealing with “legacy” uranium sites and the need to remediate adverse environmental impacts. Examples of Cold War-era legacy sites under current remediation efforts include the Wismut sites in former East Germany, the Moab, Utah site in the US and contaminated land in the Czech Republic. The Wismut project alone has been described as “probably the ‘worst’ uranium-mining legacy in the world”.¹⁹

Uranium mining today, and its regulatory oversight, are now characterised much more by environmental and worker protection, social responsibility and regulatory oversight. As with the other stages of the nuclear fuel cycle, increased public accountability, transparent regulatory processes and environmental stewardship have meant that uranium mining regulation today is accomplished within clear requirements. It should be noted that this is the case not only with respect to uranium mines. Indeed, past mining practices, in general, were conducted under a different framework and understanding, with accepted practices that would not be tolerable today.

A good illustration of the changes that have taken place in the regulatory protection of the environment with respect to uranium mines can be seen in a 2012 court decision from Ontario, Canada, in relation to Cold War-era mine operations in Canada. Although the “Cold War contracts”, which were negotiated to ensure a supply of uranium to the US AEC, resulted in profits to the mining company during the 1960s and 1970s, new obligations were being imposed from the 1990s on the mining company’s older mine sites due to legal developments in regulation. The mining company in question complied with these new regulatory obligations, but it ultimately sued the Canadian government to recover the expenses it was incurring for the changed and increased regulatory responsibilities in relation to its sites and the environmental remediation activities that were required.

In its decision, the court described the regulatory scheme that had been applicable to uranium mines at the time of the actual mining as follows:

At the time of the Cold War Contracts, uranium was regulated under the *Atomic Energy Control Act*. The regulations under that Act did not require Rio Algom to obtain licences for decommissioning activities

[I]t was standard practice for mining companies to dispose of tailings in the nearest topographical depression within the vicinity of the mine site. Few, if any, regulations applied to the processing of effluent leaving the mill or tailings.²⁰

18. See Gray, E., *supra* note 4, pp.164-171. The OPEC oil crisis may be seen to have contributed, not insignificantly, to the view that civilian nuclear power was one way of pursuing energy security.

19. See Hagen, M. and A.T. Jakubick, *supra* note 14, p.12.

20. *Rio Algom v. Canada (Attorney General)*, *supra* note 8, paras 104-106.

In contrast, the court explained the evolution of the regulation of mine sites as follows:

Extensive regulations were ultimately enacted in 1988 as the *Uranium and Thorium Mining Regulations*, SOR/88-243. These regulations required a licence before decommissioning a nuclear facility (limited at that time to active mines), and the completion of a public information process designed to inform those in the vicinity of the mine of anticipated effects on public health, safety and the environment....

With the *Nuclear Safety and Control Act* coming into force on May 31, 2000, the Canadian Nuclear Safety Commission was empowered to require financial guarantees, to order remedial actions in hazardous situations and to require responsible parties to bear the costs of decontamination and other remedial measures.

Rio Algom's tailings management costs increased dramatically because of the legislation's requirement to license and renew licenses for its closed uranium mines as nuclear facilities.²¹

Noting that the company's costs for tailings management were likely to continue in perpetuity, and were then estimated at a future cost of \$100 million dollars, the court found that Canada was not responsible for indemnifying Rio Algom for the unforeseen costs, as this was not a part of the Cold War contracts and the company was responsible for compliance with the law at the time it was enacted.

While this may be a somewhat dramatic example of the evolution in uranium mine regulation, it characterises the advances in scientific knowledge, regulatory oversight, sustainable development and the environmental law notions of "polluter pays". Similar histories of past practices evolving into modern, environmentally responsible mining practices are also evident in, for example, Australia, where early mining operations were simply abandoned at the end of their economic life. This changed as a result of increased awareness and environmental protection legislation.²² As was noted in a fairly recent IAEA technical report entitled *Establishment of Uranium Mining and Processing Operations in the Context of Sustainable Development*, in relation to the environmental issues arising from uranium mining:

the lessons of the past appear to have been learned, with almost all current operations having well-developed management plans in place at startup, which continue to be an integral part of the operating strategy, evolving with changing circumstances as development proceeds throughout the life of a project.²³

Of course, efforts made to remediate sites that are the result of poor past practices can pose more of a technical challenge than ensuring that mining practices are undertaken responsibly in the first place; economic, legal and political issues can arise as well. Nonetheless, it seems that the social acceptance of future uranium mining and production will be determined, at least in part, according to how states are perceived to have dealt with the remediation of legacy sites.²⁴

21. *Ibid.*, paras 108, 115-116.

22. See Waggitt, P. (2006), "Environmental Regulation of Uranium Mining in Australia", in Merkel and Hasche-Berger, supra note 14, p.573. The book outlines similar legacy environmental concerns from countries such as Romania and South Africa, as well as several other countries.

23. IAEA (2009), "Establishment of Uranium Mining and Processing Operations in the Context of Sustainable Development", IAEA Doc. NF-T-1.1, p.1.

24. It is noted in IAEA NF-T-1.1, supra note 24, p.8, that "legacy issues arising from past inappropriate or non-existent environmental standards still adversely impact the perception of the current uranium mining and processing industry."

(ii) *Regulation today*

The modern regulatory scheme for uranium mines may be seen as a product of a mature international nuclear regulatory structure, with independent regulatory bodies, mandates for protection of workers and the public, public processes and environmental stewardship on the part of industry. International control of uranium trade is affected by international law instruments and strict rules. With increased attention given to international best practices and standards by state governments, as well as regulatory bodies and industry, the modern regulation of the uranium mining industry has developed several features.

There are several aspects of the modern regulation of uranium mine projects that are worth outlining, in terms of their evolution and the commonalities arising from international law instruments. These include aboriginal and public involvement, social considerations, environmental assessment and protection, radiation safety and waste management.

Aboriginal and indigenous peoples and uranium mining

One important aspect of most reviews of a potential new uranium mine includes consideration of the social and economic impact that a new mine project is likely to have on a local population. The population that lives in the vicinity of a mine is an important consideration in any proposal, as is the potential for impacts on that population. In many parts of the world, indigenous and aboriginal peoples live close to where there have been and may be valuable uranium ores. It has been noted that, when considering past uranium mining practices, one is struck by the social and political dynamics that were at play.²⁵

With our modern emphasis on the socio-economic impacts of industry and environmental responsibility, government policies with respect to mining and regulatory permitting processes today depend much more on social acceptance. Social acceptance, in turn, requires transparent processes, public involvement and consultative exchanges with populations. In this regard, the United Nations (UN) Declaration on the Rights of Indigenous Peoples was adopted by the UN General Assembly in 2007.²⁶ While not creating new rights, it does reflect an expression of the principles by which states mean to approach issues affecting indigenous peoples.

Article 29 of the Declaration provides:

1. Indigenous peoples have the right to the conservation and protection of the environment and the productive capacity of their lands or territories and resources. States shall establish and implement assistance programmes for indigenous peoples for such conservation and protection, without discrimination.
2. States shall take effective measures to ensure that no storage or disposal of hazardous materials shall take place in the lands or territories of indigenous peoples without their free, prior and informed consent.
3. States shall also take effective measures to ensure, as needed, that programmes for monitoring, maintaining and restoring the health of indigenous peoples, as developed and implemented by the peoples affected by such materials, are duly implemented.

25. See Hecht, G., *supra* note 12, p.22.

26. See "United Nations Declaration on the Rights of Indigenous Peoples", UN Doc.A/61/295 (2007), available at: www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf.

Impacts on, and benefits to, indigenous populations are an important part of the responsible development of resources and will continue to be so.

An example of aboriginal engagement in uranium mining and their consideration in regulatory processes may be found in the context of Canadian uranium mine operations, which at present are taking place exclusively in northern Saskatchewan, an area whose population is largely aboriginal. The nuclear regulator, the Canadian Nuclear Safety Commission (CNSC), and the federal and provincial governments that make decisions with respect to the mines in this area, recognise a duty under the Canadian constitution to consult with aboriginal peoples whose rights may be affected by decisions that are being contemplated.²⁷ In that context, the role of aboriginal people in the environmental impact assessment process, as well as the CNSC licensing process, is prominent and valued.

In its 1997 report, for example, the panel that considered the potential impacts of the development of a new mine addressed the situation of Saskatchewan's aboriginal communities as follows in its recommendations:

It is important to recognize that this project is being developed in an area to which aboriginal people are attached historically and spiritually. We are of the opinion that northern people, because they must bear the greatest environmental risk associated with this project and because of their traditional roots in this part of Canada, deserve to share more generously than other Canadians in the benefits produced by the McArthur River Project.²⁸

The following recommendations were made by the panel and have been implemented with respect to the project: that local people be continuously consulted throughout the duration of the project; that the operator be required to report annually on its public involvement programmes; that an objective of obtaining at least 35% of all required goods and services from northern suppliers be established for the project; that employment objectives for the participation of northerners in the mine and mill work force be increased from the present level (about 50%) by 1% per year until it reaches at least 67%; that the operator be required to report annually on the employment and business opportunities for northerners; and that the government agencies and departments providing services in northern Saskatchewan adopt human resources objectives that would lead to a substantial increase in northern participation in their staff.

Environmental assessment and protection

Environmental impact assessment is now a common feature of most proposals to exploit a new mine. Moreover, international instruments relating to public involvement in such assessment processes have led to a significant change in the way that mine development, alongside other major resource projects, may occur.

27. See *Rio Tinto Alcan Inc. v. Carrier Sekani Tribal Council*, 2010 SCC 43, where the Court reiterated the elements that give rise to this duty on the Crown and provided guidance on the role of a statutory tribunal with respect to the discharge of the duty and the evaluation of whether the duty has been discharged. It found that a tribunal with the power to consider the adequacy of consultation should "provide whatever relief it considers appropriate in the circumstances, in accordance with the remedial powers expressly or impliedly conferred upon it by statute." *Ibid.*, para.61. On this reasoning and as an agent of Her Majesty, the CNSC discharges its licensing authority in accordance with the honour of the Crown, and considers potential effects on Aboriginal rights that could be caused by its licensing decisions, as well as measures that may be required to accommodate effects on rights.

28. See Joint Federal-Provincial Panel on Uranium Mining Developments in Northern Saskatchewan (McArthur River) (1997), "Executive Summary", Report of the Joint Federal-Provincial Panel on Uranium Mining Developments in Northern Saskatchewan (McArthur River), February, available at: www.ceaa-acee.gc.ca/default.asp?lang=En&n=8D68F440-1.

At an international level, certain fundamental principles and objectives have been set down in legal instruments, beginning with the Stockholm Declaration on the Human Environment²⁹ in 1972 and continuing with the Rio Declaration on Environment and Development³⁰ in 1992. In addition, international environmental law has, over time, established a core of legal principles and norms, both procedural and substantive:

Some of these principles are considered more substantive, that is, focused on outcomes, as the “no harm” rule, the “polluter pays” principle, and state responsibility and liability; while others are more procedural, with their focus on means, such as the duty to notify, consult and negotiate; the principle of effective public participation in decision-making; and the precautionary principle. Still others combine both substantive and procedural aspects, such as “good neighbourliness” and the duty to cooperate. Needless to say, however, there is usually no bright line distinguishing substance from procedure.³¹

Both substantive and procedural requirements are evidenced in environmental impact assessment processes. The need to protect our environment from the damage that may be caused by human activity, and the right to a clean environment, is a preoccupation of our modern world that may be seen in modern uranium mine development.

The right to access information about the environment, to public participation in decision-making about the environment and to have access to justice, as characterised in the Aarhus Convention,³² well encapsulate the notion of environmental democracy, where decisions affecting our environment are intended to be reached through public involvement and “larger societal forces.”³³ Such societal forces can be quite active when considering the relative merits of new uranium mine development.

It is through inquiries into the potential effects of a mine project on the natural and socioeconomic environment that policy decisions regarding mines may be made. The sweeping Ranger Environmental Commission in Australia was initiated in 1975 to inquire into the potential impact of the development of the Ranger uranium deposit, and the result was a “watershed for the Australian uranium industry ... setting the framework for future industry regulation” and export control in that country.³⁴

Environmental reviews also identify baseline data, important for operations as a way to gauge performance; the data may be used to impose regulatory limits and predict whether there will be any cumulative effects of the operation on the environment. In this context, protection of the natural environment around a mine operation is a way to protect the health and safety of the public.

29. See “Declaration of the United Nations Conference on the Human Environment”, concluded 16 June 1972, UN Doc. A/CONF.48/14/Rev.1 (1973), 11 ILM 1416 (1972).

30. See UN Doc. A/CONF.151/26 (Vol.1) (12 August 1992).

31. Nanda, V.P. (2006), “International environmental norms applicable to nuclear activities, with particular focus on decisions of international tribunals and international settlements”, in *Denver Journal of International Law and Policy*, Vol.35, No.1, Winter, University of Denver, Colorado, pp.47-65.

32. See UN Economic Commission for Europe (UNECE), “Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters” (25 June 1998), 2161 UNTS 447, entered into force 30 October 2001, available at: www.unece.org/fileadmin/DAM/env/pp/documents/cep43e.pdf.

33. See UNECE (2000), “The Aarhus Convention: An Implementation Guide”, ECE/CEP/72, New York and Geneva, p.29.

34. See Sorrentino, C.M.R., *supra* note 17, p.10.

There has thus been increased internationalisation of environmental standards that are adhered to by companies on a voluntary basis. For example, the International Organization for Standardization (ISO) 14001 standard sets criteria for an environmental management system, although it does not set environmental performance requirements. If such requirements are imposed, it would likely be by way of licence conditions or other conditions of a regulatory authorisation. The ISO standard outlines a framework to ensure that throughout the life of a project, the environmental impact of that project is measured and improved.

Radiation protection and radioactive waste management

While there are many aspects of uranium mining processes that are quite similar to other mining activity, in terms of worker health and safety concerns, it is in the area of radiation protection that uranium mining requires specific regulatory oversight. Control of radioactive materials, control over worker doses and measurement of radiation are important parts of the protection of mine workers.

To be acceptable, modern mining practices require controls to ensure engineered containment, shielding and ventilation, as well as contamination control. Commitment to the “as low as reasonably achievable” (ALARA) principle is required, with codes of practice in place. A state’s specific regulations dealing with the control of radiation exposures in uranium mining and processing can be formed on the basis of the IAEA safety standards, as well as the recommendations of the International Commission on Radiological Protection (ICRP).

From an industry perspective, corporate social responsibility (CSR) has become an important concept for many industrial actors who work throughout the world, in terms of the principles of sustainable development and how industry actors demonstrate their stewardship of the environment and their concern for worker safety and adequate protection of the public. This is particularly so with respect to mining companies. The OECD has Guidelines for Multinational Enterprises, which provides voluntary principles and standards for responsible business conduct in areas such as employment and industrial relations, human rights, environment, information disclosure, combating bribery, consumer interests, science and technology, competition, and taxation.³⁵ In addition, some government initiatives provide similar guidance and accountability. In Canada, for example, the Office of the Extractive Sector Corporate Social Responsibility Counsellor was formed in 2009 to review the CSR practices of Canadian mining companies operating outside Canada.³⁶ The Canadian CSR Strategy for Canadian mining companies operating overseas includes: to support initiatives to enhance the capacity of countries to manage the development of minerals, oil and gas and benefit from the resources; to promote International Finance Corporation Performance Standards on Environmental and Social Sustainability for extractive projects with potential adverse social or environmental impacts; and to ensure respect for Voluntary Principles on Security and Human Rights for projects involving private or public security forces.³⁷

35. See OECD (2011), *OECD Guidelines for Multinational Enterprises*, OECD, Paris, available at: www.oecd-ilibrary.org/governance/oecd-guidelines-for-multinational-enterprises_9789264115415-en.

36. See Office of the Extractive Sector Corporate Social Responsibility Counsellor, available at: www.international.gc.ca/csr_counsellor-conseiller_rse/index.aspx.

37. See Foreign Affairs, Trade and Development Canada (2009), “Building the Canadian Advantage: A Corporate Social Responsibility (CSR) Strategy for the Canadian International Extractive Sector,” available at: www.international.gc.ca/trade-agreements-accords-commerciaux/topics-domaines/other-autre/csr-strat-rse.aspx.

Radioactive waste can be a matter of major regulatory concern for uranium mine operations. Although uranium mining waste is of relatively low activity, there is a very large volume of the waste. In this, as in other aspects of uranium mine regulation, modern standards that exist at the international level can be implemented through state law and regulation.

The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention)³⁸ is an international agreement, which deals with waste and imposes certain obligations on states party to the convention. Although it is an “incentive Convention”³⁹ and therefore contains objectives and principles as obligations, rather than technical requirements, it nonetheless provides a framework for radioactive waste management to which a state can adhere. Article 3, paragraph 2 of the Joint Convention provides:

This Convention shall also apply to the safety of radioactive waste management when the radioactive waste results from civilian applications. However, this Convention shall not apply to waste that contains only naturally occurring radioactive materials and that does not originate from the nuclear fuel cycle, unless it constitutes a disused sealed source or it is declared as radioactive waste for the purposes of this Convention by the Contracting Party.

Thus, a state party to the Joint Convention would consider mine waste as a part of waste that is subject to the Joint Convention. That is, while mine waste rock and ore residue are naturally-occurring radioactive materials, the mining and processing of uranium is, generally speaking, a nuclear fuel cycle activity.

The “General Safety Requirements” outlined in Article 11 of the Joint Convention with respect to radioactive waste management may be seen as those which should, in any event, inform any national uranium mine waste management regulations:

Each Contracting Party shall take the appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

[...]

- (ii) ensure that the generation of radioactive waste is kept to the minimum practicable;
- (iii) take into account interdependencies among the different steps in radioactive waste management;
- (iv) provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;
- (v) take into account the biological, chemical and other hazards that may be associated with radioactive waste management;
- (vi) strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation;
- (vii) aim to avoid imposing undue burdens on future generations.

38. The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention), INFCIRC/546, opened for signature 29 September 1997, 2153 UNTS 357, entered into force 18 June 2001.

39. *Ibid.*, para.(x) of the Preamble.

The last item concerns the sustainable development principle, which requires an approach that takes a view of both the needs and desires of people in the present moment, as well as those of future generations. In this regard, the current approach to uranium mining and production is one of life-cycle management, to treat each stage in the life of a process as a phase of the overall process, so as to ensure that decommissioning, rehabilitation and institutional control – and the funds necessary for these steps – are in place before a project is first authorised so that benefits today are not gained at the cost of future generations.

Mine tailings and waste rock are two of the most significant waste issues that must be addressed by any uranium mine operator, and state requirements, based often on IAEA guidance,⁴⁰ are imposed to this end.

Since it falls to states to impose the necessary legal and regulatory requirements for environmental protection and safety, it should be noted that many of the international instruments and standards are either not binding as international law, or do not contain binding technical requirements. It is of importance that states themselves determine how to implement into law the scientific knowledge and systems that exist, for which engagement at the international level is generally advisable.⁴¹

Part 2 – Uranium trade and control

Uranium ores and ore concentrates, as well as uranium in other stages of the fuel cycle, are moved physically in large quantities and often over long distances. When states that are suppliers of uranium export their ore concentrates, and then uranium in subsequent forms is moved around as it is processed through the fuel cycle, international controls and obligations may begin to apply.

Transport and security

With respect to both transportation safety and security requirements, the applicability and extent of the governing international instruments depends on the nature of the material in question, as well as on the mode of travel and on the international borders concerned. With respect to the Convention on the Physical Protection of Nuclear Material (CPPNM),⁴² for example, the guidance offered in relation to the protection of uranium ore concentrates indicates that they should be “protected in accordance with prudent management practices”, without further detail. It falls to states to craft physical protection arrangements that are appropriate at mines, in transport, and for international shipping.

40. See IAEA (2010), “Best Practice in Environmental Management of Uranium Mining”, IAEA Nuclear Energy Series No.NF-T-1.2, IAEA, Vienna.

41. It should be noted that sometimes, the non-binding nature of such safety guides can be a cause of concern where, for example, the lack of binding rules in international law dealing with environmental impact assessments and the management of radioactive waste in relation to uranium mining can result in national laws that are considered weak. For an examination of this issue in relation to new mines in Malawi, see Kachale, M. (2010), “The Efficacy of International Regulation of Uranium Mining: Malawi as a Case Study”, in *Commonwealth Law Bulletin*, Vol.36, No.4, December, Routledge, London, p.653.

42. Convention on the Physical Protection of Nuclear Material (CPPNM), INFCIRC/274/Rev.1, opened for signature 3 March 1980, 1456 UNTS 125, entered into force 8 February 1987. See also the Amendment to the CPPNM, opened for signature 8 July 2005, GOV/INF/2005/10-GC(49)/INF/6, not yet in force, in IAEA (2005), “Nuclear Security - Measures to Protect against Nuclear Terrorism, Report of the Director General”.

With respect to the Regulations for the Safe Transport of Radioactive Material,⁴³ these requirements, too, are implemented at the level of the national government. However, they are considered to be de facto binding legal norms under international law.⁴⁴ States implement, according to their own legal systems, these regulations established by the IAEA.

With the combination of international legal instruments, IAEA standards and state controls, the movement of uranium is meant to be effected safely and securely. The rules of uranium trade that determine the conditions under which uranium is traded and exported to other countries will be examined in the next section.

The Treaty on the Non-Proliferation of Nuclear Weapons (NPT)⁴⁵ and uranium trade

The entry into force of the NPT in 1970 made it obligatory for uranium supply countries that were NPT state parties, to ensure that uranium sales did not go to a nuclear weapons programme of a non-nuclear weapon state. For non-nuclear weapon states that are NPT signatories, the commitment made is to forego nuclear weapons and to accept safeguards by the IAEA. However, all signatories make a commitment not to provide material to non-nuclear weapon states, except under IAEA safeguards. Article III.2 of the NPT provides:

Each State Party to the Treaty undertakes not to provide: (a) source or special fissionable material, or (b) equipment or material especially designed or prepared for the processing, use or production of special fissionable material, to any non-nuclear weapon State for peaceful purposes, unless the source or special fissionable material shall be subject to the safeguards required by this Article.

For states that sign the NPT, then, it has become a matter of international legal obligation, and not just government policy or preference, to take measures to ensure that exports are not destined for a nuclear weapons programme of a non-nuclear weapon state. In return, the treaty recognises an “inalienable right” of states that accept these terms, to pursue the peaceful uses of nuclear energy. In this way, the NPT provides a legal expression for the rules of international nuclear behaviour.

“Source material” is defined in article XX of the Statute of the IAEA⁴⁶ as:

uranium containing the mixture of isotopes occurring in nature; uranium depleted in the isotope 235; thorium; any of the foregoing in the form of metal, alloy, chemical compound, or concentrate; any other material containing one or more of the foregoing in such concentration as the Board of Governors shall from time to time determine; and such other material as the Board of Governors shall from time to time determine.

The applicable definition of “special fissionable material” explicitly excludes source material from its scope. As a result, uranium ore that is produced and milled into uranium oxide, or what is termed “yellowcake” (U₃O₈), is “source material” for the purposes of the NPT, but is not special fissionable material.

43. IAEA (2012), Regulations for the Safe Transport of Radioactive Material, IAEA Safety Standards, Specific Safety Requirements No.SSR-6, IAEA, Vienna.

44. Jankowitsch-Prevor, O. (2010), “The International Law of Transport of Nuclear and Radioactive Material” in OECD/NEA, International Nuclear Law: History, Evolution and Outlook, OECD/NEA, Paris, p.195.

45. The Treaty on the Non-Proliferation of Nuclear Weapons (NPT), opened for signature 1 July 1968, 729 UNTS 161, entered into force 5 March 1970.

46. IAEA (1989), The Statute of the IAEA, Vienna, available at: www.iaea.org/About/statute.html.

What are “the safeguards that are required by this Article”, under Article III.2 of the NPT, in relation to uranium mining and ore production? Under INFCIRC/153, the model comprehensive safeguards agreement, paragraph 112 states: “The term source material shall not be interpreted as applying to ore or ore residue.”⁴⁷ Furthermore, paragraph 33 is clear that states are not required to include material in mining or ore processing activities as part of the material accounting and verification that is done in a detailed fashion as safeguards. Full safeguards accountancy and verification procedures apply to uranium once it is “of a composition and purity suitable for fuel fabrication or for being isotopically enriched”.⁴⁸ This means, in practice, that once uranium concentrate is ready to proceed to the next stage in the nuclear fuel cycle – conversion, enrichment and then fuel fabrication – it is subject to all of the requirements of safeguards accountancy and verification by the IAEA.⁴⁹

Before this stage, the safeguards requirements are related to reporting to the IAEA. That is, under paragraph 34(a) of the model comprehensive safeguards agreement, states are required to report on the quantity, composition and destination of uranium ore concentrate exports to non-nuclear weapon states. This reporting is also required with respect to imports of uranium ore concentrates, unless destined for non-nuclear purposes.

Additional reporting requirements related to uranium mining activities arise under INFCIRC/540, the model Additional Protocol text.⁵⁰ Under this instrument, states must report to the IAEA on the locations, operational status, estimated annual production capacity and current annual production of their mines and concentration plants (article 2.a(v)), as well as provide information concerning their source material in terms of intended uses, import and export [Article 2.a(vi)]. This reporting is very important from a monitoring perspective, and is not particularly onerous to provide, in practice. An Additional Protocol also requires information on the export and import of pre-safeguarded source material for non-nuclear purposes, where exports/imports of uranium exceed 10 tonnes. Under an Additional Protocol, it is possible for IAEA inspectors to seek complementary access to sites that have been reported on [Article 4.a(i)]. Access to sites provides a measure of verification of exclusively peaceful purposes, and determines whether there is absence of undeclared activities in relation to mining and ore processing. Moreover, since exporting states provide the Agency with detailed information with respect to each shipment of uranium resources, the IAEA is then capable of following up in the receiving state to ensure that safeguards are applied as and when required.

The result of the NPT obligation, the definitions and the resulting safeguards agreements that are negotiated with the IAEA to implement trade for exclusively peaceful purposes, is that states, which are uranium ore supply countries, have a means of showing that their exported uranium is destined for only peaceful nuclear energy production. With a comprehensive safeguards agreement and an Additional

47. IAEA (1972), “The Structure and Content of Agreements Between the Agency and States Required in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons”, IAEA Doc. INFCIRC/153 (Corrected), IAEA, Vienna.

48. *Ibid.*, INFCIRC/153 (Corrected), para.34(c).

49. For an interesting consideration of why full-scope safeguards could not feasibly apply to uranium mines, with proposals to extend material control and accounting safeguards to intermediate processing activities, see Kemp, S.R. (2006), “On the Feasibility of Safeguarding Uranium Mines”, in *Nonproliferation Review*, Vol.13, No.2, July, Monterey Institute of International Studies, Monterey California, pp.417-425.

50. Model Protocol Additional to the Agreement(s) Between State(s) and the International Atomic Energy Agency for the Application of Safeguards (1997), IAEA Doc. INFCIRC/540 (Corrected).

Protocol, the IAEA has a relatively complete picture of a state's holdings of nuclear material.

It is not only safeguards agreements themselves that constitute the uranium export control regime. As a result of the international law requirements of the NPT, countries that are suppliers of nuclear material (and equipment) have joined together in order to "informally" agree upon the conditions under which the supply of such material is to be provided, in light of non-proliferation obligations and a desire for commercial activity and trade. Without a binding international agreement, these countries have undertaken to implement, through their domestic legislation, the agreed-upon conditions for the supply of nuclear material to non-nuclear weapon states. Interestingly, while there is no internationally-binding instrument in relation to these conditions for trade, the IAEA nonetheless officially circulates, to all member states of the IAEA, the documents reflecting the political commitments of the supplier states to impose particular requirements for nuclear trade.⁵¹ The Nuclear Suppliers Group (NSG) Guidelines, for example, may be found in INFCIRC/254/Rev.8.⁵² At present, the NSG counts 48 member states.

One means to implement states' non-proliferation obligations, as well as their own government policies and perhaps NSG commitments, is through nuclear cooperation agreements (NCAs). These are bilateral nuclear trade agreements that provide a means by which a supplier state can impose obligations on a recipient state with respect to the material at issue. Generally speaking, NCAs address uranium trade by outlining such reciprocal obligations as:

- state assurances of exclusively peaceful use;
- physical protection requirements;
- limits on retransfer or enrichment/reprocessing of material;
- IAEA safeguards.

States require that such conditions be applied to uranium supplied from one state to the other. NCAs are generally negotiated to reflect domestic legislation, which implements the state's NPT obligations, if applicable, as well as other obligations that may arise from international agreements (such as the Convention on the Physical Protection of Nuclear Material) and domestic policy choices. NCAs generally provide for notifications between the states, prior consents, and inventory reports to each other on nuclear items supplied under the NCA. Beyond the requirements of the NPT and other international agreements to which a state is bound, a state may determine in an NCA what other non-proliferation measures and obligations it wishes to impose. For example, some states, such as the US, would wish to see bilateral nuclear co-operation concluded only between states that are willing to agree to forego uranium enrichment technology or spent fuel reprocessing capability. Due to proliferation concerns, such sensitive nuclear fuel cycle technologies can be closely guarded for good reason. As with many things related to uranium trade, questions of security of fuel supply, as well as matching demand with supply, may determine what leverage is exerted in NCAs in different circumstances.

51. For a more detailed explanation of how the nuclear export control regime has developed post-NPT and in particular, the activities of nuclear supplier regimes, see Jankowitsch-Prevor, O., (2011), "A New Role of Industrial Operators in Trade in an Evolving Nuclear Export Control Regime" in Michel, Q. (ed.), *supra* note 13, pp.19-24 in particular.

52. IAEA (2006), "Communications Received from Certain Member States Regarding Guidelines for the Export of Nuclear Material, Equipment and Technology", IAEA Doc. INFCIRC/254/Rev.8, Part 1, 20 March, IAEA, Vienna.

For some states and some populations, past linkages between uranium mine production and nuclear weapons development have remained in the public discourse, and ethical considerations related to nuclear weapons can extend beyond the obligations under the NPT even when these have been satisfied, and can amount to objection to uranium mine development. What has been termed “vertical proliferation” may be of concern to a population that is anxious to see its natural resources used for only peaceful purposes. Vertical proliferation is a description of the concern that a state with nuclear weapons receiving uranium or other source materials for exclusively peaceful purposes could thereby “free up” its other nuclear material for a weapons programme. The thinking is that the contribution of source material from the NPT-compliant state may indirectly contribute to the ability of the other state to maintain or increase its weapons stockpile or capacity. As a matter of domestic politics and public concern, such issues are addressed at a state level.

The geopolitics of uranium trade

Non-proliferation is not the only factor at play in a state’s determination of the extent to which it may participate in uranium trade; nor is simple monetary gain the sole driver of uranium trade. It has been said that “[g]overnment decisions on whether and under what circumstances to allow uranium exports are not a simple trade-off between proliferation risk and export earnings.”⁵³ In Australia, for example, the argument has been made that given the “small value of Australia’s uranium exports as a proportion of natural resource exports,” it has not been the economics of uranium trade that is the biggest driver of export policy, but rather the importance of bilateral relations between states and relative power balances in the world.⁵⁴ Foreign policy issues and national interests must inform decisions regarding how uranium trade is undertaken. What states receive in return for being suppliers of uranium, then, is not necessarily measured solely in economic terms.

For some countries, being major suppliers of uranium provides the chance to influence the global trade in uranium and to support non-proliferation interests. In his statement on Australia’s uranium policy in 1977, for example, then Prime Minister Fraser noted that the country’s role in the NPT and the IAEA would “depend to a great extent on whether or not it is a major supplier of uranium. Only as a producer and supplier of uranium can Australia be an effective voice in achieving improved international safeguards and controls.”⁵⁵

It is also possible to view the geopolitics of uranium trade through the historical lens of colonies, empires and power balances. The relationships between “nuclear powers” and “developing nations”, particularly in terms of historical uranium mining experience in African nations, is discussed at length in *Being Nuclear: Africans and the Global Uranium Trade*, a book that explores the geopolitical aspects of the treatment of uranium mines as part of the nuclear fuel cycle.⁵⁶

As is the case with other sources of energy production, energy self-sufficiency and energy security can be factors that drive a state’s motivation to purchase uranium as an energy source. Reliability of supply is an important consideration in this respect. At the same time, uranium supplier states also have an interest in maintaining control over their resources. Restrictions on foreign ownership in the

53. The statement was made in relation to Australia in Clarke, M., et al. (eds.) (2011), *Australia’s Uranium Trade: The Domestic and Foreign Policy Challenges of a Contentious Export*, Ashgate Publishing Ltd., United Kingdom, p.170.

54. *Ibid.*, Chapter 7, Medcalf, R., “Powering Major Powers: Understanding Australian Uranium Export Decisions on China, Russia and India”, pp.175-176.

55. *Ibid.*, Chapter 8, “Australian and Canadian Nuclear Policy: The Challenge of India”, p.192.

56. See Hecht, G., *supra* note 12.

uranium mining sector are one way that states can assert control over their domestic resources, where it is considered in the strategic interest of the state to do so. Canada, for example, has a policy on Non-Resident Ownership in the Uranium Mining Sector⁵⁷ by which foreign ownership in a Canadian mining project is limited, currently to 49%. Resident ownership levels of less than 51% may be permitted, if it can be established that the project is in fact Canadian-controlled; and exemptions to the policy are considered where it is demonstrated that Canadian partners cannot be found. Canada is not alone in having controls over its uranium resources. Reviews of large foreign investments are considered by many states to be a matter of national security, and limits on foreign ownership of uranium mine resources may be considered by some states to be important in order to ensure control over sensitive fuel cycle materials.

A state does not have energy security merely by having access to uranium ore. Rather, conversion, enrichment and fuel fabrication are, for the most part,⁵⁸ particular steps that must also be met. It is beyond the scope of this overview of the regulation of uranium mine production to address nuclear fuel cycle geopolitics which, from a “security of supply” perspective, remain a very important consideration. It is sufficient to note that nuclear fuel cycle considerations, and access to technology for the fuel cycle, remain an issue for states that are seeking to ensure a supply of nuclear fuel for nuclear energy programmes.⁵⁹

Conclusion

Uranium mining is undertaken with modern mining practices, with regulatory oversight, public involvement in decision making and clear obligations to rehabilitate sites through decommissioning after mine operations have ceased. Thus, mine projects may or may not take longer to reach production, but they do so with greater transparency, health and safety measures to protect workers and the public and environmental protection.

The uranium mining industry remains concentrated, with 10 companies accounting for 87% of the world’s uranium production in 2010. The “main players” are considered to be the French state company Areva, the Canadian Cameco, Anglo-Australian Rio Tinto and the Kazakhstan state company KazAtomProm.⁶⁰ However, a shift in mine investment to other countries has been noted:

Globally, of the 31 mines that were planned to open from 2009 to 2012 only five were located in Australia, the US and Canada. Thirty-four countries in Africa have already granted exploration licences with Niger issuing more than 100 exploration permits in two years and Botswana issuing 138. During the period 2009-2012, uranium production was expected to increase 118% in Niger, Namibia, Malawi and South Africa.⁶¹

While the number of exploration authorisations issued is not indicative of the number of mines that will be constructed, there nevertheless appears to be more

57. See Non-Resident Ownership in the Uranium Mining Sector, available at: www.nrcan.gc.ca/energy/sources/uranium-nuclear/1500.

58. Some reactor technologies, like the CANDU reactor from Canada, use natural uranium fuel, and so enrichment is not a required step in the fuel cycle with respect to such reactors; however, most reactors in operation do use fuel fabricated from enriched uranium.

59. A detailed treatment of the nuclear fuel cycle may be consulted in “Multilateral Approaches to the Nuclear Fuel Cycle: Expert Group Report to the Director General of the IAEA”, supra note 3.

60. Conde, M. and G. Kallis, supra note 2.

61. *Ibid.*

new and varied potential uranium mining locales. However, concerns over non-proliferation vulnerabilities have arisen as a result of the potential increase in uranium resource markets, since new sources of uranium could potentially go to small domestic centrifuge enrichment programmes in other countries. Multilateral approaches to the nuclear fuel cycle are one way to address the concerns related to sensitive technologies and to ensure that all states have the chance to exercise their “inalienable right” to the peaceful uses of nuclear energy without the risk of a proliferation of uranium used for military purposes. For many uranium mining states, this will be a consideration for the future.

In the meantime, it remains clear that there is an adequate demand for the mining of ore, and ever-improving standards and accountabilities in the uranium mining market, will ensure safe and sustainable industry practices.

Turkish nuclear legislation: Developments for a nuclear newcomer

by *Erinç Ercan and Horst Schneider**

Turkey's current and future economic growth is estimated by OECD "to rise to above 3% in 2013 and, as the global recovery gathers strength, to pick up to 4.5% in 2014". The energy situation, particularly, in the electricity sector with supply from different energy sources and a high rate of importation has led to recognition by the Turkish government of a need for nuclear energy. The Turkish Ministry of Energy and Natural Resources has declared that:

Turkey's energy policy principally aims at: making energy available for the consumers in terms of cost, time and amount, exploiting public and private facilities within the framework of free market practices, discouraging import dependency, securing a strong position for our country in regional and global trade of energy, ensuring the availability of diversified resources, routes and technologies, ensuring maximum use of renewable resources, increasing energy efficiency [and], minimising negative environmental impact while producing and using energy and natural resources.¹

At the same time, nuclear energy is deemed to have positive environmental aspects and to promote technological development – the overall goal is to secure electricity supply at affordable costs for economic and private consumption. The concrete goal for electricity production by nuclear power plants (NPPs) in Turkey until 2023 is 4% of primary energy production. At the end of the foreseen development, 12 NPPs are planned to operate in Turkey at three sites.²

Turkey's nuclear history dates back to the 1950s. A research reactor operated from 1962-1977, which was followed by an additional reactor in 1984 but no commercial NPP has been licensed up to now. Therefore, it is of interest to

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1. OECD: Turkey – Economic forecast summary (May 2013), available at: www.oecd.org/economy/turkeyeconomicforecastsummary.htm (accessed 28 July 2013); Enerji ve Tabii Kaynaklar Bakanlığı (ETKB), available at: www.enerji.gov.tr/index.php?dil=en&sf=webpages&b=enerji_EN&bn=215&hn=&nm=40717&id=40717 (accessed 10 July 2013); 10th Development Plan for Turkey (2014-2018), submitted by Prime Minister Recep Tayyip Erdoğan on 13 June 2013 to the Turkish Grand National Assembly, p.117, No.781 and No.784, available at: http://pbk.tbmm.gov.tr/dokumanlar/10-kalkinma_plani.pdf (accessed 27 July 2013). The Governor of the Central Bank of the Republic of Turkey expects an economic growth rate of 3-4%. "Announced year-end growth forecast" (27 August 2013), TRT Haber, available at: www.trthaber.com/haber/ekonomi/yil-sonu-buyume-tahmini-aciklandi-98756.html (accessed 27 August 2013). However, the Turkish economy has been criticised because of its high level of indebtedness. Interview of Öztürk, A., in Tavşanoğlu, L. (27 August 2013), "The sixth most indebted country in the world, Turkey", Cumhuriyet, available at: www.cumhuriyet.com.tr/?hn=437422&kn=9&ka=4&kb=9 (accessed 27 August 2013).
2. For the Turkish government's intentions, see 10th Development Plan for Turkey (fn.1), p.117, No.781 and pp.118-119, No.790, and Republic of Turkey Ministry for Energy and Natural Resources, Budget Presentation for the Year 2013 by Minister Taner Yıldız at the Turkish Grand National Assembly on 15 December 2012, p.6, (in Turkish only), available at: www.enerji.gov.tr/yayinlar_raporlar/2013_Genel_Kurul_Konusmasi.pdf (accessed 27 July 2013).

understand to what extent nuclear legislation and nuclear safety technology for NPPs are already available or underway in Turkey. Moreover, the organisational structure, especially of the regulatory body, has to be examined in detail in order to conclude how far Turkey meets its obligations and commitments, which are laid down in the Convention on Nuclear Safety (CNS), and to understand in which areas Turkey has transposed Euratom legislation, being *acquis communautaire* of the European Union (EU). The European Commission has stated that adoption by Turkey “of a framework nuclear law, which would ensure a level of nuclear safety in full compliance with EU standards” remains outstanding; yet the necessity of nuclear safety is clearly underlined by Turkey’s Minister of Energy and Natural Resources.³

The pathway to nuclear energy in Turkey in the past decade has been rather accelerated by the Turkish government, which has envisaged three sites that were already determined, in principle, in the 1960s. For the Mersin-Akkuyu site on the Mediterranean coast in the south of Turkey, a site licence was approved in 1976, which is deemed still valid by Turkish authorities. On 12 May 2010, the “Agreement on Cooperation in Relation to the Construction and Operation of a Nuclear Power Plant at the Akkuyu Site in the Republic of Turkey” was concluded between the governments of Turkey and Russia. The first of four reactors is to start operation in 2020 and from then onwards, each year one additional reactor is planned to begin operation until 2023, with a total site capacity of 4 800 MWe.⁴ At the second site, Sinop-İnceburun, on the northern Black Sea coast of Turkey, four reactors - ATMEA1 - will be constructed by Japanese Mitsubishi, together with the French company AREVA on the basis of a Turkish-Japanese Agreement of 3 May 2013. The first reactor is likely to start operation in 2023.⁵ Site investigations will soon begin for the third site, most likely at Kırklareli-İğneada, on the Black Sea coast in the north-west of Turkey (Thrace).⁶

The scope of legal investigation in this article focuses on nuclear legislation with regard to siting, construction, operation and decommissioning of NPPs, taking into account the main issues of nuclear safety, security, safeguards, radiological protection and nuclear third party liability. The state of existing legislation and, furthermore, of drafts published or announced related to substantive regulations and organisational aspects are at the centre of this article. International conventions and agreements, national legislation consisting of the constitution, laws, decrees and regulations as binding norms and otherwise, directives and non-binding guides provide the legal structure for nuclear activities. The evaluation of Turkish nuclear

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3. European Commission (10 October 2012), “2012 Turkey Progress Report”, Document SWD(2012) 336 final, Chapter 15: Energy, p.62, available at: http://ec.europa.eu/enlargement/pdf/key_documents/2012/package/tr_rapport_2012_en.pdf (accessed 28 July 2013); Remarks of Minister of Energy and Natural Resources Taner Yıldız, “Akkuyu ve Sinop’ta yapılacak nükleer santraller için her türlü tedbiri alacağız” TRT Türk (in Turkish only), available at: www.trtturk.com.tr/haber/yildiz-akkuyu-ve-sinopta-yapilacak-nukleer-santraller-icin-her-turlu-tedbiri-alacagiz.html, and “4 Ülkeden Birini Seçeceğiz” (20 October 2012), TRT Haber, available at: www.trthaber.com/haber/ekonomi/4-ulkeden-birini-sececegiz-60284.html (accessed 28 July 2013).
 4. See 10th Development Plan for Turkey (fn.1), p.117, No.781.
 5. See fn.4.
 6. Remarks of Minister of Energy and Natural Resources Taner Yıldız, “Bakan Yıldız açıkladı: ‘3. nükleer santralin yeri için İğneada adaylardan biri’” Gazete Trakya (in Turkish only), available at: www.gazetetrakya.com/Haber-Bakan_Yildiz_acikladi_3_nukleer_santralin_yeri_icin_igneada_adaylardan_biri-986952.gazetetrakya (accessed 28 July 2013); 10th Development Plan for Turkey (fn.1), p.119, No.790.

legislation⁷ with regard to the accomplishment of the obligations under, in particular, the CNS and Euratom directives, leads finally to the perspective on the specific issues that should be addressed in the regulation of nuclear energy for Turkey's future energy needs and to ensure conformity with international standards of the International Atomic Energy Agency (IAEA) and the OECD Nuclear Energy Agency (NEA).

A brief discussion of Turkish energy legislation and institutional structure is necessary, because NPPs also need a licence for electricity production under Turkey's energy legislation. The Turkish government is aiming for greater privatisation in the energy sector. The current electricity market is governed, on the one hand, by the Electricity Market Law and Electricity Market License Regulation, which requires NPPs to have an electricity production licence and, on the other hand, by specific institutions.

In terms of the Electricity Market Law, private legal entities who wish to obtain an electricity generation licence (Article 2, paragraph 1 and Article 3, paragraph 1(c) no.1, together with Article 6 (a) of the Electricity Market License Regulation) must "be established as incorporated or limited liability companies in accordance with the provisions of the Turkish Commercial Law" (Article 2, paragraph 3).

The relevant institutions in Turkey's energy sector include: the Energy Market Regulatory Authority (EPDK, *Enerji Piyasası Düzenleme Kurumu*), which grants electricity production licences; the Turkish Electricity Distribution Company (TEDAŞ, *Türkiye Elektrik Dağıtım A.Ş.*), involved in electricity distribution and trade "in accordance with principles of productivity and profitableness"; the Turkish Electricity Trading and Contracting Company Inc. (TETAŞ, *Türkiye Elektrik Ticaret ve Taahhüt A.Ş.*), which engages in trading and contracting during the period of transition to an electricity market system; the state-owned Electricity Generation Company (EÜAŞ, *Elektrik Üretim A.Ş.*), which was established "to generate electricity in compliance with the energy and economic policies of the state and in accordance with the principles of efficiency and profitability" and with the "mission ... to generate reliable, economical, [qualitative], environmentally friendly energy by using the resources in our country efficiently so as to increase the public welfare"; and the Turkish Electricity Transmission Company (TEİAŞ, *Türkiye Elektrik İletim A.Ş.*) which, since 2001, deals with transmission facilities in the country and carries out the planning of load dispatch and operation services "acting in compliance with the new market structure depending upon the transmission license obtained from Electricity

7. Turkish nuclear legislation is available through several international institutions, particularly IAEA (2012), "Country Nuclear Power Profiles, 2012 Edition, Turkey (updated 2012)", available at: www-pub.iaea.org/MTCD/Publications/PDF/CNPP2012_CD/country_profiles/Turkey/Turkey.htm (accessed 28 July 2013); OECD/NEA (2008), "Nuclear legislation in OECD countries: Turkey", available at: www.oecd-nea.org/law/legislation/turkey.pdf (accessed 28 July 2013); World Nuclear Association (WNA) (2013), "Nuclear Power in Turkey", available at: www.world-nuclear.org/info/Country-Profiles/Countries-T-Z/Turkey/ (accessed 28 July 2013).

Market Regulatory Authority (EMRA [EPDK]) on [13 March] 2003". An Energy Stock Exchange is being developed in Turkey.⁸

A. Nuclear legislation as a substantial legal framework for NPPs in Turkey

International conventions and agreements, as well as international co-operation

Turkey has been a member of the IAEA since 1957 and adheres to the following conventions: the Paris Convention on Third Party Liability in the Field of Nuclear Energy; the Treaty on the Non-Proliferation of Nuclear Weapons (NPT); the Convention on the Physical Protection of Nuclear Material (but not the Amendment to the Convention of 8 July 2005); the Convention on Early Notification of a Nuclear Accident; the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency; the Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention; the CNS; and the International Convention for the Suppression of Acts of Nuclear Terrorism.

Turkey has concluded bilateral agreements on nuclear co-operation particularly with Canada, China, Finland, France, Japan, Russia and the United States of America. Turkey has not yet ratified: the Protocol of 2004 to the Paris Convention; the Brussels Supplementary Convention and its Protocol of 2004; the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management of 12 September 1997; and the Amendment to the Convention on the Physical Protection of Nuclear Material of 8 July 2005. However, ratification of the latter two conventions is expected in the near future. Since the Espoo Convention, as well as the Aarhus Convention are of importance to the consideration of

8. Electricity Market Law, No.4628, adopted 20 February 2001, published in the Official Gazette (OG) No.24335 (3 March 2001), version in English available at: www.emra.org.tr/index.php/electricity-market/legislation (accessed 30 July 2013). See also Republic of Turkey, Turkish Atomic Energy Authority (September 2010), "National Report for the Convention on Nuclear Safety, Report No.5, A Full Report to the Fifth Review Meeting of Nuclear Safety Convention", p.6 (Electricity Market Law) and p.9 (license from Energy Market Regulatory Authority); Republic of Turkey, Turkish Atomic Energy Authority (August 2013), "A Full Report to the 6th Review Meeting of Nuclear Safety Convention", p.11 (Electricity Market Law) and p.13 (license from Energy Market Regulatory Authority), available at: www.taek.gov.tr/en/belgeler-formlar/documents/reports/Turkeys-National-Report-to-Sixth-Meeting-of-Convention-on-Nuclear-Safety/; Electricity Market License Regulation (Elektrik Piyasası Lisans Yönetmeliği), OG No.24836 (4 August 2002), actual version as of 31 January 2013, (in Turkish only), available at: www.epdk.org.tr/index.php/elektrik-piyasasi/mevzuat?id=74 (accessed 30 July 2013). For institutions see EPDK, available at: www.epdk.gov.tr/ (28 July 2013); TEDAŞ, available at: www.tedas.gov.tr/en/Pages/AboutUs.aspx (accessed 28 July 2013); TETAŞ, (in Turkish only), available at: www.tetas.gov.tr/dynamic_large.aspx?values=misyon-vizyon.htm&mainmenuid=0&mainsubmenuid=14&setdeger=0&pagesid=0&categorysid=5 (accessed 28 July 2013); EÜAŞ available at: www.euas.gov.tr/Sayfalar/Eng/Hakkimizda.aspx (accessed 28 July 2013); TEİAŞ, available at: www.teias.gov.tr/eng/CompanyBrief.aspx (accessed 28 July 2013). On the Energy Stock Exchange (Enerji Borsası yolda), Minister Yıldız is reported discussing the "Enerji Piyasaları İşletim AŞ" (in Turkish only), "Enerji Borsası yolda" (17 July 2013), TRT Haber (in Turkish only), available at: www.trthaber.com/haber/ekonomi/enerji-borsasi-yolda-93955.html (accessed 28 July 2013). The establishment of the Energy Stock Exchange (Enerji Piyasaları İşletme A.Ş.) was to be announced in September 2013. "Enerji Borsası'nda sona yaklaşıldı" (27 August 2013), TRT Haber available at: www.trthaber.com/haber/ekonomi/enerji-borsasinda-sona-yaklasildi-98784.html (accessed 29 August 2013).

environmental aspects of the licensing of NPPs and to public participation, it should be noted that Turkey has not ratified these two conventions.⁹

Special bilateral agreements on specific projects at Mersin-Akkuyu and Sinop-İnceburun sites have been concluded between Turkey and Russia (12 May 2010) and Turkey and Japan (3 May 2013). The Turkish-Russian agreement states for the licensing of NPPs: “The NPP shall be licensed and inspected in accordance with the laws and regulations of the Republic of Turkey in terms of nuclear safety and radiation protection” (Article 8, paragraph 1). Regarding nuclear third party liability: “Third party liability for nuclear damage, which may arise in connection with cooperation under this Agreement will be regulated in compliance with the international agreements and instruments to which the Republic of Turkey is or will be a party and national laws and regulations of the Turkish Party”.¹⁰ Therefore, it can be concluded that this agreement does not create any legal obligation of its own in regard to nuclear safety, security, safeguards, radioprotection and nuclear third party liability requirements. The 2007 legislation, particularly Law No.5710, together with criteria and regulation, was not followed by the Turkish government and competent authorities in order to engage NPP companies at the Mersin-Akkuyu site (2010) nor at the Sinop-İnceburun site (2013).¹¹

International conventions and agreements transposed into Turkish law have the effect of domestic law (“International agreements duly put into effect bear the force of law.”) but in cases of contradiction, international legislation is overriding. According to the Constitution of the Republic of Turkey, “In the case of a conflict between international agreements in the area of fundamental rights and freedoms duly put into effect and the domestic laws due to differences in provisions on the same matter, the provisions of international agreements shall prevail.”¹²

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9. See Turkish Atomic Energy Authority website “Agreements”, available at: www.taek.gov.tr/en/international/agreements.html (accessed 28 July 2013). For the Espoo Convention, see 1989 UNTS 309, available at: http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-4&chapter=27&lang=en (accessed 28 July 2013); for the Aarhus Convention, see 2161 UNTS 447, available at: http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-13&chapter=27&lang=en (accessed 28 July 2013). However, Turkey has decided on “the adoption of the EU Acquis” (Republic of Turkey (August 2013) (fn.8), p.11, No.4.1.1 and, therefore, will have to be in line with these conventions in substance. For the ratification process concerning the conventions on physical protection and radioactive waste issues, see Republic of Turkey (August 2013) (fn.8), p.3, No.2.2.
 10. Agreement Between the Government of the Republic of Turkey and the Government of the Russian Federation on Cooperation in Relation to the Construction and Operation of a Nuclear Power Plant at the Akkuyu Site in the Republic of Turkey, Article 16, OG No.27721 of 6 October 2010 (also in English).
 11. See 10th Development Plan for Turkey (fn.1), p.117, no.781 and pp.118-119, no.790 regarding the Sinop-İnceburun site. Explanations on Law No.5710 are given by Ercan, E. and H. Schneider (publication forthcoming 2014), “Turkey as a Newcomer in Nuclear New Build – Turkey’s Development in the Field of Nuclear Energy and a Systematic View on Progress Particularly in Nuclear Legislation”, in Raetzke, C. (ed.), Nuclear Law in EU and Beyond – Nuclear Safety; New Build and Phase Out, Proceedings of the 13th German International Nuclear Law Association (INLA) conference, Nomos Verlagsgesellschaft, Baden-Baden, Chapters 3.3.1-3, 5.1.
 12. Constitution of the Republic of Turkey, Article 90, paragraph 5, sentences 1 and 3 (voted as Law No.2709 on 7 November 1982, OG No.17874, 20 November 1982), version in English available at: www.byegm.gov.tr/content.aspx?s=tcotrot (published by the Prime Ministry) or www.constitution.org/cons/turkey/turk_cons.htm (accessed 27 July 2013).

National legislation

The legal structure in Turkey consists, in general, of the constitution, laws including international instruments (conventions, bilateral agreements) transposed into Turkish legislation, decrees and regulations, directives and guides. The Turkish Atomic Energy Authority (TAEK) also issues decisions, recommendations and internal directives.¹³ Decrees are issued by the Council of Ministers (Article 115 of the Constitution), whilst regulations are issued by “the Prime Ministry, the ministries, and public corporate bodies ... in order to ensure the application of laws and regulations” (Article 124 of the Constitution). TAEK issues regulations relating to their particular fields of operation, provided that they are not contrary to these laws and regulations (Article 124 of the Constitution). Thus, under the Constitution, decrees are above regulations in the hierarchy of norms; the most important regulations are those issued by the Prime Ministry, whilst regulations issued by public corporate bodies, such as TAEK as the nuclear regulatory body in Turkey, are the most inferior.

Decrees and regulations as binding norms are complemented by directives and guides, which are issued by administrative bodies to provide additional details on the implementation of decrees and regulations but which may not contradict them. These directives and guides may constitute more than the self-commitment of the administrative body and can also effectively bind external bodies, particularly the applicant for a licence.¹⁴

TAEK regulations in accordance with Article 124 of the Constitution and TAEK’s directives and guides¹⁵ build important and substantial elements of nuclear legislation in Turkey. The legal effect of Russian regulations and rules mentioned several times by TAEK in “A Full Report to the 6th Review Meeting of Nuclear Safety Convention” is not clear. However, these regulations and rules may be binding according to the requirements of applicable safety legislation for NPPs in Turkey under the “Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants”, even though the obligatory translation of the Russian texts into Turkish language is not expressly declared by TAEK.¹⁶

The Constitution is relevant to nuclear legislation in regard to regulation of fundamental rights and duties (Articles 43, 49, 50 and 56) and legal, administrative and judicial aspects (Articles 88, 90, 91, 104, 115, 123-125). Existing Turkish laws do not regulate the substantive safety requirements for NPPs to be taken into account

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13. This presentation on Turkish nuclear law follows English terminology used by TAEK in “Republic of Turkey” (August 2013, fn.8), p.10, whilst in the Constitution’s English version (fn.12) a different terminology exists (Article 115 “regulation” whilst TAEK uses “decree” and Article 124 “by-law” whilst TAEK uses “regulation”). Republic of Turkey (August 2013), (fn.8), p.10, includes regulations and safety guides as “Mandatory or Guidance” and “Regulatory Policy Decisions and Recommendations”, whilst directives are neither mentioned nor registered in Annex II on pp.67-68. However, a concrete directive is explained, for example, on p.16. Furthermore, internal directives are mentioned (p.38) but not available on TAEK’s homepage, nor are they referred to in Annex II (p.67-68).
 14. Kuluçlu, E., (2008) “Türk Hukuk Sisteminde Normlar Hiyerarşisi ve Sayıştay Denetimine Etkileri”, *Sayıştay Dergisi*, Sayı, Vol.71, p.7, paragraph 4. The directives and guides are classified as administrative activities and are subject to judicial review (p.17).
 15. The Atomic Energy Commission (AEC) as an administrative organ of TAEK exercises important functions according to Law No.2690 on the establishment of TAEK.
 16. See Republic of Turkey (August 2013) (fn.8), p.16, no.4.3 and p.61. However, it is indicated with regard to the Akkuyu NPP project: “According to Turkish legislation, the formal language of communication is Turkish.” *Ibid.*, p.28. See fn.33 for the directive. See fn.30 for the “List of Licensing Basis for Akkuyu Nuclear Power Plant, Revision 1”.

within the licensing procedure, such as those that can be found, for example, in the German Atomic Energy Act (Section 7, paragraph 2, no.3) in the Swiss Nuclear Energy Act (Article 4) and in the French Nuclear Transparency and Safety Act (Article 29, paragraph 1, sentence 1).¹⁷ Since Law No.3154 regulating the Ministry of Energy and Natural Resources (ETKB) is not at all clear in regards to administrative nuclear acts and activities and Law No.2690 on the establishment of TAEK only establishes TAEK competences, at best Law No.5710, together with “Criteria to be Met by Investors Who Will Construct and Operate Nuclear Power Plants” and the Regulation on Procedures and Principles with regard to Law No.5710, could provide the basis for general or perhaps even detailed safety requirements for NPPs. Indeed Law No.5710 was established and evaluated as a crucial nuclear law.¹⁸ It aims at providing, “in accordance with the energy plan and policy, the procedures and principles for the construction and operation of nuclear power plants and the sale of energy from those plants” (Article 1) and consequently does not create individual obligations for NPP owners already regulated under other legislation, particularly in the Decree on Licensing of Nuclear Installations (1983). However, Law No.5710 was partly cancelled by the Constitutional Court and the Council of State in such a way as to pose the question as to whether this law could still be executed to meet the entire scope of legislative goals. The law was not executed because the only tender with one applicant was withdrawn and afterwards international bilateral agreements

17. Germany (Atomgesetz – German Atomic Energy Act – Act on the Peaceful Utilization of Atomic Energy and the Protection against its Hazards of December 23, 1959), Switzerland (Kernenergiegesetz – KEG – Nuclear Energy Act – NEA – of 21 March 2003 together with the Kernenergieverordnung – KEV – of 10 December 2004), France (Loi no.2006-686 du 13 juin 2006 relative à la transparence et à la sécurité en matière nucléaire; see Léger, M. and Grammatico, L. (2006), “Nuclear Transparency and Safety Act: What Changes for French Nuclear Law”, *Nuclear Law Bulletin*, No.77, Vol.2006/1, OECD/NEA, Paris, pp.7-25. For the safety philosophy in Turkey see TAEK, Nükleer Santrallarda Güvenlik Felsefesi ve Güvenlik Sistemleri (in Turkish only), available at: www.taek.gov.tr/belgeler-formlar/yayinlar/brosurler/ (accessed 28 July 2013).
18. Law No.5710 was published in OG No.26707 (21 November 2007); unofficial translations in English and French are available at *Nuclear Law Bulletin*, No.80, Vol.2007/2, OECD/NEA, Paris, pp.105-110 (English) and pp.109-114 (French). For remarks on the draft, see Ercan, E. (2007) “Die Energiepolitik der Türkei mit besonderem Augenmerk auf die Kernenergie”, atw - International Journal for Nuclear Power, Issue 1 – January, INFORUM Verlags- und Verwaltungsgesellschaft mbH, Berlin, pp.18-19. For the evaluation of this law see for example, Kuzeyli, K. (2012), “The Akkuyu Nuclear Power Plant Project – Risks and Obligations Under Nuclear Law”, Thesis, the University of Dundee, pp.2 et seq; Gürbüz, M. (2012) “An Evaluation of Turkey’s Nuclear Energy Journey in Light of the Discussions Regarding Nuclear Reactors’ Safety in the World”, *Enerji Hukuku Dergisi*, Volume 2012/2, pp.17-21; Centre for Economics and Foreign Policy Studies (2011), *The Turkish Model for Transition to Nuclear Power*, Istanbul, p.126, available at: www.edam.org.tr/EDAM/Nukleer/edamreport.pdf (accessed 12 August 2013); Kılıç, H. (2012) “Nükleer Güç Santrallerinin Kurulmasının ve İşletilmesinin Hukuki Altyapısının Değerlendirilmesi”, İCCİ 2012 Proceedings Book, Sektörel Fuarçılık Ltd. Şti, İstanbul, pp.83-86 (Summary on p.86 in English), available at: www.icci.com.tr/dosya/icci_2012_bildiriler_kitabi_36174.pdf (accessed 29 July 2013) and Özdemir, H.E. (2012), “Nükleer Güç Santrallerinin Kurulmasına İlişkin Hukuki Esaslar, On İki Levha Yayıncılık, İstanbul, pp.12-62 and pp.78-79. The instruments complementing Law No.5710 are the “Criteria to be Met by Investors Who Will Construct and Operate Nuclear Power Plants” of 19 December 2007 issued by TAEK, available at: www.taek.gov.tr/belgeler-formlar/func-directinfo/94/ (accessed 12 August 2013), and the Regulation on Procedures and Principles with regard to Law No.5710 (in Turkish only), “Nükleer Güç Santrallerinin Kurulması Ve İşletilmesi İle Enerji Satışına İlişkin Kanun Kapsamında Yapılacak Yarışma ve Sözleşmeye İlişkin Usul ve Esaslar İle Teşvikler Hakkında Yönetmelik”, voted by the Council of Ministers on 10 March 2008 and published in OG No.26821 of 19 March 2008. The Regulation does not deal with nuclear safety topics. The Criteria and the Regulation are mentioned in Article 3, paragraph 3 of Law No.5710.

were concluded for NPPs at Mersin-Akkuyu and Sinop-İnceburun sites in 2010 and 2013 respectively.¹⁹ Law No.2690 on the establishment of TAEK is actually the only relevant Turkish nuclear law.²⁰ This law establishing TAEK as the nuclear regulatory body is crucial for the understanding of Turkish nuclear law in force, particularly with regard to NPPs' site, construction and operation licences, although this law provides no legal basis for specific administrative acts (especially licences and enforcement acts). Moreover, no specific regulation can be found with substantial requirements or criteria for nuclear safety and security. In accordance with Article 123 (1) and (3) of the Constitution, TAEK is established as a state authority and is provided with clearly defined competences by a law voted by the Turkish Grand National Assembly. The law's objective is "to render the peaceful use of atomic energy in Turkey for the benefits of state" and, therefore, "to determine and recommend the basic principles and policies, to implement, organize, support, coordinate and control the scientific, technical and administrative studies and affairs" (Article 1). Although the issuance of a draft nuclear law was unofficially announced in 2009 and the law expected to enter into force in 2010, the draft law mentioned in Turkey's CNS Review Report of September 2010 was publicly not available, nor the fundamentals known or details noted for the "Draft Nuclear Energy and Radiation Law"²¹ announced in August 2013.

Details on nuclear safety of NPPs are set out in decrees and regulations referred to in Articles 115 and 124 of the Constitution and directives and guides predominantly based on Law No.2690. These specify requirements for design and operation, licensing, improvement, supervision/control/inspection, de-commissioning, security, safeguards/non-proliferation issues of physical protection, combating trafficking, terrorism and radiation protection (transport, radioactive waste management, storage facilities and final disposal). Nuclear third party liability requirements are included in principle since specific Turkish legislation on nuclear third party liability does not yet exist.²² Environmental protection, such as the provision for an environmental impact assessment (EIA), is a separate legal matter.

The Decree on Licensing of Nuclear Installations of 1983 is unchanged and still in force. NPPs are subject to three licensing steps: a site licence, construction licence

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19. See Ercan, E. and H. Schneider (fn.11), Chapter 3.3.1. TAEK refers to Law No.5710 in regard to "main principles, related to decommissioning and Radioactive Waste accounts" and "Payments to the Decommissioning and Radioactive Waste management accounts" but does not specify this law as a law "Concerning the Safety of Nuclear Installations". See Republic of Turkey (August 2013), (fn.8), p.27 sections 8.1.2.-8.1.3 and p.67 (Annex II).
 20. This is officially stated in Republic of Turkey (August 2013), (fn.8), on the one hand, at pp.11, 13, 18 and 22-23 where Law No.5710 is not referred to as a law establishing safety regulation and on the other hand, at p.67 Annex II, where Law No.2690 is shown as a law "Concerning the Safety of Nuclear Installations". Law No.2690 was published in OG No.17753 of 13 July 1982, an English version is available at: www.taek.gov.tr/en/belgeler-formlar/documents/law/ (accessed 29 July 2013).
 21. Republic of Turkey (September 2010), (fn.8), pp.12, 14 and 17-19 with regard to Articles 9, 12, 17 and 19 of the CNS. The drafting of such a law was mentioned in TAEK's Annual 2010 and 2011 Activity Reports (fn.27), p.35 and p.45 but not in TAEK's Annual 2012 Activity Report, see pp.43-44, nor in Republic of Turkey, Turkish Atomic Energy Authority (May 2012), "National Report for the Second Extraordinary Meeting of Convention on Nuclear Safety", pp.18-22. On the contrary, it is referred to several times in Republic of Turkey (August 2013), (fn.8), for example, pp.2-3, Section 2.2 ("Draft Nuclear Energy and Radiation Law" planned to be submitted to the Prime Minister by the end of December 2013) and pp.11, 16, 22, 24 and 25 with regard to Articles 7, 8, 9 and 10 of the CNS. For the unofficial announcement of TAEK having issued a draft nuclear law see *Nuclear Law Bulletin*, No.83, Vol.2009/1, OECD/NEA, Paris, p.109.
 22. See Ercan, E. and H. Schneider (fn.11), Chapter 3.3.8.

and operation licence (Article 8).²³ In addition, according to Article 6, in order to construct and operate a NPP, a company has to apply for a licence which TAEK considers as a separate licence to be obtained before the site licence.²⁴ With regard to requiring a separate licence (Article 6; “the applicant has to submit ... documents ... describing his technical and financial abilities.”), it should be noted that: 1. two requirements of Article 6 are also reflected in Article 9.1 and 9.2 (information in the site licence application on “the nuclear reactor facility” and “the technical capability”), 2. Articles 35 (revoking of the licence), 54 and 55 seem inapplicable (Article 6 earmarks no “license conditions” and does not refer to the remaining provisions of Article 35) and 3. Article 6 does not contain any obligation for the owner to inform TAEK on changes in “his technical and financial abilities”. Corresponding requirements can be found in other articles of the decree. For example, Article 14.9 and 14.11; Article 23.5 (Documents for the Commissioning Permit “related to the adequacy and organization of commissioning personnel”); Article 26.3 and lastly in Article 34, paragraph 1, under which “It is compulsory that the applicant should provide regular and periodical training for his licensed operating staff and submit related reports and operating reports to the Authority” (“Authority” means TAEK). The short stage between application and issuing of a licence, according to Article 6 (21 days), for Akkuyu Project Company may depend on Article 5 (Project Company) and Article 6 (Implementation of the Project) of the Turkish-Russian Agreement of 12 May 2010, based on strong support from the Russian Government. Lastly, it remains unclear whether this licence may precede a positive EIA decision.²⁵

The Decree on Licensing of Nuclear Installations subdivides the licensing procedures for construction and for operation into separate permits: limited work permit, commissioning permit, fuel loading and pre-operational test permit, full power operating permit necessary for the final licences for construction and operation (Articles 13-21 and 22-35). The operation licences allow unlimited operation without periodic safety assessment at fixed stages. The applicant for a licence has to submit documents and reports, which are reviewed by the Advisory Committee on Nuclear Safety, which advises TAEK’s nuclear safety department. The department prepares an evaluation report submitted by TAEK’s vice president together with a report to the president of TAEK, who provides these reports

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23. OG No.18256 of 19 December 1983; unofficial English translation available at: www.taek.gov.tr/en/belgeler-formlar/documents/Regulations/nuclear-safety/ (accessed 29 July 2013). The decommissioning stage is not defined in the Decree but “will be addressed in Draft Nuclear Energy and Radiation Law” – see Republic of Turkey (August 2013), (fn.8), p.16, Section 4.3.
24. See TAEK, “Akkuyu Nükleer Santral Lisanslama”, “Adım/Kurucu olarak tanınma/28 şubat 2011”, available at: <http://www.taek.gov.tr/nukleer-guvenlik/nukleer-enerji-ve-reaktorler/165-akkuyu-nukleer-guc-santrali/429-akkuyu-nukleer-santral-lisanslamasi.html>, and TAEK, “Feb.7th, 2011: APC applied to TAEK for being recognized as an owner, according to the Article 6 of the Decree on Licensing of Nuclear Installations. Feb. 28th, 2011 TAEK recognized APC as the owner”, available at: www.taek.gov.tr/en/institutional/akkuyu-nuclear-power-plant.html (accessed 12 July 2013). Furthermore, Article 4, paragraph 1(a) together with Article 7, paragraph 1, sentence 1 of the Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants and Özdemir, H. E. (fn.18), p.159, fn.151; Republic of Turkey (September 2010) (fn.8), p.8, and Republic of Turkey (August 2013), (fn.8), pp.2 and 8. See Ercan, E. and H. Schneider (fn.11), Chapter 3.3.4.1, fn.93, for another interpretation of Article 6, whilst Stoiber, C. et al. (2010), Handbook on Nuclear Law: Implementing Legislation, IAEA Publication 1456, IAEA, Vienna, p.60, propose such a licence (available at: www-pub.iaea.org/MTCD/Publications/PDF/Pub1456_web.pdf).
25. See Republic of Turkey (September 2010), (fn.8), p.9; Republic of Turkey (August 2013) (fn.8), p.14, no.4.1.7 and Özdemir, H. E. (fn.24), pp.173 et seq.

to the Atomic Energy Commission (AEC). The AEC then determines the adequacy of the evaluation report and a decision is then released to the applicant by TAEK. Licence revocation is referred to in Article 35.

After the operation licence has been granted, a permit from TAEK is needed for “required modifications at a nuclear installation” (Article 55, “Modifications at the Installation”). Therefore, a condition of an operating licence is that “no modifications can be made in nuclear reactor facility, in the operating limits and conditions, and operating instructions and procedures without having obtained the permission of the Authority” (Article 32.3), which refers to administrative control of changes after a licence has been approved.²⁶ The applicant has to submit a report “stating the nature of intended changes, the reasons, and confirming that the safe operation of the installation shall in no way be impaired” (Article 55, sentence 2). Approvals are granted by TAEK based on the decision of AEC (Article 55, sentences 6 and 7). A re-start operation permit is necessary for a nuclear installation of which the operating licence was temporarily revoked (Article 54). Articles 51-53 refer to inspection procedures but the Regulation of Nuclear Safety Inspections and Enforcement, which came into force in 2007 and was modified in 2008, provides more specific guidance on inspections. Article 7 of the Decree on Licensing of Nuclear Installations requires “insurance or other financial guaranties according to the Paris Convention”. The decree does not regulate the validity of licences issued before the date of decree enforcement (Article 58); therefore, the validity of the site licence issued in 1976 for the Akkuyu site and transferred to Akkuyu Project Company may be of legal concern.

For radiological protection the Radiation Safety Decree of 1985 has not been changed and is still valid and applicable to NPPs; consequently, NPPs not only need licences, according to the Decree on Licensing of Nuclear Installations but also for radiation safety issues (Article 7). The Regulation on Radiation Safety, which was last changed in 2010 and meets Euratom standards, is not applicable to NPPs (Article 2, paragraph 2). The Regulation on Protection of Outside Workers in Controlled Areas from the Risks of Ionizing Radiation, published in the Official Gazette (OG) No.27698 of 18 June 2011, is valid also for controlled areas in NPPs, but for workers inside NPPs there remains a gap. A new “Decree on Radiation Protection” is said to have been drafted. The draft is planned to be finalised before the end of 2014 but is not yet published. Furthermore, it is not known whether a separate licence for radiation protection will still be obligatory.²⁷

26. For “the construction and erection phase” Article 21.4 provides: “Any modification in the facility which might affect safety is subjected to the approval of the Authority” (TAEK). Details on the procedure for an approval are not specified. However, Article 21.2 stipulates for “changes ... required due to safety” that “the conditions of the construction license may be modified ...”.

27. See Radiation Safety Decree, OG No.18861 (7 September 1985), English version available at: www.taek.gov.tr/en/belgeler-formlar/documents/Regulations/radiation-safety/Radiation-Safety-Decree/ (accessed 29 July 2013); Regulation on Radiation Safety, OG No.20983 (6 September 1991), abolished by new Regulation on Radiation Safety, OG No.23999 (24 March 2000), most recently revised by regulation, OG No.27600 (3 June 2010), English version available at: www.taek.gov.tr/en/belgeler-formlar/documents/Regulations/radiation-safety/ (accessed 29 July 2013); Regulation on Protection of Outside Workers from the Risks of Ionizing Radiation in Controlled Areas, OG No.27698 (18 June 2011), English version available at: www.taek.gov.tr/en/belgeler-formlar/func-startdown/757/ (accessed 29 July 2013); Ercan, E. and H. Schneider (fn.11), Chapters 3.3.4.2 and 3.3.5.1, including the subject of workers inside NPPs with reference to Limoncuoğlu, S. A. (2012), “The Missing Part of Nuclear Power Plant Regulations in Turkey: Occupational Health and Safety”, *Mediterranean Journal of Social Sciences*, Vol.3, No.6, March, pp.123-128 (Chapter 3.2, second paragraph, third sentence). For the announced Decree on Radiation Protection see

Regulations pursuant to Article 124 of the Constitution were put into force for the first time or modified regulations were issued after Law No.5710 had been voted in the Turkish Grand National Assembly in November 2007.²⁸ The Regulation on Specific Principles for Safety of Nuclear Power Plants and the Regulation on Design Principles for Safety of Nuclear Power Plants were published in OG No.27027 of 17 October 2008 and are based on Article 4, paragraph 1 (e) of Law No.2690. The first regulation deals with technical matters, such as site evaluation, which is referred to in Articles 5-8: external factors affecting the plant, radiological impact of the plant, feasibility of emergency plans and ultimate heat sink. Design, manufacturing and construction are covered in Articles 9-14, which include general design basis, quality assurance in design, proven technology, design features, safety assessment of design and provision of quality. Articles 15-18 refer to organisational components, for example, “a commissioning programme” involving “control of physical and functional characteristics of structures, systems and components” (Article 15). Baseline data collection is also featured. Concerning operation, Articles 19-29 mention the establishment of “a strong organization directly under the plant management to ensure responsibility of safe operation of the plant in all operations” (Article 19), as well as staffing and responsibilities, training, in-service inspection, feedback, maintenance, testing, inspection and quality management. Articles 31-34 address accident management and emergency.

The Regulation on Design Principles for Safety of Nuclear Power Plants controls general design specifications and specific design features. The general norms can be found in Articles 9-14 of the Regulation on Specific Principles for Safety of Nuclear Power Plants; for example, Article 12 states: “Regarding plant design features articles of Regulation on Design Principles for Safety of Nuclear Power Plants ... are applied.” The Regulation on Nuclear Power Plant Sites published on 9 March 2009 in OG No.27176 sets out the main elements of a NPP site, such as the effects of external events, site characteristics and site area characteristics possibly influencing transport of radioactive material and population distribution and density and particularly states “the site shall be deemed unsuitable” if deficiencies identified cannot be compensated (Article 5).

Regulations on Clearance in Nuclear Facilities and Release of Site from Regulatory Control and on Radioactive Waste Management were published in OG No.28582 of 9 March 2013. The first regulation comprises clearance principles (Article 5) and clearance limits (Articles 6–8), measurements (Article 9) and in particular, the removal of site from regulatory control (Chapter 3, Articles 14-15). The Regulation on Radioactive Waste Management focuses on requirements and principles that include responsibility, control of radioactive waste generation, management system, safety management, safety culture, human factor and transparency, radioactive waste management steps, release of radioactive waste to the environment, general principles and general safety principles in radioactive waste facilities, radioactive waste management in nuclear and radiation facilities and inspections and sanctions. The regulation also applies to final waste disposal in “deep disposal facilities” (Article 4(c) and Article 29 paragraphs 2-3). The Regulation

Republic of Turkey (September 2010), (fn.8), p.15 and Republic of Turkey (August 2013), (fn.8), p.43. TAEK mentioned the draft (“Radyasyondan Korunma Tüzüğü” taslağı) in the Annual 2010 and 2011 Activity Reports (pp.37, 45) but not in the respective chapter of the Annual 2012 Activity Report (p.43, 53-54). See TAEK 2010, 2011, 2012 Yılı Faaliyet Raporları, the Activity Reports are available in Turkish only at: www.taek.gov.tr/belgeler-formlar/sgm/faaliyet_raporlari/ (accessed 26 July 2013).

28. English versions of all regulations referred to in this chapter (with the exception of that mentioned in fn.32) are published by TAEK, www.taek.gov.tr/en/belgeler-formlar/documents/Regulations/ (accessed 29 July 2013).

on Waste from the Use of Radioactive Materials (OG No.25571 of 2 September 2004) is not applicable to spent fuel of NPPs.

The juridification of issues dealing with nuclear safety management began in 2007 when the Regulation on the Basic Quality Management Requirements for Safety in Nuclear Facilities was published in OG No.26642 of 13 September 2007 (which was later modified in 2009).²⁹ Main issues addressed are responsibilities of the organisation (Article 5), the role of TAEK in general and for enforcement (Articles 6-7), the management system which must ensure that “safety has highest priority in all activities of organization” (Article 8, with the principle of safety orientation and “priority is safety” specified in Articles 9 and 13), the structure and system of organisation ensuring a quality management system that provides “a systematic approach in practice with the subordinate goal of doing work correctly at first attempt” (Article 15), process management (Article 16), training and qualification (Article 18), document management and records (Article 20) and review and self-assessment being conducted as independent assessment (Articles 25-26). Many guides coded GK-KYS (Güvenlik Kilavuzu - Kalite Yönetim Sistemi/Safety Guide - Quality Management System) detail quality management in administrative practice, particularly for NPPs.³⁰

Regarding physical protection, a new Regulation on Physical Protection of Nuclear Materials and Nuclear Facilities entered into force in 2012, and the 1979 regulation was repealed.³¹ Predominant aspects of this regulation deal with nuclear security culture (Article 5), the interplay between nuclear security and nuclear safety (“physical protection system ... shall not weaken the effectiveness of” nuclear safety, Article 6), liability (“The authorized person shall be primarily responsible to ensure physical protection during carrying out any activity authorized by” TAEK, Article 8), the physical protection system and program (Article 10), measures against theft during handling, usage and storage of nuclear materials in limited access areas, protected areas and inner areas (Articles 19-21), measures to counter sabotage of

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29. OG No.27144 of 17 February 2009, English version available through TAEK at: www.taek.gov.tr/en/belgeler-formlar/documents/Regulations/nuclear-safety/The-Regulation-on--The-Basic-Quality-Management-Requirements--for-Safety-in-Nuclear-Facilities/ (accessed 27 July 2013).
30. Guide on Establishing and Implementing a Quality Assurance Programme for Safety in Nuclear Installations/GK-KYS-01, 10.12.2009; Guide on Assessment of the Implementation of the Quality Assurance Programme for Safety in Nuclear Installations, GK-KYS-05, 24.05.2010; Guide on Quality Assurance in Procurement of Items and Services for Safety in Nuclear Installations /GK-KYS-06, 24.05.2010; Guide on Quality Assurance in Manufacturing for Safety in Nuclear Installations/GK-KYS-07, 31.05.2011; Guide on Quality Assurance in Research and Development for Safety in Nuclear Installations/GK-KYS-08, 31.05.2011; Guide on Establishing and Implementing a Quality Assurance Programme in Siting for Safety of Nuclear Installations/GK-KYS-09, 24.05.2010; Guide on Quality Assurance in Design for Safety of Nuclear Installations /GK-KYS-10, 29.09.2011; Guide on Quality Assurance in Construction for Safety of Nuclear Installations/GK-KYS-11, 29.09.2011; Guide on Quality Assurance in Commissioning for Safety of Nuclear Installations/GK-KYS-12, 29.09.2011; Guide on Quality Assurance in Operation for Safety of Nuclear Installations/GK-KYS-13, 29.09.2011; Guide on Quality Assurance in Decommissioning for Safety of Nuclear Installations/GK-KYS-14, 29.09.2011. All these guides (in Turkish only) are available at: www.taek.gov.tr/belgeler-formlar/mevzuat/yonerge-kilavuzlar/kilavuzlar/ (accessed 30 July 2013). English titles taken from TAEK (11 July 2013), “List of Licensing Basis for Akkuyu Nuclear Power Plant, Revision 1”, available at: www.taek.gov.tr/belgeler-formlar/ngd-belgeleri/Akkuyu-NGS-nin-Lisanslamas%C4%B1nda-Esas-Al%C4%B1nacak-MKS-Listesi/ (accessed July 30 2013) and Republic of Turkey (August 2013) (fn.8), Annex II, pp.67-68.
31. OG No.28300 of 22 May 2012, available through TAEK at: www.taek.gov.tr/en/belgeler-formlar/documents/Regulations/nuclear-safety/Regulation-the-Physical-Protection-of-Nuclear-Facilities-and-Nuclear-Materials/ (accessed 27 July 2013).

nuclear facilities and materials (Articles 25-27) and measures against theft and sabotage during transportation of nuclear materials (Articles 28-35). Articles 36-41 address inspections, exercises and sanctions. Other related regulations include: Regulations on Emergency (National Application Regulation on Nuclear and Radiological Emergency, which is based on Law No.2690 and Article 4 of the Radiation Safety Decree), Tasks Regarding Chemical, Biological, Radiological and Nuclear Hazards,³² Safe Transportation of Radioactive Materials, Accounting for and Control of Nuclear Materials and on Issuing Documents Base to Export Permission for Nuclear and Nuclear Dual Use Items. These nuclear regulations are generally based on Law No.2690, which established TAEK and laid down its competences and duties. The Regulation on the Basic Quality Management Requirements for Safety in Nuclear Facilities and the Regulation on Nuclear Safety Inspections and Enforcement are also based on the Decree on Licensing of Nuclear Installations without referring to a specific article. However, the Regulation on Physical Protection of Nuclear Materials and Nuclear Facilities (published in 2012) is explicitly based on Articles 13, 14, 25, 35, 39, 45 and 50 of the Decree on Licensing of Nuclear Installations. In any event, the Decree on Licensing of Nuclear Installations does not present a definite basis for enforcement of such specific regulations on safety and security. A draft “Regulation on Nuclear Installation Safety”, mentioned in Turkey’s national full reports to the fifth and sixth review meetings of the CNS, has not yet entered into force and is not publicly available.

Directives and guides further specify nuclear safety and security factors, as well as administrative and NPP management issues. The Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants, which repealed (Article 8) the Directive on Principles of Licensing of Nuclear Power Plants approved by AEC on 24 May 2010,³³ contains important licensing principles.³⁴ Per Article 3, the “directive has been prepared in accordance with [Law No.2690 on establishing TAEK] and The Decree on Licensing of Nuclear Installations ...”. However, no specific article of the decree is cited nor does the decree contain references to determine details in directives. The general clause of Article 124 of the Constitution on regulations (by-laws) being issued “in order to ensure the application of laws and [decrees] relating to their particular fields of operation, provided that they are not contrary to these laws and [decrees]” is not affected. Consequently it should be clarified as to which articles of the Decree on Licensing of Nuclear Installations the directive is implementing. For example,

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32. See “Kimyasal, Biyolojik, Radyolojik ve Nükleer Tehlikelere Dair Görev Yönetmeliği” in OG No.28281 of 3 May 2012 (in Turkish only); TAEK, “Kaza ve Tehlike Durumu”, available at: www.taek.gov.tr/acil-durumlar/kaza-ve-tehlike-durumu.html (accessed 8 August 2013); “Büyük Endüstriyel Kazaların Kontrolü Hakkında Yönetmelik” (in Turkish only), available at: www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.14218&sourceXmlSearch=&MevzuatIlli=0 (accessed 8 August); “Başbakanlık Kriz Yönetim Merkezi Yönetmeliği” (this regulation is applicable when a nuclear incident happens), available at: www.taek.gov.tr/acil-durumlar/kaza-ve-tehlike-durumu/139-ilgili-mevzuat/367-basbakanlik-kriz-yonetim-merkezi-yonetmeli.html (accessed 8 August 2013).
33. See TAEK, available at: www.taek.gov.tr/en/belgeler-formlar/documents/Regulations/nuclear-safety/, published 13 December 2012, (accessed 8 July 2013) but the date of entry into force is not specified.
34. TAEK announced and clarified these principles as guiding its own actions, and though they do not constitute legally binding norms on the owner or applicant, TAEK implements the directive strictly in practice. See TAEK, “Lisanslama Süreci” (in Turkish only), available at: www.taek.gov.tr/nukleer-guvenlik/nukleer-enerji-ve-reaktorler/165-ak-kuyu-nukleer-guc-santrali/425-taek-lisanslama-ilkeleri.html (accessed 31 July 2013), and Republic of Turkey (August 2013) (fn.8), p.16, Section 4.3. Regarding the binding or non-binding character of directives in Turkish nuclear legislation, see Ercan, E. and H. Schneider (fn.11), Chapter 3.1, fn.47.

concerning the reference plant, Article 9.1 and 9.5, and Article 14.3 and 14.7 of the Decree seem to be particularly relevant; with regard to safety requirements, Article 9.9, 9.12, and Articles 14.2 (“Safety Principles, criteria and standards to be applied for the design construction, quality assurance, commissioning, operating and decommissioning of the facility”), 14.3, 14.5, 14.7 and Article 23.1 are applicable. The decree, however, contains no regulations on the applicant’s obligation to submit before the application for the construction licence, a special list according to Article 6(1) of the directive: “The Owner shall prepare a complete list of regulations ... as well as of guides and standards to be applied in the licensing process, together with a report (Annex I) containing information on the preparation process of the list and indicating its conformance to this directive”³⁵ With regard to the evaluation of nuclear safety, the “order of priority of the regulations to form the licensing basis” as specified in Article 6(2) is of tremendous importance. The priority is: “a) Regulations of The Republic of Turkey, b) IAEA Nuclear Safety Series documents under the categories of ‘safety fundamentals’ and ‘safety requirements’, c) In the areas deemed not adequately covered by subparagraphs (a) and (b), nuclear safety regulations in the Vendor Country, in force as of a date approved by the Authority [TAEK]”. Furthermore, for “safety related issues deemed not adequately covered by regulations mentioned in subparagraphs (a), (b), and (c), a third country regulation conforming to relevant IAEA safety guides or to the design of the plant, for which the license application has been made” must be taken into account. The procedure for proposing a reference plant is addressed in Article 7. Finally it should be noted that

35. See TAEK’s explanations on the actual implementation of the issues covered in the Directive 16 August, 2012: APC submitted a reference plant proposal to TAEK, according to the Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants. TAEK reviewed this report and the AEC approved Novovoronezh-2 Nuclear Power Plant in Russian Federation as the reference plant for Akkuyu NPP. 2 November, 2012: APC submitted the list and report on “Regulations, Guides and Standards Forming Licensing Basis for Akkuyu Nuclear Power Plant”, according to the Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants. TAEK reviewed the list and the report. TAEK Atomic Energy Commission approved the “List of Licensing Basis Requirements, Guides and Standards and its Approval Conditions for Akkuyu Nuclear Power Plant”, available at: www.taek.gov.tr/en/institutional/akkuyu-nuclear-power-plant.html (accessed 31 July 2013). However, it is not clear whether the Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants was already in force. TAEK announced that on 8 September 2011, the reference plant was proposed, according to the Directive of 2010, which was then repealed by Article 8 of the Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants in 2012. “Öte yandan Akkuyu Proje şirketi, ‘Nükleer Güç Santrallerinin Lisanslama İlkelerine İlişkin Yönerge’ hükümleri çerçevesinde 8 Eylül 2011 tarihinde Rusya’da inşa edilmekte olan Novovoronezh II nükleer güç santralini ANS için referans santral olarak önermiştir”, (in Turkish only), available at: www.taek.gov.tr/bilgi-kosesi/165-nukleer-enerji-ve-reaktorler/akkuyu-nukleer-guc-santrali/430-akkuyu-nukleer-santral-projesi.html (accessed 31 July 2013). With regard to Article 7, paragraph 1, sentence 1 of the Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants, it should be noted that the provision of information on the reference plant by the project company would not have been accomplished within the three-month prescribed period, i.e. from 28 February 2011, because it was not submitted until 2 November 2012. See TAEK website, available at: www.taek.gov.tr/en/institutional/akkuyu-nuclear-power-plant.html (accessed 12 July 2013). However, Provisional Article 1 of the directive “Already Recognized as Owner” states: “The durations cited in Article 7 of this directive shall be complied with to the extent possible.” See TAEK for the new Revision 1 of the “List of Licensing Basis for Akkuyu Nuclear Power Plant” (fn.30), available at: www.taek.gov.tr/en/institutional/akkuyu-nuclear-power-plant.html (accessed 31 July 2013) and Republic of Turkey (August 2013), (fn.8), p.16.

the order of priority reflects the approach of TAEK to ensure safety of NPPs and support for TAEK external experts.³⁶ However, from a legal point of view, two primary questions have to be raised: 1. Are regulations (a) – (d) binding for the licence applicant and subject to the process of judicial review? 2. Why could diverging safety requirements (lit. c and d) exist for different NPPs depending on their fabrication origin (foreign state)? Moreover, it has to be taken into account that IAEA “Safety Fundamentals” are written at a high level and thus can be interpreted differently in their specific application to a NPP. That means the implementation of these regulations in the design, construction and operation phases may reflect not only one technical approach. TAEK seems to suggest a binding character of the norms referred to in the Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants by requiring strict adherence to this directive with respect to the Akkuyu NGS A.Ş.

With regard to judicial review, the legislation on licensing together with the licensing principles for NPPs in the Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants is fairly well-developed and far reaching but in some aspects, particularly in a systematic legal manner, difficult to understand. Furthermore, it seems to be rather ambiguous and complicated in regard to the question as to why the principles laid down in the directive are not addressed in a regulation being issued by TAEK. For example, as is conducted by TAEK with the Regulation on Specific Principles for Safety of Nuclear Power Plants. Consequently, methodical retracing of specific safety requirements by judges may be touchy, thus possibly creating legal risks for the continued existence of licences approved by TAEK at the end of the judicial review.

TAEK guides, though at the bottom of the hierarchy of norms, aim to support the execution of regulations issued by TAEK and which serve primarily to transpose IAEA Safety Standards into Turkish nuclear legislation. They are binding on TAEK and therefore, TAEK must take them into account when deciding whether to grant a licence, according to the Decree on Licensing of Nuclear Installations. Consequently, these guides should also be taken into consideration by the licence applicant in preparing and submitting documents and reports for the licence application. There are numerous guides on subjects other than the quality management system. The most important guide for nuclear safety in NPPs is the Guide on Specific Design Principles.³⁷ This guide addresses levels of defense in-depth, plant states and objectives, independence between all levels, the safety and security interface, radiological protection and waste management and external events, including earthquakes and aircraft crashes (Articles 4-10). Other guides deal with management issues,³⁸ quality assurance,³⁹ the form of the site report for NPPs, inspection and testing, fire protection, external man-induced events to be taken into consideration

36. See the structure of the list provided for tender no.190420 of 26 December 2012 for Procurement of Technical Support Services During Review and Assessment of Construction License Application for Akkuyu Nuclear Power Plant, cancelled on 22 March 2013. Meanwhile, TAEK has published a Revision 1 (fn.30).

37. See “Özel Tasarım İlkeler Kılavuzu” (in Turkish only), available at: www.taek.gov.tr/en/belgeler-formlar/mevzuat/yonerge-kilavuzlar/kilavuzlar/%C3%96zel-Tasar%C4%B1m-%C4%B0lkeleri-K%C4%B1lavuzu/ (accessed 1 August 2013).

38. See Guide on Management of Non-Conformance Control and Corrective Actions for Safety in Nuclear Installations/GK-KYS-02, 10 December 2009 and Guide on Management of Document Control and Records for Safety in Nuclear Installations/GK-KYS-03, 10 December 2009. Both guides (in Turkish only) are available at: www.taek.gov.tr/belgeler-formlar/mevzuat/yonerge-kilavuzlar/kilavuzlar/ (accessed 1 August 2013). The English titles have been taken from TAEK documents (fn.30).

39. See fn.30.

in the design of NPPs, documentation of NPP site activities, NPPs' earthquake design, earthquake-related subjects in regards to a site licence and limited work permit.⁴⁰

The important issues of periodic safety assessment, formal public participation and stakeholder involvement in the nuclear licensing process, and nuclear third party liability are not addressed and still need to be transposed into Turkish legislation.⁴¹

B. Organisational legal framework for the nuclear regulatory body (TAEK)

Competences and duties of government ministries and agencies for Turkey's nuclear energy program have developed in parallel to other aspects of the development of the nuclear energy program. The ETKB is responsible for nuclear energy within the Turkish government. At present, Law No.3154 of 19 February 1985 on Organization and Duties of the ETKB addresses, with regard to energy supply, the responsibility to investigate the country's short and long-term energy needs, to support an appropriate energy supply policy and to take the necessary measures, especially in the areas of research, implementation, development, evaluation, control and protection, and to establish the appropriate institutions [Article 2(a) – (c), (f), and (g)]. With respect to nuclear energy, ETKB states that “nuclear power plants must be preferred for their environmental qualities. ... For the continuity of electricity generation, nuclear power plants are safer and have higher availability compared to thermal and hydraulic power plants”. By the amendment of 11 October 2011, the Nuclear Energy Project Implementation Department (NEPIO) was assigned the main duties of coordinating NPP project works and legislation and informing the public.⁴² TAEK, which is affiliated to ETKB, was established by Law No.2690 in

40. See Guide on Format and Content of Site Report for Nuclear Power Plants/GK-GR-01, 10.12.2009, “Nükleer Güç Santralleri için Yer Raporu Biçim ve İçeriği Kılavuzu”, available at: www.taek.gov.tr/en/belgeler-formlar/func-startdown/607/ (accessed 1 August 2013); Guide on Inspection and Testing for Acceptance for Safety in Nuclear Installations/GK-KYS-04, 10.12.2009; Guide on Fire Protection in Nuclear Power Plants (“Nükleer Güç Santrallerinde Yangından Korunma Güvenlik Kılavuzu”); Guide on External Man-Induced Events in Relation to Nuclear Power Plant Design (“Nükleer Güç Santrallerinin Tasarımında İnsan Kaynaklı Dış Olaylar Üzerine Güvenlik Kılavuzu”); Guide on Documentation Examples, Work Instructions and Procedures for the QA Program for Survey, Assessment and Approval of Nuclear Power Plant Sites (“Nükleer Güç Tesisi Sahalarının Gözlem, Değerlendirme ve Onaylanması için Kalite Temini Programı Kapsamında Kullanılan Doküman Örnekleri, Prosedürler veya İş Talimatları için Kılavuz”); Guide on Seismic Design and Qualification of Nuclear Installations (“Nükleer Santral Tesislerinin Deprem Tasarımı ve Yeterliliği Kılavuzu”); Guide on the Earthquake Related Subject Requested in the Issuance of Limited Work Permit and Site License, 1989 (“Nükleer Tesislere Yer Lisansı ve Sınırlı Çalışma İzininin Verilmesinde Aranacak Depremle İlgili Konular Hakkında Kılavuz, 1989”). These guides (in Turkish only) are available at: www.taek.gov.tr/belgeler-formlar/mevzuat/yonerge-kilavuzlar/kilavuzlar/ (accessed 1 August 2013). The English titles have been taken from TAEK documents (fn.30).

41. See Ercan, E. and H. Schneider (fn.11), Chapters 3.3.8, 5.1.4 and 5.2.

42. See ETKB, “Ministry”, available at: www.enerji.gov.tr/index.php?dil=en&sf=webpages&b=bakanlik_EN&bn=200&hn=12&nm=422&id=422 (accessed 1 August 2013) and “Nuclear Energy”, available at: www.enerji.gov.tr/index.php?dil=en&sf=webpages&b=nukleerenerji_EN&bn=224&hn=&nm=40717&id=40738 (accessed 1 August 2013). For NEPIO, see Republic of Turkey (August 2013) (fn.8), p.14, no.4.1.8, and Article 8(f) and Article 10/D of Law No.3154 as of 11 October 2011 (in Turkish only), available at: www.enerji.gov.tr/mevzuat/3154/Enerji_ve_Tabii_Kaynaklar_Bakanliginin_Teskilat_ve_Gorevleri_Hakkinda_Kanun.pdf (accessed 15 August 2013). Before Law No.3154, ETKB's establishment upon Presidential Approval No.4-400 dated 25 December 1963 on the basis of the authority vested by Law No.4951 was valid.

1982. This law has also transformed the Atomic Energy Commission (AEC), which had been established by Law No.6821 in 1956 and was the first competent Turkish nuclear regulatory body.⁴³ Under Law No.5710, Temporary Article 1 (2007) “TAEK shall carry out its duty in accordance with ... Act No.2690 ... until a new institution will execute the duty of regulating and inspection of nuclear activities is founded.”. “The 10th Development Plan for Turkey 2014-2018” states that an independent, efficient and competent regulatory system will be created.⁴⁴ However, TAEK does not seem to fulfill the requirements of Article 8 (2) of the CNS nor Article 5.2 of European Council Directive 2009/71/Euratom (25 June 2009) establishing a Community framework for safety of nuclear installations⁴⁵ with regard to “effective separation” of regulatory bodies, not least because the Turkish Prime Minister plays an important role in nuclear affairs (for example, in AEC and in AEC’s role within the licensing procedure, and finally the revocation of licences in accordance with Article 35, sentence 3 of the Decree on Licensing of Nuclear Installations).⁴⁶

At present, the main competences and duties of TAEK, according to Article 4 of Law No.2690, are “to determine the general principles to be complied with all kinds of ... special fissionable material ... used in nuclear fields and to make recommendations ... hereon”, particularly “to give approval, permission and license related to the site selection, instruction [construction], operation and environmental protection of nuclear power and research reactors and nuclear fuel cycle facilities; to do necessary studies and controls, to limit (restrict) the operating authority in case of noncompliance with the permission or license; to cancel permanently or temporarily the permission or license given and to make recommendations to the Prime Minister for the shutdown of those installations; to prepare the necessary technical guides, decrees and regulations for those purposes”, “to take the necessary measures or have them taken for the safe process, transport, permanent or temporary storage of the radioactive wastes of the nuclear facilities ...”, “to collect, disseminate and introduce the necessary information ... related to the application of atomic energy; to announce the necessary information to public; to enlighten the public in nuclear matters”, “to carry out studies related to national and international

43. OG No.17753 of 13 July 1982; English version at: www.taek.gov.tr/en/belgeler-formlar/documents/law/ (accessed 1 August 2013). For TAEK’s affiliation to ETKB see Republic of Turkey (August 2013) (fn.8), p.14, no.4.1.6. More details in Ercan, E. and H. Schneider (fn.11), Introduction, at fn.9 and Chapter 3.3.2.

44. See 10th Development Plan for Turkey (fn.1), p.119, no.791. It is worth noting that the plan refers to an independent “system” and not a “regulatory body”. See Ercan, E. and H. Schneider (fn.11), Chapter 5.1.4, fn.184, and Ercan, E. and H. Schneider (2012), “Turkey’s way to nuclear energy – An example for a newcomer’s new build”, atw – International Journal for Nuclear Power, Issue 10, October, INFORUM Verlags- und Verwaltungsgesellschaft mbH, Berlin, p.589 and fn.81, available at: www.kernenergie.de/kernenergie-en/service/fachzeitschrift-atw/hefte-themen/2012/oct/index.php. (accessed 1 August 2013).

45. Official Journal of the European Union L 172/18 (2 July 2009).

46. Critical evaluation of TAEK in its functions as nuclear regulatory body is expressed by Kuzeyli, K. (fn.18), pp.39-44; Gürbüz, M. (fn.18), pp.109-129, especially pp.122-124; Centre for Economics and Foreign Policy Studies (2012), The Turkish Model for Transition to Nuclear Energy II, Istanbul, pp.125-151, available at: <http://edam.org.tr/en/EDAM/Nuclear/Nuclear%20Report%202012/edamreport2012big.pdf> (accessed 2 August 2013). See also Ercan, E. and H. Schneider (fn.11), Chapter 3.3.6 and fn.133. As regards to the role of Prime Minister, the Circular 2012/8 of Prime Minister Recep Tayyip Erdoğan, fourth paragraph (concerning the Turkish-Russian Agreement on Akkuyu NPPs, he requested that the termination of all project works and activities should be brought to an end with urgency – “Projenin gecikmeye mahal vermeden zamanında tamamlanabilmesi için, kamu kurum ve kuruluşlarımızca her türlü iş ve işlemler ivedilikle sonuçlandırılacaktır.”), published (only in Turkish) in OG No.28240 of 21 March 2012, should also be taken into consideration.

law in the nuclear field and to propose the necessary regulatory arrangements” and “to prepare and implement the decrees and regulations determining the basis related to the protection of nuclear materials and facilities and to control the subjects related to those and to give comments about the regulations to be prepared by other institutions related to this subject”. Article 18 provides that “The regulations prepared by the Turkish Atomic Energy Authority shall enter into force after the approval of the Prime Minister”, while according to Article 4(a) TAEK always has to take into account also “the State’s ... economic development”.

Law No.2690 also addresses the subject of TAEK’s administrative organs, including the AEC (Article 6)⁴⁷ and the Advisory Council (Article 7).⁴⁸ These institutions, as well as the Advisory Committee on Nuclear Safety⁴⁹ are assigned to the President of TAEK⁵⁰ and their working systems are arranged by regulations (Article 6(c), paragraph 2 and Article 7, paragraph 4).⁵¹ TAEK’s Ethics Commission should also be mentioned, although it does not specifically refer to nuclear topics (their tasks are related primarily to the proper exercise of TAEK’s responsibilities and to the fight against corruption).⁵² The AEC is the most important institution because it decides in substance on the site licence, the limited work permit, the construction licence, the full power operating permit and the operation licence (Article 3, Article 12 paragraph 1, Article 17 paragraph 1, Articles 20 and 31 of the Decree on Licensing of Nuclear Installations). AEC’s members are primarily from ministries and “The Prime Minister, presides [over] the Atomic Energy Commission’s meetings whenever he deems necessary” [Law No.2690, Article 6(a)].

TAEK’s administrative activities and acts are managed by several regulations. The Regulation of Nuclear Safety Inspections and Enforcement, published in the OG No.26642 of 13 September 2007 (repealing the Regulation on Quality Assurance and Inspection of Nuclear Facilities, OG No.22932 of 13 March 1997), and modified in 2008, is of primary importance to its organisation, because of the type and scope of inspections it covers. These include planned and reactive inspections (Articles 7–10), “[A]uthorized organization, contractor, sub-contractor, suppliers and sub-suppliers are ... subject to inspections” that concern “review and assessment of all required records and documentation belong to every stage of nuclear facility, performing monitoring, tracing and audit actions, if desired, practical inspection and measurement to make or to be made and negotiating with facility management and employees” (Article 6). Enforcement actions include suspension of authorisation and cessation of activities up to two days, considering “the importance, urgency and severity of violation in terms of nuclear safety”, or in cases of resistance to inspection or failures to make timely corrective actions (Articles 19-22). These provisions provide TAEK with more concrete competences and duties than do

47. See TAEK website, “Atomic Energy Commission”, available at: www.taek.gov.tr/en/institutional/atomic-energy-commission.html (accessed 2 August 2013), and Republic of Turkey (August 2013) (fn.8), p.20: “AEC also acts as a decision making body for licenses and some of the permits for nuclear installations”.

48. See TAEK website, “Advisory Council”, available at: www.taek.gov.tr/en/institutional/advisory-council.html (accessed 2 August 2013).

49. See TAEK website, “Advisory Committee on Nuclear Safety”, available at: www.taek.gov.tr/en/institutional/advisory-committee-on-nuclear-safety.html (accessed 2 August 2013).

50. See TAEK Organization Chart, available at: www.taek.gov.tr/en/institutional/taek-organization-chart.html (accessed 2 August 2013).

51. See Regulation on Working Procedures of Atomic Energy Commission, OG No.17927 (13 January 1983); Regulation on Organization and Working Procedures of Advisory Council, OG No.19312 (15 December 1986); Regulation on the Establishment and Working Procedures of Advisory Committee on Nuclear Safety, OG No.23106 (10 September 1997).

52. See TAEK Etik Komisyonu, (in Turkish only), available at: www.taek.gov.tr/kurumsal/taek-etik-komisyonu.html (accessed 19 August 2013).

Articles 51-53 of the Decree on Licensing of Nuclear Installations to ensure NPP safety and security from siting to decommissioning (Article 4(a) of the Regulation of Nuclear Safety Inspections and Enforcement).

The activities of TAEK are also influenced by the Directive on Granting of Functions to Inspectors for Nuclear Safety (*Nükleer Güvenlik Denetçisi Yetkilendirilmesine İlişkin Yönerge*), in particular, the competence and responsibilities, independence and objectivity of inspectors and their training (Articles 5-8 and 10). These subjects are also addressed in a more general manner in the Regulation on Nuclear Energy Expertise, recently published in the OG No.28641 of 8 May 2013, which addresses TAEK's personnel acquisition activities.⁵³

In terms of human capital, TAEK seems to lack sufficient capacity on its own staff, even though AEC may invite experts to its meetings. Moreover, the availability of external experts and technical support organisations (TSOs) to TAEK is presently unsatisfactory. Lastly, while research and development capacities and institutions are in principle available, although their main objectives do not focus on commercial NPPs, a substantial nuclear industry does not yet exist in Turkey.⁵⁴

C. Non-nuclear legislation of importance for NPPs

TAEK regards Environmental Law as the most important non-nuclear law concerning NPPs. According to the Regulation on Environmental Impact Assessment, NPPs must obtain a positive environmental impact assessment (EIA) result before any nuclear licence is issued.⁵⁵ Protection of agriculture, groundwater, coasts and pollution from hazardous substances and sabotage must also be taken into account.⁵⁶

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53. The regulation [Atom Enerjisi Uzmanlığı Yönetmeliği, OG No.28641 (8 May 2013)], as well as the directive (*yönerge*) are not published by TAEK on its website.
54. On staff shortage see (in Turkish only) TAEK, (2013) "2012 Yılı Faaliyet Raporu" (fn.27), p.143 (Chapter B "Vasıflı personel temininde güçlükler" and "Verilen hizmet yoğunluğuna rağmen personel sayısının yetersiz olması") and Republic of Turkey (August 2013) (fn.8), pp.29-30, Section 8.2.4 and p.31, Section 8.2.6, though at p.4, Section 2.2, several activities aiming at technical support are noted and at p.23, Section 5.2.4 the aspect of competence of staff and training personnel is addressed, including reference to Article 4(h) of Law No.2690. For AEC and experts, see Article 6, paragraph 2 of the Regulation of Working Procedures of the Atomic Energy Commission (fn.51). On TSOs, see TAEK's fourth tender of 2 August 2013 (the first three tenders having been cancelled by TAEK), available at: www.taek.gov.tr/en/news-flash/1087-invitation-to-tender-for-procurement-of-technical-support-services-on-regulatory-control-during-the-construction-license-application-for-anpp-new.html (accessed 14 August 2013); Republic of Turkey (August 2013) (fn.8), p.29 Section 8.2.4 and p.31, Section 8.2.6; Ercan, E. and H. Schneider (fn.11), Chapters 3.3.6, 5.1.5 and 5.2; for research activities see TAEK website, "Research & Development", available at: www.taek.gov.tr/en/research-development.html (accessed 2 August 2013).
55. See Republic of Turkey (September 2010), (fn.8), pp.6, 9 and 22 (Annex II "Laws" no.2), and Republic of Turkey (August 2013), (fn.8), pp.14 and 53-54 (this report does not refer to the Environmental Law in Annex II on p.67). Environmental Law No.2872, OG No.18132 (11 August 1983), most recently changed in 2006 by Law No.5491 of 26 April 2006, OG No.26167 (13 May 2006); Regulation on Environmental Impact Assessment, OG No.21489 (7 February 1993), version in OG No.26939 (17 July 2008) most recently changed in OG No.28609 (5 April 2013); more details in Ercan, E. and H. Schneider (fn.11), Chapter 4.1.
56. See Ercan, E. and H. Schneider (fn.11), Chapter 4.2, fn.169; see for aspects on pollution control the Regulation Regarding Permits and Licenses that Must be Obtained Pursuant to the Environmental Law (4 June 2009), available at: www.cakmak.av.tr/articles/Construction_Infrustructure/Regulation%20Regarding%20Permits%20And%20Licenses%20That%20Must%20Be%20Obtained%20Pursuant%20To%20The%20Environmental%20Law.pdf (accessed 2 August 2013). For a general overview, see the new Revision 1, "List of Licensing Basis for Akkuyu Nuclear Power Plant" of TAEK (fn.30) and (fn.35).

D. Access to justice

Nuclear administrative law is executed through various acts and administrative processes. Judicial review is guaranteed by the Constitution (Article 125) and is exercised by administrative courts, as well as the State Council.⁵⁷ Individual recourse to the Constitutional Court has been possible since 2010/2011.⁵⁸ According to the procedure under the Administrative Justice Act (İdarî Usul Kanunu), judicial review of decisions by TAEK (acting as a nuclear regulatory body) will be an important aspect of developing NPP projects in Turkey.⁵⁹ However, it should be noted that several EIA decisions have been cancelled or abrogated by administrative courts.⁶⁰

E. Specific activities for the first and second NPP in Turkey

The first NPPs are planned for the Mersin-Akkuyu site, the second site will be at Sinop-İnceburun and a third site will probably be situated at Kırklareli-İğneada. The first two sites were envisaged in the 1960s and were selected in the 1970s.⁶¹

According to the Turkish-Russian Agreement of 12 May 2010, four reactors with a total capacity of about 4800 MWe will be constructed at the Mersin-Akkuyu site and begin operation between 2020 to 2023. The Russian-owned Akkuyu NGS A.Ş. (APC), being a private corporation under Turkish law was acknowledged by TAEK on 28 February 2011 as the owner in accordance with Article 6 of the Decree on Licensing of Nuclear Installations. The Akkuyu site was allocated to APC in 2011, as specified in the Akkuyu Project Agreement (the Turkish-Russian Agreement of 12 May 2010). Site-related investigations were carried out in 2011 and 2012. A site licence had been approved in 1976 for the then Turkish Electric Company (TEK) and, being deemed still valid, was transferred to APC in accordance with the Akkuyu Project Agreement. TAEK declared in 2011 “Conditions for Akkuyu Site License” as a complementary of the site licence. An EIA is ongoing after submission of an environmental report to the Ministry of Environment and Urbanization on 9 July 2013, but an application for the construction licence has not yet been submitted to

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57. See Güran, S. (1996), “Administrative Law”, in Ansay, T. and D. Wallace (eds), *Introduction to Turkish Law*, Kluwer Law International, The Hague, pp.75-80, Section B. “Judicial Control of Administration”.
58. Articles 148 and 149 as well as Provisional Article 18 of the Constitution have been changed by Law No.5982 of 7 July 2010 and at the same time Law No.6216 of 30 March 2011 on Procedures of the Constitutional Court was adopted; see “Hukuki Yardım, Anayasa Mahkemesi’ne Bireysel Başvuru Yapabilir Miyim?” (in Turkish only), available at: www.hukukiyardim.gov.tr/sayfalar/amahkeme.html (accessed 3 August 2013): “7.5.2010 tarih ve 5982 sayılı Türkiye Cumhuriyeti Anayasasının Bazı Maddelerinde Değişiklik Yapılması Hakkında Kanun ile hayata geçmiştir. Bu anayasal reform ile bireysel başvuru bağlamında Anayasa’nın 148. ve 149. maddeleri ile Geçici 18. maddesinde değişiklikler yapılmıştır. Ayrıca bu değişikliklere paralel olarak bireysel başvuruyu daha da somut kılmak amacıyla 30.3.2011 tarih ve 6216 sayılı Anayasa Mahkemesinin Kuruluşu ve Yargılama Usulleri Hakkında Kanun kabul edilmiştir.”
59. Procedure of Administrative Justice Act [İdarî Yargılama Usulü Kanunu, Law No.2577 of 6 January 1982, OG No.17580 (20 January 1982)], English version available at: <http://en.hukuki.net/index.php?topic=56.0> (accessed 3 August 2013). Details on judicial review of licences according to the Decree on Licensing of Nuclear Installations are presented by Özdemir, H.E. (fn.24), pp.179-182. With regard to Law No.5710, see the rulings of the Council of State and the Constitutional Court referred to in Ercan, E. and H. Schneider (fn.19).
60. See Ercan, E. and H. Schneider (fn.11), Chapter 4.1.
61. Dünya Enerji Konseyi (World Energy Council) Türk Milli Komitesi (2012), *Enerji Raporu 2012*, Aralık 2012, pp.192-197, (in Turkish only), available at: www.dektmk.org.tr/upresimler/enerjirapor2012.pdf (accessed 4 August 2013).

TAEK.⁶² The electricity production licence for Akkuyu NGS A.Ş. in accordance with the Electricity Market Law and Electricity Market License Regulation to be issued by EPDK, is outstanding.

With regard to the site licence of 1976 and the transfer to Akkuyu NGS A.Ş., some legal doubts and concerns with respect to judicial review have to be noted. The site licence issued in 1976 could no longer be valid because the Decree on Licensing of Nuclear Installations, which entered into force in 1983, does not regulate the continuation of licences previously granted. Moreover, the Decree on Licensing of Nuclear Installations does not cover the transfer of a site licence. Article 32.1 of the Decree reads: “The operating license cannot be transferred without the permission of the Authority” (TAEK). Even if the transfer of the site licence is not excluded under Article 32.1, the procedure for such a transfer remains unclear. Furthermore, the question might be raised whether the site licence could have been transferred only after a positive decision on EIA by the Ministry of Environment and Urbanization. In accordance with Article 6(3) of the Regulation on Environmental Impact Assessment, a licence for a NPP project may be granted only after a positive EIA decision. These legal concerns may affect the procedure for the construction licence since the applicant must have obtained a site licence (Article 13 of the Decree).

The second NPP with four reactors and a total capacity of about 4 480 MWe at Sinop-İnceburun will be constructed and operated on the basis of the Turkish-Japanese Agreement of 3 May 2013. Site investigations will be carried out for two years with the beginning of operation of the first reactor foreseen for 2023. Ownership of the project is not yet decided, although ETK Minister Taner Yıldız has deemed public-private partnership possible. However, in August 2012, Electricity Generation Company (EÜAŞ) was recognised by TAEK as an owner, according to Article 6 of the Decree on Licensing Nuclear Installations.⁶³

The third NPP site, probably at Kırklareli-İğneada, was recently mentioned by Minister Yıldız as the subject of further site investigations possibly carried out in co-operation with Japan. Turkey’s Prime Minister Erdoğan and Minister Yıldız announced that Turkish-designed reactors would be built at the site. Total capacity is fixed at about 5 000 MWe.⁶⁴

62. For information on Akkuyu see TAEK website, “Akkuyu Nuclear Power Plant”, available at: www.taek.gov.tr/en/institutional/akkuyu-nuclear-power-plant.html and for more detail (in Turkish only) at: www.taek.gov.tr/nukleer-guvenlik/nukleer-enerji-ve-reaktorler/165-akkuyu-nukleer-guc-santrali/430-akkuyu-nukleer-santral-projesi.html (accessed 4 August 2013); AKKUYU NGS AŞ, available at: www.akkunpp.com/index.php (accessed 4 August 2013), Republic of Turkey (August 2013) (fn.8), pp.2, 8, 54-58, furthermore 10th Development Plan for Turkey (fn.1), p.117, no.781 and pp.118-119, no.790.

63. See 10th Development Plan for Turkey (fn.1), p.117, no.781; Republic of Turkey (August 2013), (fn.8), pp.2, 8 and 58-59 (at p.58 indicating an “about 5000 MWe NPP”), “2. nükleer santral için rakam netleşti” (3 May 2013), TRT Haber (in Turkish only), available at: www.trthaber.com/haber/gundem/2-nukleer-santral-icin-rakam-netlesti-84720.html (accessed 4 August 2013); the declaration of Taner Yıldız during a press conference on 6 May 2013 was published at the website (in Turkish only) of T.C. Enerji ve Tabii Kaynaklar Bakanlığı, “Bakanlık Haberleri”, only for a short period.

64. Kayaoğlu, T. (2 May 2013) “Erdoğan: Sinop'taki nükleer santrali Japonya yapacak”, Zaman, (in Turkish only), available at www.zaman.com.tr/_erdogan-sinoptaki-nukleer-santrali-japonya-yapacak_2085049.html (accessed 4 August 2013); “Hedef yerli nükleer”, TRT Haber (in Turkish only), available at: www.trthaber.com/haber/gundem/hedef-yerli-nukleer-84960.html (accessed 4 August 2013) and www.trthaber.com/haber/ekonomi/biz-ucu-ncu-nukleer-santrali-yapariz-85458.html (accessed 4 August 2013); 10th Development Plan for Turkey (fn.1), pp.118-119, No.790.

F. Conclusion and outlook

Conclusion

Nuclear legislation in Turkey is quite well-developed, having progressed considerably within the last decade. Fundamental regulations with detailed rules, particularly for nuclear safety and security, as well as radiation protection and organisational structures for the nuclear regulatory body, already exist. Announced drafts of additional regulations show that developments are ongoing. However, some legal concerns with regard to international legislation and best practice have to be expressed. Moreover, there are certain doubts about the realisation of goals for operation of five NPPs by 2023 (four at Mersin-Akkuyu and one at Sinop-İnceburun) given past delays with projects. In any event, the historical development of Turkish nuclear legislation does, however, seem to be an approach more suitable for the needs of political programmes and intentions rather than systematic, transparent and comprehensive structuring of nuclear law and legislation. In lieu of project progress-oriented and developed bottom-up strategy (Decree on Licensing of Nuclear Installations, 1983, and draft Nuclear Energy and Radiation Law announced for December 2013), Turkey may, at the end of the day, better profit from a substantial top-down methodology (i.e. legislation starting with a nuclear law framework on the basis of which specific issues of safety, security and safeguards are implemented in detailed decrees and regulations) and consequently, nuclear legislation elaborated step-by-step, as well as structured systematically. The best approach would be to put into force a nuclear legal framework under a law that takes into particular consideration the IAEA *Handbook on Nuclear Law – Implementing Nuclear Legislation*.⁶⁵ In such a law the most important principles and the basic types of licences, especially for NPPs, would be included. Furthermore, the establishment, primary responsibilities, tasks and duties of the nuclear regulatory body, should be regulated by this law. The law should also include the basis for details of licensing procedures, in particular, by decrees and regulations for safety and security requirements and for radiological protection. The regulatory body itself may not have the competence to issue such regulations but it can develop internal administrative directives and guides as non-binding nuclear legislation. The structures of the existing Electricity Market Law and Environmental Law could, in principle, serve as examples.⁶⁶ In practice, IAEA offers effective support.⁶⁷ All drafts announced by TAEK in August

65. Stoiber, C. et al. (2003), *Handbook on Nuclear Law*, IAEA Publication 1160, IAEA, Vienna; Stoiber, C. et al. (fn.24), available at: www-pub.iaea.org/MTCD/Publications/PDF/Pub1456_web.pdf (accessed 2 August 2013), and IAEA Office of Legal Affairs website, “Legislative Assistance”, available at: <http://ola.iaea.org/ola/legislative-assistance.html> (accessed 5 August 2013).

66. See for instance, the regulatory body, Article 4, paragraph 1 and for detailed decrees and regulations Article 3, paragraph 1, no.3 of Electricity Market Law (fn.8) and Article 10, paragraph 4 of the Environmental Law (fn.55).

67. IAEA (2013), “Nuclear Safety Review 2013”, GC(57)/INF/3, IAEA/NSR/2013, IAEA, Vienna, pp.34-35, No.136: “In 2012, the IAEA conducted numerous peer reviews, expert missions and training activities at the request of Member States embarking on nuclear power programmes. These missions and activities have identified many common weaknesses and challenges for the safe, secure and successful implementation of a nuclear power programme. Major issues included establishing a functioning, effective and independent regulatory framework and body; establishing a management system at the regulatory body; building the necessary regulatory human and technical competences and capabilities; developing safety regulations that will be used in bid specifications or during the licensing process; and establishing national arrangements for providing the necessary technical support. Given the short project schedules of some Member States for the introduction of nuclear power, these weaknesses may adversely impact the ability of those regulatory bodies to perform their regulatory functions e.g. the capacity to

2013 in the “Full Report to the 6th Review Meeting”, especially the “Draft Nuclear Energy and Radiation Law”, should be published as soon as possible in order to make feasible a broad and deepened scientific, jurisprudential consideration, as well as public discussion of the proposals. In the course of new nuclear legislation, a review on the Decree on Licensing of Nuclear Installations, unchanged since 1983, seems overdue.

Turkey is a contracting party of the CNS since entry into force of the convention (24 October 1996),⁶⁸ but only recently (in August 2013) published and made publicly available for the first time its report to the convention, the “Full Report to the 6th Review Meeting”. This is a welcome step because it reflects exercise of the political principle of transparency⁶⁹ for such a report for the first time. On this basis, the extent to which Turkey complies with obligatory principles laid down in the convention can be evaluated. Thus, the following table is oriented to an article-by-article-approach, according to the actual guidelines applicable to national reports under the CNS.⁷⁰ In the table, the main Turkish laws and regulations are noted, as well as pertinent references to Turkey’s “Full Report to the 6th Review Meeting”, although the report does not always refer to specific articles in the cited laws, decrees or regulations with regard to the assessment of the Turkish programme against the convention’s principles.

perform the review and assessment of construction licence applications.” On p.35, No.137 Turkey is mentioned with regard to technical co-operation; see also pp.35-37, Nos.138-147, available at: www.iaea.org/About/Policy/GC/GC57/GC57InfDocuments/English/gc57inf-3_en.pdf (accessed 25 July 2013).

68. Ratification on 14 January 1995 and deposit on 8 March 1995, see IAEA INFCIRC 449 of 5 July 1994, available at: www.iaea.org/Publications/Documents/Conventions/nuclear_safety_status.pdf (accessed 2 August 2013).
69. See for the principle of transparency within public administration the programme of the party in government power in Turkey (Justice and Development Party - Adalet ve Kalkınma Partisi, AKP), Party Programme Chapter IV.4.1 (“Transparency, accountability and foresee ability in the public administration shall be introduced in every area and stage of the government.” - “Kamu yönetiminde şeffaflık, hesap verme sorumluluğu ve öngörülebilirlik, yönetimin her alan ve kademesine yerleştirilmelidir.”), available at: www.akparti.org.tr/English/akparti/parti-programme#bolum_ and www.akparti.org.tr/site/akparti/parti-programi#bolum_ (accessed 15 August 2013).
70. IAEA (2013), “Guidelines regarding National Reports under the Convention on Nuclear Safety”, INFCIRC/572/Rev.4, April, available at: www.iaea.org/Publications/Documents/Inf_circs/2013/infcirc572r4.pdf (accessed 25 July 2013). See the reference to these guidelines in Republic of Turkey (August 2013), (fn.8), pp.1 and 64. For Turkey’s “Report to the Fifth Review Meeting”, Republic of Turkey (September 2010), (fn.8) the guidelines published as INFCIRC/572/Rev.3 (28 September 2009) were relevant.

CNS Article and title	Turkish Nuclear Legislation (application of principles of the convention in Turkish legislation and regulations, with potential gaps and deficiencies)	Turkey's Full Report for the CNS August 2013
7 Legislative and Regulatory Framework	<p>International conventions and agreements, national laws, decrees, regulations, directives and guides provide a well-developed framework for safety regulations and a licensing system, including safety assessment and inspection, as well as enforcement. However, some conventions are not yet ratified and transposed in Turkish national law and areas of licensing need to be clarified or completed.</p> <p>Contrary to the Full Report (p.17, Section.4.5 "explicitly declared ... that nuclear installation cannot be operated without a valid license") in the Decree on Licensing of Nuclear Installations (1983) no article formally states that (see Article 6, as implemented by TAEK, and Articles 22-34 and Article 35, in particular).</p> <p>Revocation of license: Decree on Licensing of Nuclear Installations (1983), Article 35; Regulation on Specific Principles for Safety of Nuclear Power Plants (2008), Article 24(1).</p> <p>Concerning the revision process and norms in Turkish nuclear legislation, in general there is no rule in Decree 1983 that involves participation from the public or non-governmental organisations (NGOs).</p>	<p>pp.10-17 (p.10: directives are not mentioned in the "hierarchical pyramid of Turkish regulatory structure")</p> <p>Other aspects unclear</p>
8 Regulatory body	<p>Decree On Licensing of Nuclear Installations (1983), Article 35 (revocation of license); Regulation on Specific Principles for Safety of Nuclear Power Plants (2008), Article 24(1).</p> <p>Substantial nuclear legislation on the regulatory body (TAEK) under Law No.2690 (Law on Turkish Atomic Energy Authority, 1982).</p> <p>Some weakness in full report with regard to "(Quality) management system of the regulatory body" and "Openness and transparency of regulatory activities".</p> <p>No "effective separation" of the regulatory body's nuclear activities as such (promotion of nuclear energy on the one hand and implementation of nuclear safety on the other hand) and furthermore, within nuclear safety activities [Prime Minister's role in the AEC acting as a decision making body for licences and some permits for nuclear installations (p.20)]. However, at p.22, no.5.2.1, the aspect of the establishment of a "regulatory body fully independent from utilization and promotion agencies and organizations" is mentioned as an issue for the "draft Nuclear Energy and Radiation Law".</p>	<p>pp.18-23 (p.23 section 5.2.5 on public information with reference to Article 4 of Law No.2690: focus seems to be more on provision of information to the public rather than involvement of the public)</p>
9 Responsibility of the licence holder ⁷¹	<p>Decree On Licensing of Nuclear Installations (1983) indicates the responsibility of the licence holder in Articles 14.8-14.9, Article 18.4, Article 21.3, Article 23.2, Article 23.5, Articles 26.1-26.3, Article 32.2 and Article 32.4. Article 6 does not speak directly to the principle.</p>	<p>p.24: "Prime responsibility ... of ... the holder of the relevant license ... is implied in the Decree ... 1983"</p>
10 Priority to safety	<p>Regulation on Specific Principles for Safety of Nuclear Power Plants (2008), Article 29; Regulation on the Basic Quality Management Requirements for Safety in Nuclear Facilities (2007, changed 2009), Article 5.1 ("importance to safety"), Article 8.1 ("... management system integrating safety ... ensuring that safety has highest priority in all activities of organization"), Article 9.1(a), Article 13 ("A QMS is created, applied, retained and maintained with improvements which priority is safety."), Articles 25-26 (Review and Self-Assessment; Independent Assessment); Guidelines for Quality Management Systems for Safety of Nuclear Facilities GK-KYS 01-14 2009-2011; Regulation on Nuclear Safety Inspections and Enforcement 2007.</p> <p>Priority to safety within TAEK (Law No.2690 on Turkish Atomic Energy Authority, 1982 does not use the word "safety" in Article 4 "Duties, Responsibilities and Jurisdictions", the word "safe" is used only once in (f): "safe process").</p>	<p>p.25: "Draft Nuclear Energy and Radiation Law has provisions on the responsibilities and obligations of license holders and regulatory organization."</p>
11 Financial and human resources	<p>In Decree On Licensing of Nuclear Installations (1983), Article 6 "financial abilities" but especially the "processes to assess the financial provisions" (Full Report) do not refer to the need of transparency nor a periodic review for that purpose, Decree On Licensing of Nuclear Installations (1983), Article 34, paragraph 1 (training of staff); Regulation on Specific Principles for Safety of Nuclear Power Plants (2008), Articles 19, 21, 22 and 26.</p>	<p>pp.26-31 (Specific Articles of the Decree 1983 are not identified)</p>

71. For the prime responsibility of safety concerning the licence holder see Schneider, H. (2010) "Verantwortung der Genehmigungsinhaber für die Sicherheit der Kernkraftwerke", atw -International Journal for Nuclear Power, Vol.55, Issue 2 – February, p.122. From the English abstract "Licensee Responsibility for Nuclear Power Plant Safety" on p.79: "The operator's responsibility for nuclear safety can be required and achieved only on the basis of permits granted, which must meet legal requirements."

CNS Article and title	Turkish Nuclear Legislation (application of principles of the convention in Turkish legislation and regulations, with potential gaps and deficiencies)	Turkey's Full Report for the CNS August 2013
12 Human factors	Law No.2690 Article 4(b), (g) and (h); Decree On Licensing of Nuclear Installations (1983), Article 14.9, Article 23.5, Article 26.3, Article 32.4, Article 34; Regulation on Design Principles for Safety of Nuclear Power Plants (2008), Articles 20-21; Regulation on Specific Principles for Safety of Nuclear Power Plants (2008), Articles 9 and 19, Article 20.1, Articles 21-23 and 27; Regulation on the Basic Quality Management Requirements for Safety in Nuclear Facilities (2007, changed 2009), Article 9(b) and (c), Article 14(f), Article 15(a) and (d), Article 15.4, Article 18.1 and 18.2, Articles 19 and 24-26. Legal concerns that the Turkish-Russian Agreement (together with "Russian normative documents and standards") could build a legal basis for fulfilling CNS obligations/commitments.	pp.32-33 (p.32 reference to Turkish-Russian Agreement and Russian normative documents and standards)
13 Quality assurance	Decree On Licensing of Nuclear Installations (1983), Article 9.11, Article 14.8; Regulation on the Basic Quality Management Requirements for Safety in Nuclear Facilities (2007, changed 2009), Article 9(a) Article 14(a), Article 15(a) and Article 21, together with Guidelines for Quality Management Systems for Safety of Nuclear Facilities GK-KYS-01-14 2009-2011; "Nükleer Güç Tesislerinin Yer Seçimi ile İlgili Etüt ve Değerlendirme Çalışmalarında Kalite Temini Yönetmeliği" (OG No.24766 of 26 May 2002); Regulation on Specific Principles for Safety of Nuclear Power Plants (2008), Articles 10 and 13; Regulation on Nuclear Power Plant Sites (2009), Article 6.	pp.34-37 (pp.34-35 with reference to Akkuyu Quality Management System manual)
14 Assessment and verification of safety	Decree On Licensing of Nuclear Installations (1983), Articles 9, 14, 23, 26, 28-29, 34, 51-53 (inspections); Regulation on Nuclear Safety Inspections and Enforcement (2007), Articles 5-10 and 15-18; Regulation on Nuclear Power Plant Sites (2009), Article 6; Regulation on Specific Principles for Safety of Nuclear Power Plants (2008), Articles 13, 23 and 27; Regulation on Design Principles for Safety of Nuclear Power Plants 2008; Regulation on the Basic Quality Management Requirements for Safety in Nuclear Facilities (2007, changed 2009), Article 4(c), Articles 25-26; Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants Articles 5-7; A Guide on Fire Protection in Nuclear Power Plants, A Guide on External Man-Induced Events in Relation to Nuclear Power Plant Design, A Guide on Seismic Design and Qualification of Nuclear Installations and Qualification and a Guide on the Earthquake Related Subject Requested In the Issuance of Limited Work Permit and Site License (1989). With regard to decisions on a licence, it is not clear whether and to what extent discretion beyond the legal requirements is applicable (in other words: is the applicant entitled to obtain, for example, the Limited Work Permit according to Article 17 of the Decree on Licensing of Nuclear Installations (1983) if adequate "protection measures" and operation "without harming the safety and the health of the public" are assured?). "Internal guidelines" have not been published.	pp.38-42 (p.38: "internal guidelines", especially "Directive on Establishment and Implementation of Licensing Project")
15 Radiation protection	The Regulation on Radiation Safety (2000) is not applicable to NPPs; the announced new "national regulations on radiation protection for nuclear installations" are not yet publicly available; Decree On Licensing of Nuclear Installations (1983), Articles 9.9, 14.6 and 23.6; Radiation Safety Decree (1985), Article 7; Regulation on Protection of Outside Workers in Controlled Areas from the Risks of Ionizing Radiation (2011); Regulation on Design Principles for Safety of Nuclear Power Plants (2008), Article 11; Regulation on Specific Principles for Safety of Nuclear Power Plants (2008), Article 25; Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants. The issue of radiation protection of internal workers is not dealt with.	pp.43-44
16 Emergency preparedness	International conventions (Convention on Early Notification of a Nuclear Accident, Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency); Decree on Licensing of Nuclear Installations (1983), Article 26.8; National Application Regulation on Nuclear and Radiological Emergency (2000, amended 2009); Regulation on Specific Principles for Safety of Nuclear Power Plants 2008, Articles 31-34; Regulation on Nuclear Power Plant Sites (2009), Article 5(c).	pp.45-50 (p.47: emergency planning not in PSAR, Article 14 of Decree 1983)
17 Siting	Decree on Licensing of Nuclear Installations (1983), Article 8.1, Articles 9-12, particularly Articles 9.3, 9.4, 9.6-9.9, Article 12, paragraph 3, Article 14.1, Article 18.4, Article 23.8, Article 26.9, Article 29.4 and Article 32.4; Regulation on Nuclear Power Plant Sites (2009), Articles 5-24; Regulation on Specific Principles for Safety of Nuclear Power Plants (2008), Articles 5-8; announced new "Draft Regulation Nuclear Installation Safety" not yet published; A Guide on Documentation Examples, Work Instructions and Procedures for the QA Program for Survey, Assessment and Approval of Nuclear Power Plant Sites.	pp.51-60
18 Design and construction	Decree on Licensing of Nuclear Installations (1983), Article 8.2, Articles 13-21, especially Articles 14.1-14.7, Article 17, paragraph 3, Article 18.3, 18.4, Article 21.2, 21.3, Article 23.8, Article 26.9, Article 29.4, Article 32.4 and Article 34, paragraph 3; Regulation on Design Principles for Safety of Nuclear Power Plants (2008), Articles 5-25; Guide on Specific Design Principles (2012); Regulation on Specific Principles for Safety of Nuclear Power Plants 2008, Articles 9-14; the Regulation on the Basic Quality Management Requirements for Safety in Nuclear Facilities (2007, changed 2009), Article 5.6, Article 16 (Process Management), Articles 20-21, Articles 25-26; Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants (2012)	pp.61-62 (p.61: legal status of Russian regulations and rules within Turkish nuclear legislation and its implementation is not explained)

CNS Article and title	Turkish Nuclear Legislation (application of principles of the convention in Turkish legislation and regulations, with potential gaps and deficiencies)	Turkey's Full Report for the CNS August 2013
19 Operation	Law No.3154 (amendment of 2011), Article 10/D(d); Law No.2690 on Turkish Atomic Energy Authority (1982), Article 4(g) and (i) may cover international operational experience feedback; Decree On Licensing of Nuclear Installations (1983), Article 8.3, Articles 22-33, Article 34, paragraph 2 (notification of accidents etc.), Articles 51-53, 55; Regulation on Specific Principles for Safety of Nuclear Power Plants (2008), Articles 15-18, Article 19 (financial and technical support and staff), Article 20 ("Operational limits and conditions"), Article 20.2 (staff), Article 21.1, 21.2, Article 22.1, Article 23, Article 24, paragraph 1, sentence 2 (feedback of operating experience), Articles 24-25, Article 26 (technical support), Article 27 (feedback) and Articles 28-29; Regulation on the Basic Quality Management Requirements for Safety in Nuclear Facilities (2007, changed 2009), Article 25.1 (periodic review); Regulation on Nuclear Safety Inspections and Enforcement; Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants (2012); Regulation on Radioactive Waste Management (2013).	p.63

Outlook

Turkey, having published for public viewing for the first time its report of a CNS review meeting on 5 August 2013,⁷² is proceeding with the completion and consolidation of its nuclear legislation. In particular, the draft "Nuclear Energy and Radiation Law", is expected for submission to the Prime Minister by the end of December 2013, and is an important step forward. This draft will address in detail the extent to which Turkey complies with the CNS today and in the near future. With regard to the regulatory body, no specific explanation of possible future legislation or restructuring is provided in the sixth review meeting report. Moreover, the structure of Turkish nuclear legislation and consequently the interaction of numerous norms in laws, decrees, regulations, directives and guides may not be changed by the draft "Nuclear Energy and Radiation Law", and thus legal concerns remain, particularly with regard to judicial review. Finally, the issue of shortage of TAEK technical capacity is still to be rectified.⁷³

*"Çok mal haramsız, çok söz yalansız olmaz."*⁷⁴

72. Republic of Turkey (August 2013), (fn.8).

73. See the new tender of TAEK published on 2 August 2013: "Invitation to Tender for Procurement of Technical Support Services on Regulatory Control During the Construction License Application for ANPP (NEW)", available at: www.taek.gov.tr/en/news-flash/1087-invitation-to-tender-for-procurement-of-technical-support-services-on-regulatory-control-during-the-construction-license-application-for-anpp-new.html (accessed 5 August 2013).

74. Yunus Emre (1240-1321?), Turkish poet and Sufi mystic. This wisdom means that much property may not be without any illegality and many words not without any falsehood.

Nuclear law and environmental law in the licensing of nuclear installations

by Christian Raetzke*

1. Introduction

Large nuclear installations can have a considerable impact on the environment, both in actual terms, due to the construction and operation of the plant and in potential terms, related to the risk of an accident. A considerable part of the multiple authorisation processes required to develop a large nuclear project is devoted to addressing the possible impact on the environment.

Accordingly, environmental protection is not only warranted by requirements and processes arising out of what is generally considered "environmental law", but also by laws governing the design, siting, construction and operation of nuclear installations. By ensuring prevention and control of radiation releases to the environment, the aspects of nuclear law governing the design, construction, operation and decommissioning of nuclear facilities pertain to the field of environmental protection just like other fields of environmental law. The perception of the public that nuclear energy is "anti-environmental" and the generally anti-nuclear stance of environmental non-governmental organisations (NGOs) should not deflect attention from the fact that protection of the environment is one of the main functions of the body of nuclear law.

In the following chapter, this general relationship between the law governing civil nuclear installations and environmental law will be analysed. The subsequent chapters will deal with environmental requirements and procedures as part of the authorisation¹ process for a nuclear installation. The role of public participation and the involvement of neighbouring states in the licensing process will also be investigated, as they are today mainly based on environmental law. Some other aspects which may also have some relation to environmental protection, such as waste management, emergency planning, multinational early notification and assistance in the case of an accident and nuclear liability, have been omitted from discussion as they lie outside the focus of this article.

2. Nuclear law and the environment

2.1 Nuclear law and environmental law

The relationship between nuclear law and environmental law has often been discussed in general terms. It seems quite obvious that some parts of nuclear law have a strong link to environmental protection whilst other aspects serve other

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1. "Authorisation" is used here as a general term for a licence, permit, consent, etc., granted by an appropriate authority. For the nuclear authorisation, the term "licence" will be used. All these words are interchangeable and depend on the legal terms used in the legislation of each country.

purposes. However, the determination of the actual extent of overlap of both fields of law is controversial.²

For the purposes of this article, it is not necessary to look at nuclear law in its entirety. Nuclear law covers a broad set of subjects, ranging from safety to liability, safeguards to security. This article will focus on the aspects of nuclear law governing the siting, design, construction and operation of nuclear facilities. This part of nuclear law – which could be called the law of nuclear installations – involves mainly the law of nuclear safety and radiological protection, the latter insofar as it deals with control of exposure outside a nuclear facility to radiation coming from that facility (and thus excluding, for example, radiological protection of workers). It includes the aspects of nuclear security dealing with physical protection measures in a nuclear facility to prevent malicious acts (sabotage) that could lead to a release of radiation.

How does nuclear law within this compass relate to environmental law? Environmental law is the body of law concerned with protecting the environment. Within national and international environmental law, environmental protection is established by two main types of legal provisions which are used in conjunction with each other. One set of environmental laws protects particular aspects of the environment, such as environmental media (water, air or the soil) or certain species or habitats, against harm, whatever the cause of that harm may be. The other group of laws protects the environment in general against specific harmful or hazardous activities or substances, such as pollution from industry, release of gases causing climate change or risks emanating from genetically modified organisms. Beyond and above these two types of substantive law, there is a layer of procedural environmental law covering all these aspects and embodied, for example, by requirements for preparing an Environmental Impact Assessment (EIA).

In this general context, it is apparent that the law of nuclear installations (as defined above) performs a function which can be discerned as part of environmental law: it is the law protecting man and the environment³ against a specific hazard, namely the potential harmful effects of radiation emanating from a nuclear installation.

A survey of international nuclear law instruments relating to civil nuclear activities confirms that the protection of the environment is acknowledged as a

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2. A considerable degree of overlap is identified by Reyners, P. (2007), “Le droit nucléaire confronté au droit de l’environnement: Autonomie ou complémentarité?”, *Revue québécoise de droit international*, (hors-série), pp.149-186. Reyners states that the “finality of both branches is, to a certain degree, identical” (p.149), underlines the “cross-fertilisation” of both areas of law (p.168) and concludes, jokingly adapting a quote from Molière, that “the practitioners of nuclear law have for a long time done environmental law without knowing it” (p.183). A more restrictive view is taken by Emmerechts, S. (2008), “Environmental Law and Nuclear Law: A Growing Symbiosis”, *Nuclear Law Bulletin*, No.82 (2008/2), OECD/NEA, Paris, pp.91-110, and, in a more pronounced manner, by the same author in “Environmental Protection under Nuclear Law: Still a Long Way to Go” (2010), in OECD Nuclear Energy Agency, *International Nuclear Law: History, Evolution and Outlook*, 10th Anniversary of the International School of Nuclear Law, OECD/NEA, Paris, pp.121-156 (see especially Section 3, “Does nuclear law really protect the environment?”, p.149). Emmerechts contrasts nuclear law against environmental law and asserts that nuclear law does not yet fully protect the environment.
 3. See in this context the definition in the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) (1991), 1989 UNTS 309, Article 1, paragraph vii, of “impact” as “any effect caused by a proposed activity on the environment including human health and safety, flora, fauna, soil, air, water, climate, landscape and historical monuments ...” (emphasis added). The text of the convention is available at: www.unece.org/env/eia/about/eia_text.html.

main function of nuclear safety requirements. The International Atomic Energy Agency (IAEA) Fundamental Safety Principles, which constitute the keystone of the IAEA's safety standards, establish as an overarching "fundamental safety objective" "to protect people and the environment from harmful effects of ionizing radiation."⁴ More specifically with respect to nuclear power plants, the 1994 Convention on Nuclear Safety establishes as one of its objectives in Article 1 "to establish and maintain effective defences in nuclear installations against potential radiological hazards in order to protect individuals, society and the environment from harmful effects of ionizing radiation from such installations".⁵

Environmental protection also figures among the objectives of nuclear safety in some national acts in the domain of nuclear energy, especially those which have been promulgated or revised in recent times. To give an example, the 2012 Japanese Act for the Establishment of the Nuclear Regulation Authority in Article 3 defines as the mission of the authority "to ensure safety in the use of nuclear energy ... for the purpose of contributing to the protection of the life, health, and property of the citizens, preservation of the environment, and national security of Japan".⁶

Nuclear security raises similar issues. A malicious act aimed at disrupting the operation of a nuclear installation not only poses a threat to life and health of humans, but may also cause widespread destruction and contamination of the environment. The IAEA Fundamental Safety Principles set forth in Section 1.10: "Safety measures and security measures have in common the aim of protecting human life and health and the environment" (emphasis added).

Protection of the environment is also established as a main objective in the 2005 Amendment (not yet in force) to the 1980 Convention on the Physical Protection of Nuclear Material.⁷

Following the same logic, in some countries, where the body of environmental laws is codified in one instrument (i.e. the environmental code), the code encompasses the law that applies to nuclear installations. In Sweden, the Environmental Code⁸ introduced in 1999 extends its application to radiological protection and nuclear safety. These fields are covered in parallel by two separate topical laws, the Act on Nuclear Activities⁹ and the Radiation Protection Act.¹⁰ In a 2011 report, an enquiry committee, stressing the fact that nuclear safety and radiological protection share objectives with general environmental law,

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4. IAEA (and other sponsoring organisations) (2006), Fundamental Safety Principles, Safety Fundamentals, IAEA Safety Standards Series No.SF-1, IAEA, Vienna, p.4 (emphasis added). The IAEA Safety Standards can be downloaded at www-ns.iaea.org/standards.
 5. Convention on Nuclear Safety (1994), IAEA Doc. INFCIRC/449, 1963 UNTS 317 (entered into force 24 October 1996) (emphasis added).
 6. Act No.47, Extra Official Gazette of 27 June 2012 (emphasis added); a provisional English translation is available at the Nuclear Regulation Authority's website at www.nsr.go.jp/English/data/rl_0617.pdf. An unofficial translation of excerpts from Act No.47 has been published in the *Nuclear Law Bulletin*, No.90 (2012/2), pp.217-255.
 7. IAEA (2005), Nuclear Security – Measures to Protect Against Nuclear Terrorism: Amendment to the Convention on the Physical Protection of Nuclear Material, IAEA Doc. GOV/INF/2005/10-GC(49)/INF/6, Attachment, p.3, "Preamble", third paragraph: "Bearing in mind that physical protection is of vital importance for the protection of public health, safety, the environment and national and international security" (emphasis added).
 8. *Miljöbalk, Svensk författningssamling* 1998:808. An unofficial English translation of the code is available at: www.regeringen.se/content/1/c6/02/28/47/385ef12a.pdf.
 9. *Lag om kärnteknisk verksamhet, Svensk författningssamling* 1984:3. An unofficial English translation is available at: www.stralsakerhetsmyndigheten.se/Global/IRRS/Act%20on%20Nuclear%20Activities.pdf.
 10. *Strålskyddslag, Svensk författningssamling* 1988:220. An unofficial English translation can be found at: www.stralsakerhetsmyndigheten.se/Global/IRRS/Radiation%20Protection%20Act.pdf.

recommended to merge the two “nuclear” acts into the Environmental Code.¹¹ In France, such a step was recently taken. The 2006 Act on Transparency and Safety in the Nuclear Field, which contained the set of provisions relating to nuclear installations and regulatory procedures, was stripped of almost all of its articles, which were then transferred and integrated into the Code de l’Environnement.¹²

Finally, it is worth pointing out that many textbooks on environmental law treat nuclear law, particularly the law governing nuclear installations, as part of the greater context of environmental law.¹³

2.2 Principles of environmental law and nuclear law

Environmental law today is governed by a number of principles that have evolved and won international recognition over recent decades. Given the strong link between nuclear law and environmental protection, it is hardly surprising that there has always been fruitful interaction between nuclear law and more general environmental law.¹⁴ In fact, nuclear law, which began its development in the 1950s and therefore roughly 20 years before the ascent of general environmental law, has in some instances greatly contributed to these principles. Two principles of environmental law particularly relevant for potentially hazardous installations are the principle of prevention and the precautionary principle.

The principle of prevention (or of preventive action) requires operators and states to prevent environmental damage, or at least to limit and control activities that may cause environmental damage. Preventing damage from exposure to radiation has been from the beginning the main objective of the law governing nuclear installations.¹⁵ Indeed, it can be said that nuclear law in this respect epitomises the principle of prevention. The defence-in-depth approach in nuclear safety is its perfect embodiment. This approach assumes that failures and errors will occur and provides for multiple layers of measures to compensate or correct them so no harm is caused.¹⁶ In fact, it can be said that contrary to the law covering other

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11. *Strålsäkerhet – gällande rätt i ny form: Slutbetänkande av Utredningen om en samordnad reglering på kärnteknik- och strålskyddsområdet (Strålsäkerhetsutredningen)* (2011), SOU 2011:18, Stockholm. The report – which includes an English summary – is available at: www.regeringen.se/sb/d/14454/a/161669.
 12. Ordonnance n° 2012-6 du 5 janvier 2012 modifiant les livres Ier et V du code de l’environnement, JORF n°0005 du 6 janvier 2012, p.218.
 13. This is generally the case in German books; see, by way of example, Kloepfer, M. (1998), *Umweltrecht*, C.H. Beck, 2nd edn., Chap.15, and Sparwasser, R., R. Engel, A. Voßkuhle (2003), *Umweltrecht*, C.F. Müller, 5th edn., Chap.7B. For a UK textbook, see Woolley, D., J. Pugh-Smith, R. Langham, W. Upton (ed.) (2000), *Environmental Law*, Oxford University Press, Chap.8 “Radioactive and Hazardous Substances, and Genetically Modified Organisms”. Nuclear law is not treated in Bell, S. and D. McGillivray (2000), *Environmental Law*, Blackstone, 5th ed., but the authors in their introduction on p.4 number nuclear law among the “areas of what is undeniably environmental law which are omitted on grounds of space” and state that in the area of radioactivity “there is a large overlap between the environmental and human protection parts of the law”. As an example of a textbook on international law, see Sands, P. and J. Peel, (2012), *Principles of International Environmental Law*, Chap.11 “Hazardous substances and activities”, Cambridge University Press, 3rd ed., pp.536 et seq.
 14. Reyners, P. (fn.2, p.168) calls it a “cross-fertilisation” (*fertilisation croisée*) of both areas of law.
 15. This view is acknowledged by Emmerechts, S. in “Environmental Protection under Nuclear Law: Still a Long Way to Go”, (fn.2, p.137), albeit with the reservation that in his view nuclear law, before undergoing the influence from environmental law, focused on prevention of damage to life and property and not to the environment.
 16. For the defence-in-depth principle see IAEA (1999), “Basic Safety Principles for Nuclear Power Plants: 75-INSAG-3 rev. 1 / a report by the International Nuclear Safety Advisory Group”, INSAG-12, IAEA, Vienna, Chapter 3.2. All INSAG reports can be downloaded at: www-ns.iaea.org/committees/insag.asp.

harmful effects of industrial activities, like air or water pollution, the law of civil nuclear installations has followed from the beginning the objective that there should be no harm whatsoever caused to life and health of people.¹⁷ Even if this was not the primary objective, it is likewise not acceptable within the context of nuclear law that installations of the civil nuclear energy industry cause any predictable significant radiation-related damage to the environment. By contrast, “conventional” environmental laws accept, for example, that the construction of a large facility, such as a (nuclear or non-nuclear) power plant, leads to destruction of all flora and fauna on the construction site and that its operation, for example, routinely causes losses among the fish population of an adjacent river used for cooling water (even though all these effects must be mitigated or offset as far as possible). Comparable losses predictably inflicted on nature by radiation would not be accepted by nuclear law.

A second principle of environmental law that has acquired prominence in the last decades is the precautionary principle. This principle is defined in the 1992 Rio Declaration on Environment and Development (principle 15): “Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”¹⁸

The precautionary principle has been part of nuclear law from its beginning and it can safely be stated that one of the roots of this principle lies in nuclear law. From its origins, nuclear law was created to deal with a new and complex technology that demanded a prudent and cautious approach. This involved coping, in a precautionary manner, with uncertainty and with hypothetical events. For example, the German Act on Nuclear Energy requires, since its creation in 1959, that nuclear installations warrant “the precaution (*Vorsorge*) against damage which is necessary in the light of the state of the art in science and technology”.¹⁹ In a landmark decision of 1985 concerning the planned but never built Wyhl nuclear power plant, the German Federal Administrative Court stated that “precaution” (*Vorsorge*) means more than preventing manifest dangers. According to the court, “additionally potential damages have to be taken into account which cannot be excluded because the current state of the art of science does not permit to confirm or to refute certain cause-effect-relationships, meaning there is no danger but merely a suspicion of danger or a ‘potential for concern’”.²⁰

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17. The German Federal Constitutional Court, in its most important decision concerning the use of nuclear energy, held in 1978 that the German Nuclear Energy Act “does not accept, in the context of the construction or operation of a [nuclear] installation, any residual damage” to life and health (BVerfGE 49, 89, at p.137 – Kalkar I; the statement is repeated and amplified on p.141). The court goes on to explain that this does not mean that any residual risk of an accident must be entirely excluded; it suffices that it is practically excluded. “Remaining uncertainties are owed to the limits of the cognitive capacities of man”. *Id.*, p.143.
 18. Rio Declaration on Environment and Development, Annex I to the Report of the United Nations Conference on Environment and Development, Rio de Janeiro 3-14 June 1992, UN Doc. A/CONF.151/26 (Vol.I).
 19. *Gesetz über die friedliche Verwendung der Kernenergie und den Schutz gegen ihre Gefahren (Atomgesetz)* (Act on the Peaceful Use of Atomic Energy and the Protection against its Hazards [Atomic Energy Act]), of 23 December 1959, as amended and promulgated on 15 July 1985, BGBl. 1985 I, p.1565), Article 7, paragraph 2, no.3. An unofficial English translation of the Act can be found at: www.bfs.de/bfs/recht/rsh/englisch.html.
 20. Judgement of 7 December 1985, 7 C 65.82, BVerwGE 72, 300, p.315 (translation by the author).

The precautionary principle later found its way into other German environmental laws²¹ and started to appear in international environmental law instruments from the late 1980s onwards.²² Most authors concur that it can be traced back to German law and its *Vorsorgeprinzip*.²³ And this in turn, as we have seen, was developed mainly in German nuclear law. Quite obviously, the precautionary principle has since experienced substantial development on the international stage and today there is no need to revert to its origins in German (nuclear) law to understand its meaning or significance. In the context of this article, this historical digression is simply intended to make the point that the law of nuclear installations has greatly contributed to the overall development of environmental law.

Finally, it can be mentioned that nuclear law, at least in some countries, has developed procedural approaches in the licensing of nuclear installations which were precursors to key elements of today's environmental law such as the environmental impact assessment (EIA)²⁴ and public participation in decision-making.²⁵

As a preliminary conclusion, it can be stated that there is no fundamental opposition or contradiction between nuclear law and environmental law in the licensing of nuclear installations. To the contrary, the law of nuclear installations can be said to be part of the wider body of environmental law. The law of nuclear installations protects the environment from radiation while other fields of environmental legislation take care of other environmental impacts linked to nuclear activities. In an authorisation process for a nuclear facility, both are allocated their respective roles. They are to a large extent based on the same general principles and they interact on the same level to protect the environment.²⁶ This conjunction will be explored in the next chapters.

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21. The most important is the Act on the Prevention of Harmful Effects on the Environment Caused by Air Pollution, Noise, Vibration and Similar Phenomena (Federal Immission Control Act) (*Gesetz zum Schutz vor schädlichen Umwelteinwirkungen durch Luftverunreinigungen, Geräusche, Erschütterungen und ähnliche Vorgänge [Bundes-Immissionsschutzgesetz]*) of 15 March 1974, as amended and newly promulgated on 26 September 2002, BGBl. 2002 I, p.3830, where the *Vorsorgeprinzip* is (since 1974) enshrined in the central provision of Art.5, paragraph 1, no.2.
 22. The first explicit reference was in the Ministerial Declaration of the Second International Conference on the Protection of the North Sea of November 1987 (the London Declaration) in paragraphs VII, XV (ii) and XVI (i). The declaration is available at www.ospar.org/html_documents/ospar/html/2nsc-1987_london_declaration.pdf. See Morrison, F.L. and R. Wolfrum (eds.) (2000), *International, Regional and National Environmental Law*, Kluwer, p.10.
 23. Sands, P. and J. Peel (fn.13), p.218; Bell, S. and D. McGillivray (fn.13), p.48; Woolley, D. et al. (eds.) (fn.13), p.96. See also Freestone, D. and E. Hey (eds.) (1996), *The Precautionary Principle and International Law, The Challenge of Implementation*, Kluwer, p.4, where it is pointed out that the precautionary concept was introduced by the German delegation to the International North Sea Ministerial Conferences, from where it made its way into other global environmental regimes.
 24. See below, Chapter 5.1, for more details on the precursory role of nuclear for the EIA.
 25. See below, Chapter 6.1, for more details on the precursory role of nuclear law for public participation.
 26. This conclusion is compatible with the general approach taken by Reyners, P. (fn.2), whereas Emmerechts, S. (fn.2, p.155), adopts a somewhat different view when stating that nuclear law does not effectively protect the environment and stressing the need for environmental law to “influence” nuclear law in order to change this perceived shortcoming.

3. Regulation of the impact of nuclear installations on the environment

3.1 Introduction

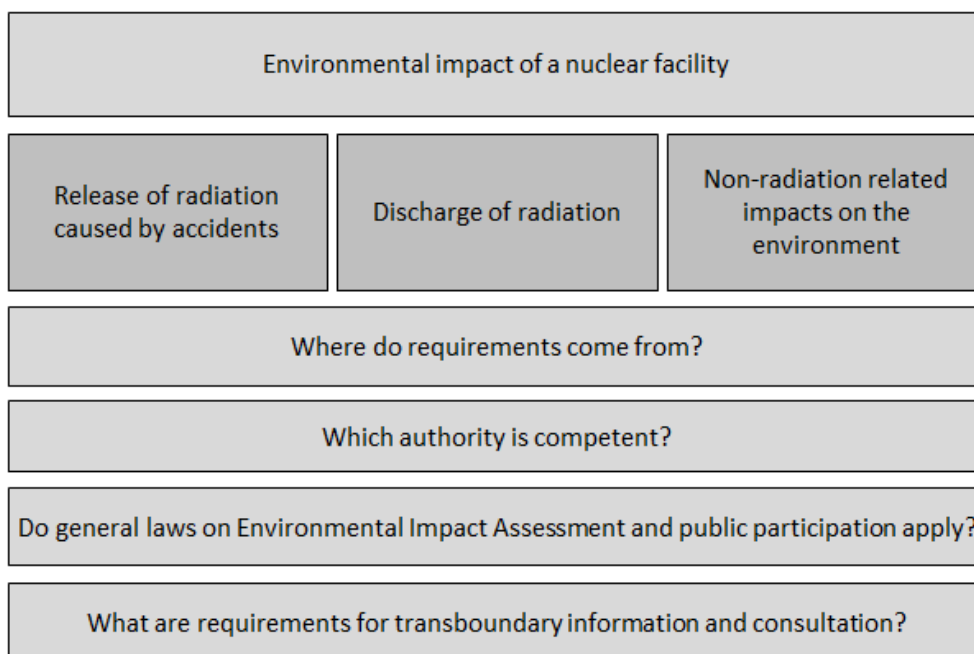
As outlined above, nuclear installations are subject to two related sets of laws concerning their impact on the environment: nuclear and radiation-specific legislation on the one hand and environmental legislation applying to all hazardous, polluting and land-consuming activities on the other. The rule of two sets of laws is clearly mirrored in the distribution of administrative competencies: some specific “nuclear” aspects are certainly in the province of the nuclear regulator, while more “conventional” impacts may be regulated by other authorities.

When looking at the licensing process for nuclear installations, it is proposed to distinguish three topical layers of preventing or mitigating actual or potential impacts of the installation on the environment, which may be governed by different legal requirements and procedures:

- Making sure that no accident occurs (whether by unfavourable circumstances or as a result of malicious acts) which causes potentially harmful release of radiation to the environment, or that the consequences of an accident or incident are mitigated.
- Making sure that the planned discharge of radiation into the environment (air, water) during operation is within defined limits so as not to cause harm to the environment.
- Preventing, mitigating or compensating for non-radiation related environmental impacts of the nuclear installation, such as land use, thermal discharge into waters, visual detriment and increased road traffic.

In the following chapters of this article, applicable requirements, competent authorities and relevant assessment, authorisation and consultation procedures will be analysed for each of these three aspects.

Figure 1: Overview of the topics of the following chapters



3.2 Accidents

Avoidance of unplanned releases of radiation from a nuclear facility benefits man and the environment at the same time. A nuclear accident may lead to widespread contamination of the environment. This not only results in exposure of human beings to higher levels of radiation unless protective measures such as evacuation are taken; it can also lead to impacts on life and health of animals and plants.²⁷

Prevention and mitigation of accidents that lead to a release of radiation to the environment is the subject of nuclear safety. It also involves nuclear security (insofar as the latter deals with physical protection of nuclear installations against sabotage) and radiological protection (insofar as it concerns the effects of exposure to radiation as the result of an accident).

Nuclear safety is commonly defined as the achievement of proper operating conditions, prevention of accidents, or mitigation of accident consequences, resulting in protection of workers, the public and the environment from undue radiation hazards.²⁸ Nuclear safety requirements are established by the nuclear law of each country. Often, overarching high-level requirements are laid down in legislation,²⁹ such as “adequate protection to the health and safety of the public” in the US Atomic Energy Act³⁰ or “precaution against damage which is necessary in the light of the state of the art in science and technology” in the German Nuclear Energy Act.³¹ A recurrent principle for nuclear safety (and for health and safety in general) is the ALARP principle – the risk must be as low as reasonably practicable.³² The high-level safety requirement is often underpinned with more detailed provisions in government ordinances (decrees) and in regulations, the latter typically being established by the regulatory authority. There are no internationally binding safety standards as such. However, in practice the IAEA Safety Standards play a substantial role and national requirements can be expected to generally conform to them.

In substance, national requirements are more or less consistent and embody generally acknowledged principles, first and foremost the defence-in-depth principle, with associated engineering principles such as redundancy, diversity or fail-safe. Technical safety requirements are complemented with requirements on the organisation of the operator and with an emphasis in regulatory activities on an overarching safety culture.³³ The 2011 event at the Fukushima nuclear power plant has put an additional focus on specific safety aspects in the licensing of nuclear installations, namely proper consideration of site-specific extreme natural hazards, analysis of the consequences of a loss of safety functions and strengthening of

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27. For a summary analysis of damage inflicted on animals and plants by the two major nuclear accidents which had a considerable impact on the environment, namely at the south-eastern Urals (Mayak) in 1957 and in Chernobyl in 1986, see United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) (1996), “Effects of Radiation on the Environment”, Scientific Annex to the 1996 Report to the General Assembly, available at www.unscear.org/unscear/en/general_assembly.html.
 28. IAEA (2007), “IAEA Safety Glossary,” IAEA, Vienna, available at: www-ns.iaea.org/standards/safety-glossary.asp.
 29. See Raetzke, C. and M. Micklinghoff, (2006), “Existing Nuclear Power Plants and New Safety Requirements – An International Survey”, Heymanns Verlag, pp.194-195.
 30. Atomic Energy Act of 1954, Section 182 (a), 42 USC 2232(a).
 31. German Atomic Energy Act (fn.19), Article 7, paragraph 2, no.3.
 32. A classic example for ALARP (in a legislation which applies to nuclear activities but is not nuclear-specific) is the UK Health and Safety at Work etc. Act of 1974, Section 2. For more details on this act and on ALARP, see Raetzke, C. and M. Micklinghoff (fn.29), pp.197-198.
 33. The best overview of nuclear safety principles is INSAG-12 (fn.16).

severe accident management.³⁴ Compliance with safety requirements is demonstrated in the licensing process by way of the safety analysis report (SAR) and additional documents. There are no specific design requirements addressing protection of the environment since any unplanned release of radiation, as indicated above, is at the same time a threat to life and health of humans and to the environment.

Sabotage of a nuclear facility may lead to the same effects as an accident, namely an unplanned release of radiation. Requirements on the physical protection of the nuclear facility, which include design features and technical and administrative means intended to cope with sabotage, are established in general laws and regulations³⁵ and in licence provisions determined by the competent authority.

3.3 Discharge of radiation in normal operation

The second source of exposure of the environment (including people outside the facility) to radiation is the normal operation of a nuclear facility. In practice, exposure mainly results from the discharge of radionuclides to the environment (liquid and gaseous discharges). Direct radiation, e.g. from the reactor core, is in practice less relevant. It is minimised below natural radiation levels by design provisions and it is practically invariable during the lifetime of a plant.

As with nuclear safety, requirements on the discharge of radionuclides, which are part of the greater area of radiation protection, are defined in national laws and regulations. To a higher degree than in nuclear safety, radiological protection requirements are closely modelled on international standards and recommendations issued by the International Commission on Radiological Protection (ICRP), the IAEA, the European Union (EU) and other bodies.³⁶ The well-known three principles of radiological protection: justification, dose limitation and optimisation (ALARA – exposure as low as reasonably achievable), will only be mentioned here.³⁷

Authorisation for a nuclear installation establishes discharge limits for radioactive substances which normally, in application of the ALARA principle, are below the permissible limits as laid down in legislation and regulations. They apply both to normal operation and to design basis accidents. When determining the radiological impact of a nuclear installation and designing protective measures, such as discharge limits, the authority assesses pathways leading to exposure of humans (“representative person” or “critical group”) to radiation. This involves modelling and assessing the contamination of environment media and of edible plants and animals, which results in de facto control and reduction of this contamination.

This approach seems to differ somewhat from the approach taken in other fields of environmental law, e.g. concerning air and water pollution, by concentrating on the effects of radiation on human beings. However, the approach is based on the

34. See “EU ‘Stress Test’ Specifications”, Declaration of European Nuclear Safety Regulators Group (ENSREG) (13 May 2011), Annex I, p.4, available at: www.ensreg.eu/sites/default/files/EU%20Stress%20tests%20specifications_1.pdf.

35. For example, the German Atomic Energy Act (fn.19) in Article 7, paragraph 2, no.5, requires for the granting of a licence that “the necessary protection has been provided against disruptive action or other interference by third parties”.

36. For an overview, see Lazo, E.N. (2007), “The International Systems of Radiological Protection: Key Structures and Current Challenges”, *Nuclear Law Bulletin*, No.80 (2007/2), OECD/NEA, Paris, pp.49-63.

37. For the three principles, see ICRP (2007), Recommendations of the ICRP, Ann. ICRP 37 (2-4), ICRP Publication 103, Section 5.6, p.88; Lochard, J. and M.C. Grenery-Boehler, (1993), “Optimising Radiation Protection – The Ethical and Legal Bases”, *Nuclear Law Bulletin*, No.52 (1993/2), OECD/NEA, Paris, pp.9-27, at p.10.

principle, as formulated in the ICRP Publication 26 (1977), that “if man is adequately protected then other living things are also likely to be sufficiently protected”.³⁸ This means that the goals of environmental protection are served by protection of human beings according to strict standards which result in protection of the environment as a whole.

Currently there is a trend towards an approach that would require that the effects of radiation on the environment should, to a certain extent, additionally be analysed and controlled in their own right, not merely in conjunction with human exposures.³⁹ As the recent (2011) edition of the IAEA International Basic Safety Standards explains,

The system of protection and safety required by these Standards generally provides for appropriate protection of the environment from harmful effects of radiation. Nevertheless, international trends in this field show an increasing awareness of the vulnerability of the environment. Trends also indicate the need to be able to demonstrate (rather than to assume) that the environment is protected against effects of industrial pollutants, including radionuclides, in a wider range of environmental situations, irrespective of any human connection.⁴⁰

While these developments are of high interest, it bears emphasis that they do not invalidate the classic approach; they merely complement it. In the field of radiological protection, scientific evidence still supports the basic principle that man is representative of detrimental effects of radiation on the environment and that protection of man in conjunction with the optimisation principle suffices to guarantee protection of the environment as a whole. The ICRP still endorses this view and does not propose to set any new dose limits specific to environmental protection.⁴¹ The trend in radiological protection towards a greater focus on the environment in its own right seems to be driven less by new findings overturning the existing knowledge than by the general quest for integrated and sustainable approaches and by societal expectations.⁴² The increased attention to the effects of radiation on the environment may result in added emphasis on demonstration of protection. So far, however, it has not led to any specific additional requirements at the level of individual nuclear installations and it is unlikely to do so in any near future.

It has been suggested that the human-based approach in radiation protection betrays an “anthropocentric” attitude of radiation protection and of nuclear law in general which prevents it from truly becoming part of environmental law.⁴³ As explained above, this view does not adequately take into account the fact that requirements modelled on the protection of humans result, by an inevitable connection, in the protection of the environment as a whole. The law of nuclear

38. ICRP (1977), Recommendations of the ICRP, Ann. ICRP 1 (3), ICRP Publication 26, paragraph 14.

39. See OECD Nuclear Energy Agency (2003), “Radiological Protection of the Environment: Summary Report of the Issues”, OECD/NEA, Paris, available at: www.oecd-nea.org/tp/reports/2003/nea3691-environment.pdf.

40. IAEA (2011), “Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards” (Interim Edition), No. GSR Part 3 (Interim), IAEA, Vienna, paragraphs 1.33 and 1.34.

41. ICRP Publication 103 (fn.37), p.16 at (w).

42. This is emphasised in Chapter 2 of the 2003 OECD Report (fn.39) dealing with societal expectations.

43. Emmerechts, S., “Environmental Protection under Nuclear Law: Still a Long Way to Go” (fn.2), pp.149-151. Emmerechts deduces from the “anthropocentric” approach of radiation protection an “anthropocentric” approach of nuclear law in general and states that this “has limited an effective and full breakthrough in nuclear law of the principles that are at the heart of environmental law” (p.151).

installations protects the environment without even containing any specific reactor design requirements destined uniquely to protect the environment as such independent of human beings. As long as there is no scientific evidence invalidating the classic approach and independent of the rather philosophical discussion whether environmental protection in general is, or should be, “anthropocentric” or “ecocentric”, the fact that nuclear safety and radiological protection standards are modelled to guarantee the protection of humans does not indicate a neglect of the protection of the environment.

3.4 Non-radiation related impacts on the environment

Nuclear installations, especially larger ones such as nuclear power plants or nuclear fuel cycle facilities, typically have a number of non-radiation related impacts on the environment. The most significant are:

- extraction of cooling water from and discharge to rivers, lakes or the sea. One of the main effects and concerns is the warming of rivers or estuaries through discharge of used cooling water;
- land use for construction, additional laydown areas and additional traffic infrastructure; this may entail destruction or impairment of biotopes/habitats and specially protected areas;
- emissions and disturbance during the construction phase (noise, traffic, light disturbance, temporary facilities); and
- visual detriment to the landscape caused by the proposed facility.

These impacts occur to a differing extent throughout the entire life of the facility. Some impacts begin from the first construction preparation work (*e.g.* clearing the site by felling trees); others are connected to plant operation (*e.g.* discharge of cooling water) or finally to decommissioning and dismantling activities. Some are temporary (*e.g.* noise and traffic during construction), others are permanent (visual detriment, cooling water discharges).

For these non-radiation related impacts, which are comparable to those of other industrial facilities, the requirements contained in non-nuclear specific environmental legislation apply. Typical legislation comprises laws which protect environmental media (air, water, soil), as well as particular habitats and species.

Laws protecting environmental media often refer to a technical standard of limiting discharge to the environment in order to minimise the adverse environmental impact. An example of this is the Best Available Technology (BAT) standard used in the EU and in some US acts (for example in Section 316(b) of the Clean Water Act – see footnote 47). In the EU Directive 2010/75 on industrial emissions (integrated pollution prevention and control), BAT is defined as

the most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing the basis for emission limit values and other permit conditions designed to prevent and, where that is not practicable, to reduce emissions and the impact on the environment as a whole...⁴⁴

Generally, the definition of terms such as BAT comprises an inherent limitation ensuring that only reasonable measures can be required, taking into account economic aspects. The EU Directive states that “‘available techniques’ means those

44. Directive 2010/75/EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast), OJ L 334/17 (17 December 2010), Article 3, paragraph 10.

developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages.”⁴⁵

A certain similarity between ALARP/ALARA and BAT is apparent, although the first originates from nuclear law and radiological protection and the latter from general environmental law and this also delineates a distinct field of application for both principles. Sometimes, however, BAT is also used in nuclear safety regulations.⁴⁶

The example of cooling water amply demonstrates how non-radiation related requirements can have a decisive effect on nuclear installations. The US Clean Water Act requires BAT for cooling water structures of industrial facilities.⁴⁷ In recent years, in the context of licence renewal procedures for existing nuclear power plants, the departments of environmental protection of several US states decided that this standard required closed-cycle cooling (meaning cooling towers) instead of a “once-through” cooling process. Closed-cycle cooling was found to substantially mitigate two issues linked to “once-through” cooling, namely the entrainment and killing of fish at the water intake and the heating up of river temperature through thermal discharge.⁴⁸ As a result of these decisions, several operators of nuclear power plants in the United States (US) considered or decided not to make use of their renewed nuclear licences and to close down their plants in the coming years because erecting cooling towers would not be economically warranted.⁴⁹ To give another example, a German riverside nuclear power plant (now closed) with a once-through cooling process had to cease operation during hot summers because the discharge of cooling water caused river temperature, downstream from the cooling water outlet, to reach specified limits. Plans for adding cooling towers never materialised due to the huge cost of such a construction project. Thus, up to the end of the plant’s operating lifetime, the operator had to take the consequences and to live with potential mandatory summer shutdowns depending on weather conditions.

Another relevant layer of environmental legislation comprises laws protecting certain areas important for biodiversity, for example habitats which are home to rare species (see, as an example, the EU Habitats Directive 92/43⁵⁰). These laws normally require assessment of the impact of a project on listed habitats and establish the principle that an authorisation not be awarded to a plan or project if it may adversely affect the integrity of the protected site. Nuclear power plants are

45. See *ibid.*, Article 3, paragraph 10(b). Similarly, Section 304(b)(2)(B) of the US Clean Water Act, 33 USC 1314(b)(2)(B), states that “Factors relating to the assessment of best available technology shall take into account ... the cost of achieving such effluent reduction.”

46. For more details and examples for BAT in nuclear regulations see Raetzke, C. and M. Micklinghoff (fn.29), p.199.

47. The Federal Water Pollution Control Act of 1972, as amended (the Clean Water Act), sec.316 (b), 33 USC 1326 (b), reads as follows: “Any standard established pursuant to Section 301 or Section 306 of this Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.”

48. Vine, G. (2010), “Cooling Water Issues and Opportunities at U.S. Nuclear Power Plants”, Idaho National Laboratory, December, INL/EXT-10-20208 Rev.1, pp.2-3 et seq. The paper is available at: www.inl.gov/technicalpublications/documents/4731807.pdf.

49. See Wald, M. (2010), “Oyster Creek Reactor to Close by 2019”, The New York Times, December 8, available at: www.nytimes.com/2010/12/09/nyregion/09nuke.html?_r=0; DiSavino, S. (2011), “NY power plant water rule threatens Indian Point reactors”, Reuters, July 20, available at: www.reuters.com/article/2011/07/20/us-utilities-entergy-indianpoint-idUSTRE76J6NB20110720.

50. Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, OJ L 206/7 (22 July 1992).

often located in remote areas, rich in unspoilt nature, which may contain listed habitats according to relevant legislation. In order to have access to cooling water, they are almost inevitably situated besides a river, an estuary or the sea so that protected aquatic or marine populations could be affected. The vicinity of a protected habitat can lead to the authorisation being granted with certain modifications or conditions. To give an example, the construction licence for a nuclear installation may contain a clause that construction work involving a high level of noise, such as hammering down foundation piles, is prohibited in the breeding season in order to protect birds in an adjacent habitat. Even if there is no means to avoid significant impact on the integrity of the habitat, an authorisation may nevertheless be granted on an exceptional basis if the reasons for the project prevail.⁵¹ This may be the case, depending on circumstances, for the construction of large nuclear facilities which play an important role for reaching the goals of the national energy strategy. In such a case, compensatory habitat areas would have to be provided.

4. Authorisation procedures and competent authorities

4.1 Preceding steps

The authorisation procedure (or set of procedures) for a nuclear installation is normally embedded in a larger context of government action, especially if the installation is part of a comprehensive new build programme.⁵² By the time the applicant starts the authorisation procedure by filing an application, often evaluations and decisions concerning the environmental impact of the facility have already been effected to a certain extent. States embarking in nuclear power will start with a feasibility study and will adopt a plan or programme. Environmental aspects are – or should be – considered and dealt with already at this level. In these early stages, the IAEA Milestones Document states that the environmental issues associated with nuclear power should be analysed by the Nuclear Energy Programme Implementing Organisation (NEPIO).⁵³ Environmental aspects should also play a key role in identifying suitable sites for nuclear installations, besides other criteria such as the geological characteristics of the site, the availability of cooling water or the position in the electricity grid.⁵⁴

In terms of environmental protection, the Strategic Environmental Assessment (SEA) (also called Strategic Environmental Impact Assessment) is a tool related to such a pre-authorisation phase in project development; namely, the planning and programming level (“upstream”) – such as plans for a programme of construction of a number of new nuclear power plants or for a national waste disposal strategy.⁵⁵ As

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51. For an example, see Article 6, paragraph 4 of Council Directive 92/43/EEC on EU Habitats, cited in the previous footnote: “imperative reasons of overriding public interest”.
 52. The IAEA has published guidance on these steps. A comprehensive overview of the approach recommended by the Agency is IAEA (2007), Milestones in the Development of a National Infrastructure for Nuclear Power, IAEA Nuclear Energy Series NG-G-3.1, IAEA, Vienna.
 53. IAEA Milestones, *ibid.*, para.3.13.1.
 54. As the IAEA Milestones, *ibid.*, para.3.13.1. set forth, formal environmental studies and reports should be conducted early, beginning with site categorisation and selection.
 55. The 2003 Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context (the Kiev Protocol to the Espoo Convention), which entered into force in 2010, introduced the obligation (in Article 4, paragraph 2) to perform an SEA for “plans and programmes ... which set the framework for future development consent” for projects listed in annex 1 to the Protocol, which includes nuclear power plants and nuclear reactors. The Kiev Protocol, together with additional information such as status of ratifications, is available on the UNECE website at www.unece.org/env/eia/sea_protocol.html. The EU SEA directive contains a comparable obligation. See Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and

is well-known, the SEA was developed as an additional instrument complementing and preceding the EIA because of the perception that at the stage of authorisation of a particular project, many decisions which are potentially detrimental to the environment may have already been taken at the strategic level and could not be reversed for a local project.

These steps obviously have an impact on the authorisation procedure for a particular nuclear installation. The results obtained and the decisions made concerning environmental protection in these earlier steps should serve as input into the authorisation process and the same issues should not be investigated again. Ideally, this would result in a systematic stepwise approach where environmentally relevant decisions are first taken on a very general level, setting a framework which is then relevant for individual projects within the established programme.

An example for such an approach is the United Kingdom (UK). In the framework of a new energy infrastructure programme, Parliament in July 2011 adopted a number of National Policy Statements (NPS), one of them concerning new nuclear build.⁵⁶ The nuclear NPS includes a list of suitable sites. The draft NPS was subjected to an Appraisal of Sustainability⁵⁷ which incorporated an SEA. Subsequent authorisation procedures for individual nuclear power plants will build on the NPS and will not reiterate the appraisals and decisions contained in the NPS. In parallel, eligible reactor designs were scrutinised by nuclear and environmental authorities in the Generic Design Acceptance (GDA) process.⁵⁸ Just like the NPS, the GDA, including its environmental evaluations, will be a basis for the permit procedures for individual nuclear installations.

Finally, some nuclear regulatory systems offer the possibility of a generic, project-independent review and approval of potential sites, including an EIA, upon application. The major example for this is the US early site permit. Environmental aspects play a key role for such a permit. Since the specific reactor design is not yet determined at this stage, the EIA is based on a generic “plant parameter envelope” of acceptance criteria. In a subsequent licensing process for a particular installation, the applicant can reference the early site permit. To the extent the projected installation keeps within the envelope criteria used for the permit, the matters dealt with in the permit are deemed resolved, leaving no room for a new assessment.⁵⁹

Having mentioned all these pre-licensing steps, there may also be cases where the authorisation process for an individual nuclear installation is not significantly “front-loaded” and not embedded in a broader context of programmes and evaluations. This may occur, for example, when a single nuclear installation is

programmes on the environment, OJ L 197/30, (21 July 2001), Article 3, paragraphs 1 and 2. For more details on an SEA in the nuclear context, see Salter, I., P. Robinson, M. Freeman, J. Jagasia (2012), “Environmental impacts and assessment in nuclear power programmes”, in Agustín, A. (ed.), *Infrastructure and methodologies for the justification of nuclear power programmes*, Woodhead Publishing, pp.567-596.

56. United Kingdom (UK) Department of Energy and Climate Change (2011), *National Policy Statement for Nuclear Power Generation (EN-6)*, July, London, Vols.1 and 2, available at: https://whitehall-admin.production.alpha.gov.co.uk/government/uploads/system/uploads/attachment_data/file/37051/2009-nps-for-nuclear-volume1.pdf.
57. UK Department of Energy and Climate Change (2010), *Appraisal of Sustainability of the revised draft Nuclear National Policy Statement: Main Report*, October, London, available at www.gov.uk/government/publications/appraisal-of-sustainability-of-the-revised-draft-nuclear-national-policy-statement.
58. For more information on GDA, see the website of the UK health and safety regulator HSE at: www.hse.gov.uk/newreactors/background.htm.
59. On the early site permit, see Burns, S. (2008), “Looking Backward, Moving Forward: Licensing New Reactors in the United States”, *Nuclear Law Bulletin*, No.81 (2008/1), OECD/NEA, Paris, pp.7-29, particularly pp.19-20.

added to an existing national fleet. In this case, where there are no preceding evaluations to rely on, the authorisation process will obviously have to cover the full scope of environmental assessments and decisions.

4.2 Authorisation of a project

As scope, contents and structure of authorisations for nuclear installations, as well as the distribution of competencies, are entirely a matter of national legislation, they vary considerably from country to country. Looking at the strictly “nuclear” part of licensing, there may be one comprehensive licence covering siting, design, construction and operation, such as the combined licence (COL) in the US or the nuclear site licence in the UK. In other countries, there are several licences addressing, for example, construction and operation; sometimes, siting is the object of a separate licence. This picture is further complicated considering that some countries, as mentioned above, feature optional pre-licensing steps involving the project-independent assessment of a site or design.⁶⁰

In some countries, legislation establishes that the environmental impact is assessed within the nuclear licensing process and that the licence issued by the nuclear regulator covers, fully or in part, environmental issues. This is the case, for example, in the US⁶¹ and in Germany⁶². In such a system, either the nuclear regulator additionally fulfils, with appropriate staff and expertise, the functions of the environmental regulator, or the nuclear regulator involves the competent environmental authorities and issues its licence only after having received their comments or having obtained their approval.⁶³ Even in the US and Germany, the competencies of the nuclear authorities in the environmental field are not comprehensive; some specific separate environmental permits (e.g. for water use) must be obtained from the competent authorities.

In other countries, substantial additional environmental authorisations besides the nuclear licence need to be obtained. According to some national laws, there is a comprehensive environmental permit, which is separate from nuclear licensing and includes environmental aspects and the EIA. This can be a general authorisation, such as the development consent under Section 37 of the UK Planning Act 2008.⁶⁴ Additionally, the developer of a nuclear installation project may need to apply for a number of separate environmental permits, each covering a particular issue of environmental protection. For example, separate permits may be required for

60. For a summary overview of nuclear licensing procedures in different countries see World Nuclear Association (WNA) (2013), *Licensing and Project Development of New Nuclear Plants*, pp.12-13. The report can be found at www.world-nuclear.org/uploadedFiles/org/WNA/Publications/Working_Group_Reports/WNA_REPORT_Nuclear_Licensing.pdf.

61. The environmental assessment is done by the US Nuclear Regulatory Commission as part of an early site permit or a combined licence procedure according to the criteria in 10 CFR part 51 (2013), “Environmental protection regulations for domestic licensing and related regulatory functions”, which implement the US National Environmental Policy Act (NEPA) of 1969, 42 USC 4332, 4334-4335. See Burns, S. (fn.59), p.11.

62. According to Article 2a of the German Atomic Energy Act (fn.19), “the environmental impact assessment shall constitute an integrated part of the licensing procedures stipulated by this Act”; this means it is part of the nuclear licensing process. According to Article 8, paragraph 2, any licence which would be required for the facility according to the Federal Immission Control Act – which is the most important piece of legislation dealing with “conventional”-environmental impact (see fn.21) – is replaced by the nuclear licence.

63. Article 8, paragraph 2 of the German Atomic Energy Act (fn.19) obliges the nuclear regulator to “make its decision in agreement with the ... authority in charge of pollution control”.

64. The Planning Act is available at www.legislation.gov.uk/ukpga/2008/29/contents. For its relevance in the context of new nuclear build in the UK, see Tromans, S. (2010), *Nuclear Law*, 2nd edn., Hart Publishing, Oxford, pp.137-138, and Salter et al. (fn.55), pp.582-586.

airborne and water discharges. Even within one medium, there may be different authorisations. For example, permits related to the use of water can separately cover the use of water during construction work (e.g. Section 404 US Clean Water Act – discharge of dredged or fill material into water), extraction of water for cooling during operation and discharge of cooling water into rivers or seas.

To give an example for a system with sophisticated authorisation requirements, under the UK regime a nuclear installation not only requires a nuclear site licence and a development consent but also additional separate authorisations issued by the UK Environment Agency *inter alia* for:⁶⁵

- the disposal of radioactive waste (under the Environmental Permitting (England and Wales) Regulations 2010) – this covers discharge of radiation during operation;
- the discharge of aqueous effluents (under the same regulations);
- some auxiliary conventional plants, e.g. a combustion plant (again, under the same regulations and, depending on circumstances, also under the Greenhouse Gas Emissions Trading Scheme Regulations 2005);
- the abstraction of water (for example for cooling or process use) from inland waters or groundwater (under The Water Resources Act 1991); and
- the construction of new or enhanced flood defence structures (under the same Act).

The repartition of subject matters between nuclear licensing and other environmental authorisations is mirrored in the distribution of competencies of the relevant authorities. Quite obviously, nuclear safety issues are at the core of the nuclear regulator's competence and will normally not be dealt with by non-nuclear authorities. Regulation of radioactive discharges is often also the remit of the nuclear regulator; however there are examples of this being taken over by an environmental regulator. In the UK, for example, the Office for Nuclear Regulation (ONR) is responsible for nuclear safety issues, whilst the Environment Agency, as mentioned above, is competent for regulating discharges of radiation into the environment during operation (which is defined, in the UK, as “discharge of radioactive wastes”).⁶⁶ Assessment and authorisation of non-radiation related impacts, finally, will be taken over by environmental authorities unless, as indicated above, the nuclear regulator has comprehensive competence.

Care should be taken in legislation that nuclear licences and other environmental authorisations are adequately coordinated. An example of difficulties in this respect is Sweden. As mentioned above, the 1999 Environmental Code applies to nuclear activities in parallel with the Nuclear Operations Act. Construction or power uprate of a nuclear power plant requires both a nuclear licence, issued by the government based on a statement by the nuclear regulator, the Swedish Radiation Safety Authority (*Strålsäkerhetsmyndigheten* – SSM), and an environmental licence awarded by the Environmental Court. Both licences overlap in their scope. In one case it actually happened that the Environmental Court turned down an application concerning a nuclear power plant (including a proposed power uprate) for reasons

65. See UK Environment Agency (2013), *Process and Information Document for Generic Assessment of Candidate Nuclear Power Plant Designs*, March, Version 2, p.1, available at: <https://publications.environment-agency.gov.uk/skeleton/publications/ViewPublication.aspx?id=564f30eb-1012-430e-a8e9-d08dd1501fdd>.

66. See Environmental Permitting (England and Wales) Regulations 2010, SI 2010/675 (as amended).

including nuclear safety and security, whilst at the same time the SSM did not see any obstacles.⁶⁷ As a result, the Swedish government asked an enquiry commission to propose ways to resolve the unsatisfactory situation. In a 2011 report, the commission recommended merging the Nuclear Operations Act and the Radiation Protection Act into the Environmental Code and to provide for a single overall licensing procedure for nuclear power plants under that Code.⁶⁸

The IAEA Milestones stress that the responsibilities of the regulatory body and other environmental agencies should be clearly defined.⁶⁹ Rules for cooperation of these bodies are often based on national legislation or regulations or on interagency agreements. In the UK, for example, the Health and Safety Executive (the parent body of ONR) and the Environment Agency have signed a memorandum of understanding in order to minimise duplication and conflict.⁷⁰ Another example is the memorandum concluded in the US between the Environment Protection Agency (EPA) and the Nuclear Regulatory Commission (NRC) concerning nuclear facility decommissioning and clean-up of contaminated sites.⁷¹

5. Instruments for assessing environmental impacts

5.1 Background

The investigation and evaluation of the environmental impact of an industrial installation is today an essential part of the authorisation procedure for such facility.

The EIA has evolved into the major tool to assess the impact of a planned facility on the environment. It is an integral part of the authorisation procedure and it informs the final decision of the relevant authority. The EIA has become, on national and international level, part of cross-cutting general environmental law; it applies to civil nuclear installations in the same manner as to other potentially hazardous or polluting activities.

The first state to establish the EIA in domestic legislation was the US under the 1969 National Environmental Policy Act. Since then, the EIA has appeared in the legislation of a large number of states. In 1985, EU Directive 85/337 obliged EU member states to pass legislation on EIA.⁷² On an international level (if only regional), an obligation to perform an EIA for proposed activities, which may have a significant adverse transboundary environmental impact, is the subject of the 1991 Convention on Environmental Impact Assessment in a Transboundary Context (the Espoo

67. This case concerned the Ringhals nuclear power plant (NPP). On 20 October 2005, the government took a decision overriding the Environmental Court so that Ringhals NPP could continue operation. Both for Ringhals and for other Swedish nuclear power plants, however, the competent Environmental Courts have subsequently issued licence conditions dealing with nuclear safety. See Swedish Ministry of the Environment (2007), "Sweden's Fourth National Report under the Convention on Nuclear Safety", Ds 2007:30, p.37. The report is available at: www-ns.iaea.org/conventions/nuclear-safety.asp.

68. For the report of the commission, see fn.11.

69. IAEA Milestones (fn.52), para.3.13.1.

70. "Memorandum of Understanding between the Health and Safety Executive and the Environment Agency on Matters of Mutual Concern at Nuclear Sites Licensed by HSE in England and Wales", (2002, not dated), available at: www.hse.gov.uk/nuclear/nucmou.pdf.

71. "Memorandum of Understanding between the Environmental Protection Agency and the Nuclear Regulatory Commission – Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites", signed 30 September/9 October 2002, available at: www.epa.gov/superfund/health/contaminants/radiation/pdfs/mou2fin.pdf. This has been kindly brought to the author's attention by Sam Emmerechts.

72. OJ L 175/40 (5 July 1985). EU Directive 2011/92 on the assessment of the effects of certain public and private projects on the environment, OJ L 26/1 (28 January 2012), has replaced the original directive (codification).

Convention) concluded under the auspices of the United Nations Economic Commission for Europe (UNECE).⁷³ The obligation to perform an EIA for an industrial activity with possible adverse transboundary impact has also been acknowledged recently by the International Court of Justice (ICJ) in the *Pulp Mills on the River Uruguay* case to be an obligation under international customary law.⁷⁴

With respect to nuclear licensing, issues of nuclear safety, security and radiological protection are covered in great detail and depth in the documents, investigations and evaluations underpinning the nuclear licence, such as the Preliminary Safety Analysis Report submitted to the regulator as a basis for the construction licence. Given the potential hazard of a nuclear installation, the applicant must demonstrate in a comprehensive manner that the installation complies with all relevant requirements. Licensing of nuclear installations has for a long time included an assessment of the environment of the site and an evaluation of the facility's impact on the environment, especially in terms of radiation. This evaluation can be seen as a precursor for the EIA; it has been suggested that today's EIA with its broad range of application has developed by extending this analysis to non-nuclear projects.⁷⁵ Today, there is the issue of delimitation of subject matters between the EIA and the technical assessment documents submitted with the application for the nuclear licence (see Chapter 5.2). Finally, the Radiological Environmental Impact Assessment (REIA) will be explained below (see Chapter 5.3) as a tool to evaluate the radiation-specific impact on the environment.

5.2 EIA for a nuclear installation

Since large civil nuclear installations can potentially cause impacts in a very large area, there is often a compelling case to assume transboundary effects and as a consequence, an obligation, under international law as explained above, to perform an EIA. In practice, the question whether or not to perform an EIA for a planned nuclear facility rarely seems to be controversial, since many states pursuing civil nuclear projects have introduced an EIA requirement in their domestic legislation and large nuclear projects will always fulfil the relevant trigger criteria⁷⁶ (however, controversy may arise over the question of which activities constitute a "major change" of an existing nuclear installation entailing a new EIA⁷⁷). However, the contents and standards of the EIA for a particular project may always become a matter of discussion.

73. For the Espoo Convention, see fn.3. There are 45 parties to the convention (as of November 2013), including a majority of states of Europe and Central Asia plus Canada. For a list of parties, see the UNECE website at: www.unece.org/env/eia/eia.html.

74. *Pulp Mills on the River Uruguay* (Argentina vs. Uruguay) (20 April 2010), ICJ Reports 2010, p.14, at pp.82-83, paragraph 204. See Cletienne, M. (2010), "International Court of Justice on Potential Transboundary Damage and its Consequences in Nuclear Law", *Nuclear Law Bulletin*, No.86 (2010/2), OECD/NEA, Paris, pp.59-66.

75. Phuong, H.V. (1995), "Le rôle précurseur du nucléaire dans le développement des études d'impact sur l'environnement", Proceedings of the Biennial Congress of the International Nuclear Law Association in Rio de Janeiro 1993, FORENSE publishers, pp.45-57.

76. The Espoo Convention in its Annex 1 lists nuclear power plants regardless of their thermal output (there is one exception for very small research installations). It also lists a number of fuel cycle facilities, including plants for production or enrichment of nuclear fuel, reprocessing plants, installations for the processing of spent fuel or high-level radioactive waste, final repositories for radioactive waste and off-site storage facilities for spent fuel (provided storage is planned for more than 10 years).

77. A controversial issue is whether lifetime extension of a nuclear power plant necessitates an EIA. See Espoo Implementation Committee (2013), Report of the Implementation Committee on its 27th session, ECE/MP.EIA/IC/2013/2, March 12-14, which deals, inter alia, with the extension of the Rivne NPP in Ukraine, close to the border with Belarus and Poland. The report is available on the website of UNECE at: www.unece.org/fileadmin/DAM/env/documents/2013/eia/ic/ece.mp.eia.ic.2013.2_adv_copy.pdf.

It is assumed that the reader is familiar with the general elements of an EIA. Hence, this section concentrates on the specific aspects of an EIA for a nuclear installation.

National legislation can establish different assessment procedures for different kinds of activities depending on their impact, varying in the level of scrutiny (e.g. broad screening vs. a comprehensive study) or type of administrative process (e.g. review by an authority vs. review by a panel with experts). For example, the Canadian Environmental Assessment Act provided until recently for three tracks of environmental assessment: a screen, a comprehensive study and a panel review.⁷⁸ The manner of public participation can also be established in different ways, ranging from written comments up to a full public enquiry with oral hearings. Large civil nuclear installations would normally be attributed to the category requiring the most rigorous assessment and the greatest involvement of the public.⁷⁹

The mandatory contents to be covered in the EIA documentation, which is often called the EIA Report or (as in the US) Environmental Impact Statement,⁸⁰ are prescribed in general terms in national legislation (the Espoo Convention and the relevant EU Directive 2011/92, respectively, contain such a list). The EIA for a nuclear facility will in any case include the radiation-related impact on the environment during normal operation, which is an essential part of the general environmental impact. Whereas the Espoo Convention does not expressly mention radiation in its list in Appendix II, the EU Directive in its Annex IV requires “an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed project” (emphasis added).

It is less obvious to what extent safety aspects (prevention and mitigation of accidents), both for nuclear and for other potentially hazardous installations, should be covered by an EIA. Neither Annex IV of Directive 2011/92, detailing the contents of the information to be included in the EIA, nor Appendix II of the Espoo Convention mention accidents. However, the Directive specifies in Annex III, which refers to selection and screening criteria, in determining whether an EIA should be done at all, “the risk of accidents, having regard in particular to substances or technologies used” should be considered. It therefore seems clear that the risk linked to accidents should generally be covered in the EIA⁸¹ and this would apply to nuclear installations in particular.⁸² However, as mentioned above, nuclear safety issues are extensively covered in nuclear licensing documents, such as the Safety Analysis Report (SAR). In practice, the EIA should focus on placing information on the risk and consequences

78. Berger, S. (2008), “Environmental Law Developments in Nuclear Energy”, *Nuclear Law Bulletin*, No.81 (2008/1), OECD/NEA, Paris, pp.55-73, at p.59. In 2012, however, a new Canadian Environmental Assessment Act came into force (S.C. 2012, c.19, s.52) and there are now just two triggers – the screen and a panel review. See Fortier, M. (2012), “The Quest for a Streamlined Canadian Environmental Assessment Act: Are We There Yet?”, in: Berger, S. (ed.), *Key Developments in Environmental Law 2012*, Canada Law Book, Chapter 2, p.28.

79. Berger, S. (*ibid.*, p.78) examines the Canadian Nuclear Safety Commission’s approach to proceeding to a full panel review – which has the potential for being the most rigorous form of assessment – as opposed to a screening or comprehensive study.

80. The Espoo Convention uses the term environmental impact assessment documentation.

81. Tromans, S. (2012), *Environmental Impact Assessment*, 2nd edn, Bloomsbury, London, p.217.

82. For the UK practice see Tromans, S., *Nuclear Law* (fn.64), p.157. In Germany, the 1977 Nuclear Licensing Procedure Ordinance, *Bundesgesetzblatt I* 2006 No.58 (as amended through 2006), obliges the applicant, in Article 3 paragraph (1)1.c) and e), to provide a description of safety features (including those destined to cope with design basis and beyond design basis accidents) and of radiological consequences of design basis accidents. This is made available to the public as prescribed in Article 6, paragraph (1). The ordinance is available, in an unofficial English translation, at: www.bfs.de/de/bfs/recht/rsh/englisch.html/#1.

of accidents into the larger context of the facility's impact on the environment and making this information accessible to the public. Therefore, it should normally be expected that the EIA report analyses and describes the impact caused by a design basis accident (or postulated accident) in accordance with regulations defining limits for annual doses of members of the public. Concerning severe accidents with extremely remote probability, the EIA report might discuss, in a generic fashion, the release and distribution of radiation based on an estimate of source terms and representative meteorological conditions. A good example for an EIA report covering these aspects is the EIA conducted for the Finnish Olkiluoto 4 NPP.⁸³

An issue often confronted in the context of nuclear projects is the analysis, in the EIA, of "reasonable alternatives" as required in the Espoo Convention⁸⁴, in the EU Directive⁸⁵ and in national laws. It seems hardly reasonable to oblige the applicant to include a study investigating the alternatives of generating the same amount of electricity by other means (e.g. coal, gas or renewables). In purely practical terms, the regulator dealing with the authorisation process, particularly if it is the nuclear regulator, would not be competent to discuss and evaluate these far-reaching energy policy alternatives; and for a project developer a meaningful comparison of alternatives seems hardly possible, given the complexity of the matter. Instead, the relevant issues and alternatives should be decided beforehand, in a more general energy policy plan or programme, which itself can be accompanied by an environmental assessment (the SEA, see above).

A good example of this is the UK National Policy Statement (NPS). As mentioned above, the NPS on nuclear energy discussed and decided the question whether nuclear power is needed or whether other forms of energy production should take precedence. The panel dealing with the development consent application (and the EIA) for a particular nuclear power plant does not reiterate these issues.⁸⁶ In Canada according to section 16 (1)(e) of the Environmental Assessment Act valid until 2012,⁸⁷ the Canadian Nuclear Safety Commission did have discretion to consider "any other matter relevant..., such as the need for the project and alternatives to the project". The Commission, however, took the view that it would only require alternatives to a nuclear energy project (such as renewable energy) to be considered in the case that a first assessment of the project indicated such severe adverse environmental consequences that would prompt a proponent to consider alternatives. As of 2008, there had been no project where this was the case.⁸⁸ In Finland, the EIA done by TVO

83. See Chapter 10 "Nuclear safety and the impacts of exceptional situations and accidents" of Teollisuuden Voima Oyj's (TVO's) EIA Report (January 2008), *Extension of the Olkiluoto Nuclear Power Plant by a Fourth Unit*, pp.148-157. The document is available at: www.tem.fi/files/18506/YVA_selostusraportti_EN_Secured.pdf.

84. Appendix II, paragraph (b) of the Espoo Convention requires "a description, where appropriate, of reasonable alternatives (for example, locational or technological) to the proposed activity and also the no-action alternative".

85. Directive 2011/92 (fn.72), Annex IV, paragraph 2.

86. The panel for the Hinkley Point C application expressly stated it did not include in its EIA analysis "matters of principle that were considered and decided by Government in designating the energy NPS", in particular the need for nuclear infrastructure. See Panel's Report in respect of an application for a Development Consent Order for Hinkley Point C Nuclear Generating Station and Associated Development (19 December 2012), paragraph 1.6. The report is available as "Annex A" at: <http://infrastructure.planningportal.gov.uk/projects/south-west/hinkley-point-c-new-nuclear-power-station>.

87. S.C. 1992, c.37.

88. See Berger, S. (fn.78), p.65. As Stanley Berger has pointed out to the author, in the new Canadian Environmental Assessment Act 2012 (S.C. 2012, c.19, s.52) the relevant wording has been changed: Section 19 (1)(f) reads: "taking into account ... the purpose of the designated project". It is yet unclear whether this will have an effect on the commission's policy. The 2012 Act is available at: <http://laws-lois.justice.gc.ca/eng/acts/c-15.21/index.html>.

for the Olkiluoto 4 NPP did investigate the impact of the “zero option”, by assuming that the electricity to be generated by the planned Olkiluoto 4 unit would instead be purchased on the Nordic electricity market and describing the environmental impact of electricity generation according to the structure of that market.⁸⁹ However, the report does not – and obviously cannot – draw a definitive conclusion regarding this issue.

Project alternatives which can be evaluated in a reasonable and meaningful manner in the context of the authorisation procedure of a nuclear facility are technical variants within the overall scope of the project (e.g. once-through cooling vs. the use of cooling towers; or the use of hybrid cooling towers vs. normal cooling towers), different variants of the exact location of installations on the site or alternatives for construction infrastructure (e.g. building a jetty for delivery of components by the sea vs. building a road for heavy load vehicles).

It is important to carefully define the impact of the EIA process on the decision finally taken by the competent authority, be it the nuclear regulator or an environmental authority. The Espoo Convention obliges parties to ensure that “due account is taken of the outcome of the environmental impact assessment”⁹⁰; similarly, the EU Directive 2011/92 requires that the outcome “shall be taken into consideration in the development consent procedure”.⁹¹ As a minimum, the EIA “informs” the decision of the authority whether to grant an authorisation for the project. Where it is found that the project would breach mandatory limits for detrimental effects – such as radiological protection requirements or those concerning specially protected habitats – and these cannot be prevented or mitigated by licence conditions, the licence may be refused, unless there is the option of some special exception or compensation (such as the “imperative reasons of overriding public interest” under the EU Habitats directive discussed above). If no mandatory limits are breached, the authority will, by way of conditions added to the licence, as far as legally possible make sure that negative effects on the environment which have been identified by the EIA are prevented, mitigated or compensated. As the example of required cooling towers for existing nuclear power plants shows, it is conceivable that licence conditions protecting the environment are so onerous or expensive that the applicant decides not to go forward with the project.

5.3 Radiological impact assessment

Independent of, and complementary to, the principles and requirements governing the overall assessment of the environmental impact of a planned activity, an assessment of plant operation and event consequences causing radiological risks for the environment is at the core of any nuclear authorisation procedure.

The IAEA Safety Standard on Safety Assessment (GSR Part 4) states: “It shall be determined in the safety assessment for a facility or activity whether adequate measures are in place to protect people *and the environment* from harmful effects of ionizing radiation.”⁹²

The IAEA Basic Safety Standards establish that “Any person or organization applying for authorization ... shall, as required by the regulatory body, have an appropriate prospective assessment made for *radiological environmental impacts*,

89. See the EIA Report for Olkiluoto 4 (fn.83), Chapter 11.

90. Espoo Convention (fn.3), Article 6, paragraph 1.

91. EU Directive 2011/92 (fn.72), Article 8.

92. IAEA (2009), “Safety Assessment for Facilities and Activities, General Safety Requirements”, No.GSR Part 4, Requirement 9, IAEA, Vienna (emphasis added).

commensurate with the radiation risks associated with the facility or activity.” (emphasis added)⁹³

With specific regard to radioactive discharges, the Basic Safety Standards oblige the applicant to:

- determine the characteristics and activity of the material to be discharged, and the possible points and methods of discharge;
- determine by an appropriate pre-operational study all significant exposure pathways by which discharged radionuclides could give rise to exposure of members of the public;
- assess the doses to the representative person due to the planned discharges;
- consider the radiological environmental impacts in an integrated manner with features of the system of protection and safety, as required by the regulatory body; and
- submit the findings to the regulatory body as an input to the establishment by the regulatory body of authorised limits on discharges and conditions for their implementation.

The tool to assess the radiation-specific impact on the environment is the Radiological Environmental Impact Assessment (REIA).⁹⁴ This is a procedure for evaluating the likely direct radiological effects that may be caused by a proposed facility or activity on human health and other elements in the environment, for example flora and fauna. It should consider exposures resulting from normal operations and those that may potentially occur as a result of accidents (potential exposures). As a result of this assessment, the authorisation will contain discharge limits and it will specify requirements on the nuclear safety of the facility.

The REIA clearly overlaps with the EIA and it should be an integrated part of it. A REIA may be performed at more than one stage in a nuclear licensing process. At an initial level, the REIA may be relatively descriptive in nature and based on generic data and conservative assumptions. It would be subsequently revised and, in a final stage, included in the Final Safety Assessment Report for the nuclear installation. At these later stages, it would have to consider more details in the modelling and site specific issues and improved data where possible.⁹⁵

After commissioning and during operation of the nuclear facility, the nuclear safety assessment, including the REIA, is periodically reviewed and updated.⁹⁶ The same goes for the decommissioning phase.

6. Participation of the public

6.1 Background

Involvement and participation of the public in the decision-making on programmes and projects with environmental impacts is a topic which has received increasing attention in the past several decades and is today seen to be crucial for planning and authorisation procedures. Specifically, EIA and SEA have evolved into an important means not only for assessing and controlling environmental impact, but also for dealing with environmental concerns of the public.

93. IAEA No.GSR Part 3 (fn.40), paragraph 3.9 (e).

94. The REIA is the subject of an IAEA Safety Guide currently in preparation (No.DS427).

95. IAEA Draft Safety Guide DS427, *ibid.*, (draft version 4 of July 2013), paragraph 4.7., p.16.

96. IAEA GSR Part 4 (fn.92), Requirement 24.

The 1998 Aarhus Convention⁹⁷ is the main international (in this case, regional) instrument covering information and participation of the public in environmental matters. Concerning, more specifically, participation in an authorisation procedure, the 1991 Espoo Convention, which has been mentioned in previous chapters of this article, had already established public participation as a major element of an EIA, without however containing detailed provisions.⁹⁸ In this respect, the Aarhus Convention complements the earlier convention.⁹⁹ All relevant “catalogues” of projects with potential environmental impacts which trigger a public participation exercise – both in the two conventions,¹⁰⁰ in EU law¹⁰¹ and in national environmental law of most countries – include large nuclear installations. Therefore, public participation in the licensing of nuclear installations is today mostly governed by procedural rules of general environmental law.

In this context, general environmental law seems to have somewhat “overtaken” nuclear law, at least on the international level.¹⁰² Even if the importance of public participation in nuclear activities is reflected in IAEA documents such as the Safety Standard GSR Part 1 “Governmental, Legal and Regulatory Framework for Safety”¹⁰³ or INSAG-20 “Stakeholder Involvement in Nuclear Issues”¹⁰⁴, international instruments on nuclear law as yet hardly establish binding obligations for authorities to interact with the public. Public participation in licensing is completely outside the scope of the Convention on Nuclear Safety. The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management at least requires states to make information on the safety of a proposed spent fuel or radioactive waste management facility available to members of the public,¹⁰⁵ but it does not mention information on the environmental impact, nor does it foresee a possibility for the public to voice comments.

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97. United Nations Economic Commission for Europe (UNECE), Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, Aarhus (Denmark), 25 June 1998, 2161 UNTS 447 (entered into force 30 October 2001). The text of the convention is available on the UNECE website at: www.unece.org/env/pp/treatytext.html, and a status list of participants at: www.unece.org/env/pp/ratification.html. Participation includes a majority of states of Europe and a number of states of Central Asia.
 98. Article 2, paragraph 2 of the Espoo Convention (fn.3) requires “the establishment of an environmental impact assessment procedure that permits public participation”; Article 2, paragraph 6 provides for “an opportunity to the public in the areas likely to be affected to participate in relevant environmental impact assessment procedures”.
 99. It should be noted, however, that the Espoo Convention only applies to EIAs in a transboundary context, whereas application of the Aarhus Convention is independent of any transboundary impacts of a project.
 100. For the catalogue of the Espoo Convention, see fn.76. In the Aarhus Convention (fn.97), specified nuclear installations (mainly nuclear power stations and major installations of the fuel cycle) are listed in Annex I, paragraph 1.
 101. The relevant catalogue is in Annex I of Directive 2011/92 (fn.72). For nuclear installations, see Annex I, paragraphs 2(b) and 3.
 102. Reyners, P. (fn.2, p.172) states that general environmental law is “more advanced” than nuclear law when it comes to information, consultation and participation of the public. A similar observation is made by Emmerechts, S. in “Environmental Protection under Nuclear Law: Still a Long Way to Go” (fn.2), p.152.
 103. IAEA (2010), “Governmental, Legal and Regulatory Framework for Safety”, No.GSR Part 1, Requirement 36: Communication and consultation with interested parties, p.32. An IAEA Safety Guide underpinning the requirement for communication and consultation with the public and more detailed guidance is currently under preparation (No.DS460).
 104. IAEA INSAG (2006), “Stakeholder Involvement in Nuclear Issues”, INSAG-20, IAEA, Vienna.
 105. IAEA, Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 5 September 1997, IAEA INFCIRC/546, 2153 UNTS 357 (entered into force 18 June 2001), Article 6, paragraph 1(iii) (for spent fuel management facilities) and Article 13, paragraph 1(iii) (for waste management facilities).

On the national level, however, the picture is more varied and in some cases nuclear law preceded general environmental law in establishing public consultation procedures. In a survey on Western European nuclear countries conducted in 1977, when public participation had yet to be systematically introduced into general environmental law, Norbert Pelzer and Werner Bischof came to the conclusion that “Germany, France and the Netherlands have relatively elaborate systems for public enquiry or participation in nuclear licensing procedures” whereas these were lacking in other countries.¹⁰⁶ Looking outside Western Europe, the US also had elaborate provisions on public participation at that time, including oral hearings and circulation of draft environmental statements for public comment.¹⁰⁷ In the aforementioned countries, the existing systems of nuclear procedural law more or less covered and absorbed the participation requirements developing with the rise of environmental law.¹⁰⁸ By contrast, in those countries which did not originally feature elements of public participation in nuclear law, the implementation of modern environmental law and its public participation requirements had an impact on the licensing procedure for nuclear installations. It is interesting to note that in Sweden the previously mentioned 2011 report on harmonisation of rules for nuclear activities justified its recommendation to merge nuclear legislation into the Environmental Code by stating, *inter alia*, that public participation is more comprehensive under the code than under nuclear-specific legislation.¹⁰⁹

As mentioned, involvement of the public is today an important part of EIA and SEA and public participation in the authorisation of nuclear installations normally takes place within these processes. Depending on the national legal framework, the public may also be involved in parts of the specific nuclear licensing procedure, if this is separate from the environmental assessment. If several authorisation processes for a single nuclear project involve public participation exercises, these should be coordinated as early and as meaningfully as possible to avoid delay, obstruction, inconsistencies and contradictory outcomes.

Three functions of public involvement are highlighted in the Aarhus Convention: general access to relevant information; participation in decision-making; and access to justice. The first aspect will not be investigated here, as it concerns the general availability of environmental information to the public. The other two topics are relevant in the context of authorisation of nuclear installations and will now be explored.

106. Pelzer, N. and W. Bischof (1977), “Comparative Review of Public Participation in Nuclear Licensing Procedures in Certain European Countries”, *Nuclear Law Bulletin*, No.19 (May 1977), OECD/NEA, Paris, pp.53-72, at p.71.

107. See Strauss, P.L. (1977), “Die Öffentlichkeitsbeteiligung im atomrechtlichen Genehmigungsverfahren in den Vereinigten Staaten” (article itself is in English), in Lukes, R. (ed.), *Fünftes Deutsches Atomrechts – Symposium*, Carl Heymanns Verlag, pp.279-297.

108. In Germany, for example, the 1977 Nuclear Licensing Procedure Ordinance (fn.82), the first version of which was issued in 1960, features provisions on comprehensive public participation in the licensing of nuclear facilities, including a public enquiry with an oral hearing. Since 1977, several waves of new German legislation implementing Espoo and Aarhus Conventions (and corresponding EU legislation) left these provisions of the ordinance largely unchanged in substance because they were found to be sufficient to fully cover the new requirements.

109. For the report, see fn.11. On p.72, the report states: “Under the present Nuclear Operations Act or the Radiation Protection Act, licensing applications are prepared and examined by means of a written procedure that does not offer the same general public access as a main hearing in the Environment Court”.

6.2 Participation in decision making

As with the EIA, it is assumed that the reader is familiar with major elements of public participation in an authorisation procedure for a large project with considerable environmental impact. Here, only those aspects will be highlighted which have specific relevance for nuclear projects. In any case, it must be taken into account that public participation is shaped by national law (which may be influenced by international or EU law) and that there are many variants from country to country. The general political and legal framework, tradition and history of a country will influence the way public participation is established in legislation, regulations and practice.

Expectations and objectives imposed on public participation procedures by legal instruments, policy documents, politicians and the public itself have been constantly growing in the last few decades; and nuclear projects, in particular, tend to be showcases where all aspects of public participation are put to the test and opponents try hard to pull all levers. Not surprisingly, nuclear projects have contributed some major examples of “monster” public enquiries.¹¹⁰

One aspect of public consultation in nuclear is that opponents are, as a rule, generally opposed to the use of the technology, not only against particular aspects of the individual project. As mentioned,¹¹¹ some countries have organised decision-making and associated public participation for nuclear projects (and other large-scale projects) in a stepwise approach, moving forward from general to detailed issues. In such a system, general aspects of a nuclear power project, which have been the subject of public participation in an early stage of the procedure, should not be re-considered again later. When the public has been heard in the process leading to a decision to introduce or enlarge a nuclear power programme or to implement a specific nuclear power plant project, it does not seem reasonable to re-consult the public on these general policy issues in the licensing stage, which focuses on the safety and environmental protection merits of the individual installation.¹¹²

As with the outcome of an EIA in general, the crucial question is how public concerns are dealt with when the competent authority takes the decision about granting an authorisation for a nuclear installation. The Aarhus Convention requires that “due account is taken of the outcome of the public participation”;¹¹³ in the same generic fashion, the EU EIA Directive 2011/92 requires that the “results of consultations ... be taken into consideration”.¹¹⁴ In most national jurisdictions, legislation uses similar wording. In practice, this means that the authority, when

110. The inquiry for the Sizewell B NPP in the UK lasted from January 1983 to March 1985 and took 340 days; see Tromans, S. (fn.64), pp.128-9. In Germany, the longest oral hearing (*Erörterungstermin*) concerned the Konrad repository for low and medium-level radioactive waste. It lasted from September 1992 to March 1993 and took 75 days. In both cases, the authorisations were eventually issued. Burns, S. (fn.59), p.15 gives the example of the Shoreham and Seabrook nuclear plants in the US where operation was delayed by several years, and in the case of Shoreham eventually even prevented, as a cause of difficulties in the operating licence procedures, which many observers claimed were also attributable to the NRC's hearing process. This eventually led to the NRC adopting the new one-step licensing procedure (10 CFR Part 52) where the pre-operation hearing is greatly restricted in scope; *ibid.*, p.25-27.

111. See the UK system explained in Chapter 4.1.

112. Salter et al. (fn.55), p.584, in the context of the UK system with National Policy Statements (NPS), make the point that “NPS are meant to avoid policy disputes being raised further down the line in respect of specific project applications”.

113. Aarhus Convention (fn.97), Article 6, paragraph 8.

114. EU Directive 2011/92 (fn.72), Article 8.

issuing its decision, has to indicate how it has taken public comments and objections into account. Some objections may induce the authorisation body to modify the draft authorisation or to introduce a licence condition; others may not have any effect. In the latter case, the authority would normally have to explain why the objection has been disregarded. However, the opinions voiced by the public are in no way binding for the authority and the public does not have the right to decide the outcome of the authorisation decision or to exercise a veto power in relation to a specific project. Obviously, in democratic countries, citizens can influence, by voting or by political activity, the general approach of national or regional governments in matters of nuclear energy.¹¹⁵ In some countries, there may be the possibility of a referendum specifically on that issue.¹¹⁶ National nuclear or general environmental legislation may, in some cases, establish that the municipality where the nuclear installation is to be situated has a veto right or must give its consent;¹¹⁷ in such a case, local opponents can influence the municipal actors. But again, it must be clearly stated that public participation in an authorisation procedure is not about having the public decide about the project.

Another specific aspect of public participation in the authorisation of nuclear projects, as compared to other projects, such as motorways or ports, is the high level of technical detail and technical and scientific expertise underpinning the authorisation decision and especially the decision whether a sufficient level of nuclear safety is achieved, based on an evaluation of low probability events. This requirement leads to obvious limits in the extent and effectiveness of public participation due to lack of expertise in members of the general public. Provisions in nuclear-specific or environmental law may require the applicant to make available to the public, either in the framework of the EIA or in the nuclear-specific licensing process, a comprehensible explanation of the safety features of the plant.¹¹⁸ Additional questions are whether it is desirable – and, if desirable, whether it is feasible – to build up nuclear safety competence within the public and to enable interested members of the public access to independent expertise to achieve a fully “autonomous evaluation” and to improve the quality of participation. The outcome of this discussion remains to be seen.¹¹⁹

115. An example is Germany where the phase-out of nuclear power started in 1998 with the election to power of two parties – the Social Democrats and the Green Party – which had pledged in their election programmes to implement the phase-out, whereas the outgoing government was in favour of nuclear power.

116. Well-known referenda on nuclear have been held in Switzerland (one in 1990, leading to a 10-year moratorium on new build, and one in 2003, rejecting proposals to extend this moratorium or to phase out nuclear power altogether) and in Italy (one in 1987 leading to eventual closure of the country’s nuclear power plants and one in June 2011 putting an end to legislation that would have enabled construction of new installations).

117. This is the case in Finland. See Nuclear Energy Act, 11.12.1987/990, Section 14. The Act, in an unofficial English translation, is available on the website of the Finnish nuclear regulator STUK at: www.stuk.fi/julkaisut_maaraykset/en_GB/lainsaadanto/.

118. By way of example, the German Nuclear Licence Procedure Ordinance (fn.82), Article 3 paragraph 1(1), states that one purpose of the applicant’s main report lies in “enabling third parties in particular to see whether or not their rights may be affected by the impacts associated with the installation and its operation”. The Ordinance requires, in Article 3 paragraph 4, “a brief, readily understandable description of the installation and its likely effects on the public and the neighbourhood”.

119. This was one of the topics discussed at the 4th European Roundtable “Aarhus Convention and Nuclear” under the title “Aarhus Convention implementation in the context of Nuclear Safety”, organised by the French “Association Nationale des Comités et Commissions Locales d’Information” (ANCCLI) and the Directorate-General Energy of the European Commission (DG-ENER), with support of the European Economic and Social Committee (EESC) and the French Institute for Radiation Protection and Nuclear Safety

It is sometimes asserted that public participation is essential to guarantee nuclear safety; in this context, it has been suggested that the public should become the “fourth pillar” of nuclear safety besides the regulator, the operator and technical safety organisations.¹²⁰ What can be said, of course, is that intensive public scrutiny may in a certain way contribute to nuclear safety by challenging the experts to do their analyses as transparently, comprehensively and soundly as possible, and to present a generally understandable and compelling justification. Public attention may also be vital to put a spotlight on institutional deficiencies which threaten to compromise safety, such as a lack of independence of the regulator. However, it is suggested here that the function of public participation to give factual input to experts and to provide them with insights they might otherwise not be sufficiently aware of is more effective for the “general” environmental impact of a nuclear installation than for very technical and complicated radiation-related aspects and particularly for nuclear safety. In any case, a concept based on the assumption that the work of experts from the licence applicant, the regulator, the vendor and, if applicable, a technical support organisation, may not be sufficient to warrant safety and that additional public input is needed would seem somewhat worrying.

To conclude, everyone – including the author – agrees that public participation is of utmost importance. However, there is reason to believe that its effectiveness and significance would not necessarily be further enhanced if the occasions for public input in the authorisation process were ever more multiplied or if the information made available through the process was simply increased even beyond levels already reached in states with a mature system of public participation. Legislation should establish clearly focused stepwise participation procedures that should be handled by the competent authorities in a fair, rigorous, predictable, comprehensible and transparent manner. A very delicate but important task of the main actors, including politicians, is to give the public a clear view both of the extent and of the limitations of public participation, instead of raising expectations that cannot be fulfilled.

6.3 Access to justice

As its third tier, besides access to environmental information and participation in decision making, the Aarhus Convention¹²¹ – followed by the EU Directive 2011/92¹²² – contains provisions granting access to justice to citizens in environmental matters. Under certain conditions subject to the administrative procedural law of the state concerned, members of the public have the right to challenge the substantive and procedural legality of the authorisation decision or to challenge acts and omissions by private persons and public authorities which contravene provisions of national environmental law. States are required, under certain circumstances, to extend this access to justice to environmental NGOs.

(IRSN) in Brussels on 4 and 5 December 2012. The presentations can be downloaded at: www.eesc.europa.eu/?i=portal.en.events-and-activities-european-roundtable-aarhus-convention.

120. Aarhus Convention and Nuclear, Joint Event on Public Participation in Decision Making in the Nuclear Domain, March 2013, organised under the auspices of the Aarhus Convention’s Task Force on Public Participation in Decision-Making, the Directorate-General Energy of the European Commission and the French “Association Nationale des Comités et Commissions Locales d’Information” (ANCCLI), Report, p.9. The report is available at: www.ancli.fr/Europe-International/ACN-Convention-d-Aarhus-et-nucleaire-Aarhus-Convention-Nuclear.

121. Aarhus Convention (fn.97), Article 9.

122. EU Directive 2011/92 (fn.72), Article 11 (former Article 10a of Directive 85/337 as introduced by Directive 2003/35).

Again, as with other procedural aspects, access to court to challenge authorisation of a large nuclear project is not necessarily an “invention” of modern environmental law. To varying extent, states have from the outset enabled citizens to appeal licensing decisions for nuclear installations based either on their general administrative law or their nuclear law. Certainly, the enhancement of environmental law based on the Aarhus Convention and related developments in many countries have strengthened this aspect. Generally, however, the extent of access to justice concerning authorisations for nuclear installations still seems to depend largely on the general legal and administrative law system of each country. It is interesting to note that there is a varying degree of practical relevance of court decisions for nuclear law. In some countries, such as Germany and the US, court decisions have been instrumental in the development of nuclear law; in others, law courts have not played a substantial role. It is also a matter of national administrative law and practice whether procedural or substantive relief is granted – i.e. whether law courts limit their evaluation to the question of the fairness of the proceedings and the correct application of the relevant procedures, or whether they enter into the substantive merits of the case and pronounce a judgment on if the installation is “safe enough” to warrant a positive licensing decision.¹²³

Legal challenges in nuclear cases can be directed against a general policy, plan or programme to introduce or extend nuclear power. A well-known and fairly recent example of this is the successful Greenpeace claim against the UK government and its 2006 consultation on nuclear energy.¹²⁴ Claims can also concern the authorisation for a particular nuclear power plant. In Germany, virtually all licences for nuclear power plants have been taken to court. In at least one case, the judges repealed the licence, resulting in the nuclear power plant, having operated only about a year, to be closed down and eventually decommissioned.¹²⁵ In Germany, as a rule, legal challenges were to a greater extent based on alleged nuclear safety and security deficits, whilst non-radiation related environmental impacts played a minor role. It would be worthwhile to investigate whether this is also generally true in other countries.

123. In Germany, administrative law courts are in principle bound to judge the merits of the case. In the first judgements concerning NPP licences from the late 1960s, law courts, in very elaborate decisions, actually pronounced on the safety of the NPP concerned after having extensively heard experts. This became increasingly unsatisfactory and ended when the highest courts introduced into nuclear law the doctrine of an “evaluation prerogative” (*Einschätzungsprärogative*) of administration, meaning that law courts, instead of doing their own full analysis, only assess whether the analysis done by the regulator is based on sufficient investigation and whether its evaluation is sufficiently conservative. This still obliges the law court to inquire into substantive aspects, if necessary with the help of experts, but it does greatly reduce depth and scope of its assessment. The pivotal judgement is that of the Federal Administrative Court concerning the Wyhl NPP (fn.20) at p.317. See Sellner, D. and G. Hennenhöfer (2012), “Atom- und Strahlenschutzrecht”, in Hansmann, K. and D. Sellner (ed.), *Grundzüge des Umweltrechts*, Erich Schmidt Verlag, 4th ed., pp.937 et seq.

124. *R. (Greenpeace Ltd.) v Secretary of State for Trade and Industry*, 2007 All E.R.(D) 192 (H.C. [Admin]). On this court case, see Tromans, S. (fn.64), pp.133-135, and Berger, S. (fn.78), pp.55-58.

125. This was the Mülheim-Kärlich plant which was shut down in 1988 when cancellation of the licence by the competent regional law court was endorsed by the Federal Administrative Court (09.09.1988, 7 C 3.86, E80, 207). Subsequent efforts to re-issue an amended licence eventually failed when this was again cancelled by the law courts (see the decision of the Federal Administrative Court of 14.01.1998, 11 C 11.96, E106, 115), the main reason being that seismic issues had not been adequately taken into account in the licensing process. In 2001 RWE, the plant owner, abandoned further efforts to reopen the plant and decided to decommission the facility.

One aspect promoted by the ascent of general environmental law is the enhanced position given to NGOs in administrative and judicial issues. This has created some conflicts within more restrictive national systems, such as in Germany where traditionally access to court is limited to individuals who can demonstrate that they hold individual public law rights, which are possibly infringed by the authorisation. Legislation giving NGOs much greater access than before was introduced in Germany in 2004 and enhanced in 2006, and led to discussion about whether it is desirable to shift implementation and guardianship of the common good away from public authorities to private NGOs.¹²⁶ Very recently, the Trianel judgement of the ECJ¹²⁷ has again strengthened the access of NGOs to law courts. These issues are important for nuclear projects. It has already been pointed out that authorisation processes for nuclear installations often become “landmark processes” in which the most recent developments in procedural law are applied by stakeholders, including NGOs.¹²⁸

7. Transboundary aspects

7.1 Background

Transboundary environmental issues are of particular relevance for civil nuclear facilities, for several reasons. Due to their (real or perceived) potential hazard, nuclear installations are often the focus of attention of governments and of the public, not only in the country where they are situated but also in neighbouring states. Nuclear installations are frequently located near a border. To provide adequate cooling water, many potential or existing sites for nuclear installations are situated besides large rivers or straits. These often happen to form the boundary between two countries, so that the neighbouring country is as affected as the installation country; and the countries situated further downstream may also be directly affected by potential water-related impact. In smaller countries, regardless of the site chosen, a certain degree of proximity of a nuclear installation to another country may be almost unavoidable. The 1986 Chernobyl accident has shown that the effects of a large release of radiation can spread over a considerable area and can affect an entire continent. When a nuclear project is announced, the government and citizens of a country may be troubled by the project and may wish to be involved, even though this country is not directly adjacent to the installation country and may actually be far away.¹²⁹

Thus, in the nuclear field the practical impact of transboundary environmental aspects is apparent. Many nuclear installations situated at or near borders have been, and sometimes still are, the subject of political controversy between states.¹³⁰

126. Feldmann, U. (2006), “Was bedeuten Aarhus-, Espookonvention und SEA-Protokoll für das Atomrecht?” in Pelzer, N. (ed.), *Bausteine eines globalen Atomrechtsregimes – Elements of a Global Nuclear Law Regime, Proceedings of the regional conference of AIDN/INLA 2006 in Goslar, Germany*, pp.233-258, at p.243-244.

127. Judgment of 12 May 2011, C-115/09, *Bund für Umwelt und Naturschutz Deutschland v. Bezirksregierung Arnsberg*, ECR 2011 I-03673.

128. See Feldmann, U. (fn.126), p.245.

129. For example, Austria, at its request, was included in the consultation for the licensing of the Olkiluoto 4 NPP. The distance from Olkiluoto to the Austrian border is about 1 400 km.

130. Examples are Sellafield (UK, opposed by Ireland); Fermi 2 (US, with concerns voiced by Canada); Cattenom (France, opposed by Luxemburg); Krsk (Slovenia, with concerns voiced by Italy); Fessenheim (France, with opposition from the neighbouring German region). For these and other cases, see Handl, G. (1993), *Grenzüberschreitendes nukleares Risiko und völkerrechtlicher Schutzanspruch*, Duncker & Humblot, Berlin, p.32. A current case is the planned Ostrovets NPP in Belarus which is opposed by Lithuania. The Ostrovets site is close to the Lithuanian border and 40 km away from the Lithuanian capital Vilnius.

The proximity of nuclear installations to the border of another country hostile to its operation may have been in some cases a decisive factor in the decision not to build, or to shut down, these installations.¹³¹

These international aspects can put substantive requirements on authorisations (below, 7.2) and require the procedural involvement of other states and their citizens (below, 7.3).

7.2 Obligations concerning environmental protection

Whilst states are acknowledged to hold a sovereign right to implement their own environmental policies, there is also emerging recognition of the duty of states to ensure that an activity performed on their territory does not significantly impair the environment of other states.¹³² The Espoo Convention establishes that: “The Parties shall, either individually or jointly, take all appropriate and effective measures to prevent, reduce and control significant adverse transboundary environmental impact from proposed activities.”¹³³

Beyond this general principle of state responsibility for the impairment of the environment outside its territory, which has been judged by the International Court of Justice to have become “part of the corpus of international law relating to the environment”,¹³⁴ there are some conventions which establish legally binding limits on pollution or use of certain aspects of the environment and which may apply to nuclear activities, such as some conventions to protect the marine environment.¹³⁵ In the nuclear field, the Convention on Nuclear Safety and the Joint Convention are topical, but they do not establish binding and precise safety requirements for installations.

What does the general obligation of respecting the environment of other states mean for nuclear installations? Opponents of nuclear energy have sometimes suggested that operation of a nuclear power plant is an “ultra-hazardous” activity which, if performed near the border of another country, constitutes in itself a breach of international law. However, independent of the perception of the amount of risk generally connected with the operation of nuclear power plants, a wholesale prohibition of such installations near the border of another state clearly is not warranted by current practice and cannot be said to be part of customary international law.¹³⁶

131. This is manifest in the case of Barsebaeck NPP in Sweden. This installation is close to the Danish capital Copenhagen and has caused constant friction between Sweden and Denmark. When a law gave the Swedish government the power to order closure of any NPP against compensation, the government selected Barsebaeck and ordered shutdown of unit 1 in 1999 and unit 2 in 2005. It is widely accepted that this choice was significantly determined by the desire to end the controversy with Denmark.

132. For a more detailed account, see Shaw, M.N. (2003), *International Law*, 5th ed., Cambridge, pp.760 et seq.

133. Espoo Convention (fn.3), Article 2, paragraph 1.

134. Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion to the UN General Assembly, ICJ Reports 1996, pp.226, 242.

135. For more details on the relevant conventions, see Emmerechts, S. (2010), “Environmental Protection under Nuclear Law: Still a Long Way to Go” (fn.2), pp.125-126. One example where a convention became relevant was the court proceeding initiated by Ireland against the UK under the United Nations Convention on the Law of the Sea (UNCLOS) concerning the MOX facility at Sellafield. See Permanent Court of Arbitration, Order No.3, 24 June 2003, and the account of the case given by Tromans, S. (fn.64), pp.407-409.

136. Faßbender, K. (2012), “Atomkraftwerke aus umweltvölker- und nachbarrechtlicher Sicht”, *Zeitschrift für Umweltrecht*, Bremen, pp.267-274, at p.272.

Arguably, the obligation to prevent and control transboundary environmental impact does put some obligations on a country to ensure the safety of its planned and existing nuclear power plants and to limit the discharge of radiation. Given that the Convention on Nuclear Safety does not contain specific safety requirements, the IAEA safety standards would seem to be ideal points of reference for such an assessment. But as explained above, these standards are not binding on IAEA member states; there seems to be no sufficient evidence that there is a customary principle of law that they define the extent of a country's obligation to prevent radiological harm to the environment of another country.¹³⁷ However, it can be safely assumed that if a nuclear installation is subject to, and compliant with, national laws, regulations and standards which comply with IAEA safety standards, including the Basic Safety Standards for radiological protection, the installation state should be "on the safe side" concerning its international obligations. The same should apply for environmental protection, if standards reflecting international best practice, such as BAT, are effectively implemented.

In practical terms, defining the extent of a state's obligation to prevent and control transboundary environmental impacts would acquire true relevance in the case of a breach of this obligation and, if as a result, the state's liability were invoked after an accident. The question of state liability (as opposed to civil liability of the operator of a hazardous installation) for damage caused by radiation, as for environmental damage in general, is a controversial one,¹³⁸ this is underlined by a lack of existing practice, with states being rather reluctant to establish claims against other states.¹³⁹ This shall only be mentioned as questions of liability fall outside the scope of this article.

7.3 Transboundary consultation and participation

The corollary to the general obligation of states to respect the environment of other states is the existence of procedural principles or obligations to involve other countries in the environmental assessment of a project if this possibly has significant impact on their environment. Consultation of other countries means consulting with their representatives, i.e. governments; additionally, there may an obligation to extend information and participation to the public in other states as well. Here again, nuclear law has developed some obligations on its own but this has been complemented and enhanced by developments in general environmental law.

Bilateral agreements have been concluded between countries with nuclear programmes on exchange of information and consultation.¹⁴⁰ To give an example, Germany and Switzerland concluded in 1983, a governmental agreement on reciprocal information on construction and operation of nuclear installations close to the border.¹⁴¹ The agreement installs a "German-Swiss Commission on the safety

137. See Faßbender, K., *ibid.*, p.272.

138. See Reyners, P. (2010), "Liability Problems Associated with the Current Patchwork Nuclear Liability Regime within the EU States", in: Pelzer, N., *European Nuclear Liability Law in a Process of Change, Proceedings of the 12th German INLA Conference 2009*, Nomos (Baden-Baden), pp.93-104, at p.95; Pelzer, N. (2010), "Compensation for Large-scale and Catastrophic Nuclear Damage", in Nótári, T. and Török, G., *Prudentia Juris Gentium Potestate, honorary publication for Vanda Lamm*, MTA Jogtudományi Intézete, Budapest, pp.341-357, at pp.341- 342. Both authors give further references.

139. See Sands, P. and J. Peel (fn.13), Chapter 17, p.717-720. The authors point out, by way of example, that no claims were made against the former Soviet Union after the 1986 Chernobyl accident in spite of the large-scale contamination of the territory of other States caused by that event; *ibid.*, p.718.

140. Sands, P. and J. Peel (*ibid.*, p.542) mention several of these agreements, for example ones between Spain and Portugal and between France and Belgium.

141. Vereinbarung zwischen der Regierung der Bundesrepublik Deutschland und der

of nuclear installations” where matters affecting the agreement, and more general matters, are discussed. It does not mention consultation of the public. Currently there are six agreements between Germany and neighbouring states about exchange of information for nuclear installations near the border.¹⁴²

On the level of international nuclear law instruments, the Convention on Nuclear Safety in Article 17 obliges Parties to “take the appropriate steps to ensure that appropriate procedures are established and implemented: (...) for consulting Contracting Parties in the vicinity of a proposed nuclear installation, insofar as they are likely to be affected by that installation.” The Joint Convention has equivalent wording in Articles 6 and 13 concerning, respectively, spent fuel and nuclear waste management facilities. Neither Convention provides, however, for information to, or participation of, the public in neighbouring countries.¹⁴³

An interesting case of an obligation to consult a supranational institution, codified in an instrument of regional nuclear law, is the obligation of EU member States, according to Article 37 of the Euratom Treaty¹⁴⁴, to inform the European Commission and receive its opinion before they issue any discharge authorisation for radioactive effluents.¹⁴⁵ The data provided by the member State must enable the Commission “to determine whether the implementation of such plan is liable to result in the radioactive contamination of the water, soil or airspace of another Member State”.¹⁴⁶

In the domain of general environmental law, transboundary consultation is obviously a key subject of the Espoo Convention. According to the convention, the installation state has to furnish the affected state with the EIA documentation and has to enter into consultations with the state, concerning, inter alia, the potential transboundary impact of the proposed activity and measures to reduce or eliminate its impact.¹⁴⁷ Such transboundary participation can also refer to an SEA.¹⁴⁸

Regierung der Schweizerischen Eidgenossenschaft über die gegenseitige Unterrichtung beim Bau und Betrieb grenznaher kerntechnischer Einrichtungen of 10 August 1982, BGBl. II 1983, p.734.

142. See the website of the German Ministry for the Environment at: www.bmu.de/themen/atomenergie-strahlenschutz/atomenergiesicherheit/internationales/bilateralezusammenarbeit.
143. This is also highlighted by Emmerechts, S. in “Environmental Protection under Nuclear Law: Still a Long Way to Go”, (fn.2), p.152.
144. Treaty establishing the European Atomic Energy Community of 25 March 1957, OJ C 327 (26 October 2012) (consolidated version 2012).
145. In the English version, the obligation in Article 37 of the Euratom Treaty applies to any “plan for the disposal of radioactive waste”. This wording is somewhat misleading: Article 37 actually addresses discharge of radioactive effluents. The versions in other languages are more accurate in this respect. See Grunwald, J., “From Challenge to Response: Dormant Powers in Euratom Law”, in: Raetzke, C. (ed.), *Nuclear law in the EU and Beyond, Proceedings of the AIDN / INLA Regional Conference 2013 in Leipzig*, Nomos Publishers (forthcoming), p.33 and fn.44.
146. Euratom Treaty (fn.144), Article 37. For more details and for a list of topical EU decisions, see Grunwald, J. (2003), *Das Energierecht der Europäischen Gemeinschaften*, De Gruyter (Berlin), p.225.
147. Espoo Convention (fn.3), Articles 3 to 5.
148. See Kiev Protocol (fn.55), Article 10. A recent example is the SEA conducted for the Polish new build programme in 2011-2013. See Palm, M. and M. Pfaff, “Poland and Germany: Issues of Transboundary Consultation”, in Raetzke, C. (ed.), *Nuclear law in the EU and Beyond, Proceedings of the AIDN / INLA Regional Conference 2013 in Leipzig*, Nomos Publishers (forthcoming), pp.167-174.

Given all these various conventions and agreements specific to nuclear or applying, among others, to large nuclear installations, it has been suggested that “there is now sufficient treaty and other state practice to indicate that customary international law requires states that are planning nuclear activities which might entail a significant risk of transfrontier pollution to give early advice to any state affected and to enter into good faith consultations at the request of such a state”.¹⁴⁹

As mentioned, even countries which do not have common borders with an installation state may adopt the view they could be affected by a significant adverse transboundary impact of a nuclear facility, even if they have not been notified by the installation state. The Espoo Convention contains a mechanism for any contracting state which has not been notified to enter into discussions with the installation state and, if necessary, to refer the issue of its participation to an enquiry commission.¹⁵⁰

Compared to the bilateral and international nuclear law instruments mentioned above, the Espoo Convention goes one step further by obliging states to provide an opportunity to the public in the areas likely to be affected to participate in relevant environmental impact assessment procedures. Both the installation state and the affected state have to ensure that the public of the affected state in the areas likely to be affected is informed of the project and is provided with possibilities for making comments or objections on the proposed activity.¹⁵¹ Interacting with the public in all relevant countries necessitates considerable time and effort. It may mean, for example, translating “at least relevant parts” of the environmental documentation into several languages.¹⁵² The transboundary process also means granting foreign citizens effective access to public information and discussion events, and may also involve staging such events in other countries. Since the authorities of the state of origin lack any administrative power on the territory of other states, this can only be done in close cooperation with the authorities of these states.¹⁵³ Just as with public participation on a national level, and perhaps even more markedly so, it is important to state that transboundary public participation is fraught with expectations difficult to meet and that the public cannot expect to be able to change the general decision for nuclear power taken in the installation country.¹⁵⁴

149. See Sands, P. and J. Peel (fn.13), p.542.

150. Espoo Convention (fn.3), Article 3, paragraph 7, and Appendix IV.

151. Espoo Convention (fn.3), Article 3, paragraph 8, and Article 4, paragraph 2.

152. Espoo Implementation Committee (2010), Report of the Implementation Committee on its 18th session, ECE/MP.EIA/IC/2010/2, March 19, paragraph 35 (concerning participation of the public in the Netherlands in the decision making for a non-nuclear project in Belgium). The report is available on the UNECE website at www.unece.org/fileadmin/DAM/env/documents/2010/eia/ic/ece.mp.eia.ic.2010.2.e.pdf.

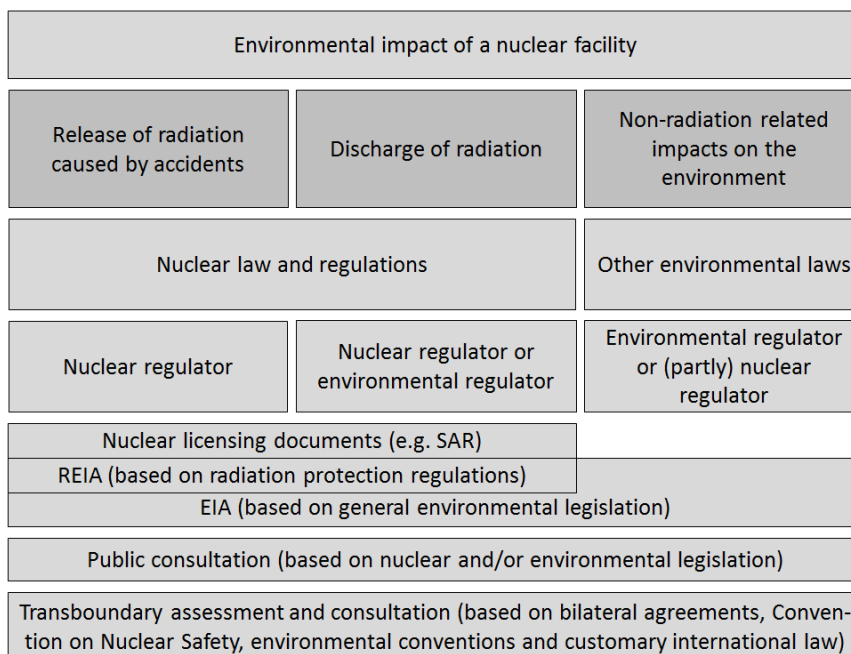
153. The Espoo Implementation Committee stated that the party of origin’s competent authority has “to provide the possibility for the public of the affected Party to participate in the procedure of the Party of origin ... The Party of origin’s competent authority should furthermore support the affected Party’s competent authority in providing effective participation for the public of the affected Party in the procedure for transboundary environmental impact assessment.” Espoo Implementation Committee (2010), Report of the Implementation Committee on its 19th session, ECE/MP.EIA/IC/2010/4, September 23, paragraph 19 c). The report is available on the UNECE website at www.unece.org/fileadmin/DAM/env/documents/2010/eia/ic/ece.mp.eia.ic.2010.4.e.pdf.

154. Palm, M. and M. Pfaff (fn.148), p.169.

8. Conclusion

A summary overview of the results explained in the chapters of this article, put in relation to the three layers of the environmental impact of a nuclear installation established at the outset of this article, could look like this:

Figure 2: Summary overview of the results presented in the preceding chapters



Nuclear law contains the necessary instruments to effectively protect the environment against the damaging effects of radiation emanating from nuclear installations. Other laws within the wider body of environmental law provide the corresponding tools regulating other, non-radiation related impacts of nuclear installations on the environment. Still other laws, whether attributable to the particular field of nuclear law or to the wider realm of general environmental law, establish the necessary procedures, including a comprehensive assessment of the impact of a nuclear installation on the environment, information and participation of the public and cooperation with neighbouring states. This totality of environmental (nuclear and non-nuclear) law puts the necessary tools at the disposal of the authorities responsible for licensing nuclear installations. If well-conceived by legislators and well applied and coordinated by authorities, these legal provisions and procedures should interlock to form an effective and efficient system to prevent or control the potentially harmful impact of nuclear installations on the environment.

Case law

France

Conseil d'État decision, 28 June 2013, refusing to suspend operation of the Fessenheim nuclear power plant (Request Nos. 351986, 358080, 358094, 358095)

The Tri-National Association for Nuclear Protection (an environmental protection association) called for immediate suspension of operation of the Fessenheim nuclear power plant, as well as annulment of an implicit decision to reject this request by the Nuclear Safety Authority (Autorité de sûreté nucléaire – ASN) and the ministers responsible for nuclear safety.

The association argued that despite periodic visits by ASN and additional safety assessments conducted following the Fukushima accident, ASN and the ministers responsible for nuclear safety had violated their obligation to suspend operation of the nuclear facility, which posed serious risks due to:

1. insufficient consideration of seismic and flood risk;
2. an abnormal number of incidents recorded since 2004;
3. illegal plant disposal standards, supposedly conflicting with the directive of 23 October 2000 establishing a framework for Community action in the field of water policy.

By its decision of 28 June 2013, the Conseil d'État (French supreme administrative court) rejected the association's appeal and concluded that continued operation of the Fessenheim nuclear power plant did not pose any serious risk.

Slovak Republic

New developments including the Supreme Court's judgment in a matter involving Greenpeace Slovakia's claims regarding the Mochovce nuclear power plant

The case concerns the Nuclear Regulatory Authority's (NRA) administrative decision No.246/2008 of 14 August 2008 on the approval of modifications to construction, prior to the completion of the Mochovce nuclear power plant units 3 and 4 by Slovenske elektrarne, the builder of these two units.

During the administrative proceedings, Greenpeace submitted to the NRA a list of objections to the Mochovce nuclear power plant units 3 and 4. Greenpeace later submitted an appeal against NRA decision No.246/2008 of 14 November 2009, in which Greenpeace argued that it should be considered a "participant" under the Aarhus Convention to the administrative proceedings for the approval of the modifications to construction prior to the completion of Mochovce units 3 and 4. Greenpeace also argued that a full-scope environmental impact assessment (EIA) should be executed in this case and that any NRA decision had to address the objections submitted to the NRA by Greenpeace in August 2008.

The NRA held the appellate administrative proceedings, for which purposes Greenpeace was accepted as a participant, but the NRA adopted the second administrative decision No.79/2009 of 28 April 2009. NRA decision No.79/2009 dismissed the Greenpeace appeal. Therefore, in July 2009, Greenpeace filed a claim

at the district court (the court of first instance), seeking review of the lawfulness of NRA decision No.79/2009. The hearing took place on the 11 May 2012. The district court decided the case in favour of the NRA; subsequently, Greenpeace filed an appeal with the Supreme Court. The NRA provided its response on 18 July 2012, and the Supreme Court delivered its final judgment on 9 August 2013 without a court hearing being held.

The Supreme Court's judgment of August 2013 overturned the district court decision in such a way that the Supreme Court abolished NRA decision No.79/2009 of 28 April 2009, in which NRA had denied Greenpeace's appeal against the NRA's first administrative decision No.246/2008. The NRA is, therefore, obliged to renew the administrative proceedings on Greenpeace's appeal against decision No.246/2008, in which the NRA approved the construction modifications before the completion of Mochovce units 3 and 4. Greenpeace argued in its appeal that they were entitled to be a participant in the administrative proceedings and that as a participant, they were entitled to full scope EIA proceeding concerning the construction modifications to Mochovce units 3 and 4.

The renewal of the administrative proceedings creates the following complicated situation:

- the construction of Mochovce units 3 and 4 has continued since the first decision No.246/2008 was issued, and some modifications have been implemented by the builder;
- the Supreme Court ordered the NRA to hold the EIA proceedings and to consider the objections against modifications as stated by Greenpeace in their appeal of 2008; however, construction has proceeded for the past five years since the first decision No.246/2008 was issued;
- the NRA is the final licensing authority for the units but the EIA proceeding itself is undertaken by the Ministry of Environment, decisions of which in environmental matters, are binding on the NRA;
- EIA proceedings regarding the modifications to Mochovce units 3 and 4 were held in 2009-2010, but only for the purpose of the commissioning and operating licence for Mochovce units 3 and 4;
- the Ministry of Environment provided the NRA with a statement that an EIA procedure was not necessary for the modification of a construction licence that was issued in 1986, but many technological modifications to improve nuclear safety were included and approved since that time; and
- the complicating factor in this matter is the requirement of Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, which states in its Annex 1 that any modification to a nuclear installation has to be subject to new EIA proceedings.

In this case, the NRA has reopened the administrative proceedings and issued a first, but not a final, decision (No.761/2013) on 21 August 2013 that denied the suspensory effect of the Greenpeace appeal on NRA's 2008 decision. The NRA reasoned that the denial of such effect was warranted by an urgent public interest and with the threat of irretrievable loss on the part of a participant to the proceedings.

Greenpeace immediately submitted a protest against decision No.761/2013 to the Attorney General in which it objected to the alleged unlawfulness of the NRA's decision by which the suspensory effect was denied. NRA was asked to provide the

Attorney General with the relevant decision and the complete administrative file. The case remains pending.

New developments in the matter involving Greenpeace's demands for information under the Freedom of Information Act

Greenpeace had demanded that the NRA disclose the text of the preliminary safety report on Mochovce units 3 and 4 in accordance with Act No.211/2000 Coll. Freedom of Information Act, as amended.

Greenpeace claimed their right to information (especially environmental information); the NRA claimed that such sensitive information could endanger public security if it was easily accessible and made publicly available. The NRA dismissed Greenpeace's application in NRA decision 39/2010 of 1 February 2010.

In April 2010, Greenpeace lodged a claim for review of the lawfulness of NRA decision No.39/2010 in the district court. On 25 October 2011, the district court decided in favour of the NRA and denied the Greenpeace claim. Subsequently, Greenpeace filed an appeal.

In consideration of the appeal, the Supreme Court, in its judgment of 1 August 2012, reversed the district court judgment and returned the proceeding to the district court, holding that the district court, in its decision, did not adequately deal with the full scope of the plaintiff's claims and that its decision lacked sufficient reasoning, especially in regard to application of the Aarhus Convention. Therefore, the district decision was not reviewable.

In the subsequent district court proceeding, the court hearing was scheduled to be held on 19 February 2013, but it was postponed to 16 April 2013, due to new claims submitted by the NRA. On 19 June 2013, the NRA received the district court judgment that overturned NRA decision No.39/2010 of 1 February 2010 and returned the case to the NRA for renewed administrative proceedings, when the NRA should have considered the Greenpeace appeal against the NRA's initial administrative decision.

The NRA submitted an appeal against the district court decision on 2 July 2013 and is currently waiting for a Supreme Court decision.

Switzerland

Judgment of the Federal Supreme Court in the matter of the Département fédéral de l'environnement, des transports, de l'énergie et de la communication (DETEC)¹ against Ursula Balmer-Schafroth and others on consideration of admissibility of a request to withdraw the operating licence for the Mühleberg nuclear power plant

On 14 May 2013, the Federal Supreme Court denied an appeal by DETEC against the decision of the Federal Administrative Court,² which provided that DETEC must examine the merits of a request to withdraw the operating licence for the Mühleberg nuclear power plant. This request was filed in March 2011 due to fissures in the core shroud, lack of a cooling water supply independent of the Aar river and other issues considered by the claimants to be serious safety defects concerning the plant.

1. Federal Department of Environment, Transport, Energy and Communication.
2. See *Nuclear Law Bulletin*, No.90 (2012/2), OECD/NEA, Paris, pp.109-110.

United States

Judgment of the Court of Appeals for the District of Columbia Circuit granting petition for writ of mandamus ordering US Nuclear Regulatory Commission (NRC) to resume Yucca Mountain licensing

In 2011, several parties, including the states of South Carolina and Washington, petitioned the DC Circuit for a writ of mandamus ordering the NRC to resume the licensing process for a nuclear waste repository at Yucca Mountain in Nevada. The DC Circuit “ordered that the case be held in abeyance”³ to allow “time for Congress to clarify this issue if it wished to do so.” In 2013, with neither Congress nor the NRC having acted to change the status quo, the DC Circuit granted the petition, reasoning that NRC’s inaction had gone on too long in spite of explicit direction from the court and, therefore, that the circumstances merited mandamus.⁴

The Department of Energy (DOE) had submitted its licence application for Yucca Mountain to the NRC for review in June 2008. The Nuclear Waste Policy Act (NWPA) mandates that the NRC “issue a final decision approving or disapproving the issuance of a construction authorization not later than the expiration of 3 years after the date of the submission of such application, except that the Commission may extend such deadline by not more than 12 months” subject to specified reporting requirements.⁵ The NRC’s Atomic Safety and Licensing Board began its review of the Yucca Mountain application, but on 3 March 2010, the DOE filed a motion to withdraw its application with prejudice. Thereafter, Congress ceased appropriating new funds for the licensing process in fiscal year 2011. However, as of 2013, the Commission had approximately USD 11 million in appropriated funds remaining to continue consideration of the licence application.

In essence, this case concerned whether the NRC lawfully exercised its discretion in choosing not to use the remaining funds after Congress and the Executive abandoned support for the Yucca Mountain project. The NRC articulated several reasons not to continue the licensing process, including that Congress had appropriated little or no money for the project in the past three years, and that the DOE had expressed its intent not to pursue the Yucca Mountain repository.

The DC Circuit held that the NRC must continue the licensing process so long as funds remain and that the NRC may not rely on communication from the President or members of Congress to violate its statutory obligations. Further, the court distinguished this circumstance from others in which the court had declined to issue mandamus on the grounds that in this case, the NRC has a statutory mandate with a defined deadline and had already been warned that “either the agency had to act or the Court would grant mandamus in the future.”

The NRC subsequently issued an order inviting participants in the Yucca Mountain adjudicatory proceeding to provide their views on how the Commission should proceed in light of the court’s order. The NRC also has directed its staff to develop pertinent funding information. The NRC will review the comments submitted by the parties, as well as the information it receives from the NRC staff and decide the path forward in the licensing process.

3. See *In re: Aiken County*, 645 F.3d 428, 436 (DC Cir. 2011).

4. *In re: Aiken County*, No.11-1271 (DC Cir., 13 August 2013).

5. Section 114(d), 42 USC 10134(d).

Judgment of the Court of Appeals for the Second Circuit invalidating two Vermont statutes as pre-empted by the Atomic Energy Act

The state of Vermont petitioned the Second Circuit court of appeals for review of a district court ruling⁶ that granted Entergy Nuclear Vermont Yankee, LLC (Entergy), the operator of the Vermont Yankee Nuclear Power Station (Vermont Yankee), a permanent injunction against the enforcement of two Vermont laws, Acts 74 and 160. Vermont's petition also sought review of the district court's grant of an injunction against Vermont's conditioning continued operation of Vermont Yankee on the existence of a power purchase agreement (PPA) between Vermont and Entergy on the basis that Vermont's action violated the dormant commerce clause under the US Constitution. In response, Entergy asked for review of the district court's denial of Entergy's request for a permanent injunction against Vermont's conditioning continued operation of Vermont Yankee on the existence of a PPA based on Entergy's claim that Vermont's action violated the Federal Power Act. The court of appeals upheld the injunction against Acts 74 and 160. However, the court found that because no PPA yet exists and because Entergy has not sought review from the Federal Energy Regulatory Commission, Entergy's requests for an injunction against Vermont's continued operation of Vermont Yankee on a favorable PPA were not ready, i.e. "unripe," for judicial review.⁷

Vermont Acts 74 and 160 removed authority to issue a certificate of public good, which is needed for Vermont Yankee to continue operating, from a state regulatory agency to the Vermont legislature. Although these laws required the legislature to consider certain factors in making its determination whether to permit further operation,⁸ failure of the legislature to affirmatively grant the certificate of public good would have been unreviewable. For that reason, and because the state legislature was motivated by concern for nuclear safety (a purpose for which only the federal government has competency), the court of appeals held that a declaratory judgment on the enforceability of Acts 74 and 160 was appropriate.

The US Supreme Court had ruled in *Pacific Gas and Electric Co. v. State Energy Resources Conservation and Development Commission*, 461 US 190 (1983), that the federal Atomic Energy Act vests exclusive jurisdiction over the radiological health and safety of nuclear power plants in the NRC and, therefore, that states are pre-empted under the US Constitution from regulating such matters. The court of appeals held that "the [Supreme] Court's admonition against a 'state judgment that nuclear power is not safe enough to be further developed,' ... requires us to conduct a more searching review to determine whether a statute was enacted based upon radiological safety concerns."⁹ The district court found that the Vermont legislature was primarily motivated by radiological safety concerns and that finding formed the basis for its granting Entergy's request for a permanent injunction. The court of appeals affirmed the district court's findings and ruling on pre-emption.

Vermont argued (1) that these laws were enacted to enable it to pursue diversity of energy production; (2) that shutting down Vermont Yankee might help the state to identify more cost-effective sources of energy; and (3) that without a permanent

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6. Entergy Nuclear Vermont Yankee, LLC v. Shumlin, 838 F. Supp. 2d 183 (D. Vermont 2012).
 7. Entergy Nuclear Vermont Yankee, LLC v. Shumlin, Nos.12-707 & 12-791 (2nd Cir., 14 August 2013).
 8. These considerations included the "public health" implications of dry cask storage of spent nuclear fuel and decommissioning and Entergy's plans and resources for decommissioning.
 9. Entergy Nuclear Vermont Yankee, LLC v. Shumlin, Nos.12-707 & 12-791, slip opinion p.30, (2nd Cir., 14 August 2013).

disposal site for spent nuclear fuel, the costs of managing spent fuel stored on-site might fall to the state if Vermont Yankee's owners became insolvent.

The court of appeals found that these arguments lacked substance. First, because Vermont has the authority to direct its utilities to purchase power from virtually any source, shutting down Vermont Yankee, which is a merchant plant that already sells power to customers outside of Vermont, would be unrelated to Vermont's legitimate pursuit of energy diversity. Indeed, a Vermont power company had recently entered into a power purchasing agreement with Seabrook Nuclear Generating Station in the neighbouring state of New Hampshire. Second, again because of Vermont Yankee's status as a merchant plant, Vermont utilities are free to purchase power from any number of competing power plants and need not shut down Vermont Yankee to do so. Third, Vermont's concerns about the costs of decommissioning were unpersuasive in light of the NRC's regulations requiring nuclear power plants to pre-fund decommissioning and to provide periodic reports on the status of those funds.

After determining that Vermont's stated purposes for its two laws were unpersuasive, the court of appeals examined the district court's findings based on its review of the legislative history about the Vermont legislature's primary purpose. The district court found, and the court of appeals upheld, the conclusion that the Vermont legislature was primarily motivated by radiological safety concerns and expressly sought to avoid expressing those concerns in order to evade federal preemption under the *Pacific Gas and Electric* case. Because Vermont was primarily motivated by concerns about radiological safety, and because Vermont's stated purposes for Acts 74 and 160 were unpersuasive, the court of appeals upheld the district court's grant of permanent injunction based on its finding that the two laws are pre-empted by the AEA.

Judgment of the NRC on transferring Shieldalloy site to New Jersey's jurisdiction

Section 274 of the Atomic Energy Act authorises the NRC to transfer regulatory authority over specified categories of radioactive materials to any state if it finds that the state's regulatory program is "adequate" to protect the public health and safety with respect to the materials the state seeks to regulate and is "compatible" with its program for regulation of such materials.¹⁰ In 2009, the NRC transferred such authority to the state of New Jersey. Shieldalloy, which was pursuing licence termination for the company's metal alloy manufacturing site in Newfield, New Jersey, challenged the transfer in the DC Circuit court of appeals. In 2010, that court had vacated the 2009 transfer with respect to the Shieldalloy site and transferred regulatory authority back to the NRC. On remand from the DC Circuit's 2010 decision, the NRC addressed the issues identified by the court and reinstated transfer of regulatory authority over the site to New Jersey. In 2011, Shieldalloy filed a second appeal in the DC Circuit. The court held that, in finding New Jersey's licence termination regulations to be "adequate" and "compatible" with the NRC's regulations, the NRC had failed to explain how its interpretation of one particular provision 10 CFR 20.1403(a) – was grounded in the regulatory text.¹¹ In an opinion issued in August 2013, the NRC responded to the DC Circuit's remand and reinstated its transfer of authority to New Jersey.¹²

Shieldalloy had asserted before the DC Circuit that the NRC's licence termination regulations require a licensee to compare radiation doses resulting from restricted

10. 42 USC 2021.

11. *Shieldalloy Metallurgical Corp. v. NRC*, 707 F.3d 371 (DC Cir. 2013).

12. *Shieldalloy Metallurgical Corp. (Decommissioning of the Newfield, New Jersey Site)*, CLI-13-06, 78 NRC __ (5 August 2013).

release and unrestricted-release decommissioning options and to choose the option that yields the lowest achievable dose.¹³ Shieldalloy claimed that because New Jersey had not adopted such a “comparative-dose” requirement, New Jersey’s licence termination programme was incompatible with, and less protective of the public health and safety than the NRC’s. The DC Circuit agreed with Shieldalloy that, if its interpretation of section 20.1403(a) was correct, New Jersey’s licence termination programme would likely be incompatible with the NRC’s. Moreover, the court found Shieldalloy’s interpretation to be plausible and was unable to understand how the NRC’s action was supported by the text of the regulation. However, the court remanded the decision to the NRC so that the NRC could “explain itself in a way that rationally addresses [its] concerns.”¹⁴

The NRC’s opinion first laid out some of the complexities surrounding the licence termination regulations and then described how the text of the regulation carries out the NRC’s policy determinations. First, the NRC reiterated that the doses yielded by the restricted-release and unrestricted-release decommissioning options are not susceptible to being compared meaningfully because of the significantly different risks and uncertainties associated with each option. However, due to the inherent complexities and uncertainties associated with restricted release, including reliance on engineered barriers and long-term monitoring over a 1000-year compliance period, the NRC’s preference is for unrestricted-release decommissioning.

Then in explaining how it interprets Section 20.1403(a), the NRC stated “the pivotal inquiry ... is whether it is cost-beneficial to reduce residual radioactivity to or below the level of unrestricted release, not whether unrestricted release leads to a higher or lower public dose than restricted release. If the licensee’s proposed level of residual radioactivity is as low as is cost-beneficially achievable, but still exceeds the level required for unrestricted release (25 millirem), the licensee will have demonstrated that it is not possible to further reduce residual radioactivity to a point where unrestricted release is cost-beneficial and will be eligible to pursue restricted release.”¹⁵

Because New Jersey has adopted the objective of seeking to limit the use of restricted release, and because New Jersey has adopted more stringent criteria for licence termination under restricted release than for unrestricted release, as well as more conservative criteria than the NRC’s, the NRC deemed New Jersey’s regulations to be compatible with its program under its agreement-state policy. Therefore, the NRC reinstated its transfer of authority over the Shieldalloy site to the state of New Jersey.

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13. Restricted release is a scenario in which the site has only limited permissible uses and requires that active steps, such as maintaining fencing or posting guards, be taken to prevent the public from accidentally entering the site. In an unrestricted release, the site is treated as any other property and the public need not be prevented from entering.
 14. Shieldalloy Metallurgical Corp. v. NRC, 707 F.3d 371, 382 (DC Cir. 2013).
 15. Shieldalloy Metallurgical Corp., CLI-13-06, supra, slip opinion p.17.

National legislative and regulatory activities

Algeria

Nuclear security

Establishment of a nuclear security centre

Presidential Decree No.12-87, 2012¹ established a centre specialised in training and support for nuclear security.

Armenia

Nuclear safety and radiological protection

Amendment to the Law of the Republic of Armenia on the Safe Utilization of Atomic Energy for Peaceful Purposes

In September 2013 the National Assembly (Parliament) of the Republic of Armenia adopted the Law of the Republic of Armenia on Amendments and Supplements to the Law of the Republic of Armenia on the Safe Utilization of Atomic Energy for Peaceful Purposes.² The President of the Republic of Armenia ratified the law on 23 October 2013, and it entered into force on 30 October 2013.³

This amendment establishes requirements relating to accounting for and control of nuclear materials to ensure fulfillment of obligations undertaken by the Republic of Armenia under the Agreement between the Republic of Armenia and the International Atomic Energy Agency for the Application of Safeguards in connection with the Treaty on the Non-Proliferation of Nuclear Weapons and Protocol Additional to the Agreement between the Republic of Armenia and the International Atomic Energy Agency for the Application of Safeguards in connection with the Treaty on the Non-Proliferation of Nuclear Weapons.

The law establishes technical procedures for the accounting of nuclear materials, requirements relating to the accounting and control of nuclear materials at both State and operator levels, as well as provisions related to exemption, termination of safeguards, inspections, and the requirements relating to the submission of accounting reports and other information to the IAEA with respect to safeguards implementation.

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1. Presidential decree No.12-87 of 4 Rabie Ethani 1433 (corresponding to 26 February 2012) about the creation, organisation and operation of a training and support centre for nuclear security, Official Journal No.12/2012, available in French at: www.joradp.dz/FTP/jo-francais/2012/F2012012.pdf.
 2. An English translation of the Law on the Safe Utilization of Atomic Energy for Peaceful Purposes has been published in the *Supplement to the Nuclear Law Bulletin*, No.65, June 2000, OECD/NEA, Paris, pp.3-22, and is available at: www.oecd-nea.org/law/nlb/Nlb-65/armenia.pdf.
 3. Official Bulletin No 59(999) of 30 October 2013.

Brazil

The National Commission of Nuclear Energy (Comissão nacional de Energia nuclear – CNEN) has adopted Resolution 143, dated 14 November 2012, establishing the creation of a Support Centre for Safety and Radiation Protection (Centro de Apoio à Segurança Física Nuclear e Radiológica – CENASF). This centre aims at promoting domestic capacity of technicians, collaboration between institutions and security culture in the framework of physical protection of installations with nuclear or radioactive material, in terms of preventing, detecting and responding to illicit trafficking of nuclear or radioactive material.

The CENASF is assigned with, inter alia, contributing to human resources training related to planning for nuclear security and radiation protection, as well as assessment of associated threats. It will also help provide training on the physical protection of nuclear and radioactive materials and associated installations, including physical protection during transportation of these substances and materials.

Canada

Nuclear security

The Canadian Parliament has enacted the *Nuclear Terrorism Act*,⁴ which amends the *Criminal Code*, creating four new *Criminal Code* offences related to nuclear terrorism:

- making a device, or possessing, using, transferring, exporting, importing, altering or disposing of nuclear or radioactive material or a device, or committing an act against a nuclear facility or its operations, with the intent to cause death, serious bodily harm or substantial damage to property or the environment;
- using or altering nuclear or radioactive material or a device, or committing an act against a nuclear facility or its operation, with the intent to compel a person, a government or a domestic or international organization to do, or to refrain from doing, any act;
- committing an indictable offence for the purpose of obtaining nuclear or radioactive material or a device, or to obtain access to a nuclear facility; and
- threatening to commit any of these offences.

Three of the offences call for a maximum punishment of life imprisonment – a level of punishment consistent with similar terrorism offences in the *Criminal Code*. The threat offence carries a maximum penalty of 14 years of imprisonment.

In addition, since the Amendment to the Convention on the Physical Protection of Nuclear Material (CPPNM) and the International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT) have been added to the list of international conventions, which make up the definition of terrorist activity in the *Criminal Code*, a

4. S.C. 2013, c. 13.

number of terrorism provisions now apply to the new offences, such as reverse onus bail⁵ and the availability of one-year wiretap authorisations.

Finally, the legislation is not intended to criminalise existing lawful activity, use or possession of nuclear and radioactive material or devices.

For Canada, the physical protection measures contemplated in the CPPNM Amendment have been in place for several years, through the *Nuclear Safety and Control Act*⁶ and the *Nuclear Security Regulations*.⁷ With these Criminal Code amendments coming into force on 1 November 2013, Canada will be able to ratify both the CPPNM Amendment and the ICSANT.

Liability and compensation

The Canadian government intends to introduce in 2013 a legislative proposal to replace the existing *Nuclear Liability Act*. The proposed legislation would increase the amount of compensation available to address civil nuclear damage from CAD 75 million to CAD 1 billion; broaden the number of categories for which compensation may be sought; and improve the procedures for delivering compensation.

The 1976 *Nuclear Liability Act* established a compensation and civil liability regime to address damages resulting from a nuclear accident. It applies to Canadian nuclear facilities, such as nuclear power plants, nuclear research reactors, fuel processing plants and facilities for managing used nuclear fuel.

The proposed legislation would maintain the key principle of “absolute liability”, which makes the operator of the nuclear facility responsible for civil injury and damage. It means that victims do not need to prove fault to make claims for injury or damages. Another important principle of the legislation is the “exclusive liability of the operator”, which means that the operator alone is liable, to the exclusion of others, such as suppliers and contractors.

The monetary limit in the Act for operator liability would be increased over a three-year time frame to CAD 1 billion. This new liability amount is commensurate with current international standards reflected in the modernised nuclear liability conventions. Operators would be permitted to guarantee their financial liability with traditional insurance and other forms of financial security. The government would provide coverage for certain risks for which no liability insurance is available; it would also provide increased coverage for lower-risk nuclear facilities, such as small research reactors at universities, through an arrangement with approved insurers.

The proposed legislation is intended to include other significant improvements, like expanded definitions of compensable damage to include economic loss, preventive measures and environmental damage. It would contain a longer limitation period for submitting compensation claims for bodily injury (30 years versus the current 10 years) to address latent illnesses – such as certain forms of cancer detected more than 10 years after an incident. The 10-year period would be maintained for all other forms of damage. The proposed legislation will elaborate

5. In Canadian law, it generally falls to the prosecution (the ‘Crown’) to show cause why someone accused of a crime should not be released pending his trial; a court will often release the accused on an undertaking or upon his entering into a recognisance specifying a sum of money that is payable to the Crown if he fails to attend court or abide by the other conditions of his release (‘bail’). However, for some more serious charges, the law provides that it is the accused who bears the onus to show cause why he should not be detained in custody until trial, with the presumption being detention.

6. S.C. 1997, c. 9.

7. SOR/2000-209.

the features of a quasi-judicial claims tribunal to be established to replace regular courts if necessary, to accelerate claims payments and provide an efficient and equitable forum.

The new legislation is intended also to implement the provisions of the IAEA Convention on Supplementary Compensation for Nuclear Damage (CSC) and allow Canada to become a party to the convention. The Government of Canada, subject to ratification, signed the CSC on 3 December 2013. The CSC addresses nuclear civil liability in the event of a nuclear incident resulting in transboundary damage. Joining it would bolster Canada's nuclear civil liability regime by financially supplementing Canada's domestic regime and by clarifying liability and compensation rules for transboundary and transportation incidents. Of the existing international nuclear liability conventions, the CSC is the most attractive for Canada because it would establish treaty relations on nuclear civil liability with the United States, which is already a party.

The CSC is not yet in force, which requires ratification by at least five countries with an installed nuclear capacity of 400 000 megawatts thermal. If Canada ratifies, it would take only one other country with a substantial nuclear power programme to join for the CSC to come into force.

France

Radioactive waste management

National plan for the management of radioactive materials and waste (PNGMDR)

The Ministry for Ecology, Sustainable Development and Energy, together with the Nuclear Safety Authority (ASN), has published a new edition of the National Plan for the Management of Radioactive Material and Waste (PNGMDR).⁸

The PNGMDR has been developed within the framework defined by the Programme Act No.2006-739 of 28 June 2006 concerning the sustainable management of radioactive materials and waste, and this third edition incorporates the requirements of Directive 2011/70/Euratom of 19 July 2011 establishing a community framework for the responsible and safe management of spent fuel and radioactive waste.

The PNGMDR provides a report on radioactive material and waste management policy and sets objectives based on findings to achieve improvement in the overall consistency of radioactive material and waste management.

Firstly, the PNGMDR seeks to improve existing management methods:

- for legacy situations, by preservation of experience;
- for mining processing residue and waste rock in terms of understanding exposure risk for the general public, long-term strength of embankments, or changes in water treatment techniques;
- for radioactive materials (spent fuel, uranium, plutonium, thorium), by conducting further studies concerning management options in the event that these materials become classified as waste,

8. See the French National Plan for the Management of Radioactive Materials and Waste 2013-2015 (available in French only) at: www.asn.fr/index.php/Les-activites-controlees-par-l-ASN/Dechets-Installations-en-demantelement/Plan-national-de-gestion-des-matieres-et-dechets-radioactifs/PNGMDR-2013-2015.

- for radioactive waste, in particular:
 - waste management by radioactive decay, regarding waste in which the radionuclides have a half-life of less than 100 days;
 - improvement in monitoring and management of storage capacity, in particular, by incinerating low level radioactive waste (LLW) or very low level waste (VLLW).

In addition, the PNGMDR plans to put in place new management classifications:

- for waste which, due to its properties, still does not have a management class and for which specific studies are expected (tritiated waste, spent sealed sources or waste from small producers outside the nuclear power generating sector) and low-level, long-life waste;
- high and intermediate level, long-life waste (HLW/ILW-LL), in developing in particular the deep geological storage (the Cigéo repository project).

International co-operation

Law No.2013-580 of 4 July 2013 authorising approval of the agreement between the Government of the French Republic and the Government of the Principality of Monaco on the management of Monegasque radioactive waste in the French territory⁹

This law authorises approval of the agreement signed on 9 November 2010 between France and Monaco, which provides that, on request of the competent authorities of Monaco, the French Minister for Energy, after consultation with the French National Agency for Radioactive Waste Management (Agence nationale pour la gestion des déchets radioactifs – Andra) and the ASN, may authorise the management of Monegasque radioactive waste in the French territory, subject to availability of corresponding repositories and in compliance with technical conditions for waste acceptance, which are applicable to them.

Radioactive waste is defined as “all products or materials in which no further use is foreseen or planned and whose radioactive properties were acquired or used in the Monegasque territory by entities whose exhaustive list is annexed”. These entities are the Science Centre of Monaco, the company Exsymol, Princess Grace Hospital, the IAEA laboratory in Monaco, the Monegasque Sanitation Company, the Cardio-Thoracic Centre of Monaco, as well as the Monaco Institute of Medicine and Sports Surgery.

This agreement is concluded for a duration of 25 years, renewable by tacit agreement.

9. Loi n° 2013-580 du 4 juillet 2013 autorisant l'approbation de l'accord entre le Gouvernement de la République française et le Gouvernement de la Principauté de Monaco relatif à la prise en charge sur le territoire français de déchets radioactifs monégasques, Journal officiel lois et décrets (J.O.L. et D.), 6 July 2013, p. 11266 , Text No.1.

Decree No.2013-675 of 25 July 2013 publishing an agreement of co-operation between the Government of the French Republic and the Government of the Kingdom of Saudi Arabia for the development of nuclear energy for peaceful purposes (with annex), signed in Riyadh on 22 February 2011¹⁰

The agreement published by this decree aims to strengthen co-operation in the field of nuclear energy for peaceful purposes, such as the application of nuclear energy for power generation or uranium exploration and mining. It is concluded for a duration of 20 years.

Germany

Radioactive waste management

Act for retrieving radioactive waste from and decommissioning the Asse II Mine (2013)

The Act on Expediting the Retrieval of Radioactive Waste from and the Decommissioning of the Asse II Mine (*Schachtanlage Asse II*) was published on 20 April 2013 in the *Bundesgesetzblatt* (BGBl.)¹¹ and, according to Article 2, entered into force on 25 April 2013.¹² The Act amended Section 57b of the Atomic Energy Act¹³ with a view to implementing the purpose of the Act. Pursuant to paragraph 1, the provisions applicable to the federal installations for the safekeeping and disposal of radioactive waste as defined in Section 9a, paragraph 3, of the Atomic Energy Act shall also apply to the operation and the decommissioning of the Asse II Mine, but as amended by paragraphs 2 to 8 of the revised Section 57b.

Pursuant to paragraph 2, the Asse II Mine must be decommissioned without delay. The decommissioning shall only commence after retrieval of the waste. The retrieval must be stopped if its continuation poses a radiological or safety risk to workers or the general public. Such risk is in particular assumed if the dose limits under Section 5 of the Radiation Protection Ordinance¹⁴ or the mining safety requirements cannot be met. If the retrieval of the radioactive waste can only be achieved through a deviation from legal requirements, the mine has to be decommissioned taking into account the advantages and the disadvantages of all reasonable options. Prior to such decision the parliament must be informed.

Paragraphs 3 and 4 establish the details of the licensing and the plan approval procedures respectively. Paragraph 5, based on Section 114 of the Radiation Protection Ordinance, defines certain activities which may be performed without a licence. The value of accident planning (*Störfallplanungswert*) related to retrieval or decommissioning measures is, in deviation from the usual prerequisites established under Section 117, paragraph 16, of the Radiation Protection Ordinance, to be determined individually by the regulatory body.

The costs of the continuation of the operation and of the decommissioning are to be borne by the federal state (paragraph 6). The issuance of licences for the

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10. Décret n° 2013-675 du 25 juillet 2013 portant publication de l'accord de coopération entre le Gouvernement de la République française et le Gouvernement du Royaume d'Arabie saoudite pour le développement des utilisations pacifiques de l'énergie nucléaire (ensemble une annexe), signé à Riyad le 22 février 2011, J.O.L. et D., 27 July 2013, p.12558, text No. 6.
 11. Gesetz zur Beschleunigung der Rückholung radioaktiver Abfälle und der Stilllegung der Schachtanlage II of 20 April 2013, BGBl. 2013 I, p.921.
 12. See also Nuclear Law Bulletin, No.91 (2013/1), OECD/NEA, Paris, p.118.
 13. Gesetz über die friedliche Verwendung der Kernenergie und den Schutz gegen ihre Gefahren (Atomgesetz), BGBl. 1985 I, p.1565, as last amended on 24 February 2012, BGBl. 2012 I, p.212).
 14. Strahlenschutzverordnung of 20 July 2001, as last amended on 24 February 2012, BGBl. 2001 I, p.1714; BGBl. 2002 I, p.1459; BGBl. 2012 I, p.212.

acceptance of radioactive waste and for its storage is not allowed (paragraph 7). According to paragraph 8, the Federal Office for Radiation Protection is, within its competence pursuant to Section 23, paragraph 1 no. 2, of the Atomic Energy Act, authorised to take security measures in accordance with Section 19, paragraph 3, of the Atomic Energy Act.

In order to ensure that comprehensive information is available to the general public, essential documents as listed in Section 10 of the Environmental Information Act¹⁵ shall be made available through an Internet platform. These documents in particular also include instructions, recommendations and administrative rules.

Repository Site Selection Act (2013)

Parliament passed the Act on the Search and Selection of a Site for a Final Repository for Heat-Generating Radioactive Waste and to Amend other Acts (Repository Site Selection Act). It was published on 23 July 2013 in the *Bundesgesetzblatt*.¹⁶

The act is a so-called “article law” by which various articles under the same heading amend, or newly issue, different acts:

- Article 1 of the act contains the Repository Site Selection Act with Sections 1-30;
- Article 2 contains related amendments to the Atomic Energy Act with amendments to Sections 6, 9a, 9b, 9d, 21a, 21, 23d (new section), 24, 57b, 58 Atomic Energy Act;
- Article 3 contains the Act on the Establishment of a Federal Office for Nuclear Waste Disposal with Sections 1-4;
- Articles 4 and 5 contain amendments to the nuclear cost provisions,¹⁷ to the 2010 Act on the Environmental Impact Assessment,¹⁸ and to the 2009 Federal Civil Servants Remuneration Act.¹⁹

Pursuant to Article 6, the act will enter into force as follows: Article 1, Sections 3 to 5 and 21 to 30, Article 2 nos.2, 4, 6 and 9 to 11, and Article 5, paragraph 1 entered into force on 27 July 2013. The other provisions of the act will enter into force on 1 January 2014.

According to Section 1 of the Repository Site Selection Act (RSSA), the goal of the act, in a science-based and transparent procedure, is to find the site for a final repository for highly radioactive waste generated in Germany. The site must be located in the territory of Germany and shall ensure the best possible safety for a period of one million years. In furtherance of this goal, the Federal Republic of Germany will not conclude agreements with other states which, in compliance with

15. *Umweltinformationsgesetz* of 22 December 2004, BGBl. 2004 I, p.3704.

16. *Gesetz zur Suche und Auswahl eines Standortes für ein Endlager für Wärme entwickelnde radioaktive Abfälle und zur Änderung anderer Gesetze (Standortauswahlgesetz – StandAG)*, BGBl. 2013 I, p.2553. On the Parliamentary history, see *Bundestags-Drucksachen* 17/13471, 17/14181.

17. *Gesetz zur Änderung von Kostenvorschriften zum Atomgesetz* of 20 August 1980, BGBl. 1980 I, p.1556; *Kostenverordnung zum Atomgesetz* of 17 December 1981, as last amended on 29 August 2008, BGBl. 1981 I, p.1457; BGBl. 2008 I, p.1793.

18. *Gesetz über die Umweltverträglichkeitsprüfung* of 24 February 2010 as last amended on 8 April 2013, BGBl. 2010 I p.94; 2013 I p.734.

19. *Bundesbesoldungsgesetz* of 19 June 2009, as last amended on 3 July 2013, BGBl. 2009 I, p.1434; BGBl. 2013 I, p.1978.

the provisions of the EU Directive 2011/70/Euratom,²⁰ would allow the shipment of radioactive waste including spent nuclear fuel to be disposed of outside the territory of Germany. The site selection procedure shall be finalised by the year 2031.

Prior to, and in preparation of, the site selection a “Commission Storage Highly Radioactive Waste” (the commission) [*“Kommission Lagerung hoch radioaktiver Abfälle” (Kommission)*] shall be established pursuant to Section 3 of the RSSA. The commission consists of 33 persons: the chairperson, who will, on the basis of a joint proposal, be selected by the *Bundestag* and by the *Bundesrat* (Federal Council); the other persons shall represent social groups: eight representatives of the scientific community, two representatives each from environmental organisations, from religious groups, from industry, from trade unions, and eight members each from the Federal Parliament (*Bundestag*) and the *Länder* (provincial governments). The commission shall agree by consensus or at least with a two-thirds majority by 31 December 2015 on a report on the site selection procedure. The report will assess all relevant matters of principle and issues recommendations for action (RSSA Section 3). The subject matter to be addressed in the report is described in RSSA Section 4. The commission, in principle, meets in public and publishes its report at the conclusion of its final session (RSSA Section 5).

Pursuant to Section 6, the Federal Office for Radiation Protection (*Bundesamt für Strahlenschutz*) is the public project developer (*Vorhabenträger*) which is entrusted with the implementation of the site selection procedure. It, *inter alia*, makes proposals for the selection of site regions or exploratory programmes. The Federal Office for Nuclear Waste Disposal (*Bundesamt für kerntechnische Entsorgung*), which is newly established by RSSA Article 3, regulates the site selection procedure by deciding on the exploratory programmes and the site related test criteria, among other things (RSSA Section 7).

Chapter 2 of the RSSA (Sections 8-11) organises the participation of authorities and of the general public. After finalisation of the work of the commission established under RSSA Section 3 and after evaluation of the RSSA by the *Bundestag* in accordance with RSSA Section 4, paragraph 4 (sentence 2), the Federal Ministry for the Environment, Nature Conservation and Reactor Safety shall, with the consent of both houses of the Federal Parliament (*Deutscher Bundestag, Bundesrat*), establish as provided in RSSA Section 8 a pluralistically composed national accompanying committee designed to accompany the process of site selection in a way which is oriented towards the common good (*“pluralistisch zusammengesetztes gesellschaftliches nationales Begleittgremium zur gemeinwohlorientierten Begleitung des Prozesses der Standortauswahl”*). The members of the accompanying committee are granted access to all files and dossiers of the Federal Office for Nuclear Waste Disposal and of the public project developer, the Federal Office or Radiation Protection. Both federal offices must ensure that the general public will be comprehensively informed from an early stage and throughout the entire period of the site selection procedure about the goals of the procedure, the status of its realisation and its possible effects. To this end, public hearings and civil dialogues are to be organised and the Internet is to be used to share information with the public. The act provides a list of the documents which at least have to be publicly communicated (RSSA Section 9, paragraph 2). The competent *Länder* ministries and major municipal associations and, as appropriate, local governments and public interest bodies shall participate in developing the decision-making bases as defined in RSSA Section 4, paragraph 2 no.2.

20. Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste, OJ L 199, 2.8.2011, p.48.

The procedure for the site selection is regulated in Chapter 3 of the RSSA (Sections 12-20). The public project developer shall have the duty, as defined in Section 6 of the RSSA, to conduct opencast and underground exploration of the sites determined by the site selection procedure. The exploration is subject to the Federal Mining Act.²¹ The project developer has to cooperate with certain research centres and to take into account the findings of other scientific institutions or competent administrative bodies. The act describes in Sections 13-18 the requirements and conditions that the exploration process must meet. At the end of this procedure, the Federal Office for Radiation Protection as the project developer has to present a final comparative site comparison and make a “site proposal” upon consideration of all relevant facts of the exploration procedure including the results of public hearings (RSSA Section 19). The Federal Ministry for the Environment, Nature Conservation and Reactor Safety shall verify whether the site selection procedure was conducted in compliance with the prerequisites and criteria of the Act and then introduce the site proposal in form of a draft law to the *Bundestag*. In balancing all public and private interests, Parliament will adopt a site proposal as a federal law (RSSA Section 20). This decision is binding upon the subsequent licensing procedure under Section 9b of the Atomic Energy Act with regard to the construction, operation and decommissioning of the final repository.

Chapter 4 contains provisions on costs (RSSA Sections 21-28, 30). The public project developer and the Federal Office for Nuclear Waste Disposal will apportion the costs of the implementation of the site selection procedure among the holders of licences pursuant to Sections 6, 7 or 9 of the Atomic Energy Act and to Section 7 of the Radiation Protection Ordinance, as far as radioactive waste is generated or is expected to be generated and would need to be delivered to a final repository according to Section 9a, paragraph 3, of the Atomic Energy Act (the so-called *Umlagepflichtige*). The Federal Office for Nuclear Waste Disposal requests advance payments from the licence holders, who are the *Umlagepflichtige*.

Chapter 5 (RSSA Section 29 RSSA) contains a special provision concerning the Gorleben Salt Dome. Gorleben will be treated in the same way as other possible sites and shall be subject to the same criteria and requirements. Only within the respective stage of the procedure under Sections 13-20 of the RSSA may Gorleben be compared with other sites provided it is not excluded pursuant to Section 29, paragraph 1 (sentence 5) of the RSSA. In particular the salt dome must not be used as a reference site for evaluation of other sites. Lessons learnt from the exploration of Gorleben must not be used for the site comparison stipulated under RSSA Section 19. The mining exploration of the salt dome will end with the entry into force of RSSA, as will the preliminary safety investigation which will be terminated without an estimation of the salt dome’s technical suitability as a repository.

Greece

Management of spent fuel and radioactive waste

Decree transposing Council Directive 2011/70/Euratom

Presidential Decree No.122, Government Gazette No.177/A of 12 August 2013 transposed Council Directive 2011/70/Euratom establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste²² into national legislation.

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21. *Bundesberggesetz* of 13 August 1980, as last amended on 31 July 2009, BGBl. 1980 I, p.1310; BGBl. 2009 I, p.2585.
 22. *Official Journal of the European Union*, L 199, 2.8.2011, p.48.

Ireland

Transport of radioactive material

Adoption of European Communities (Carriage of Dangerous Goods by Road and Use of Transportable Pressure Equipment) (Amendment) Regulations 2013

The Minister for Jobs, Enterprise and Innovation issued the European Communities (Carriage of Dangerous Goods by Road and Use of Transportable Pressure Equipment) (Amendment) Regulations 2013²³ in July 2013.

These regulations transpose into Irish law Commission Directive 2012/45/EU²⁴ adapting for the second time the Annexes to Directive 2008/68/EC (insofar as that Directive relates to the transport of dangerous goods by road).²⁵ Commission Directive 2012/45/EU gives effect to the amendments to the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), whose last amended version came into force on 1 January 2013.

The regulations, together with the European Communities (Carriage of Dangerous Goods by Road and Use of Transportable Pressure Equipment) Regulations 2011²⁶, which they amend, and the ADR, place duties on the various participants associated with the carriage of dangerous goods by road. These include requirements for vehicles, tanks, tank containers, receptacles and packages containing dangerous goods during their transport. They require that drivers, and others involved in the transport by road of dangerous goods, be adequately trained and, in the case of drivers, hold certificates for such training.

Luxembourg

Nuclear safety and radiological protection

Transposition of Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste

On 30 July 2013 the latest amendment of the Grand-ducal regulation of 14 December 2000²⁷ concerning the protection of the population against the dangers arising from ionising radiation was promulgated. The amendment served to transpose the Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste.²⁸

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23. Statutory Instrument (S.I.) No.238 of 2013, available at: www.irishstatutebook.ie/2013/en/si/0238.html.
 24. Commission Directive 2012/45/EU of 3 December 2012 adapting for the second time the Annexes to Directive 2008/68/EC of the European Parliament and of the Council on the inland transport of dangerous goods to scientific and technical progress, OJ L 332, 4.12.2012, p.18.
 25. Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods, OJ L 260, 30.9.2008, p.13.
 26. S.I. No.349 of 2011.
 27. Mémorial A n° 146 du 06.08.2013, available at: www.legilux.public.lu/leg/a/archives/2013/0146/2013A2876A.html.
 28. *Official Journal of the European Union*, L 199, 2.8.2011, p.48.

Poland

Nuclear safety and radiological protection

New requirements for employees

The Regulation of the Council of Ministers of 10 August 2012 on positions important for nuclear safety and radiological protection and on radiological protection inspectors²⁹ includes the types of authorisations necessary for a radiation protection inspector and the types of activities which may be supervised under these authorisations as well as detailed conditions for granting these authorisations. This regulation also covers candidates who are applying for authorisations to occupy positions important for nuclear safety and radiological protection.

New detailed requirements for nuclear facility siting

The Regulation of the Council of Ministers on the detailed scope of assessment with regard to land intended for the siting of a nuclear facility, cases excluding land to be considered eligible for the siting of a nuclear facility and on requirements concerning siting report for a nuclear facility was issued on 10 August 2012.³⁰ The regulation is a fulfilment of the authorisation included in Article 35b, Chapter 4 of the Atomic Law Act of 29 November 2000.³¹

This regulation determines the detailed scope of assessment with regard to land intended for the siting of a nuclear facility, including *inter alia* seismic and tectonic information, geological and engineering conditions, hydro-geological conditions, hydrology and meteorology, as well as information regarding various external events resulting from human activity, natural events, population density and land management, information on the survey of geological structure, distribution of radioactive isotopes concentration in the soil, surface water, underground water and in the atmosphere, and an analysis of the distribution of ionising radiation dose rate. This regulation also establishes conditions for excluding land from eligibility for the siting of a nuclear facility and determines the scope of the siting report for such facility.

New detailed requirements for nuclear facility design

The Regulation of the Council of Ministers of 31 August 2012 on nuclear safety and radiological protection requirements which must be fulfilled by a nuclear facility design³² is a fulfilment of the authorisation included in Article 36c, Chapter 3 of the Atomic Law Act of 29 November 2000. The amendment of the Atomic Law Act connected with the implementation of the provisions of Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations, performed by means of the Act of 13 May 2011 on the amendment of the Atomic Law Act and other acts³³ set forth, on the statutory level, the basic terms and conditions which must be fulfilled by a design of a nuclear facility with respect to nuclear safety and radiological protection, as well as the safe functioning of technical devices installed and operated at the nuclear facility. The regulation provides further detail concerning the requirements indicated in the act and it determines requirements applicable to different types of nuclear facilities to be accounted for in the nuclear facility design concerning safety

29. *Official Journal of Laws of 2012*, Item 1022.

30. *Official Journal of Laws of 2012*, Item 1025.

31. *Official Journal of Laws of 2012*, Items 264 and 908. The consolidated text of the Atomic Law Act is available at: www.paa.gov.pl/sites/default/files/Specialistyczne/%21Atomic_Law.pdf.

32. *Official Journal of Laws of 2012*, Item 1048.

33. *Official Journal of Laws of 2011*, No.132, Item 766.

level sequences, design safety objectives, probabilistic safety criteria, safety functions, safety classification, design basis, classification of nuclear facility states, postulated initiating events, operational states, considered accidents, common cause failure, single failure criterion, safe state after shutdown, qualification tests, ageing of systems and components of construction and equipment of the nuclear facility. The regulation also imposes detailed requirements for the design of particular systems, structures and components of the nuclear facility, which are important for nuclear safety and radiological protection, such as the reactor itself, reactor cooling circuit, reactor containment system, measurement and control systems, electric power supply systems, radioactive waste and spent nuclear fuel management systems, and the external cooling systems and auxiliary systems.

New requirements for the commissioning and operation of a nuclear facility

The Regulation of the Council of Ministers of 11 February 2013 on requirements for the commissioning and operation of nuclear facilities³⁴ established requirements which, in particular, concern: nuclear facility operating limits and conditions, nuclear fuel handling, obligatory commissioning tests of nuclear facility systems, commissioning program and procedures, elements of nuclear facility commissioning records and commissioning report and elements of nuclear facility operation records. The regulation is a fulfilment of the authorisation included in the Article 38 of the Atomic Law Act of 29 November 2000.

According to the regulation, in order to ensure appropriate levels of nuclear safety and radiological protection during all stages of commissioning and operation of a nuclear facility, commissioning and operation shall be performed in accordance with operational limits and conditions, which shall be subject to review during the commissioning and operation of a nuclear facility. Operational limits and conditions shall include all modes of normal operation of a nuclear facility, in particular, during operation at power, the reactor's sub-critical states and reloading of nuclear fuel and transitions between these modes. Operational limits and conditions shall include at least:

- 1) safety limits;
- 2) limiting settings for safety systems;
- 3) limits and conditions for normal operation;
- 4) requirements concerning inspection and surveillance over systems, structures and components of the nuclear facility important for ensuring nuclear safety and radiological protection; and
- 5) minimum required staffing of operational personnel, including control room operators.

A nuclear facility shall be commissioned and operated in a manner that will ensure nuclear safety and radiological protection of personnel and general public in accordance with the licence issued by the President of the Polish National Atomic Energy Agency (PAA), the Polish regulatory authority and the implemented integrated management system. Nuclear facility commissioning shall be conducted according to a nuclear facility commissioning programme approved by the President of the PAA. The programme shall list all pre-commissioning tests of nuclear facility systems, construction elements and installations to be completed, in particular:

- 1) pre-commissioning tests, including tests required under the technical inspection regulations;

34. *Official Journal of Laws of 2013, Item 281.*

- 2) fuel load and sub-criticality tests;
- 3) preliminary criticality tests and low power output tests and power output tests.

The nuclear facility commissioning programme shall specify:

1. the organisation of commissioning works, including their division into particular commissioning stages; and
2. the programmes for particular stages of the nuclear facility's commissioning.

Commissioning works in a nuclear facility shall be conducted in accordance with commissioning procedures developed, verified, approved, modified and revoked according to the principles set out in the integrated management system. Procedures for the operation stage of the nuclear facility, in particular, those with regard to conducting the nuclear facility operational processes, shall be verified during commissioning to the extent practical.

Operation of a nuclear facility shall be conducted in accordance with operating procedures developed, verified, approved, modified and revoked according to the principles set out in the integrated management system. The operating procedures of a nuclear facility shall be developed on the basis of the design documentation, in particular, the safety analysis report, as well as on the basis of operational limits and conditions and the results of commissioning reviews. Operating procedures of a nuclear facility shall be developed for particular states of the nuclear facility.

Experience from the operation of the nuclear facility shall be subject to systematic assessment, which shall take into account, in particular, extraordinary events in the nuclear facility in order to identify their causes.

New requirements for the organisational unit commissioning, operating or decommissioning a nuclear facility

The Regulation of the Council of Ministers of 10 August 2012 on activities important for nuclear safety and radiological protection in an organisational unit conducting activity, which consists in commissioning, operations or decommissioning of a nuclear power plant³⁵ is a fulfilment of the authorisation included in Article 12d, Chapter 8 of the Atomic Law Act of 29 November 2000.

This regulation contains a detailed list of activities important for nuclear safety in an organisational unit conducting activity, which consists of commissioning, operation or decommissioning of a nuclear power plant, in addition to the detailed conditions and procedure for granting authorisations to perform those activities, as well as the scope of training for candidates who are applying for authorisations to perform the above activities.

New requirements for the periodical safety assessment of a nuclear facility

The Regulation of the Council of Ministers of 27 December 2011 on periodical safety assessment of a nuclear facility³⁶ is a fulfilment of the authorisation included in Article 37e, Chapter 11 of the Atomic Law Act of 29 November 2000. This regulation provides a detailed scope of the periodical safety assessment of a nuclear facility and the scope of periodical safety assessment report.

35. *Official Journal of Laws of 2012*, Item 1024.

36. *Official Journal of Laws of 2012*, Item 556.

Radioactive waste management

New requirements relating to decommissioning fund contributions

On 10 October 2012, the Council of Ministers established the regulation on the amount of contributions to cover the costs of spent nuclear fuel and radioactive waste disposal and the costs of nuclear power plant decommissioning.³⁷ These contributions are to be paid to a decommissioning fund by the organisational unit authorised to operate a nuclear power plant.

The Regulation of the Council of Ministers of 27 December 2011 specified the form of standard quarterly report on the amount of contributions to the decommissioning fund.³⁸

New requirements for the decommissioning of a nuclear facility

The Regulation of the Council of Ministers of 11 February 2013 on nuclear safety and radiological protection requirements for the stage of decommissioning of nuclear facilities and the content of a report on decommissioning of a nuclear facility³⁹ is a fulfilment of the authorisation included in Article 38c, Chapter 3 of the Atomic Law Act of 29 November 2000.

This regulation specifies the initial activities in the decommissioning of a nuclear facility, nuclear facility decommissioning management, performance of nuclear facility decommissioning and the content of a special report on decommissioning of a nuclear facility.

General legislation

New regulation on subsidies related to nuclear safety and radiological protection

The Regulation of the Council of Ministers of 26 March 2012 on the subsidy granted for nuclear safety and radiological protection in the application of ionising radiation sets out the form of application for certain subsidies.⁴⁰

New requirements on transparency of the activities of nuclear power facilities

The Regulation of the Minister of Economy of 23 July 2012 on the detailed rules and conditions for the establishment and operation of Local Information Committees and for the cooperation between the committees and the investors in nuclear power facilities⁴¹ provides detailed conditions for the operation of committees and for the co-operation between the committees and the heads of organisational units conducting activities that may lead to exposure to radioactivity. Under the Atomic Law Act, a local community can establish a Local Information Committee, which shall inform the local community on the activities of the nuclear power facilities.

New regulation on recognition of qualifications for regulated professions

The Regulation of the Minister of the Environment of 11 September 2012 on the authorisation for recognition of qualifications for regulated professions acquired in Member States of the European Union (EU)⁴² authorises the President of PAA to recognise qualifications for regulated professions acquired in member states of the EU, the Swiss Confederation and member states of the European Free Trade

37. Official Journal of Laws of 2012, Item 1213.

38. Official Journal of Laws of 2012, Item 43.

39. Official Journal of Laws of 2013, Item 270.

40. Official Journal of Laws of 2012, Item 394.

41. Official Journal of Laws of 2012, Item 861.

42. Official Journal of Laws of 2012, Item 1088.

Association (EFTA) - parties to the Agreement on the European Economic Area. It concerns *inter alia* professions, such as radiation protection inspector, nuclear regulatory inspector, operator of a research reactor, and a specialist for accounting for nuclear material.

Portugal

General legislation

New obligations for nuclear operators

In December 2012, the Portuguese Government adopted Decree-Law No.262/2012, of 17 December, which establishes the obligations of holders of licences for nuclear facilities.⁴³ This new law provides greater detail on these issues under the larger framework of Decree-Law No.30/2012,⁴⁴ which transposed most aspects of Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations.⁴⁵

While theoretically encompassing the obligations of any nuclear facility operator, in practice, this new regime is applicable only to the Portuguese nuclear research reactor located in the Higher Institute of Technology (*Instituto Superior Técnico*), a branch of the Technical University of Lisbon (*Universidade técnica de Lisboa* – UTL). This law has, thus, replaced the ministerial order previously in force, which set out the regulatory framework for the research reactor.⁴⁶

The new regime establishes the general responsibilities and obligations of the operator, general nuclear safety requirements, the system of verification of nuclear safety and applicable administrative measures and sanctions. The law was drafted by the supervising body, the Regulatory Commission for the Safety of Nuclear Facilities (*Comissão Reguladora para a Segurança das Instalações Nucleares* – COMRSIN), on the basis of European Union (EU) Law and international best practices.

Slovak Republic

General legislation

Amendment to the 2004 Atomic Act

On 14 June 2013, Act No.143/2013 Coll.⁴⁷ was published in the Official Journal of the Slovak Republic. This act amends and supplements the 2004 Act on the peaceful use of nuclear energy (Atomic Act).⁴⁸

43. Decreto-Lei no.262/2012, de 17 de dezembro, que estabelece as obrigações dos titulares das licenças de instalações nucleares, Diário da República (DR) I no.243, 17.12.2012, p.7093.

44. Decreto-Lei no.30/2012, de 9 de fevereiro, que Transpõe a Diretiva no.2009/71/Euratom, do Conselho, de 25 de junho de 2009, que estabelece um quadro comunitário para a segurança das instalações nucleares, e cria a respetiva autoridade reguladora competente, DR I no.29, 9.2.2012, p. 653 (see *Nuclear Law Bulletin*, No.89 (2012/1), p.131).

45. OJ L172/18, 2.7.2009.

46. Despacho [Ministerial order] no.10-A/MCT/96, de 13 de março, DR II no.62, 13.3.1996, p.3430 (safety rules for the Portuguese research reactor).

47. Act No.143/2013 Coll., amending and supplementing Act No.541/2004 Coll., on the peaceful use of nuclear energy and on the amendments and supplements to some acts as amended by later acts, and amending and supplementing the Act No.238/2006 Coll., on the National Nuclear Fund for decommissioning of nuclear facilities and for management of spent fuel and radioactive waste (the Nuclear Fund Act) and on the amendments and supplements to some acts as amended by later acts.

48. On the Atomic Act, see also the *Nuclear Law Bulletin*, No.74 (2004/2), OECD/NEA, Paris, pp.61-62.

This amendment transposes Directive 2011/70/Euratom establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste and covers a number of other issues as well, including:

- an increase in the amount of liability limits for nuclear damage;
- cancellation of time limitations on operating licences, including existing valid licences (which were previously issued for the maximum of 10 years); and
- an increase in contributions from authorisation holders for construction, as well as operation of nuclear power plants.

Amendment Act No.143/2013 to the 2004 Atomic Act entered into force on 1 August 2013, except for the provisions concerning the increase in the amounts of the nuclear operator's liability for nuclear damage caused by a nuclear incident; these provisions will enter into force on 1 January 2014. The increased amounts of nuclear liability limits will be set as follows:

1. for a nuclear installation with one or more nuclear reactors for energy purposes, during their commissioning and operation, up to EUR 300 million, (which is four times higher than the limit established by the 2004 Atomic Act); and
2. for other nuclear installations during their commissioning and operation, shipments of radioactive materials and all nuclear installation in the decommissioning stage, up to EUR 185 million (which is 3.7 times higher than the limit established by the 2004 Atomic Act).

Slovenia

Nuclear safety and radiological protection

*Resolution on Nuclear and Radiation Safety in Slovenia*⁴⁹

This Resolution on Nuclear and Radiation Safety in Slovenia was first adopted by the Government in April 2013 and after that by the Parliament in June 2013. The resolution was prepared in response to one of the recommendations of the IAEA Integrated Regulatory Review Service (IRRS) mission to Slovenia, which took place from 25 September to 4 October 2011.

The resolution covers the following topics:

- fundamental safety principles;
- a description of nuclear and radiological activities in Slovenia;
- a description of international co-operation in the field of nuclear and radiation safety;
- a description of the existing legislation (including binding international legal instruments, such as conventions and other relevant international instruments);
- a description of the institutional framework;
- a description of the competence of professional support (research, education, training); and
- the objectives and measures to achieve them during the period up to 2023.

49. Official Gazette No.56/2013.

The Slovenian Nuclear Safety Administration (SNSA) shall report to the parliament on the implementation of the provisions of the resolution once a year; the report will be an integral part of the SNSA's annual report on ionising radiation protection and nuclear safety, which is adopted each year by the government and subsequently by the Parliament of the Republic of Slovenia. This report will discuss progress made toward achieving the objectives of the resolution.

Ukraine

International co-operation

Ratification of co-operation agreement with Norway

On 5 June 2013, the Supreme Council (*Verkhovna Rada*) of Ukraine ratified the agreement between the Cabinet of Ukraine and the Government of the Kingdom of Norway regarding collaboration in the field of nuclear and radiation safety, decommissioning of the Chernobyl nuclear power plant and transformation of the Chernobyl “shelter” into an ecologically safe system.⁵⁰

Co-operation arrangement between the regulatory authorities of Ukraine and Belarus

An agreement between the State Nuclear Regulatory Inspectorate of Ukraine and the Ministry of Extraordinary Situations of the Republic Belarus was signed on 5 September 2013. The Nuclear and Radiation Safety Department is organised with the Belarusian ministry. The agreement provides for bilateral collaboration between the countries' nuclear and radiation safety regulatory bodies and collaboration on matters concerning safety of nuclear energy activities and protection from ionising radiation, human resource development, public information and other scientific and technical issues.

United States

Issuance of Proposed Waste Confidence Rule and Draft Generic Environmental Impact Statement for public comment

Historically, “waste confidence” has denoted the US Nuclear Regulatory Commission's (NRC's) generic determination regarding the environmental impacts of storing spent nuclear fuel beyond the licensed operational life of a nuclear reactor. This generic analysis has been incorporated into the NRC's reviews under the National Environmental Policy Act (NEPA) for new reactor licences, renewal of reactor licences, and independent spent fuel storage installation (ISFSI) licences through the Waste Confidence Rule. On 8 June 2012, the US Court of Appeals for the DC Circuit found that some aspects of the NRC's 2010 rulemaking to update the rule did not satisfy the NRC's NEPA obligations and, therefore, the court vacated the rulemaking.⁵¹ The court indicated that in making either a “finding of no significant impact” based on an environmental assessment (EA) or an environmental impact statement (EIS) supporting the rulemaking, the NRC needed to add additional discussions concerning the impacts of failing to secure permanent disposal for spent nuclear fuel (i.e. indefinite storage) and concerning the impacts of certain aspects of potential spent fuel pool leaks and spent fuel pool fires.

50. No.325-VII of 5 June 2013.

51. *New York v. NRC*, 681 F.3d 471 (DC Cir. 2012).

In response to the Court's decision, the NRC stopped all licensing activities that relied on the Waste Confidence Rule,⁵² and created a Waste Confidence Directorate within the Office of Nuclear Material Safety and Safeguards to oversee the development of a generic environmental impact statement and revised rule on waste confidence. The Commission has instructed the directorate to prepare a final generic environmental impact statement and rule for issuance no later than September of 2014.

The NRC issued in September 2013 a proposed rule and draft generic environmental impact statement for public comment.⁵³

Because the NRC will be issuing a generic environmental impact statement, which provides a detailed analysis of the environmental impacts associated with continued storage, it is no longer necessary to make a “finding of no significant impact” as that term is used in NEPA, associated with continued storage. The final rule will codify the environmental impacts reflected in the generic environmental impact statement.

Issuance of Final Rule Updating Part 51 and Final License Renewal Generic Environmental Impact Statement Update

Under the NRC's regulations, operating and combined licences for nuclear power plants may be issued for a maximum term of 40 years. To operate after the first 40 years, nuclear power plants may apply for licence renewal. The licence renewal process is designed to assure safe operation of a nuclear power plant and protection of the environment during the licence renewal term. Under the NRC's environmental protection regulations, renewal of a nuclear power plant's operating licence requires the preparation of an environmental impact statement (EIS). To support the preparation of these EISs, the NRC issued the Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS), NUREG-1437, in 1996. In June 2013, the NRC issued the first update of the GEIS and its implementing rule in 10 CFR Part 51.⁵⁴

The original 1996 GEIS was prepared to assess the environmental impacts associated with the continued operation of nuclear power plants during the licence renewal term. The NRC also promulgated a rule that codified the findings of the 1996 GEIS into its regulations.⁵⁵ The intent was to determine which environmental impacts would result in essentially the same (i.e. generic) impact at all nuclear power plants and which ones could result in different levels of impacts at different plants and would require, therefore, a plant-specific analysis to determine the impacts. For those issues that could not be generically addressed, the NRC would prepare plant-specific supplemental EISs to the GEIS.

The NRC began its review of the original GEIS and rule on in 2003, by publishing a notice of intent to revise the 1996 GEIS.⁵⁶ As part of this process and pursuant to regulations the NRC conducted a scoping analysis, held a series of public meetings, and presented multiple documents for public comment. The latest revision of the proposed rule, draft updated GEIS, and accompanying guidance documents were released for public comment in 2009. The proposed revisions to the GEIS and rule were based on consideration of (1) comments received from the public during the public scoping period, (2) a review of comments received on plant-specific

52. Calvert Cliffs Nuclear Project, LLC (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-12-016, 76 NRC __ (7 August 2012).

53. 78 Federal Register 56,776 (13 September 2013).

54. 78 Federal Register 37,282 (20 June 2013).

55. 10 CFR Part 51, Appendix B, Table B-1, published at 61 Federal Register 28,467 (5 June 1996).

56. 68 Federal Register 33,209 (3 June 2003).

supplemental EISs completed since the 1996 GEIS was issued, and (3) lessons learnt and knowledge gained from previous and ongoing licence renewal environmental reviews.

The final update incorporates significant advances in the NRC's understanding of nuclear power plants' management of aging. NRC identified 78 environmental impact issues from continued operations and refurbishment associated with licence renewal. Of these, 17 would require plant-specific evaluations. In the 1996 rule, there were 92 environmental impact issues, 23 of which required a plant-specific analysis. This change reflects the consolidation of several review areas and the addition of some new ones. New environmental impact areas that have been evaluated generically include geology and soils, effects of dredging, groundwater use and quality, impacts of management of transmission line rights-of-way on aquatic resources, and employment and income. New impact areas that will be evaluated on a site-specific basis include release of radionuclides to groundwater, conflicts over water use and cumulative impacts.

Inflation adjustment to the Price-Anderson Act Financial Protection Regulations

Section 603 of the Energy Policy Act of 2005 amended the Price-Anderson Act to require the NRC to adjust the maximum total and annual standard deferred premiums not less than once during each five-year period following 20 August 2003, in accordance with the aggregate percentage change in the Consumer Price Index.⁵⁷ The NRC made the initial changes to the Price-Anderson Act amounts on 27 October 2005 and the first periodic inflation adjustments on 29 September 2008. This final rule makes the second required periodic inflation adjustments to the maximum total and annual standard deferred premiums.⁵⁸

The September 2008 inflation adjustments raised the maximum total deferred premium in 10 CFR 140.11(a)(4) for a reactor to USD 111.9 million and the maximum annual deferred premium to USD 17.5 million. The new 2013 inflation adjustments promulgated in this rulemaking raised the maximum total deferred premium to USD 121.255 million, and the maximum annual deferred premium to USD 18.963 million.

Uruguay

Nuclear safety and radiological protection

Law 19.056 on Radiological Protection of 4 January 2013

The law applies to all activities involving exposure or potential exposure to ionising radiation, including all activities relating to the holding, use, development, production, application, marketing, transport, distribution, repair, import, export and handling of sources of ionising radiation and radiation generators conducted within the territory of the Eastern Republic of Uruguay.

An unofficial translation of this law is available at page 191 of this edition of the *Nuclear Law Bulletin*.

57. Public Law 109-58, 119 Statutes at Large 594, 780.

58. 78 Federal Register 41,835 (12 July 2013).

Intergovernmental organisation activities

European Atomic Energy Community

Proposed legislative instruments

Proposal for a Council Directive amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations (COM/2013/715 final)

Following the call of the European Council of 25 March 2011 requiring the European Commission to review the nuclear safety framework of the European Union (EU) and to propose any necessary improvements after the Fukushima accident, the Commission adopted on 13 June 2013 a draft proposal [COM(2013) 343 final] for the revision of the current Nuclear Safety Directive.¹

In accordance with the provisions of Article 31 of the Treaty establishing the European Atomic Energy Community (Euratom Treaty), the draft proposal was submitted to the European Economic and Social Committee (EESC) for its formal opinion. The EESC, whilst making a few specific comments, gave a favourable opinion on 18 September 2013. The Commission, therefore, adopted its formal proposal on 17 October 2013 (COM/2013/715).

The proposal contains new legal provisions that will further enhance the role and independence of national regulators, as well as improve transparency on nuclear safety matters. Ambitious safety objectives for all types of nuclear installations are included, the main objective being to avoid, as much as possible, the release of radioactivity outside the containment of nuclear power plants in case of incidents or accidents. The proposal reinforces the EU wide exchange of experience by establishing a European system of topical peer reviews of nuclear installations that builds on the successful stress tests concept. The peer reviews are intended to lead to the development of harmonised, though legally non-binding, technical guidelines for the improvement of nuclear safety. Finally, the proposal introduces provisions to enhance on-site emergency preparedness and response.

Adopted legislative instruments

Commission Implementing Regulation (EU) No.495/2013 of 29 May 2013 amending Implementing Regulation (EU) No.996/2012 imposing special conditions governing the import of feed and food originating in or consigned from Japan following the accident at the Fukushima nuclear power station²

Following the accident at the Fukushima Daiichi nuclear power plant on 11 March 2011, the Commission was informed that radionuclide levels in certain food products originating in Japan exceeded the action levels in food applicable in Japan. Because such contamination may constitute a threat to public and animal health in the EU, Commission Implementing Regulation (EU) No.297/2011 imposing special conditions governing the import of feed and food originating in or consigned

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1. Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations, OJ L 172, 2.7.2009, pp.18- 22.
 2. OJ L 143, 30.5.2013, pp.3-10.

from Japan following the accident at the Fukushima nuclear power station was adopted on 25 March 2011.³ That regulation was later replaced by Commission Implementing Regulation (EU) No.961/2011,⁴ Commission Implementing Regulation (EU) No.284/2012,⁵ and Commission Implementing Regulation (EU) No.996/2012.⁶

Article 17 of Commission Implementing Regulation (EU) No.996/2012 provides for a review of its provisions when the results of sampling and analysis on the presence of radioactivity of feed and food of the third growing season after the accident would be available, i.e. by 31 March 2014. However, Article 17 also required a review by 31 March 2013 of the provisions concerning the products for which the harvest occurs mainly during the second part of the second growing season and for which all the data of the second growing season were not yet available at the time of adoption of Commission Implementing Regulation (EU) No.996/2012.

Commission Implementing Regulation (EU) No.495/2013, therefore, amends the provisions of Commission Implementing Regulation (EU) No.996/2012, and takes into account the occurrence data on radioactivity in feed and food provided by the Japanese authorities for the period between September 2012 and January 2013.

*Council Decision of 15 July 2013 authorising certain Member States to ratify, or to accede to, the Protocol amending the Vienna Convention on Civil Liability for Nuclear Damage of 21 May 1963 in the interest of the European Union and to make a declaration on the application of the relevant internal rules of Union law (2013/434/EU)*⁷

The EU has exclusive jurisdiction with regard to articles XI and XII of the Vienna Convention as amended by the Protocol of 12 September 1997 insofar as such provisions affect the rules laid down in Council Regulation (EC) No.44/2001 of 22 December 2000 on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters.⁸ The EU is, however, not in a position to become a Contracting Party to the 1997 Protocol because the Vienna Convention and its 1997 Protocol are not open to participation by regional organisations.

Under these circumstances, and given that the 1997 Protocol was negotiated with a view to improving compensation for victims of damage caused by nuclear incidents, the Council of the EU adopted on 15 July 2013 a decision authorising the member states, which are contracting parties to the Vienna Convention – i.e. Bulgaria, the Czech Republic, Estonia, Hungary, Lithuania, Poland and Slovakia – to ratify, or to accede to the 1997 Protocol in the interest of the EU.

Non-legislative instruments

Report from the Commission to the European Parliament, the Council and the Economic and Social Committee on the implementation by the Member States of Council Directive 2006/117/Euratom on the supervision and control of shipments of radioactive waste and spent fuel [COM(2013)240 final]

Council Directive 2006/117/Euratom⁹ lays down a Community system of supervision and control of transboundary shipments of radioactive waste and spent nuclear fuel, which applies whenever the country of origin or the country of

3. OJ L 80, 26.3.2011, pp.5-8.

4. OJ L 252, 28.9.2011, pp.10-15.

5. OJ L 92, 30.3.2012, pp.16-23.

6. OJ L 299, 27.10.2012, pp.31-41.

7. OJ L 220, 17.8.2013, pp.1-2.

8. OJ L 12, 16.1.2001, pp.1-23.

9. Council Directive 2006/117/Euratom of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel, OJ L 337, 5.12.2006, p.21 (the “Shipments Directive”).

destination or any country of transit is a member state of the Community. The directive ensures that concerned member states are informed about shipments of radioactive waste and spent nuclear fuel to or via their territory with the obligation to give either their consent or reasoned refusal to the shipments.

The directive foresees periodic reporting from the Commission to the European Parliament, to the Council of the EU and to the EESC, on the basis of EU member states' reports.

This first report adopted by the Commission on 25 April 2013 provides some feedback on the implementation of the general provisions of the directive (Chapter 4), as well as a summary overview of the implementation of the directive by the EU member states and of the authorisations given in the Community under the Shipments Directive.

With this report, the Commission notes that the Shipments Directive has been successfully transposed and applied in all EU member states.

International relations

Commission Decision of 24 June 2013 on granting a Euratom loan in support of the Ukraine safety upgrade program of nuclear power units [C(2013)3496]

The National Nuclear Energy Generating Company (“Energoatom”) of Ukraine has requested the Commission to grant a Euratom loan that would contribute to the financing required for the safety upgrade that would aid the 15 operating nuclear power reactors in Ukraine in reaching internationally recognised nuclear safety standards. On 24 June 2013, the Commission adopted a Decision approving the granting of a Euratom loan of up to EUR 300 million for this project.

Signature of the Agreement between the government of South Africa and the European Atomic Energy Community for co-operation in the peaceful uses of nuclear energy, 18 July 2013¹⁰

A new nuclear co-operation agreement between Euratom and South Africa was signed at the Sixth South Africa-EU Summit in Pretoria on 18 July 2013, with the aim of establishing a stable legal framework for co-operation in the nuclear field and fostering scientific co-operation between the two parties. The agreement provides, in particular, for co-operation in researching and developing nuclear energy, including fusion technologies; the use of nuclear materials and technologies, notably in health and agriculture; nuclear safety, radioactive waste and spent fuel management, decommissioning, radiological protection including emergency preparedness and response; and developing nuclear safeguards. Co-operation will include the exchange of experts, scientific and technological information, as well as establishment of joint scientific working groups.

Renewal of the Agreement between the European Atomic Energy Community and the Korean Peninsula Energy Development Organisation (KEDO)¹¹

The renewal of the agreement between Euratom and KEDO was done at New Jersey and at Brussels on 24 June and 4 July 2013 respectively, in order to continue their co-operation with the objective of implementing the termination of the Light Water Reactor project and an orderly winding up of KEDO. The continued existence of the agreement serves to protect the financial and legal interests of its members, including Euratom.

10. OJ L 204, 31.7.2013, pp.3-10.

11. OJ L 188, 9.7.2013, pp.1-2.

*Signature of the Memorandum of Understanding for a partnership between the European Atomic Energy Community and the International Atomic Energy Agency on nuclear safety co-operation, 17 September 2013*¹²

The IAEA and Euratom have developed extensive scientific and technological co-operation for many years. An existing co-operation agreement between the IAEA and Euratom, in force since 1 January 1976, provides a formal basis for the collaboration of the two organisations. So far, co-operation based on this agreement has focused on nuclear safeguards.

In May 2008, both organisations signed a Joint Statement whereby they agreed to examine concrete steps to significantly reinforce the quality and intensity of their co-operation. The IAEA and the Commission currently co-operate in various areas and their co-operation has grown significantly over the last few years.

Based on the 1976 Co-operation Agreement and the 2008 “Joint Statement”, the IAEA and Euratom signed a Memorandum of Understanding on 17 September 2013 in Vienna within the framework of the 57th General Conference of the IAEA, with the aim of defining specific areas of nuclear safety co-operation and establishing a working mechanism following the example of nuclear safeguards co-operation.

Commission Decision on the adoption of the Report of the European Atomic Energy Community for the Sixth Review Meeting of Contracting Parties to the Convention on Nuclear Safety (CNS) to be held in Vienna from 24 March to 4 April 2014 (C/2013/7005)

The Euratom Report on the implementation of the obligations under the CNS was adopted by a decision of the Commission on 23 October 2013 and submitted to the IAEA on the same day, in accordance with the procedural rules. The report presents the latest developments at the level of the EU in the field of nuclear safety since the Fifth Review Meeting of the Contracting Parties to the CNS, held from 4-14 April 2011.

International Atomic Energy Agency

IAEA Action Plan on Nuclear Safety

Two years after the adoption of the IAEA Action Plan on Nuclear Safety (GOV/2011/59-GC(55)/14) by the IAEA’s policy-making organs in September 2011, significant progress has been made in several key areas, including in the context of the action focused on improving the effectiveness of the international legal framework. Some of the main developments and related actions are summarised in the next sections. Reference may also be made to the report submitted by the IAEA Director General to the IAEA policy-making organs in August 2013 (GOV/INF/2013/8-GC(57)/INF/5).

Work is also underway on a comprehensive report on the Fukushima Daiichi accident, to be finalised in 2014. The goal is to produce an authoritative, factual and balanced assessment, addressing the causes and consequences of the accident, as well as lessons learned. The report will, among other things, cover the description and context of the accident, safety assessment, emergency preparedness and response, radiological consequences, as well as post-accident recovery.

Convention on Nuclear Safety

The third meeting of the Working Group on Effectiveness and Transparency, that was established by the Contracting Parties to the Convention on Nuclear Safety

12. Available at: http://ec.europa.eu/energy/nuclear/safety/doc/20130917_ec_iaea_mou_nuclear.pdf.

(CNS) during their Second Extraordinary Meeting in August 2012, was organised in Vienna from 2-4 September 2013. The last meeting of the Working Group will be held from 4-6 November 2013. The final report of the Working Group will include a list of actions to strengthen the CNS and will be considered at the Sixth Review Meeting of the Contracting Parties to the CNS to be held from 24 March to 4 April 2014.

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

During the Fourth Review Meeting of the Contracting Parties to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention), the contracting parties agreed to organise a Topical Meeting on Comprehensive Approaches to Managing the Back End of the Nuclear Fuel Cycle. This meeting, open only to the contracting parties to the Joint Convention, was held at IAEA Headquarters in Vienna from 16-18 October 2013. The objective was to provide a forum for the exchange of information on approaches to managing the back-end of the nuclear fuel cycle in a comprehensive manner.

Legislative assistance activities

The IAEA Secretariat continued to support member states, upon request, under its legislative assistance programme. During the period from June to September 2013, several draft national laws were reviewed and comments were provided to the countries concerned. The IAEA Office of Legal Affairs also trained scientific visitors and fellows from a number of member states in various aspects of nuclear law. Awareness missions were dispatched to member states in order to raise awareness of national policymakers about the importance of adhering to relevant international legal instruments adopted under the IAEA's auspices, and preparations are underway to conduct similar missions in other interested member states over the coming months.

IAEA Treaty Event

The second IAEA Treaty Event took place during the 57th Regular Session of the IAEA General Conference, and provided member states with a further opportunity to deposit their instruments of ratification, acceptance or approval of, or accession to, the treaties deposited with the Director General, notably those related to nuclear safety, security and civil liability for nuclear damage. During the event, Cuba and Malta deposited their respective instruments of ratification of the *Amendment to the Convention on the Physical Protection of Nuclear Material (CPPNM)*, whilst Lesotho deposited an instrument of accession to the *Convention on Early Notification of a Nuclear Accident* and an instrument of accession to the *Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency*.

Nuclear Law Institute

The third session of the Nuclear Law Institute was organised by the IAEA Office of Legal Affairs in Baden, Austria, from 29 September to 11 October 2013. The comprehensive two-week course is designed to help meet the increasing demand by IAEA member states for legislative assistance and to enable participants to acquire a solid understanding of all aspects of nuclear law, as well as to draft, amend or review their national nuclear legislation. Using modern teaching methods based on interaction and practice, all areas of nuclear law are comprehensively addressed. Approximately 63 representatives from IAEA member states participated.

Workshop for diplomats on nuclear law

The Secretariat organised a workshop for diplomats on nuclear law in Vienna, Austria, on 15 July 2013. The workshop provided diplomats and technical experts from the Permanent Missions of IAEA member states with a broad understanding of all aspects of nuclear law. It included presentations on the key international legal instruments relating to nuclear safety, nuclear security, safeguards and civil liability for nuclear damage, as well as an overview of the IAEA's legislative assistance programme. A similar workshop was held in Geneva, Switzerland on 29 April 2013.

Publication of International Law Series No.5

The explanatory text for the Joint Protocol on the Application of the Vienna Convention and the Paris Convention, which was developed by the International Expert Group on Nuclear Liability (INLEX), was recently published as IAEA International Law Series No.5.¹³

International Conference on Nuclear Security: Enhancing Global Efforts

The International Conference on Nuclear Security: Enhancing Global Efforts was convened at the IAEA headquarters in Vienna from 1-5 July 2013. The conference was attended by more than 1 300 registered participants from 125 member states, 34 of which were represented at ministerial level, and 21 intergovernmental and non-governmental organisations. The conference provided a forum where experiences and lessons learned could be discussed and ideas exchanged to identify emerging trends and to consider medium and long term objectives for international nuclear security efforts, as well as to inform the development of the IAEA's Nuclear Security Plan 2014-2017.

A highlight of the conference was the adoption by consensus of a ministerial declaration, which demonstrated a strong commitment to the common goal of strengthening nuclear security worldwide. The ministerial declaration, among other things, invited states that have not yet done so to become party to and fully implement the Convention on the Physical Protection of Nuclear Material (CPPNM) and its 2005 Amendment and the International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT). The declaration also encouraged the IAEA and states to continue efforts to promote the entry into force of the 2005 Amendment to the CPPNM at the earliest possible date. It also invited states that have not yet done so to make a political commitment to implement the non-legally binding Code of Conduct on the Safety and Security of Radioactive Sources and supplementary Guidance on the Import and Export of Radioactive Sources, and encourage all states to implement these instruments and to maintain effective security of radioactive sources throughout their life cycle. Further, the IAEA was encouraged, in consultation with member states, to consider ways of further promoting the exchange, on a voluntary basis, of information on the implementation of the legal instruments relevant to nuclear security.

The conference had main sessions and technical sessions in which technical experts from member states and various organisations participated. In the session on implementing and enhancing the international nuclear security framework, and as reflected in the President's Summary of the Conference, the participants agreed that the universalisation of the international legal instruments in the area of nuclear security is of the utmost importance and should be promoted, not only by the states concerned, but also by international bodies, such as the IAEA. They also agreed that

13. IAEA (2013), The 1988 Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention - Explanatory Text, IAEA International Law Series No.5, Vienna.

in this area, there now exists a working system of binding and non-binding instruments that complement and reinforce each other, and that the IAEA plays an indispensable role in bringing together and facilitating the work of technical, legal and political experts to develop both the binding and, in particular, the non-binding measures and guidelines for application by member states. Finally, they agreed that in the nuclear sphere, there is a delicate balance between transparency and confidentiality, which should be developed very carefully in order not to jeopardise the future of the peaceful use of nuclear energy, to prevent the threat to humanity caused by malicious acts, and to build confidence that nuclear security measures are applied appropriately worldwide.

Further information on the conference, including the ministerial declaration and the president's summary, can be found on the IAEA's website.¹⁴

57th Regular Session of the IAEA General Conference

The 57th Regular Session of the IAEA General Conference was held in Vienna, Austria, from 16-20 September 2013. Delegates from 159 member states and representatives of various international organisations participated in the conference.

Resolutions of the conference

A number of resolutions were adopted by the General Conference. As in previous years, two resolutions – GC(57)/RES/7 relating to international co-operation in nuclear, radiation, transport and waste safety and GC(57)/RES/8 relating to nuclear security – include sections that are of legal relevance. All resolutions adopted during the 57th Regular Session of the General Conference are available on the IAEA website: www.iaea.org/About/Policy/GC/GC56/Resolutions/index.html.

- Measures to Strengthen International Cooperation in Nuclear, Radiation, Transport and Waste Safety [GC(57)/RES/9]

Conventions, Regulatory Frameworks and Supporting Non-Legally-Binding Instruments for Safety

The resolution allotted a specific section – Part 2 – to cover matters relating to conventions, regulatory frameworks and non-legally binding instruments on safety. In Part 2, the General Conference urged all member states, in particular those planning, constructing, commissioning or operating nuclear power plants or considering nuclear power programs, to become Contracting Parties to the Convention on Nuclear Safety. It also urged all member states, particularly those exploring nuclear energy, to become parties to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. It further urged all member states to become parties to the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency and thereby contribute to a broader and stronger international emergency response capability, to the benefit of all member states.

The General Conference continued to endorse the principles and objectives of the Code of Conduct on the Safety and Security of Radioactive Sources, underlined the important role of the Guidance on the Import and Export of Radioactive Sources, and urged all States to make a political commitment to implement the Code of Conduct and to act in accordance with its associated Guidance. It noted that as of 30 June 2013, 117 states had made a political commitment to implement

14. Available at: www-pub.iaea.org/iaeameetings/43046/International-Conference-on-Nuclear-Security-Enhancing-Global-Efforts.

the Code of Conduct and 89 of those states had notified the Director General of their intention to act in accordance with the Guidance, and requested the IAEA Secretariat to continue providing support in order to facilitate states' implementation of said instruments.

The Conference also urged member states with research reactors under construction, in operation, being decommissioned or in extended shutdown to apply the guidance of the non-legally-binding Code of Conduct on the Safety of Research Reactors.

Further, the Conference requested the IAEA to review the effectiveness of existing international instruments for the safety of nuclear facilities, and urged member states to strengthen regulatory effectiveness in the field of nuclear, radiation, transport and waste safety and to continue promoting co-operation and co-ordination among regulatory bodies within a member state, as appropriate, and among member states.

Nuclear liability

The General Conference again recognised the importance of having in place effective and coherent nuclear liability mechanisms at the national and global levels (preambular paragraph [dd]), and made specific reference to the Paris Convention on Third Party Liability in the Field of Nuclear Energy, the Vienna Convention on Civil Liability for Nuclear Damage, the Brussels Convention supplementary to the Paris Convention, the Joint Protocol Related to the Application of the Vienna Convention and the Paris Convention, as well as the protocols amending these conventions and the Convention on Supplementary Compensation for Nuclear Damage, and the objectives thereof (preambular paragraph [ee]). It noted the intention of the Convention on Supplementary Compensation for Nuclear Damage to establish a worldwide nuclear liability regime based on the principles of nuclear liability law, without prejudice to other liability regimes. It also referred to the Joint Statement on liability for nuclear damage that was made by France and the United States.

In Part 2 of the resolution, the General Conference continued to recognise the valuable work of the International Expert Group on Nuclear Liability (INLEX), took note of its recommendations on establishing a global nuclear liability regime, encouraged the continuation of INLEX, notably for the identification of actions to address gaps in existing nuclear liability regimes and support for the IAEA's outreach activities to facilitate the achievement of a global nuclear liability regime, and encouraged member states, as appropriate, to give due consideration to the possibility of joining international nuclear liability instruments.

In Part 7 of the resolution relating to transport safety, the Conference continued to stress the importance of having effective liability mechanisms in place to ensure prompt compensation for damage to people, property and the environment, as well as actual economic loss due to a radiological accident or incident during the transport of radioactive material, including maritime transport, and noted, in particular, the application of the principles of nuclear liability, including strict liability, in the event of a nuclear accident or incident during the transport of radioactive material.

National infrastructures

In Part 1 of the resolution, the General Conference requested the Secretariat to continue to assist, upon request, member states, particularly member states considering or embarking on a nuclear power program, in developing and improving their national infrastructure, including legislative and regulatory frameworks, for nuclear, radiological, transport and waste safety.

Nuclear installation safety

In Part 5 of the resolution, the General Conference took account of the outcomes of the Second Extraordinary Meeting of the Contracting Parties to the Convention on Nuclear Safety, recognised the efforts of the “Effectiveness and Transparency” working group established to report to the Sixth Review Meeting of the Contracting Parties on a list of actions to strengthen the CNS and on proposals to amend, as necessary, the CNS, and encouraged the contracting parties to actively participate in both the working group and the Sixth Review Meeting in April 2014.

Safety of spent fuel and radioactive waste management

In Part 8 of the resolution, the General Conference encouraged contracting parties to the Joint Convention to build on the work carried out inter-sessionally (on 14-18 April 2013) since the Fourth Review Meeting of the Contracting Parties, and encouraged the IAEA Secretariat to continue supporting the review process.

Safe management of radioactive sources

In Part 10 of the resolution, the General Conference encouraged member states to support the review meetings on the non-legally-binding Code of Conduct on the Safety and Security of Radioactive Sources and its associated Guidance on the Import and Export of Radioactive Sources so as to ensure their continuing relevance, and requested the Secretariat to continue to foster information exchange on the implementation of the Code of Conduct and its associated Guidance.

The General Conference also appreciated the intensive efforts undertaken by the IAEA Secretariat to develop a code of conduct on the transboundary movement of scrap metal, or materials produced from scrap metal, that may inadvertently contain radioactive material, and encouraged the Secretariat to make the results of the discussion conducted on this issue available to member states by issuing a relevant technical document and to facilitate meetings between member states as the need arises on the lessons learned in this regard.

Nuclear and Radiological Incident and Emergency Preparedness and Response

The General Conference recognised that implementation 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, notably in the areas of technical and administrative procedures, may be further enhanced and, therefore, requested the Secretariat to provide support to the contracting parties to the two conventions and to other international organisations in strengthening technical and administrative procedures so as to enhance the implementation of both conventions effectively, and also requested the Secretariat to improve the effectiveness of the international arrangements for communication during a nuclear or radiological emergency. Further, the General Conference requested the Secretariat, in collaboration with member states, to continue to address the conclusions of the Sixth Meeting of the Representatives of the Competent Authorities and to further enhance the international nuclear and radiological emergency preparedness and response system.

- Nuclear Security [GC(57)/RES/10]

The General Conference again reaffirmed the importance of the Convention on the Physical Protection of Nuclear Material (CPPNM) and the value of the Amendment extending its scope.

It also noted the IAEA’s central role in developing comprehensive nuclear security guidance documents and, on request, providing assistance to member states in order to facilitate their implementation.

The General Conference noted the recommended requirements for measures to protect against sabotage of nuclear facilities and unauthorised removal of nuclear material in use, transport and storage included in IAEA Nuclear Security Series No. 13 (INFCIRC/225/Rev.5), which uses a graded approach, and it looked forward to the preparation of further guidance on the implementation of the recommended requirements, including during the process of construction and maintenance of nuclear facilities.

The General Conference reaffirmed the importance and value of the non-legally-binding Code of Conduct on the Safety and Security of Radioactive Sources and underlined the important role of the supplementary Guidance on the Import and Export of Radioactive Sources.

The General Conference encouraged all member states that had not yet done so to become parties to the CPPNM and ratify, accept or approve the 2005 Amendment to the CPPNM as soon as possible, and encouraged the IAEA to continue efforts to promote the entry into force of the amendment at the earliest possible date. It also encouraged all states party to the CPPNM that had not yet done so to ratify, accept or approve the amendment as soon as possible, and encouraged them to act in accordance with the objectives and purposes of the amendment until such time as it enters into force.

The General Conference also encouraged all member states that had not yet done so to become parties to the International Convention on the Suppression of Acts of Nuclear Terrorism as soon as possible.

Likewise, the General Conference invited states that had not yet done so to make political commitments to implement the non-legally binding Code of Conduct on the Safety and Security of Radioactive Sources and the revised supplementary Guidance on the Import and Export of Radioactive Sources, and encouraged all states to implement these instruments and to maintain effective security of radioactive sources throughout their life cycle.

The Conference also encouraged the IAEA, in consultation with member states, to consider ways of further promoting, on a voluntary basis, the exchange of information on the implementation of the international legal instruments relevant to nuclear security.

OECD Nuclear Energy Agency

Joint Declaration on Co-operation signed with the China Atomic Energy Authority

The NEA and the China Atomic Energy Authority (CAEA) have signed a Joint Declaration on Co-operation in the Field of Peaceful Uses of Nuclear Energy. The agreement foresees co-operation in a number of areas, including nuclear safety, nuclear science, new reactor designs, radiological protection and radioactive waste management. It also provides for collaboration on nuclear energy technology development, economic analysis and the fuel cycle. The Joint Declaration is intended to facilitate wider international co-operation on fundamentally important scientific research, the assessment of innovative technologies and the development of national and international legal frameworks, in the interest of further strengthening the safety of nuclear power.

The CAEA, which represents China at the International Atomic Energy Agency (IAEA), is responsible for developing policies on the peaceful uses of nuclear energy, as well as developing programmes, planning and industrial standards. It supervises and co-ordinates China's major nuclear research and development projects and co-operates with international organisations.

China has a major presence in the nuclear energy field with 18 operational reactors (including a 20 MWe fast breeder reactor called the CEFR) and a further 30 reactors under construction, in line with the country's decision to increase its reliance on nuclear energy. China's research and development efforts are also significant, with over a dozen research reactors in operation. The country plans to further develop fast breeder reactor technology, as well as construct a demonstration Generation IV high-temperature, gas-cooled reactor using pebble bed fuel (the 200 MWe HTR-PM).

While the principle of co-operation with China is already established at the OECD level, the country has also been involved since 2006 in two programmes for which the NEA acts as Technical Secretariat. China is a member of the Generation IV International Forum (GIF, an international research and development initiative for the next generation of nuclear energy systems), and its National Nuclear Safety Administration (NNSA) participates in the Multinational Design Evaluation Programme (MDEP, an international forum of nuclear regulators, which is reviewing new reactor designs). In addition, China has been participating in two joint projects under NEA auspices, one on information sharing on occupational radiological protection and the other on mitigating hydrogen risks in nuclear power plants.

See the complete press release at: www.oecd-nea.org/press/2013/2013-04.html.

Benchmark Study of the Accident at the Fukushima Daiichi Nuclear Power Station

The NEA has undertaken a number of activities following the March 2011 accident at the Fukushima Daiichi nuclear power plant in Japan.¹⁵ In November 2012, the NEA initiated the Benchmark Study on the Accident at the Fukushima Daiichi Nuclear Power Station (BSAF) in order to evaluate the progression of the accident and the status of the reactor cores in units 1 to 3 of the Fukushima Daiichi nuclear power plant – an essential step in preparing for fuel debris removal and the dismantling and decommissioning of the power plant.

On 15-17 October 2013, representatives from BSAF member organisations in France, Germany, Japan, Korea, Russia, Spain, Switzerland and the United States met to review progress of the project. Participants noted that there was agreement between the various analysis and the limited information available on plant behaviour. Differences in analysis assumptions were seen as an important basis for future modelling and investigative work into possible accident scenarios. Participants also mapped out a schedule for the remaining project activities, with a view to the completion of a final report in the latter half of 2014.

Further information on the BSAF benchmark is available at: www.oecd-nea.org/jointproj/bsaf.html.

New report – The Fukushima Daiichi Nuclear Power Plant Accident: OECD/NEA Nuclear Safety Response and Lessons Learnt

In September 2013, the OECD Nuclear Energy Agency (NEA) published a report on the actions taken by its member countries and standing technical committees in response to the March 2011 accident at the Fukushima Daiichi nuclear power plant. *The Fukushima Daiichi Nuclear Power Plant Accident: OECD/NEA Nuclear Safety Response and Lessons Learnt*¹⁶ outlines international efforts to strengthen nuclear regulation,

15. For an overview of NEA activities in response to the Fukushima Daiichi accident, see: www.oecd-nea.org/press/2013/news-01.html.

16. OECD/NEA (2013), *The Fukushima Daiichi Nuclear Power Plant Accident: OECD/NEA Nuclear Safety Response and Lessons Learnt*, Paris, available at www.oecd-nea.org/pub/2013/7161-fukushima2013.pdf.

safety, research and radiological protection in the post-Fukushima context. It also highlights key messages and lessons learnt, notably as related to assurance of safety, shared responsibilities, human and organisational factors, defence-in-depth, stakeholder engagement, crisis communication and emergency preparedness.

In the weeks following the March 2011 accident at the Fukushima Daiichi nuclear power plant, the NEA began establishing expert groups in the nuclear safety and radiological protection areas, as well as contributing to information exchange with the Japanese authorities and other international organisations. It promptly provided a forum for high-level decision makers and regulators within the G8-G20 frameworks. The NEA actions in response to the accident have been carried out primarily by the three NEA standing technical committees concerned with nuclear and radiation safety issues – the Committee on Nuclear Regulatory Activities (CNRA), the Committee on the Safety of Nuclear Installations (CSNI) and the Committee on Radiation Protection and Public Health (CRPPH) – under the leadership of the CNRA.

NEA holds workshop on nuclear regulatory approaches

On 28-30 October 2013, the NEA held a workshop on regulatory approaches and the characteristics of an effective regulator, hosted by the Swedish Radiation Safety Authority (SSM) in Stockholm. The first part of the workshop focused on the SSM study entitled *Regulatory Approaches in Nuclear Power Supervision*. The second part of the workshop reviewed the characteristics of an effective regulator and included a panel session on their importance to a given organisation and the challenges that the organisation must overcome to achieve them. For more information on the content and background of the workshop, please visit: www.oecd-nea.org/nsd/workshops/wracer/.

14th Regular Meeting of the Forum on Stakeholder Confidence (FSC)

On 17-19 September, the NEA Forum on Stakeholder Confidence (FSC) held its 14th regular meeting. The FSC welcomed new members from the Republic of Korea and the Russian Federation, who described societal aspects of managing radioactive waste in their countries, and heard updates from Finland, France, Japan and the United Kingdom. The Czech Radioactive Waste Repository Authority (SURA) and the Chair of the Czech working group “Dialogue on the Deep Geological Repository Siting Process” presented the status of the progress and gave feedback on the 2012 FSC national workshop and community visit in the Czech Republic. The meeting also included a topical session on the right of civil society to early involvement in decision-making established by the Aarhus and Espoo Conventions. The FSC was informed about the “E-TRACK” and “TgBEPPa” initiatives by the European Commission and the European Nuclear Energy Forum respectively, which are intended to foster effective citizen participation in radioactive waste management in Europe. FSC delegates also reviewed the recent FSC publication: *Stakeholder Confidence in Radioactive Waste Management: An Annotated Glossary of Key Terms*.¹⁷

17. OECD/NEA (2013), *Stakeholder Confidence in Radioactive Waste Management: An Annotated Glossary of Key Terms*, Paris, available at: www.oecd-nea.org/rwm/docs/2013/6988-fsc-glossary.pdf.

Multilateral agreements

I. Status of treaties and conventions in the field of nuclear energy as of November 2013

Non-proliferation and nuclear security

Treaty on the Non-Proliferation of Nuclear Weapons

The treaty was adopted on 12 June 1968 and entered into force on 5 March 1970. There are 190 parties to this convention (see table below). Since the last status report in *Nuclear Law Bulletin* No.90, there have been no additional ratifications.

The text of the convention is available at: www.un.org/events/npt2005/nppttreaty.html.

Afghanistan	Dominica	Lesotho	Saint Lucia
Albania	Dominican Republic	Liberia	Saint Vincent and the Grenadines
Algeria	Ecuador	Libya	Samoa
Andorra	Egypt	Liechtenstein	San Marino
Angola	El Salvador	Lithuania	Sao Tome and Principe
Antigua and Barbuda	Equatorial Guinea	Luxembourg	Saudi Arabia
Argentina	Eritrea	Macedonia (The fmr. Yug.Rep of)	Senegal
Armenia	Estonia	Madagascar	Serbia
Australia	Ethiopia	Malawi	Seychelles
Austria	Fiji	Malaysia	Sierra Leone
Azerbaijan	Finland	Maldives	Singapore
Bahamas	France	Mali	Slovakia
Bahrain	Gabon	Malta	Slovenia
Bangladesh	Gambia	Marshall Islands	Solomon Islands
Barbados	Georgia	Mauritania	Somalia
Belarus	Germany	Mauritius	South Africa
Belgium	Ghana	Mexico	Spain
Belize	Greece	Micronesia	Sri Lanka
Benin	Grenada	Moldova (Republic of)	Sudan
Bhutan	Guatemala	Monaco	Suriname
Bolivia	Guinea	Mongolia	Swaziland
Bosnia and Herzegovina	Guinea-Bissau	Montenegro	Sweden
Botswana	Guyana	Morocco	Switzerland
Brazil	Haiti	Mozambique	Syria
Brunei Darussalam	Holy See	Myanmar	Tajikistan
Bulgaria	Honduras	Namibia	Tanzania (United Republic of)
Burkina Faso	Hungary	Nauru	Thailand
Burundi	Iceland	Nepal	Timor-Leste
Cambodia	Indonesia	Netherlands	Togo
Cameroon	Iran (Islamic Republic of)	New Zealand	Tonga
Canada	Iraq	Nicaragua	Trinidad and Tobago
Cape Verde	Ireland	Niger	Tunisia
Central African Republic	Italy	Nigeria	Turkey
Chad	Jamaica	Norway	Turkmenistan
Chile	Japan	Oman	Tuvalu
China	Jordan	Palau	Uganda
Colombia	Kazakhstan	Panama	Ukraine
Comoros	Kenya	Papua New Guinea	United Arab Emirates
Congo (Democratic Republic of the)	Kiribati	Paraguay	United Kingdom
Costa Rica	Korea (Democratic People's Republic)*	Peru	United States of America
Côte d'Ivoire	Korea (Republic of)	Philippines	Uruguay
Croatia	Kuwait	Poland	Uzbekistan
Cuba	Kyrgyzstan	Portugal	Vanuatu
Cyprus	Lao People's Democratic Republic	Qatar	Venezuela
Czech Republic	Latvia	Romania	Viet Nam
Denmark	Lebanon	Russian Federation	Yemen
Djibouti		Rwanda	Zambia
		Saint Kitts and Nevis	Zimbabwe

* Note by the Secretariat: NPT state parties have never taken a collective position on the legality of the DPRK's withdrawal from the NPT. A report by the IAEA Director General entitled "Application of Safeguards in the Democratic People's Republic of Korea", GOV/2011/53GC(55)/24 indicates the legal status of the DPRK *vis-à-vis* the NPT is a matter to be clarified by states party to the NPT. See GOV/2011/53GC(55)/24 (2 September 2011), p.5, fn.18, available at: www.iaea.org/About/Policy/GC/GC55/GC55Documents/English/gc55-24_en.pdf.

Convention on the Physical Protection of Nuclear Material

The convention was adopted on 3 March 1980 and entered into force on 8 February 1987. There are 148 parties to this convention (see table below). Since the last status report in *Nuclear Law Bulletin* No.90, there has been no additional ratification.

The text of the convention is reproduced in *Nuclear Law Bulletin* No.23 and is also available at: www.iaea.org/Publications/Documents/Infcircs/Others/inf274r1.shtml.

Afghanistan	Denmark	Lao People's Democratic Republic	Portugal
Albania	Djibouti	Latvia	Qatar
Algeria	Dominica	Lebanon	Romania*
Andorra	Dominican Republic	Lesotho	Russian Federation*
Antigua and Barbuda	Ecuador	Libya	Rwanda
Argentina*	El Salvador	Liechtenstein	Saint Kitts and Nevis
Armenia*	Equatorial Guinea	Lithuania	Saint Lucia
Australia	Estonia	Luxembourg	Saudi Arabia
Austria	Fiji	Macedonia (The frmr. Yug.Rep of)	Senegal
Azerbaijan	Finland*	Madagascar	Serbia
Bahamas	France*	Mali	Seychelles
Bahrain	Gabon	Malta	Slovakia*
Bangladesh	Georgia	Marshall Islands	Slovenia*
Belarus	Germany*	Mauritania	South Africa*
Belgium*	Ghana	Mexico*	Spain*
Bolivia	Greece	Moldova (Republic of)	Sudan
Bosnia and Herzegovina	Grenada	Monaco	Swaziland
Botswana	Guatemala	Mongolia	Sweden*
Brazil*	Guinea	Montenegro	Switzerland*
Bulgaria*	Guinea-Bissau	Morocco	Tajikistan
Burkina Faso	Guyana	Mozambique	Tanzania (United Republic of)
Cambodia	Honduras	Namibia	Togo
Cameroon	Hungary*	Nauru	Tonga
Canada*	Iceland	Netherlands*	Trinidad and Tobago
Cape Verde	India*	New Zealand	Tunisia
Central African Republic	Indonesia	Nicaragua	Turkey
Chile	Ireland	Niger	Turkmenistan
China*	Israel	Nigeria	Uganda
Colombia	Italy	Niue	Ukraine*
Comoros	Ivory Coast	Norway	United Arab Emirates
Congo (Democratic Republic of the)	Jamaica	Oman	United Kingdom*
Congo (Republic of the)	Japan*	Pakistan*	United States of America*
Costa Rica	Jordan	Palau	Uruguay
Croatia	Kazakhstan	Panama	Uzbekistan
Cuba	Kenya	Paraguay	Vietnam
Cyprus	Korea (Republic of)*	Peru	Yemen
Czech Republic*	Kuwait	Philippines	Euratom
		Poland	

* Country with at least one nuclear power plant in operation.

Amendment to the Convention on the Physical Protection of Nuclear Material

The amendment was adopted on 8 July 2005 and has not yet entered into force. There are 70 contracting states to this convention (see table below). Since the last status report in *Nuclear Law Bulletin* No.90, ten states have become contracting states to this amendment: Albania, Armenia, Belgium, Cuba, Cyprus, France, Ghana, Malta, Slovakia and Uzbekistan.

The text of this amendment is available at: <http://ola.iaea.org/OLA/treaties/FullText.pdf>.

Albania	Estonia	Libya	Russian Federation*
Algeria	Fiji	Liechtenstein	Saint Lucia
Antigua and Barbuda	Finland*	Lithuania	Saudi Arabia
Argentina*	France*	Luxembourg	Seychelles
Armenia	Gabon	Macedonia (The frmr.Yug.Rep.of)	Slovakia
Australia	Georgia	Mali	Slovenia
Austria	Germany*	Malta	Spain*
Bahrain	Ghana	Mauritania	Sweden*
Belgium*	Greece	Mexico*	Switzerland*
Bosnia and Herzegovina	Hungary	Moldova (Republic of)	Tunisia
Bulgaria*	India*	Nauru	Turkmenistan
Chile	Indonesia	Netherlands	Ukraine*
China*	Israel	Niger	United Arab Emirates
Croatia	Jordan	Nigeria	United Kingdom*
Cuba	Kazakhstan	Norway	Uzbekistan
Cyprus	Kenya	Poland	Vietnam
Czech Republic*	Latvia	Portugal	
Denmark	Lesotho	Romania*	

* Country with at least one nuclear power plant in operation.

International Convention for the Suppression of Acts of Nuclear Terrorism

The convention was adopted on 13 April 2005 and entered into force on 7 July 2007. There are 88 parties to this convention (see table below). Since the last status report in *Nuclear Law Bulletin* No.90, six states have become states parties to this convention: Afghanistan, Costa Rica, France, Iraq, Kuwait and Saint Lucia.

The text of the convention is available at: http://untreaty.un.org/English/Terrorism/English_18_15.pdf.

Afghanistan	Czech Republic	Lebanon	Peru
Algeria	Denmark	Lesotho	Poland
Antigua and Barbuda	Dominican Republic	Libya	Romania Russian Federation
Armenia	El Salvador	Liechtenstein	Saint Lucia
Australia	Fiji	Lithuania	Saint Vincent and the Grenadines
Austria	Finland	Luxembourg	Saudi Arabia
Azerbaijan	France	Macedonia (The frmr.Yug.Rep of)	Serbia
Bahrain	Gabon	Malawi	Slovakia
Bangladesh	Georgia	Malta	Slovenia
Belarus	Germany	Mali	Solomon Islands
Belgium	Guinea-Bissau	Mauritania	South Africa
Brazil	Hungary	Mexico	Spain
Burundi	India	Moldova (Republic of)	Sri Lanka
Central African Republic	Iraq	Mongolia	Switzerland
Chile	Ivory Coast	Morocco	Turkey
China	Japan	Nauru	Tunisia
Comoros	Kazakhstan	Netherlands	Turkmenistan
Congo (Democratic Republic of the)	Kenya	Nicaragua	Ukraine
Costa Rica	Kiribati	Niger	United Arab Emirates
Croatia	Kuwait	Nigeria	United Kingdom
Cuba	Kyrgyzstan	Panama	Uzbekistan
Cyprus	Latvia	Paraguay	

Comprehensive Nuclear-Test-Ban Treaty

The treaty was adopted on 10 September 1996 and has not yet entered into force. There are 161 contracting states to this convention (see table below). Since the last status report in *Nuclear Law Bulletin* No.90, four countries have become contracting states to this convention: Brunei Darussalam, Chad, Guinea-Bissau and Iraq. One additional state has signed it (Niue), bringing the total of states signatories to 183, all of which are member states of the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization in Vienna, Austria.

Of the 44 "Annex 2" states whose ratification is necessary for the treaty to enter into force, the following have not yet ratified: China, the Democratic People's Republic of Korea, Egypt, India, the Islamic Republic of Iran, Israel, Pakistan and the United States of America.

The text of the treaty is reproduced in *Nuclear Law Bulletin* No.58 (December 1996) and is also available at: www.ctbto.org/fileadmin/content/treaty/treatytext.tt.html.

Afghanistan	Czech Republic	Lao People's Democratic Republic	Portugal
Albania	Denmark	Latvia	Qatar
Algeria	Djibouti	Lebanon Lesotho	Romania
Andorra	Dominican Republic	Liberia	Russian Federation
Antigua and Barbuda	Ecuador	Libya	Rwanda
Argentina	El Salvador	Liechtenstein	Saint Kitts and Nevis
Armenia	Eritrea	Lithuania	Saint Lucia
Australia	Estonia	Luxembourg	Saint Vincent and the Grenadines
Austria	Ethiopia	Macedonia (The frmr.Yug.Rep of)	Samoa
Azerbaijan	Fiji	Madagascar	San Marino
Bahamas	Finland	Malawi	Senegal
Bahrain	France	Malaysia	Serbia
Bangladesh	Gabon	Maldives	Seychelles
Barbados	Georgia	Mali	Sierra Leone
Belarus	Germany	Malta	Singapore
Belgium	Ghana	Marshall Islands	Slovakia
Belize	Greece	Mauritania	Slovenia
Benin	Grenada	Mexico	South Africa
Bolivia	Guatemala	Micronesia	Spain
Bosnia and Herzegovina	Guinea	Moldova (Republic of)	Sudan
Botswana	Guinea-Bissau	Monaco	Suriname
Brazil	Guyana	Mongolia	Sweden
Brunei Darussalam	Haiti	Montenegro	Switzerland
Bulgaria	Holy See	Morocco	Tajikistan
Burkina Faso	Honduras	Mozambique	Tanzania (United Republic of)
Burundi	Hungary	Namibia	Togo
Cambodia	Iceland	Nauru	Trinidad and Tobago
Cameroon	Indonesia	Netherlands	Tunisia
Canada	Iraq	New Zealand	Turkey
Cape Verde	Ireland	Nicaragua	Turkmenistan
Central African Republic	Italy	Niger	Uganda
Chad	Jamaica	Nigeria	Ukraine
Chile	Japan	Norway	United Arab Emirates
Colombia	Jordan	Oman	United Kingdom
Congo (Democratic Republic of)	Kazakhstan	Palau	Uruguay
Cook Islands	Kenya	Panama	Uzbekistan
Costa Rica	Kiribati	Paraguay	Vanuatu
Côte d'Ivoire	Korea (Republic of)	Peru	Venezuela
Croatia	Kuwait	Philippines	Viet Nam
Cyprus	Kyrgyzstan	Poland	Zambia

Nuclear safety and emergency response

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

The convention was adopted on 26 September 1986 and entered into force on 26 February 1987. There are 111 parties to this convention (see table below). Since the last status report in *Nuclear Law Bulletin* No.90, three countries have become states parties to this convention: Lao People's Democratic Republic, Lesotho and Paraguay.

The text of the convention is reproduced in the Supplement to the *Nuclear Law Bulletin* No.38 and is also available at: www.iaea.org/Publications/Documents/Infcircs/Others/infcirc336.shtml.

Albania	Finland*	Malaysia	Saudi Arabia
Algeria	France*	Mali	Senegal
Argentina*	Gabon	Mauritania	Serbia
Armenia*	Germany*	Mauritius	Singapore
Australia	Greece	Mexico*	Slovakia*
Austria	Guatemala	Moldova (Republic of)	Slovenia*
Bangladesh	Hungary*	Monaco	South Africa*
Belarus	Iceland	Mongolia	Spain*
Belgium*	India*	Montenegro	Sri Lanka

Bolivia	Indonesia	Morocco	Sweden*
Bosnia and Herzegovina	Iran (Islamic Republic of)*	Mozambique	Switzerland*
Botswana	Iraq	Netherlands*	Tajikistan
Brazil*	Ireland	New Zealand	Tanzania (United Republic of)
Bulgaria*	Israel	Nicaragua	Thailand
Cameroon	Italy	Nigeria	Tunisia
Canada*	Japan*	Norway	Turkey
Chile	Jordan	Oman	Ukraine*
China*	Kazakhstan	Pakistan*	United Arab Emirates
Colombia	Korea (Republic of)*	Panama	United Kingdom*
Costa Rica	Kuwait	Paraguay	United States of America*
Croatia	Lao People's Democratic Republic	Peru	Uruguay
Cuba	Latvia	Philippines	Viet Nam
Cyprus	Lebanon	Poland	Euratom
Czech Republic*	Lesotho	Portugal	Food and Agriculture Organisation
Denmark	Libya	Qatar	World Health Organisation
Egypt	Liechtenstein	Romania*	World Meteorological Organisation
El Salvador	Lithuania	Russian Federation*	
Estonia	Luxembourg	Saint Vincent and the Grenadines	
	Macedonia (The frmr.Yug.Rep of)		

* Country with at least one nuclear power plant in operation.

Convention on Early Notification of a Nuclear Accident

The convention was adopted on 26 September 1986 and entered into force on 27 October 1986. There are 117 parties to this convention (see table below). Since the last status report in *Nuclear Law Bulletin* No.90, three countries have become parties to this convention: Lao People's Democratic Republic, Lesotho and Paraguay.

The text of the convention is reproduced in the Supplement to *Nuclear Law Bulletin* No.38 and is also available at: www.iaea.org/Publications/Documents/Infcircs/Others/infcirc335.shtml.

Albania	El Salvador	Luxembourg	Saint Vincent and the Grenadines
Algeria	Estonia	Macedonia (The frmr.Yug.Rep of)	Saudi Arabia
Angola	Finland*	Malaysia	Senegal
Argentina*	France*	Mali	Serbia
Armenia*	Gabon	Mauritania	Singapore
Australia	Georgia	Mauritius	Slovakia*
Austria	Germany*	Mexico*	Slovenia*
Bahrain	Greece	Moldova (Republic of)	South Africa*
Bangladesh	Guatemala	Monaco	Spain*
Belarus	Hungary*	Mongolia	Sri Lanka
Belgium*	Iceland	Montenegro	Sweden*
Bolivia	India*	Morocco	Switzerland*
Bosnia and Herzegovina	Indonesia	Mozambique	Tajikistan
Botswana	Iran (Islamic Republic of)*	Myanmar	Tanzania (United Republic of)
Brazil*	Iraq	Netherlands*	Thailand
Bulgaria*	Ireland	New Zealand	Tunisia
Cameroon	Israel	Nicaragua	Turkey
Canada*	Italy	Nigeria	Ukraine*
Chile	Japan*	Norway	United Arab Emirates
China*	Jordan	Oman	United Kingdom*
Colombia	Kazakhstan	Pakistan*	United States of America*
Costa Rica	Korea (Republic of)*	Panama	Uruguay
Croatia	Kuwait	Peru	Viet Nam
Cuba	Lao People's Democratic Republic	Philippines	Euratom
Cyprus	Republic	Poland	Food and Agriculture Organisation
Czech Republic*	Latvia	Portugal	World Health Organisation
Denmark	Lebanon	Qatar	World Meteorological Organisation
Dominican Republic	Libya	Romania*	
Egypt	Liechtenstein	Russian Federation*	
	Lithuania		

* Country with at least one nuclear power plant in operation.

Convention on Nuclear Safety

The convention was adopted on 17 June 1994 and entered into force on 24 October 1996. There are 76 parties to this convention (see table below). Since the last status report in *Nuclear Law Bulletin* No.90, one country has become a state party to this convention: Oman.

The text of the convention is reproduced in *Nuclear Law Bulletin* No.53 and is available at: www.iaea.org/Publications/Documents/Infcircs/Others/inf449.shtml.

Albania	Denmark	Lebanon	Saudi Arabia
Argentina*	Estonia	Libya	Senegal
Armenia*	Finland*	Lithuania	Singapore
Australia	France*	Luxembourg	Slovakia*
Austria	Germany*	Macedonia (The frmr.Yug.Rep of)	Slovenia*
Bahrain	Ghana	Mali	South Africa*
Bangladesh	Greece	Malta	Spain*
Belarus	Hungary*	Mexico*	Sri Lanka
Belgium*	Iceland	Moldova (Republic of)	Sweden*
Bosnia and Herzegovina	India*	Netherlands*	Switzerland*
Brazil*	Indonesia	Nigeria	Tunisia
Bulgaria*	Ireland	Norway	Turkey
Cambodia	Italy	Oman	Ukraine*
Canada*	Japan*	Pakistan*	United Arab Emirates
Chile	Jordan	Peru	United Kingdom*
China*	Kazakhstan	Poland	United States of America*
Croatia	Korea (Republic of)*	Portugal	Uruguay
Cyprus	Kuwait	Romania*	Viet Nam
Czech Republic*	Latvia	Russian Federation*	Euratom

* Country with at least one nuclear power plant in operation.

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

The convention was adopted on 5 September 1997 and entered into force on 18 June 2001. There are 69 parties to this convention (see table below). Since the last status report in *Nuclear Law Bulletin* No.90, five countries have become states parties to this convention: Armenia, Malta, Mauritius, Oman and Vietnam.

The text of the convention is available at: www.iaea.org/Publications/Documents/Infcircs/1997/infrc546.pdf.

Albania	Estonia	Latvia	Saudi Arabia
Argentina*	Finland*	Lithuania	Senegal
Armenia	France*	Luxembourg	Slovakia*
Australia	Gabon	Macedonia (The frmr.Yug.Rep of)	Slovenia*
Austria	Georgia	Malta	South Africa*
Belarus	Germany*	Mauritania	Spain*
Belgium*	Ghana	Mauritius	Sweden*
Bosnia and Herzegovina	Greece	Moldova (Republic of)	Switzerland*
Brazil*	Hungary*	Montenegro	Tajikistan
Bulgaria*	Iceland	Morocco	Ukraine*
Canada*	Indonesia	Netherlands*	United Arab Emirates
Chile	Ireland	Nigeria	United Kingdom*
China*	Italy	Norway	United States of America*
Croatia	Japan*	Oman	Uruguay
Cyprus	Kazakhstan	Poland	Uzbekistan
Czech Republic*	Korea (Republic of) *	Portugal	Vietnam
Denmark	Kyrgyzstan	Romania*	Euratom
		Russian Federation*	

* Country with at least one nuclear power plant in operation.

Liability and compensation for nuclear damage

Paris Convention on Nuclear Third Party Liability

The convention was adopted on 29 July 1960 and entered into force on 1 April 1968, along with its 1964 Additional Protocol. The 1982 Protocol entered into force on 7 October 1988. The 2004 Protocol has not yet entered into force. There are 15 parties to this convention and to its additional protocol (see table below).

The text of the convention is available at: www.oecd-nea.org/law/nlparis_conv.html.

Belgium*	Germany*	Norway	Sweden*
Denmark	Greece	Portugal	Turkey
Finland*	Italy	Slovenia*	United Kingdom*
France*	Netherlands*	Spain*	

* Country with at least one nuclear power plant in operation.

Brussels Supplementary Convention on Third Party Liability in the Field of Nuclear Energy

The convention was adopted on 31 January 1963 and entered into force on 4 December 1974, along with its 1964 Additional Protocol. The 1982 Protocol entered into force on 1 January 1988. The 2004 Protocol has not yet entered into force. There are 12 parties to this convention (see table below).

The text of the convention is available at: www.oecd-nea.org/law/nlbrussels.html.

Belgium*	France*	Netherlands*	Spain*
Denmark	Germany*	Norway	Sweden*
Finland*	Italy	Slovenia*	United Kingdom*

* Country with at least one nuclear power plant in operation.

Protocol to Amend the Paris Convention on Nuclear Third Party Liability

The protocol was adopted on 12 February 2004 and has not yet entered into force. There are 16 signatories to this protocol, namely: Belgium, Denmark, Finland, France, Germany, Greece, Italy, the Netherlands, Norway, Portugal, Slovenia, Spain, Sweden, Switzerland,¹ Turkey and the United Kingdom. Only Norway has ratified the protocol.

The text of the protocol is reproduced in the Supplement to *Nuclear Law Bulletin* No.75 and is also available at: www.oecd-nea.org/law/paris_convention.pdf.

Protocol to Amend the Brussels Convention Supplementary to the Paris Convention

The protocol was adopted on 12 February 2004 and has not yet entered into force. There are 13 signatories to this protocol: Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Slovenia, Spain, Sweden, Switzerland² and the United Kingdom. Only Spain and Norway have ratified the protocol.

The text of the protocol is reproduced in the Supplement to *Nuclear Law Bulletin* No.75 and is also available at: www.oecd-nea.org/law/brussels_supplementary_convention.pdf.

1. Switzerland has signed the 1960 Paris Convention, the 1964 Additional Protocol to amend the Paris Convention and the 1982 and 2004 Protocols to amend the Paris Convention, as well as the 1963 Brussels Supplementary Convention (BSC), the 1964 Additional Protocol to amend the BSC and the 1982 and 2004 Protocols to amend the BSC. On 9 and 11 March 2009 respectively, Switzerland deposited its instruments of ratification of the 1960 Paris Convention and the 1963 Brussels Supplementary Convention as amended by their 1964, 1982 and 2004 amending Protocols. As these ratifications are effective only with respect to the Paris and Brussels Conventions as amended by all Protocols, entry into force for Switzerland of the Conventions as so amended will only take place once the 2004 Protocols to amend the Paris and the Brussels Conventions have themselves entered into force.
2. See fn.1.

Vienna Convention on Civil Liability for Nuclear Damage

The convention was adopted on 21 May 1963 and entered into force on 12 November 1977. There are 39 parties to this convention (see table below). Since the last status report in *Nuclear Law Bulletin* No.90, one country has become state party to this convention: Mauritius.

The text of the convention is available at: www.iaea.org/Publications/Documents/Infcircs/1996/inf500.shtml.

Argentina*	Cuba	Mauritius	Russian Federation*
Armenia*	Czech Republic*	Mexico*	Saint Vincent and the Grenadines
Belarus	Egypt	Moldova (Republic of)	Saudi Arabia
Bolivia	Estonia	Montenegro	Senegal
Bosnia-Herzegovina	Hungary*	Niger	Serbia
Brazil*	Kazakhstan	Nigeria	Slovakia
Bulgaria*	Latvia	Peru	Trinidad and Tobago
Cameroon	Lebanon	Philippines	Ukraine*
Chile	Lithuania	Poland	Uruguay
Croatia	Macedonia (The frmr.Yug.Rep of)	Romania*	

* Country with at least one nuclear power plant in operation.

Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage

The convention was adopted on 12 September 1997 and entered into force on 4 October 2003. There are 11 parties to this convention: Argentina*, Belarus, Kazakhstan, Latvia, Montenegro, Morocco, Poland, Romania*, Saudi Arabia and the United Arab Emirates, as well as Bosnia and Herzegovina, which became a State party to the protocol since the last status report in *Nuclear Law Bulletin* No.90 (* country with at least one nuclear power plant in operation).

The text of the convention is available at: www.iaea.org/Publications/Documents/Infcircs/1998/infcirc566.shtml

Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention

The joint protocol was adopted on 21 September 1988 and entered into force on 27 April 1992. There are 27 parties to this convention (see table below – “PC” or “VC” indicates that the state is party to the Paris Convention or Vienna Convention). Since the last status report in *Nuclear Law Bulletin* No.90, no new countries have become state parties to this convention.

The text of the convention is reproduced in *Nuclear Law Bulletin* No.42 and also available at: www.iaea.org/Publications/Documents/Infcircs/Others/inf402.shtml.

Bulgaria* (VC)	Estonia (VC)	Lithuania (VC)	Slovakia* (VC)
Cameroon (VC)	Finland* (PC)	Netherlands* (PC)	Slovenia* (PC)
Chile (VC)	Germany* (PC)	Norway (PC)	Sweden* (PC)
Croatia (VC)	Greece (PC)	Poland (VC)	Turkey (PC)
Czech Republic* (VC)	Hungary* (VC)	Romania* (VC)	Ukraine* (VC)
Denmark (PC)	Italy (PC)	Saint Vincent and the Grenadines (VC)	United Arab Emirates (VC)
Egypt (VC)	Latvia (VC)		Uruguay (VC)

* Country with at least one nuclear power plant in operation.

Convention on Supplementary Compensation for Nuclear Damage

The convention was adopted on 12 September 1997 and has not yet entered into force. Four countries have ratified this convention: Argentina*, Morocco, Romania* and the United States of America* (* country with at least one nuclear power plant in operation). Since the last status report in *Nuclear Law Bulletin* No.90, there have been no additional ratifications.

The text of the Convention is available at: www.iaea.org/Publications/Documents/Infcircs/1998/infcirc567.pdf.

II. Status of conventions in the field of environmental protection/assessment which affect nuclear energy use as of December 2011

Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention)

The convention was adopted on 25 June 1998 and entered into force on 30 October 2001. There are 46 parties to this convention (see table below). Since the last status report in *Nuclear Law Bulletin* No.90, there have been no additional ratifications.

The text of the convention is available at: www.unece.org/env/pp/documents/cep43e.pdf.

Albania	Denmark	Kyrgyzstan	Romania
Armenia	Estonia	Latvia	Serbia
Austria	Finland	Lithuania	Slovakia
Azerbaijan	France	Luxembourg	Slovenia
Belarus	Georgia	Macedonia (The fmr.Yug.Rep of)	Spain
Belgium	Germany	Malta	Sweden
Bosnia and Herzegovina	Greece	Moldova (Republic of)	Tajikistan
Bulgaria	Hungary	Montenegro	Turkmenistan
Croatia	Iceland	Netherlands	Ukraine
Cyprus	Ireland	Norway	United Kingdom
Czech Republic	Italy	Poland	European Union
	Kazakhstan	Portugal	

Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention)

The convention was adopted on 25 February 1991 and entered into force on 10 September 1997. There are 45 parties to this convention (see table below). Since the last status report in *Nuclear Law Bulletin* No.90, there have been no additional ratifications.

The text of the convention is available at: www.unece.org/env/eia/documents/legaltexts/conventiontextenglish.pdf.

Albania	Denmark	Latvia	Portugal
Armenia	Estonia	Liechtenstein	Romania
Austria	Finland	Lithuania	Serbia
Azerbaijan	France	Luxembourg	Slovakia
Belarus	Germany	Macedonia (The fmr.Yug.Rep of)	Slovenia
Belgium	Greece	Malta	Spain
Bosnia and Herzegovina	Hungary	Moldova (Republic of)	Sweden
Bulgaria	Ireland	Montenegro	Switzerland
Canada	Italy	Netherlands	Ukraine
Croatia	Kazakhstan	Norway	United Kingdom
Cyprus	Kyrgyzstan	Poland	European Union
Czech Republic			

Protocol on Strategic Environmental Assessment to the Espoo Convention (Kiev Protocol)

The protocol was adopted on 21 May 2003 and entered into force on 11 July 2010. There are 26 parties to this protocol: Albania, Armenia, Austria, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Lithuania, Luxembourg, Montenegro, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden and the European Union. Since the last status report in *Nuclear Law Bulletin* No.90, Cyprus has become a State party to this protocol.

The text of the protocol is available at: www.unece.org/env/eia/documents/legaltexts/protocolenglish.pdf.

Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)

The convention was adopted on 22 September 1992 and entered into force on 25 March 1998. There are 16 parties (including the European Union) to this convention (see table below).

The text of the convention is available at: www.ospar.org.

Belgium	Germany	Netherlands	Sweden
Denmark	Iceland	Norway	Switzerland
Finland	Ireland	Portugal	United Kingdom
France	Luxembourg	Spain	European Union

III. Participation in the nuclear energy treaties/conventions and in the environmental protection/assessment conventions referred to above as of November 2013 by member countries of the OECD or the NEA.

The following list illustrates the convention/treaty status of each member country of the OECD or the NEA as of November 2013.

Australia

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- International Convention for the Suppression of Acts of Nuclear Terrorism

Austria

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters
- Convention on Environmental Impact Assessment in a Transboundary Context
- Protocol on Strategic Environmental Assessment

* Not yet in force.

Belgium

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Paris Convention on Nuclear Third Party Liability
- Brussels Supplementary Convention on Third Party Liability in the Field of Nuclear Energy
- Protocol to Amend the Paris Convention on Nuclear Third Party Liability*
- Protocol to Amend the Brussels Convention Supplementary to the Paris Convention*
- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters
- Convention on Environmental Impact Assessment in a Transboundary Context
- Convention for the Protection of the Marine Environment of the North-East Atlantic

Canada

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Convention on Environmental Impact Assessment in a Transboundary Context

Chile

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Vienna Convention on Civil Liability for Nuclear Damage
- Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention

* Not yet in force.

Czech Republic

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Vienna Convention on Civil Liability for Nuclear Damage
- Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention
- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters
- Convention on Environmental Impact Assessment in a Transboundary Context
- Protocol on Strategic Environmental Assessment

Denmark

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Paris Convention on Nuclear Third Party Liability
- Brussels Supplementary Convention on Third Party Liability in the Field of Nuclear Energy
- Protocol to Amend the Paris Convention on Nuclear Third Party Liability*
- Protocol to Amend the Brussels Convention Supplementary to the Paris Convention*
- Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention
- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters
- Convention on Environmental Impact Assessment in a Transboundary Context
- Convention for the Protection of the Marine Environment of the North-East Atlantic

Estonia

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency

* Not yet in force.

- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Vienna Convention on Civil Liability for Nuclear Damage
- Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention
- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters
- Convention on Environmental Impact Assessment in a Transboundary Context
- Protocol on Strategic Environmental Assessment

Finland

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
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- Brussels Supplementary Convention on Third Party Liability in the Field of Nuclear Energy
- Protocol to Amend the Paris Convention on Nuclear Third Party Liability*
- Protocol to Amend the Brussels Convention Supplementary to the Paris Convention*
- Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention
- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters
- Convention on Environmental Impact Assessment in a Transboundary Context
- Protocol on Strategic Environmental Assessment
- Convention for the Protection of the Marine Environment of the North-East Atlantic

France

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Paris Convention on Nuclear Third Party Liability
- Brussels Supplementary Convention on Third Party Liability in the Field of Nuclear Energy

* Not yet in force.

- Protocol to Amend the Paris Convention on Nuclear Third Party Liability*
- Protocol to Amend the Brussels Convention Supplementary to the Paris Convention*
- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters
- Convention on Environmental Impact Assessment in a Transboundary Context
- Convention for the Protection of the Marine Environment of the North-East Atlantic

Germany

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
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- Convention on Environmental Impact Assessment in a Transboundary Context
- Protocol on Strategic Environmental Assessment
- Convention for the Protection of the Marine Environment of the North-East Atlantic

Greece

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Paris Convention on Nuclear Third Party Liability
- Protocol to Amend the Paris Convention on Nuclear Third Party Liability*
- Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention
- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters
- Convention on Environmental Impact Assessment in a Transboundary Context

* Not yet in force.

Hungary

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Vienna Convention on Civil Liability for Nuclear Damage
- Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention
- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters
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- Protocol on Strategic Environmental Assessment

Iceland

- Treaty on the Non-Proliferation of Nuclear Weapons
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Ireland

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- Convention on the Physical Protection of Nuclear Material
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- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
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- Convention for the Protection of the Marine Environment of the North-East Atlantic
- Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters.

* Not yet in force.

Israel

- Convention on the Physical Protection of Nuclear Material
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident

Italy

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
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- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Paris Convention on Nuclear Third Party Liability
- Brussels Supplementary Convention on Third Party Liability in the Field of Nuclear Energy
- Protocol to Amend the Paris Convention on Nuclear Third Party Liability*
- Protocol to Amend the Brussels Convention Supplementary to the Paris Convention*
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Japan

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

Korea (Republic of)

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

* Not yet in force.

Luxembourg

- Treaty on the Non-Proliferation of Nuclear Weapons
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- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
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Mexico

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Vienna Convention on Civil Liability for Nuclear Damage

Netherlands

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
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- Brussels Supplementary Convention on Third Party Liability in the Field of Nuclear Energy
- Protocol to Amend the Paris Convention on Nuclear Third Party Liability*
- Protocol to Amend the Brussels Convention Supplementary to the Paris Convention*
- Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention

* Not yet in force.

- Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters
- Convention on Environmental Impact Assessment in a Transboundary Context
- Protocol on Strategic Environmental Assessment
- Convention for the Protection of the Marine Environment of the North-East Atlantic

New Zealand

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident

Norway

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
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- Brussels Supplementary Convention on Third Party Liability in the Field of Nuclear Energy
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Poland

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Vienna Convention on Civil Liability for Nuclear Damage
- Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage
- Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention

- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters
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Portugal

- Treaty on the Non-Proliferation of Nuclear Weapons
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- Amendment to the Convention on the Physical Protection of Nuclear Material*
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
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Russian Federation**

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Vienna Convention on Civil Liability for Nuclear Damage

Slovakia

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident

* Not yet in force.

** Member country of the NEA only.

- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Vienna Convention on Civil Liability for Nuclear Damage
- Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention
- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters
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- Protocol on Strategic Environmental Assessment

Slovenia

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Paris Convention on Nuclear Third Party Liability
- Brussels Supplementary Convention on Third Party Liability in the Field of Nuclear Energy
- Protocol to Amend the Paris Convention on Nuclear Third Party Liability*
- Protocol to Amend the Brussels Convention Supplementary to the Paris Convention*
- Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention
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- Protocol on Strategic Environmental Assessment

Spain

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Paris Convention on Nuclear Third Party Liability
- Brussels Supplementary Convention on Third Party Liability in the Field of Nuclear Energy
- Protocol to Amend the Paris Convention on Nuclear Third Party Liability

* Not yet in force.

- Protocol to Amend the Brussels Convention Supplementary to the Paris Convention*
- Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters
- Convention on Environmental Impact Assessment in a Transboundary Context
- Protocol on Strategic Environmental Assessment
- Convention for the Protection of the Marine Environment of the North-East Atlantic

Sweden

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Paris Convention on Nuclear Third Party Liability
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- Protocol to Amend the Paris Convention on Nuclear Third Party Liability*
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- Protocol on Strategic Environmental Assessment
- Convention for the Protection of the Marine Environment of the North-East Atlantic

Switzerland

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

- Protocol to Amend the Paris Convention on Nuclear Third Party Liability^{*3}
- Protocol to Amend the Brussels Convention Supplementary to the Paris Convention^{*4}
- Convention on Environmental Impact Assessment in a Transboundary Context
- Convention for the Protection of the Marine Environment of the North-East Atlantic

Turkey

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Paris Convention on Nuclear Third Party Liability
- Protocol to Amend the Paris Convention on Nuclear Third Party Liability*
- Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention
- International Convention for the Suppression of Acts of Nuclear Terrorism

United Kingdom

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Amendment to the Convention on the Physical Protection of Nuclear Material*
- International Convention for the Suppression of Acts of Nuclear Terrorism
- Comprehensive Nuclear-Test-Ban Treaty*
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Paris Convention on Nuclear Third Party Liability
- Brussels Supplementary Convention on Third Party Liability in the Field of Nuclear Energy
- Protocol to Amend the Paris Convention on Nuclear Third Party Liability*
- Protocol to Amend the Brussels Convention Supplementary to the Paris Convention*
- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters
- Convention on Environmental Impact Assessment in a Transboundary Context

3. Switzerland has signed the 1960 Paris Convention, the 1964 Additional Protocol to amend the Paris Convention and the 1982 and 2004 Protocols to amend the Paris Convention, as well as the 1963 Brussels Supplementary Convention (BSC), the 1964 Additional Protocol to amend the BSC and the 1982 and 2004 Protocols to amend the BSC. On 9 and 11 March 2009 respectively, Switzerland deposited its instruments of ratification of the 1960 Paris Convention and the 1963 Brussels Supplementary Convention as amended by their 1964, 1982 and 2004 amending Protocols. As these ratifications are effective only with respect to the Paris and Brussels Conventions as amended by all Protocols, entry into force for Switzerland of the Conventions as so amended will only take place once the 2004 Protocols to amend the Paris and the Brussels Conventions have themselves entered into force.

4. See fn.3.

* Not yet in force.

- Convention for the Protection of the Marine Environment of the North-East Atlantic

United States of America

- Treaty on the Non-Proliferation of Nuclear Weapons
- Convention on the Physical Protection of Nuclear Material
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency
- Convention on Early Notification of a Nuclear Accident
- Convention on Nuclear Safety
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management
- Convention on Supplementary Compensation for Nuclear Damage

Russian Federation

FEDERAL LAW No.170 of 21 November 1995 on the use of atomic energy*

Adopted by the State Duma on 20 October 1995

(as amended by Federal Laws No.28 of 10.02.1997, No.94 of 10.07.2001, No.196 of 30.12.2001, No.33 of 28.03.2002, No.140 of 11.11.2003, No.122 of 22.08.2004, No.232 of 18.12.2006, No.13 of 05.02.2007, No.318 of 01.12.2007, No.118 of 14.07.2008, No.160 of 23.07.2008, No.309 of 30.12.2008, No.374 of 27.12.2009, No.190 of 11.07.2011, No.242 of 18.07.2011, No.248 of 19.07.2011, No.303 of 07.11.2011, No.331 of 21.11.2011, No.347 of 30.11.2011, No.93 of 25.06.2012, No.159 of 02.07.2013)

This Federal Law defines the legal basis and principles for the regulation of relations arising out of the use of atomic energy, is aimed at safeguarding human health and life, protecting the environment and protecting property when atomic energy is used, and is intended to facilitate the development of atomic science and technology and help to strengthen international arrangements for the safe use of atomic energy.

Chapter I. GENERAL PROVISIONS

Article 1. Russian Federal legislation governing the use of atomic energy (as amended by Federal No.347 of 30.11.2011)

Russian Federal legislation governing the use of atomic energy for peaceful and defence purposes is based on the Constitution of the Russian Federation, generally-recognised principles and standards of international law and the international agreements entered into by the Russian Federation which govern the use of atomic energy for peaceful and defence purposes, and is made up of this Federal Law, other Federal laws and other enactments of the Russian Federation adopted in accordance with them.

The provisions of Federal laws and other enactments of the Russian Federation which establish the requirements concerning the industrial safety of hazardous production facilities, fire safety requirements and requirements concerning the safety of hydraulic engineering structures which fall under the scope of this Federal Law shall be applied to relations arising out of the use of atomic energy for peaceful and defence purposes to the extent that they do not contradict this Federal Law.

* This document is an unofficial translation of a consolidated text of the Federal Law No.170 of the Russian Federation on the Use of Atomic Energy, of 21 November 1995, as last amended by Federal Law No.159 of 2 July 2013 (Russian Gazette No.6121 of 5 July 2013). In the event of any discrepancy between this translation and the original Russian version, the latter will take precedence.

Activities connected with the development, manufacture, testing, operation and recycling of nuclear weapons and nuclear power facilities with a military purpose are not governed by this Federal Law.

Article 2. Principles and aims of legal regulation of the use of atomic energy

The main principles for the legal regulation of the use of atomic energy are:
ensuring safety in the use of atomic energy – protecting individuals, the public and the environment from radiation hazards;

accessibility of information relating to the use of atomic energy, provided that this information does not contain information constituting state secrets;

participation of citizens, commercial and non-commercial organisations (hereinafter - organisations) and other juridical persons in the discussion of state policy, draft Federal laws and other enactments of the Russian Federation, and also in practical activities in the field of the use of atomic energy;

compensation for damage caused by radiation; provision of socio-economic compensation to workers at facilities which use atomic energy for the adverse effects of ionising radiation on human health and for additional risk factors; guaranteeing social protection for citizens who live and/or work in areas where such facilities are located;

establishment of the responsibilities and functions of state safety regulatory authorities, authorities which manage the use of atomic energy, the authority empowered to manage the use of atomic energy and organisations operating in the field of the use of atomic energy;

(paragraph added by Federal Law No.347 of 30.11.2011)

independence of state safety regulatory authorities when taking decisions and exercising their powers from authorities which manage the use of atomic energy, the authority empowered to manage the use of atomic energy and organisations operating in the field of the use of atomic energy;

(paragraph added by Federal Law No.347 of 30.11.2011)

fulfilment of the international obligations and guarantees undertaken by the Russian Federation in the field of the use of atomic energy.

(paragraph added by Federal Law No.347 of 30.11.2011).

The main purposes of the legal regulation of relations arising out of all forms of activity in the field of the use of atomic energy are:

to create the legal framework for the system of state management of the use of atomic energy and the system of state regulation of safety in the use of atomic energy;

to establish the rights, obligations and responsibilities of state authorities, local government authorities, organisations and other juridical persons and citizens.

Article 3. Scope of application of this Federal Law

This Federal Law applies to the following facilities (nuclear facilities):
(as amended by Federal Law No.347 of 30.11.2011)

nuclear facilities – structures and complexes with nuclear reactors, including nuclear plants, vessels and other floating structures, spacecraft and aircraft, other means of transport and transportable devices; structures and complexes with industrial, experimental and research nuclear reactors, critical and subcritical nuclear test facilities; structures, complexes, test grounds, installations and nuclear devices for peaceful purposes; other structures, complexes and installations containing nuclear materials which are intended for the production, use, processing and transportation of nuclear fuel and nuclear materials;

radiation sources – complexes, facilities, apparatuses, equipment and components which are not classed as nuclear facilities and contain radioactive substances or generate ionising radiation;

storage facilities for nuclear materials and radioactive substances, storage facilities and repositories for radioactive waste (hereinafter – storage facilities) – stationary facilities and structures which are not classed as nuclear facilities or radiation sources and are intended for the storage of nuclear materials and radioactive substances or the storage or burial of radioactive waste; (as amended by Federal Law No.190 of 11.07.2011)

nuclear reactor fuel assembly – a mechanical object containing nuclear materials and intended to generate heat energy in a nuclear reactor by means of a controlled nuclear reaction;

(paragraph added by Federal Law No.94 of 10.07.2001)

irradiated fuel assemblies – fuel assemblies containing spent nuclear fuel which have been irradiated inside a nuclear reactor and which have been removed from it; (paragraph added by Federal Law No.94 of 10.07.2001)

nuclear materials – materials which contain or are capable of generating fissile (fissionable) nuclear substances;

radioactive substances – substances which are not classed as nuclear materials but emit ionising radiation;

radioactive waste – materials and substances which are not to be reused, and also equipment and items (including spent ionising radiation sources) whose radionuclide content exceeds the levels established in accordance with the criteria laid down by the Government of the Russian Federation.

(as amended by Federal Law No.190 of 11.07.2011)

The classification of the facilities specified in the first part of this article under the listed categories and the composition and boundaries of the aforementioned facilities shall be determined in accordance with the category of the facility by organisations which operate in the field of the use of atomic energy, in accordance with the procedure established by the Government of the Russian Federation. (second part as amended by Federal Law No.347 of 30.11.2011)

For the purposes of this Federal Law, the entire life cycle of a facility which uses atomic energy as categorised by this Federal Law refers to the siting, design (including surveying), construction, production, erection or building (including assembly, set-up and commissioning), operation, reconstruction, major repairs, decommissioning (or closure), transportation (or transfer), handling, storage, burial and reuse of facilities which use atomic energy.

(third part added by Federal Law No.347 of 30.11.2011)

This Federal Law does not apply to facilities which contain or use nuclear materials and radioactive substances in quantities and with a level of activity (and/or which emit ionising radiation at an intensity or energy level) below the levels laid down by Federal regulations and rules in the field of the use of atomic energy for which permits from the Federal state safety regulatory authorities (hereinafter – state safety regulatory authorities) are required when using atomic energy in order to pursue activities involving the aforementioned facilities, except as otherwise provided by the laws of the Russian Federation.

(part amended by Federal Law No.190 of 11.07.2011)

Article 4. Types of activity in the field of the use of atomic energy

This Federal Law applies to the following types of activity in the field of the use of atomic energy:

the siting, design, construction, operation and decommissioning of nuclear facilities, radiation sources and storage facilities, closure of radioactive waste burial sites, safety assessments of facilities which use atomic energy and/or of types of activity in the field of the use of atomic energy;

(as amended by Federal Law No.347 of 30.11.2011)

the development, production, testing, transportation, storage, reuse and use of nuclear devices for peaceful purposes and the handling thereof;

handling nuclear materials and radiation sources, including when prospecting for and mining minerals containing these materials and substances and when producing, using, processing, transporting and storing nuclear materials and radioactive substances;

maintaining safety in the use of atomic energy;

monitoring the nuclear, radiation, technical and fire safety (hereinafter - safety) of nuclear facilities, radiation sources and storage facilities, and the health of citizens when atomic energy is used;

conducting scientific experiments in all fields of the use of atomic energy;

physical protection of nuclear facilities, radiation sources, storage facilities, nuclear materials and radioactive substances;

recording and monitoring nuclear materials and radioactive substances;

exporting and importing nuclear facilities, equipment, technologies, nuclear materials, radioactive substances, special non-nuclear materials and services in the field of the use of atomic energy;

state monitoring of the radiation situation within the Russian Federation; (as amended by Federal Law No.331 of 21.11.2011)

training experts on the use of nuclear facilities, radiation sources, storage facilities, nuclear materials and radioactive substances;

pursuing other types of activity in the field of the use of atomic energy.

**Article 5. Ownership of nuclear materials, nuclear facilities, storage facilities, radiation sources and radioactive substances
(as amended by Federal Law No.13 of 05.02.2007)**

Nuclear materials may be Federal property or the property of juridical persons.

The list of nuclear materials which can only be Federal property shall be approved by the President of the Russian Federation.

The list of Russian juridical persons (i.e. juridical persons established in accordance with the laws of the Russian Federation) which may own nuclear materials shall be approved by the President of the Russian Federation.

The right of foreign states and foreign juridical persons to own nuclear materials and products produced by processing them which are imported into the Russian Federation or acquired in the Russian Federation shall be recognised in the Russian Federation.

Nuclear facilities may be Federal property or the property of Russian juridical persons, the list of which shall be approved by the President of the Russian Federation.

Storage facilities may be Federal property or the property of Russian juridical persons except where otherwise provided by Federal law.

Radiation sources and radioactive substances may be Federal property, the property of constituent entities of the Russian Federation, municipal property or the property of juridical persons.

The right to own the items referred to in this article shall be acquired and terminated on the basis prescribed by civil law, subject to the provisions of Federal laws.

(as amended by Federal Law No.190 of 11.07.2011)

Deals whereby Russian juridical persons transfer ownership of nuclear materials to a foreign state or a foreign juridical person shall be entered into by agreement with the Federal authority empowered by the Government of the Russian Federation in accordance with the procedure and terms established by the Government of the Russian Federation.

Deals whereby ownership of nuclear materials or nuclear facilities is transferred to Russian juridical persons which are not included in the lists referred to in parts three and five of this article, and deals whereby ownership of nuclear materials is transferred to a foreign state or a foreign juridical person which are entered into by

Russian juridical persons in violation of the requirements of part nine of this article, shall be null and void.

The handling of nuclear materials which are Federal property or the property of foreign states, Russian juridical persons or foreign juridical persons and the operation of nuclear facilities and storage facilities which are Federal property or the property of Russian juridical persons shall be performed by Russian organisations which hold the appropriate permits (or licences) to conduct operations in the field of the use of atomic energy.

The handling of radioactive substances and the operation of radiation sources which are Federal property, the property of constituent entities of the Russian Federation, municipal property or the property of juridical persons shall be performed by organisations which hold the appropriate permits (or licences) to conduct operations in the field of the use of atomic energy or are registered in accordance with the procedure and in the cases stipulated in article 36.1 of this Federal Law.

(as amended by Federal Law No.93 of 25.06.2012)

The owners of nuclear facilities, radiation sources, storage facilities, nuclear materials and radioactive substances shall conduct monitoring of their safekeeping and proper use in accordance with this Federal Law, other Federal laws and other enactments of the Russian Federation. The provisions of article 22 of this Federal Law shall apply to the items referred to in this article.

The provisions of this article relating to nuclear materials shall apply to radioactive waste containing nuclear materials. The provisions of this article concerning radioactive substances shall apply to radioactive waste which does not contain nuclear materials.

**Article 6. Federal regulations and rules concerning the use of atomic energy
(as amended by Federal Law No.347 of 30.11.2011)**

Federal regulations and rules (hereinafter – regulations and rules) concerning the use of atomic energy are the enactments which establish the requirements for the safe use of atomic energy, including safety requirements for facilities which use atomic energy and safety requirements for activity in the field of the use of atomic energy, including the safety objectives, principles and criteria which must be complied with when pursuing activity in the field of the use of atomic energy.

Regulations and rules concerning the use of atomic energy shall be drafted and approved in accordance with the procedure established by the Government of the Russian Federation.

The procedure for drafting regulations and rules concerning the use of atomic energy must make provision for prior publication in an official journal of drafts of the aforementioned regulations and rules, with the exception of regulations and rules concerning the use of atomic energy which constitute state secrets, and the possibility of discussing them.

These regulations and rules must take into account the recommendations of international organisations in the field of the use of atomic energy in whose work the Russian Federation participates.

Regulations and rules concerning the use of atomic energy shall be published in an official journal, with the exception of regulations and rules concerning the use of atomic energy which constitute state secrets.

After these regulations and rules enter into force, they shall be binding on all individuals pursuing activity in the field of the use of atomic energy and shall apply throughout the territory of the Russian Federation.

To facilitate compliance with the requirements laid down by regulations and rules concerning the use of atomic energy, the state safety regulatory authorities shall draw up, approve and implement safety guidelines for the use of atomic energy. Safety guidelines for the use of atomic energy shall contain

recommendations as to how to meet the requirements of regulations and rules concerning the use of atomic energy, including working methods, procedures, expert evaluations and safety assessments, and also explanations and other recommendations as to how to meet safety requirements when using atomic energy.

Chapter II.

POWERS OF THE PRESIDENT OF THE RUSSIAN FEDERATION, THE FEDERAL ASSEMBLY OF THE RUSSIAN FEDERATION, THE GOVERNMENT OF THE RUSSIAN FEDERATION AND THE FEDERAL AUTHORITIES IN THE FIELD OF THE USE OF ATOMIC ENERGY

(as amended by Federal Law No.122 of 22.08.2004)

Article 7. Powers of the President of the Russian Federation in the field of the use of atomic energy

In the field of the use of atomic energy, the President of the Russian Federation:

- establishes the main areas of focus of state policy on the use of atomic energy;
- takes decisions on safety issues relating to the use of atomic energy;
- takes decisions on matters concerning the prevention and remediation of the consequences of emergencies arising out of the use of atomic energy;
- approves lists of Russian juridical persons which may own nuclear materials and nuclear facilities;

(paragraph added by Federal Law No.13 of 05.02.2007)

- approves the list of nuclear materials which may only be Federal property;

(paragraph added by Federal Law No.13 of 05.02.2007)

- exercises the powers conferred on him by Federal laws.

(paragraph added by Federal Law No.13 of 05.02.2007)

Article 8. Powers of the Federal Assembly of the Russian Federation in the field of the use of atomic energy

In the field of the use of atomic energy, the Federal Assembly of the Russian Federation:

- adopts Federal laws concerning the use of atomic energy;

paragraph repealed. - Federal Law No.122 of 22.08.2004;

- approves budgetary allocations within the Federal budget in order to finance activity in the field of the use of atomic energy;
- approves budgetary allocations for measures to overcome the consequences of emergencies arising out of the use of atomic energy;
- holds parliamentary hearings concerning matters relating to the use of atomic energy.

Article 9. Powers of the Government of the Russian Federation in the field of the use of atomic energy

In the field of the use of atomic energy, the Government of the Russian Federation:

- enacts, on the basis of and in implementation of the Constitution of the Russian Federation, Federal laws, legislative decrees of the President of the Russian Federation, decisions and orders in the field of the use of atomic energy;
- organises the drafting of and approves and implements special Federal programmes in the field of the use of atomic energy;

(as amended by Federal Law No.122 of 22.08.2004)

- establishes the functions, working procedures, rights and duties of authorities which manage the use of atomic energy and state safety regulatory authorities (including the empowered authority) in accordance with the laws of the Russian

Federation;

(as amended by Federal Law No.347 of 30.11.2011)

establishes the accreditation procedure in the field of the use of atomic energy;

(paragraph added by Federal Law No.347 of 30.11.2011)

manages Federally-owned nuclear materials, nuclear facilities, radiation sources, storage facilities and radioactive substances;

takes decisions on the design, construction, operation and decommissioning of nuclear facilities, radiation sources and storage facilities which are under Federal ownership or of Federal or inter-regional importance, including those located within restricted-access territories;

takes decisions on the development and creation of Federally-owned nuclear facilities, radiation sources and storage facilities;

(as amended by Federal Law No.13 of 05.02.2007)

establishes the procedure for the organisation and operation of the central state automated system which monitors the radiation situation within the Russian Federation;

(paragraph added by Federal Law No.331 of 21.11.2011)

takes measures with a view to the social protection of citizens and pays socio-economic compensation for the adverse impact of ionising radiation and additional risk factors to employees of facilities which use atomic energy;

pays sums to compensate for losses due to radiation exposure in accordance with article 57 of this Federal law;

establishes the procedure for exporting and importing nuclear facilities, equipment, technologies, nuclear materials, radioactive substances, special non-nuclear materials and services in the field of the use of atomic energy;

resolves matters concerning the importation into the Russian Federation of spent nuclear fuel for processing purposes, including the process of temporary storage until it is processed, in accordance with the law;

ensures, within the limits of its powers, the physical protection of nuclear materials, nuclear facilities and storage facilities, and also Federally-owned radiation sources and radioactive substances;

(as amended by Federal Law No.13 of 05.02.2007)

monitors the fulfilment of the Russian Federation's obligations under international agreements entered into by the Russian Federation in the field of the use of atomic energy;

co-ordinates the Russian Federation's international cooperation in the field of the use of atomic energy;

exercises other powers conferred on it by the Constitution of the Russian Federation, Federal laws and decrees issued by the President of the Russian Federation.

**Article 10. Powers of Federal executive authorities
(as amended by Federal Law No.122 of 22.08.2004)**

Federal executive authorities:

take decisions on the siting of nuclear facilities, radiation sources and storage facilities which are under Federal ownership or which are of Federal or inter-regional importance in accordance with the procedure established by the laws of the Russian Federation;

(as amended by Federal Law No.13 of 05.02.2007)

conduct state assessments of planning documentation for facilities which use atomic energy in accordance with the laws of the Russian Federation relating to town planning activity;

(as amended by Federal Law No.232 of 18.12.2006)

protect the rights of citizens in relation to the use of atomic energy;

maintain safety and protect the environment where atomic energy is used;

take measures to remedy the effects of accidents arising out of the use of atomic energy;

exercise owners' powers in relation to nuclear facilities, radiation sources, storage facilities and radioactive substances which are owned by the Russian Federation;

take measures to maintain the safety of nuclear facilities, radiation sources and storage facilities;

take decisions on the construction of nuclear facilities, radiation sources and storage facilities which are under Federal ownership or which are of Federal or inter-regional importance, about the decommissioning of such facilities and about the subsequent storage of radioactive waste;

(as amended by Federal Law No.13 of 05.02.2007)

make arrangements to maintain the physical protection of nuclear facilities, radiation sources, storage facilities, nuclear materials and radioactive substances which are under Federal ownership;

provide training for experts on the use of atomic energy, including training for experts on the use of nuclear facilities, radiation sources, nuclear materials and radioactive substances;

develop and implement comprehensive socio-economic development and environmental safety programmes for territories within which facilities which use atomic energy are located;

organise and conduct state monitoring of the radiation situation within the Russian Federation.

(paragraph added by Federal Law No.331 of 21.11.2011)

The powers established by the first part of this article may be exercised by the State Atomic Energy Corporation "Rosatom" in accordance with the Federal Law "On the State Atomic Energy Corporation Rosatom".

(second part added by Federal Law No.318 of 01.12.2007)

**Article 11. Powers of the authorities of the constituent entities of the Russian Federation in the field of the use of atomic energy
(as amended by Federal Law No.122 of 22.08.2004)**

In the field of the use of atomic energy, the authorities of the constituent entities of the Russian Federation in the field of the use of atomic energy:
(as amended by Federal Law No.122 of 22.08.2004)

exercise owners' powers in relation to radiation sources and radioactive substances owned by constituent entities of the Russian Federation;
(as amended by Federal Law No.122 of 22.08.2004)

take measures to ensure the safety of radiation sources and radioactive substances owned by constituent entities of the Russian Federation;
(as amended by Federal Laws No.122 of 22.08.2004 and No.190 of 11.07.2011)

paragraph repealed. - Federal Law No.122 of 22.08.2004;

establish the procedure for and organise, with the involvement of organisations, non-government organisations (or associations) and citizens, discussion of matters relating to the use of atomic energy;

take decisions on the siting and construction within territories under their control of radiation sources and radioactive substances owned by constituent entities of the Russian Federation;

(as amended by Federal Laws No.122 of 22.08.2004 and No.190 of 11.07.2011)

participate in the protection of citizens and the environment from exposure to radiation which exceeds the limits established by regulations and rules concerning the use of atomic energy;

(as amended by Federal Law No.122 of 22.08.2004)

monitor efforts to ensure radiation safety for the public and protect the environment within territories under their control and the readiness of

organisations and citizens to act in the event of accidents at facilities which use atomic energy;

record and monitor radioactive substances within territories under their control through the system for state recording and monitoring of radioactive substances;

make arrangements for the physical protection of radiation sources and radioactive substances owned by constituent entities of the Russian Federation; (as amended by Federal Laws No.122 of 22.08.2004 and No.190 11.07.2011)

perform other functions in the field of the use of atomic energy within the limits of their existing powers.

(as amended by Federal Law No.122 of 22.08.2004)

In constituent entities of the Russian Federation – the cities of Federal importance Moscow and St. Petersburg, in accordance with the laws of the aforementioned constituent entities of the Russian Federation, the state authorities of the constituent entities of the Russian Federation – the cities of Federal importance Moscow and St. Petersburg may exercise the powers classified by this Federal Law as local authority powers.

(paragraph added by Federal Law No.122 of 22.08.2004)

Article 12. Powers of local authorities in the field of the use of atomic energy

Local authorities:

(as amended by Federal Law No.122 of 22.08.2004)

participate in the discussion and resolution of matters concerning the siting within the territories under their control of nuclear facilities, radiation sources and storage facilities;

(as amended by Federal Law No.122 of 22.08.2004)

take decisions on the siting and construction within territories under their control of radiation sources and radioactive substances owned by municipal districts;

(as amended by Federal Laws No.122 of 22.08.2004 and No.190 of 11.07.2011)

paragraph repealed. - Federal Law No.232 of 18.12.2006;

paragraph repealed. - Federal Law No.122 of 22.08.2004;

inform the public, via the mass media, of the radiation situation within the territories under their control;

(as amended by Federal Law No.122 of 22.08.2004)

paragraph repealed. - Federal Law No.122 of 22.08.2004.

Chapter III. RIGHTS OF ORGANISATIONS, INCLUDING NON-GOVERNMENT ORGANISATIONS (OR ASSOCIATIONS), AND CITIZENS IN THE FIELD OF THE USE OF ATOMIC ENERGY

Article 13. Rights of organisations, including non-government organisations (or associations), and citizens to obtain information concerning the use of atomic energy

Organisations, including non-government organisations (or associations), and citizens have the right to request and obtain, in accordance with the procedure laid down by the laws of the Russian Federation, from the relevant executive authorities and organisations, within the limits of their powers, safety information regarding nuclear facilities, radiation sources and storage facilities which are due to be built, designed, built, operated and decommissioned, apart from information which constitutes state secrets.

Citizens have the right to obtain information free of charge about the radiation situation in a given region from organisations forming part of the state system for monitoring the radiation situation within the territory of the Russian Federation. (as amended by Federal Law No.331 of 21.11.2011)

Citizens who have been irradiated have the right to receive a document concerning the level of radiation to which they have been exposed. The procedure for obtaining such a document and its format shall be established by the Federal health authorities.

For refusing to provide information or deliberately distorting or concealing objective data concerning safety in relation to the use of atomic energy, managers of organisations, including non-government organisations (or associations), and the mass media shall be liable in accordance with the laws of the Russian Federation.

Citizens of the Russian Federation have the right to visit nuclear facilities, radiation sources and storage facilities for informative purposes. The procedure for visiting facilities which use atomic energy shall be established by the Government of the Russian Federation.

Article 14. Rights of organisations, including non-government organisations (or associations), and citizens to participate in policymaking in relation to the use of atomic energy

Organisations, including non-government organisations (or associations), and citizens have the right to participate in the discussion of draft legislation and programmes concerning the use of atomic energy and also in the discussion of matters relating to the siting, design, construction, operation and decommissioning of nuclear facilities, radiation sources and storage facilities.

Within the limits of their powers, Federal authorities must conduct, with the involvement of organisations, including non-government organisations (or associations) and citizens, discussions with regard to the siting, design and construction of facilities which use atomic energy.

(second part as amended by Federal Law No.122 of 22.08.2004)

On the basis of the outcomes of such discussion, Federal executive authorities shall take decisions which must be published in an official journal. After they have been adopted, these decisions may be appealed in court by individuals or juridical persons whose rights and legally-protected interests have been violated.

(third part as amended by Federal Law No.122 of 22.08.2004)

Organisations, including non-government organisations (or associations), have the right to recommend their representatives to participate in expert evaluations of nuclear facilities, radiation sources and storage facilities during the stages of their siting, design, construction, operation and decommissioning.

Article 15. Right of citizens to compensation for losses and harm caused by radiation exposure arising out of the use of atomic energy

Citizens to whom losses and harm have been caused as a result of radiation exposure arising out of the use of atomic energy have the right to full compensation for the aforementioned losses and harm in accordance with articles 53 - 60 of this Federal Law and other legislation of the Russian Federation.

**Article 16. Rights of employees of facilities which use atomic energy to social compensation
(as amended by Federal Law No.122 of 22.08.2004)**

Employees of nuclear facilities, radiation sources and storage facilities who are posted to these facilities, and also workers engaged in any other work involving nuclear materials and radioactive substances, have the right to social compensation for the adverse effect of ionising radiation on human health and additional risk factors. The right to social compensation for the adverse impact of ionising radiation on human health (including healthcare services) is also held by individuals who previously worked at facilities which use atomic energy. The types and amounts of social compensation for the adverse effect of ionising radiation on human health

and for additional risk factors, and the sources from which it shall be financed, shall be established in Russian Federal legislation.

(as amended by Federal Law No.122 of 22.08.2004)

The procedure for granting social compensation shall be established by the Government of the Russian Federation.

(as amended by Federal Law No.122 of 22.08.2004)

Articles 17 - 18. Repealed. - Federal Law No.122 of 22.08.2004.

Article 19. Rights of citizens in relation to medical procedures involving the use of ionising radiation

At their request, citizens shall be given full details of the size of the planned and actual doses received by them when they undergo examinations or treatment.

The right to take decisions on the use of ionising radiation during medical procedures shall be granted to citizens or their statutory representatives.

Chapter IV.

STATE MANAGEMENT OF THE USE OF ATOMIC ENERGY

**Article 20. State authorities which manage the use of atomic energy
(as amended by Federal Law No.318 of 01.12.2007)**

State management of the use of atomic energy shall be performed by Federal executive authorities and the State Atomic Energy Corporation "Rosatom" (hereinafter also – authorities which manage the use of atomic energy) in accordance with the procedure laid down by this Federal law, other Federal laws and other legislation of the Russian Federation.

(first part as amended by Federal Law No.318 of 01.12.2007)

In accordance with the provisions concerning these authorities, the powers of authorities which manage the use of atomic energy include:

implementing state scientific, technical, investment and structural policy in the field of the use of atomic energy;

devising measures to ensure safety in the use of atomic energy;
(as amended by Federal Law No.122 of 22.08.2004)

drafting regulations and rules on the use of atomic energy;

paragraph repealed. - Federal Law No.122 of 22.08.2004;

developing fire prevention and physical protection measures for nuclear facilities, radiation sources, storage facilities, nuclear materials and radioactive substances;

(as amended by Federal Law No.122 of 22.08.2004)

arranging for manpower and resources to be ready to deal with emergencies at facilities which use atomic energy and conducting state monitoring of compliance with measures to prevent them;

participating in the organisation and implementation of certification of equipment, products and technologies for nuclear facilities, radiation sources and storage facilities;

state monitoring of compliance with the requirements of state standards and rules of assessment regarding product compliance in the field of the use of atomic energy;

(as amended by Federal Law No.303 of 07.11.2011)

organising state monitoring of the radiation situation within the Russian Federation in areas where facilities which use atomic energy belonging to operating organisations are located, and participating in its implementation;
(as amended by Federal Law No.331 of 21.11.2011)

state recording and monitoring of nuclear materials and radioactive substances;

state monitoring of the technical safety of ships and other floating structures with nuclear facilities and radiation sources;
developing and implementing radioactive waste handling programmes;
ensuring uniformity of measurement in the field of the use of atomic energy;
(as amended by Federal Law No.347 of 30.11.2011)
organising and conducting accreditation in the field of the use of atomic energy;
(paragraph added by Federal Law No.347 of 30.11.2011)
other functions in accordance with provisions concerning authorities which manage the use of atomic energy.

Article 21. State monitoring of the radiation situation within the Russian Federation (as amended by Federal Law No.331 of 21.11.2011)

State monitoring of the radiation situation within the Russian Federation is conducted in order to promptly identify changes in the radiation situation, to assess, forecast and prevent possible adverse consequences of irradiation for the population and the environment, and also with a view to the systematic provision of the relevant up-to-date information to state authorities, authorities which manage the use of atomic energy, state authorities which regulate safety in the use of atomic energy, and organisations so that the necessary measures may be taken to prevent or reduce the impact of radiation.

State monitoring of the radiation situation within the Russian Federation forms part of state environmental monitoring (state monitoring of the environment) and is performed within the framework of the single state automated system for the monitoring of the radiation situation within the Russian Federation and its functional subsystems.

The single state automated system for the monitoring of the radiation situation within the Russian Federation and its functional subsystems is run by the Federal executive authorities empowered by the Government of the Russian Federation and also the State Atomic Energy Corporation "Rosatom".

Activity in relation to the running of the single state automated system for the monitoring of the radiation situation within the Russian Federation and its functional subsystems is co-ordinated by the Federal executive authorities empowered by the Government of the Russian Federation.

The information obtained through state monitoring of the radiation situation within the Russian Federation shall be provided by authorities which manage the use of atomic energy and/or operating organisations to the single state automated system for the monitoring of the radiation situation within the Russian Federation and its functional subsystems.

The procedure for organising and running the single state automated system for the monitoring of the radiation situation within the Russian Federation and its functional subsystems, the powers of the relevant authorities and organisations, and the procedure and frequency for the submission of information obtained through state monitoring of the radiation situation within the Russian Federation to the single state automated system for the monitoring of the radiation situation within the Russian Federation and its functional subsystems shall be established by the Government of the Russian Federation.

Article 22. State recording and monitoring of nuclear materials, radioactive substances and radioactive waste

Regardless of the form of their ownership, nuclear materials, radioactive substances and radioactive waste shall be subject to state recording and monitoring through the system of state recording and monitoring of nuclear materials and the system of state recording and monitoring of radioactive substances and radioactive waste in order to determine the existing quantities of these materials, substances and waste at the locations where they are present, to prevent losses, unauthorised

use and misappropriation, and to provide state authorities, authorities which manage the use of atomic energy and state safety regulatory authorities with information about the presence and movements of nuclear materials, radioactive substances and radioactive waste, and also regarding their exportation and importation.

(first part as amended by Federal Law No.13 of 05.02.2007)

The procedure for organising the system of state recording and monitoring of nuclear materials and the system of state recording and monitoring of radioactive substances and radioactive waste shall be established by the Government of the Russian Federation.

(as amended by Federal Law No.190 of 11.07.2011)

Chapter V.

STATE REGULATION OF SAFETY IN THE USE OF ATOMIC ENERGY

Article 23. State regulation of safety in the use of atomic energy

State regulation of safety in the use of atomic energy entails activity on the part of the relevant Federal authorities and the State Atomic Energy Corporation "Rosatom" which is aimed at organising the drafting, approval and enactment of regulations and rules concerning the use of atomic energy, issuing permits (or licences) to perform work in the field of the use of atomic energy, accreditation, standardisation, assessing compliance, monitoring safety, and conducting expert evaluations, examinations (or inspections) and monitoring of the development and implementation of measures to protect workers at facilities which use atomic energy, the public and the environment in the event of accidents when atomic energy is used.

(as amended by Federal Laws No.122 of 22.08.2004, No.318 of 01.12.2007, No.242 of 18.07.2011 and No.347 of 30.11.2011)

Article 24. Federal authorities which perform state regulation of safety in the use of atomic energy

State regulation of safety in the use of atomic energy is performed by Federal authorities – state safety regulatory authorities which regulate safety in the use of atomic energy. These authorities are independent from other state authorities and also from organisations whose activity is connected with the use of atomic energy. (as amended by Federal Laws No.122 of 22.08.2004 and No.347 of 30.11.2011)

Types of activity in the regulation of safety in the use of atomic energy and the extent of the powers, rights, obligations and responsibility of these authorities, and the powers of officials from these authorities, shall be established in the provisions concerning state safety regulatory authorities.

(as amended by Federal Law No.347 of 30.11.2011)

Measures taken by state safety regulatory authorities to exercise the powers conferred on them must be commensurate with the potential danger associated with facilities which use atomic energy and activity in the field of the use of atomic energy.

(third part added by Federal Law No.347 of 30.11.2011)

The activity of state safety regulatory authorities shall be financed with funds from the Federal Budget.

Article 24.1. Federal state oversight in the field of the use of atomic energy (added by Federal Law No.242 of 18.07.2011)

Federal state oversight in the field of the use of atomic energy entails activity on the part of the empowered Federal authority which is intended to prevent, identify and stop violations by juridical persons operating in the field of the use of atomic

energy, their managers and other officers (hereinafter – juridical persons) of the requirements laid down by the international agreements entered into by the Russian Federation, this Federal law, other Federal laws and other enactments of the Russian Federation in the field of the use of atomic energy (hereinafter – mandatory requirements), by organising and conducting checks (or inspections) on these individuals, taking the measures prescribed by the laws of the Russian Federation to stop violations which have been identified, and through the work of the aforementioned Federal authority to systematically monitor the fulfilment of mandatory requirements and analyse and forecast performance in terms of fulfilling these requirements when juridical persons pursue their activities.

Federal state oversight in the field of the use of atomic energy is conducted by the empowered Federal authority (hereinafter, for the purposes of this article – state safety regulatory authority) in accordance with the procedure established by the Government of the Russian Federation.

Relations associated with the performance of Federal state oversight in the field of the use of atomic energy and the organisation and carrying-out of checks (or inspections) on juridical persons fall under the scope of the provisions of Federal Law No.294 of 26 December 2008 “On protection of the rights of juridical persons and individual entrepreneurs in relation to state monitoring (oversight) and municipal monitoring” with regard being had to the nature of the tasks of organising and conducting checks (or inspections) as stipulated by parts four - twelve of this article and other Federal laws.

The purpose of checks (or inspections) shall be to ascertain whether a juridical person is complying, while pursuing activity in the field of the use of atomic energy, with mandatory requirements and the terms of permits (or licences) necessary to maintain safety in the field of the use of atomic energy, and also to assess the compliance of facilities which use atomic energy, their components and systems with the aforementioned requirements.

Scheduled checks (or inspections) shall be included in the annual plan of scheduled checks (or inspections) where one year has passed since the date on which:

the juridical person was granted a permit (or licence) to pursue activity in the field of the use of atomic energy and the juridical person was registered in accordance with article 36.1 of this Federal Law;
(as amended by Federal Law No.93 of 25.06.2012)

a decision was taken, in accordance with the procedure established by the Government of the Russian Federation, to commission facilities which use atomic energy after they have been built or undergone technical upgrading, reconstruction or major repairs, including those used during the operation of facilities which use atomic energy, their components and systems, including buildings, premises, installations, hardware, equipment and materials;

the last scheduled check (or inspection) was completed.

Annual plans of scheduled checks, orders from the state safety regulatory authority to conduct checks and inspection certificates shall additionally state the name and location of the facility which uses atomic energy in respect of which monitoring measures are planned to be taken and where these measures are actually taken, respectively.

Unscheduled checks (or inspections) shall be carried out where:

the time-limit for a juridical person to comply with an order to rectify an identified infringement of mandatory requirements issued by the state safety regulatory authority has passed;

the state safety regulatory authority receives:

a request from a juridical person to grant a permit (or licence) to pursue activity in the field of the use of atomic energy, to reissue a licence or make changes to the terms of a permit (or licence), to terminate a permit (or licence), to be registered in accordance with article 36.1 of this Federal Law or to commence works which pose a

nuclear and/or radiation hazard in accordance with the regulations and rules concerning the use of atomic energy;

(as amended by Federal Law No.93 of 25.06.2012)

official data obtained through state monitoring of the radiation situation within the Russian Federation which indicate that it has changed due to the operation of facilities which use atomic energy;

(as amended by Federal Law No.331 of 21.11.2011)

enquiries and submissions from citizens, including individual entrepreneurs and juridical persons and information from state authorities (or officials from the state safety regulatory authority), local authorities and the mass media about violations of nuclear and radiation safety requirements in the use of atomic energy, including the terms of permits (or licences) which are necessary to maintain safety in the field of the use of atomic energy, requirements concerning physical protection, state recording and monitoring of nuclear materials, radioactive substances and radioactive waste, about the performance of works and pursuit of activity which have an impact on the safety of a facility which uses atomic energy and fall outside the scope of permits (or licences) which have been issued, about the pursuit of activity without the relevant permits (or licences), about breaches of mandatory requirements when constructing, operating and decommissioning facilities which use atomic energy, their components and systems, and also when handling nuclear materials, radioactive substances and radioactive waste, if such breaches pose a threat of harm to human life or health, harm to animals, plants, the environment, state security, the property of individuals and juridical persons, state or municipal property or a danger of man-made emergencies or lead to such harm and man-made emergencies;

an order to conduct an unscheduled check (or inspection) has been issued by the head (or deputy head) of the state safety regulatory authority pursuant to an instruction from the President of the Russian Federation or the Government of the Russian Federation or on the basis of a demand from a prosecutor to conduct an unscheduled check as part of oversight in relation to law enforcement on the basis of materials and enquiries received by prosecuting authorities.

Unscheduled spot checks (or inspections) on the grounds set forth in the sixth paragraph of part seven of this article may be conducted immediately with the prosecuting authority to be informed in accordance with the procedure laid down in article 10 part 12 of Federal Law No.294 of 26 December 2008 "On protection of the rights of juridical persons and individual entrepreneurs in relation to state monitoring (oversight) and municipal monitoring", without the agreement of the prosecuting authority.

The time-limit for completing checks (or inspections) of facilities which use atomic energy shall be no more than thirty working days following the day on which they were commenced.

In exceptional cases where it is necessary to conduct complicated and/or lengthy examinations, testing, special expert evaluations and investigations on the basis of reasoned proposals from officials from the state safety regulatory authority who conduct a check (or inspection), the time-limit for completing a check (or inspection) may be extended by the manager (or deputy manager) of this authority, but by no more than thirty working days.

A juridical person may be given prior notice of an unscheduled spot check (or inspection) immediately before it commences on the grounds stated in paragraph five or six of part seven of this article.

Ongoing state oversight may be instituted at individual facilities which use atomic energy in accordance with the provisions of the Federal Law No.294 of 26 December 2008 "On protection of the rights of juridical persons and individual entrepreneurs in relation to state monitoring (oversight) and municipal control".

The arrangements for ongoing state oversight, the list of facilities which use atomic energy for which this procedure shall be established, and the procedure for

implementing them shall be established by the Government of the Russian Federation.

The state safety regulatory authority and its officials have the right, in accordance with the procedure established by the laws of the Russian Federation:

- to request and receive from juridical persons, on the basis of reasoned written requests, information and documents necessary while a check (or inspection) is being carried out;

- in accordance with the established arrangements, without hindrance, upon presenting official identification and a copy of the order from the manager (or deputy manager) of the state safety regulatory authority to conduct a check, to visit facilities which use atomic energy and inspect buildings, premises, installations, technical resources, equipment and materials, and also conduct tests, experiments, expert evaluations, investigations and other monitoring measures;

- to issue juridical persons with instructions to rectify identified breaches of mandatory requirements in the construction, operation and decommissioning of facilities which use atomic energy and requirements concerning the physical protection, recording and monitoring of nuclear materials, radioactive substances and radioactive waste, and to take measures to prevent harm to life, human health, harm to animals, plants and the environment, state security, the property of individuals and juridical persons, state or municipal property and to prevent the threat of man-made emergencies;

- to draw up records of administrative violations connected with breaches of mandatory requirements, to consider cases concerning the aforementioned administrative violations and to take measures to prevent such breaches;

- to forward to the empowered authorities materials concerning violations of mandatory requirements in order to settle matters concerning the institution of criminal proceedings on the basis of evidence of offences.

A state safety regulatory authority may be called by a court to participate in a case or may intervene in a case at its own initiative or at the initiative of individuals participating in a case, to give its opinion on a claim for compensation for harm caused to life, human health, harm caused to animals, plants or the environment, the property of individuals and juridical persons, or state or municipal property as a result of a breach of mandatory requirements.

Article 25. Powers of state safety regulatory authorities

Within the limits of their powers, state safety regulatory authorities have powers:

- to submit for consideration, to bodies which have the right to introduce legislation, proposals regarding the drafting of laws on the protection of safety in the use of atomic energy;

- to draft, approve and enact regulations and rules concerning the use of atomic energy in accordance with this Federal Law and the laws of the Russian Federation;

- to licence activity in the field of the use of atomic energy for the purpose of protecting safety;

- to oversee compliance with regulations and rules concerning the use of atomic energy and terms of permits (or licences) to perform work in the field of the use of atomic energy;

- to oversee nuclear, radiation, technical and fire safety;

- to oversee the physical protection of nuclear facilities, radiation sources, storage facilities, nuclear materials and radioactive substances, to monitor central state recording systems and to monitor nuclear materials, radioactive substances and radioactive waste;

- to organise expert safety assessments (expert safety analyses) of facilities which use atomic energy and/or the types of activity in the field of the use of atomic energy by issuing orders to conduct these assessments, and considering and adopting or not

adopting reports drawn up on the basis of their outcomes;
 (as amended by Federal Law No.159 of 02.07.2013)
 to conduct checks (or inspections) in relation to the exercise of their powers
 (as amended by Federal Law No.242 of 18.07.2011)
 to participate in the organisation and performance of work in relation to the certification of equipment, products and technologies for nuclear facilities, radiation sources and storage facilities;
 to conduct monitoring in the field of environmental protection and the use of natural resources in the use of atomic energy;
 to monitor the use of material resources and funds intended for activity in the field of nuclear, radiation, technical and fire safety regulation;
 to monitor the fulfilment of the international obligations of the Russian Federation in terms of ensuring safety in the use of atomic energy;
 to take administrative action in accordance with the procedure laid down by the laws of the Russian Federation;
 to draw up, approve and bring into force guidelines on safety in the use of atomic energy;
 (paragraph added by Federal Law No.347 of 30.11.2011)
 to participate in accreditation activity in the field of the use of atomic energy.
 (paragraph added by Federal Law No.347 of 30.11.2011)

Article 26. Permits (or licences) to perform work in the field of the use of atomic energy

In this Federal Law, “permit (or licence) to perform work in the field of the use of atomic energy” means a duly drawn up document which confirms the right to pursue a particular type of activity provided that the safety of facilities which use atomic energy and the work carried out is ensured.

Permits (or licences) to perform work in the field of the use of atomic energy shall be issued by state safety regulatory authorities. These permits (or licences) shall be issued to operating organisations and organisations which perform work and provide services in the field of the use of atomic energy.

Permits (or licences) to perform work in the field of the use of atomic energy must state who the owner of the permit (or licence) is, the requirements and the conditions necessary to ensure safety while performing the work, and the expiry date of the permit (or licence).

In accordance with this Federal Law, licensing shall apply to types of activity in the field of the use of atomic energy – siting, construction, operation and decommissioning of nuclear facilities, radiation sources, storage facilities for nuclear materials and radioactive substances, repositories for radioactive waste, closure of radioactive waste burial sites, handling of nuclear materials and radioactive substances, including when prospecting for and mining uranium ores, when producing, using, processing, transporting and storing nuclear materials and radioactive substances, handling radioactive waste when it is stored, processed, transported and buried, using nuclear materials and/or radioactive substances when conducting research and development work, designing and building nuclear facilities, radiation sources, storage facilities for nuclear materials and radioactive substances, repositories for radioactive waste, manufacturing and preparing equipment for nuclear facilities, radiation sources, storage facilities for nuclear materials and radioactive substances, repositories for radioactive waste, conducting safety assessments (safety analyses) of facilities which use atomic energy and/or types of activity in the field of the use of atomic energy.

(part four as amended by Federal Law No.347 of 30.11.2011)

The introduction of new regulations and rules concerning the use of atomic energy shall not directly lead to the cessation of validity or a change in the period of

validity of permits (or licences) to perform work in the field of the use of atomic energy.

All activity in the field of the use of atomic energy which is subject to licensing by state safety regulatory authorities shall be prohibited unless a permit (or licence) to pursue it is held.

For the issue by a state safety regulatory authority of a permit (or licence) to perform work in the field of the use of atomic energy, for reissuing one and for extending the period of its validity, state duty shall be paid in the amounts and in accordance with the procedure stipulated by the laws of the Russian Federation concerning taxes and levies.

(part seven added by Federal Law No.374 of 27.12.2009)

Upon request by a licence applicant or licence-holder, a combined licence to perform several types of activity in the field of the use of atomic energy may be issued for one or more facilities where the aforementioned types of activity are pursued.

(part eight added by Federal Law No.347 of 30.11.2011, as amended by Federal Law No.93 of 25.06.2012)

The procedure for licensing, including the procedure for issuing and terminating the validity of permits (or licences), shall be established by the Government of the Russian Federation.

(part nine added by Federal Law No.347 of 30.11.2011)

When decisions are taken on the issue of permits (or licences) to perform work in the field of the use of atomic energy or changes to the terms of validity of permits (or licences), a safety assessment (or safety analysis) shall be performed for facilities which use atomic energy and/or types of activity in the field of the use of atomic energy (hereinafter – assessment). The assessment shall be organised by the authorised state safety regulatory authority and conducted at the expense of the licence applicant or licence-holder. Assessments of facilities which use atomic energy and are included in the list referred to in part 13 of article 24.1 of this Federal Law, and/or of the types of activity in the field of the use of atomic energy which are pursued at such facilities or in relation to such facilities by operating organisations, shall be conducted by organisations which provide scientific and technical support to the authorized state safety regulatory authority.

(part ten added by Federal Law No.347 of 30.11.2011, as amended by Federal Law No.159 of 02.07.2013)

The purpose of assessments shall be to analyse the compliance of the documents submitted by the applicant in order to receive a licence, which demonstrate the safety of facilities which use atomic energy and/or types of activity in the field of the use of atomic energy, and/or the actual condition of facilities which use atomic energy with the laws of the Russian Federation, regulations and rules concerning the use of atomic energy and the current level of advancement of science, engineering and manufacturing.

(part eleven added by Federal Law No.347 of 30.11.2011)

Assessments shall be conducted in accordance with the procedure established by the empowered state safety regulatory authority for the use of atomic energy.

(part twelve added by Federal Law No.347 of 30.11.2011)

**Article 26.1. Periodic safety assessments of nuclear facilities and storage facilities
(added by Federal Law No.347 of 30.11.2011)**

When operating a nuclear facility or storage facility on the basis of a permit (or licence) issued for a period of more than 10 years, the operating organisation shall conduct periodic safety assessments of the nuclear facility or storage facility. The procedure for the submission by the operating organisation to the empowered state safety regulatory authority of documents containing the results of the safety assessment of the nuclear facility or storage facility which demonstrate the safety of

its operation, and the requirements concerning the composition and content of these documents, shall be established by the empowered state safety regulatory authority.

Periodic safety assessments shall be conducted in order to assess safety status, having regard to the period of operation of the nuclear facility or storage facility, and also the ageing of equipment on the basis of the laws of the Russian Federation concerning the use of atomic energy and for the purpose of applying the results of such assessments in order to maintain safety during the operation of a nuclear facility or storage facility until the next periodic safety assessment or until the end of the period of operation of the nuclear facility or storage facility.

The first safety assessment of a nuclear facility or storage facility shall be conducted 10 years after the commencement of its operation, and shall be followed by periodic safety assessments of the nuclear facility or storage facility every 10 years until the end of its operation.

Article 27. Permits to perform work in the field of the use of atomic energy issued to workers at facilities which use atomic energy

Certain types of activity in the field of the use of atomic energy shall be performed by workers at facilities which use atomic energy provided that they hold permits issued by state safety regulatory authorities.

A list of expert workers who, due to the activity that they pursue, must receive permits to work in the field of the use of atomic energy, and also the qualification requirements for these experts, shall be established by the Government of the Russian Federation. One of the mandatory requirements in order to receive such permits is an absence of medical, including psychophysiological, contraindications.

KonsultantPlyus: comment.

For the list of medical contraindications for workers at facilities which use atomic energy, the list of duties of workers at facilities which use atomic energy to which medical contraindications apply and the requirements applicable to medical and psychophysiological examinations for workers at facilities which use atomic energy, see Decision No.233 of the RF Government of 01.03.1997.

The list of medical contraindications and the list of duties to which these contraindications apply, and the requirements for conducting medical and psychophysiological examinations, shall be established by the Federal authority empowered by the Government of the Russian Federation.

(as amended by Federal Law No.160 of 23.07.2008)

Workers who hold such permits shall be liable, in accordance with the laws of the Russian Federation, for violations committed by them when they perform their work. Where the terms of such a permit have been breached, its validity may be terminated by the state safety regulatory authority which issued the permit.

Chapter VI.

SITING AND CONSTRUCTION OF NUCLEAR FACILITIES, RADIATION SOURCES AND STORAGE FACILITIES

Article 28. Decisions on the siting and construction of nuclear facilities, radiation sources and storage facilities

Decisions on the construction of nuclear facilities, radiation sources and storage facilities which are under Federal ownership or of Federal or inter-regional importance, or located and built within restricted-access territories, shall be taken by the Government of the Russian Federation.

(part one as amended by Federal Law No.13 of 05.02.2007)

Decisions on the locations of such facilities shall be taken by the Government of the Russian Federation by agreement with the government agencies of the

constituent entities of the Russian Federation within whose territories it is proposed that these facilities shall be sited and built.

(part two as amended by Federal Law No.122 of 22.08.2004)

Decisions on the location and construction of radiation sources and radioactive substances owned by constituent entities of the Russian Federation shall be taken by the government agencies of the constituent entities of the Russian Federation within whose territories it is proposed that they shall be sited and built.

(as amended by Federal Laws No.122 of 22.08.2004 and No.190 of 11.07.2011)

Decisions on the location and construction of radiation sources and radioactive substances under municipal ownership shall be taken by the local authorities within whose territories it is proposed that they shall be sited and built.

(as amended by Federal Laws No.122 of 22.08.2004 and No.190 of 11.07.2011)

Plots of land and subsoil shall be allocated for the siting of nuclear facilities, radiation sources and storage facilities in accordance with the procedure and stipulations laid down in the laws of the Russian Federation.

(as amended by Federal Laws No.122 of 22.08.2004)

Decisions on the siting and construction of nuclear facilities, radiation sources and storage facilities shall be taken in accordance with land laws, laws on town planning activity and environmental protection laws, with regard being had to the findings of assessments conducted by non-government organisations.

(as amended by Federal Law No.232 of 18.12.2006)

The Government of the Russian Federation shall take decisions:

on the siting and construction of nuclear facilities, radiation sources and storage facilities which are under Federal ownership, of Federal or inter-regional importance or sited and built within restricted-access territories. The procedure for taking decisions on the siting and construction of nuclear facilities, radiation sources and storage facilities which are under Federal ownership, of Federal or inter-regional importance or sited and built within restricted-access territories shall be approved by the Government of the Russian Federation;

on the procedure for classifying nuclear facilities, radiation sources and storage facilities as facilities of Federal or inter-regional importance;

on the procedure for taking decisions on the siting and construction of nuclear facilities, radiation sources and storage facilities which are not under state or municipal ownership, or are not of Federal or inter-regional importance, or are not sited and built within restricted-access territories.

(part seven as amended by Federal Law No.318 of 01.12.2007)

Article 29. Reversal of decisions to build nuclear facilities, radiation sources or storage facilities

The state authority or organisation which has taken a decision to build a nuclear facility, radiation source or storage facility must reverse the decision taken by it or stop or suspend the construction of the relevant facility if additional factors leading to a reduction in the level of its safety, deterioration of the environment or other adverse effects arise. Proposals to review a decision may be adopted by state authorities, local authorities and non-government organisations (or associations).

(part one as amended by Federal Law No.318 of 01.12.2007)

Losses related to the cessation or suspension of the construction of a nuclear facility, radiation source or storage facility in the event of the emergence during the course of their construction of additional factors leading to a reduction in the level of safety of these facilities, deterioration of the environment or other adverse effects shall be compensated by way of legal proceedings at the expense of the organisations through whose fault these factors were not identified and taken into account in a timely fashion.

In all other cases, losses related to the cessation or suspension of construction of the aforementioned facilities shall be compensated with funds from the relevant budgets.

Article 30. Basic requirements for the safety of nuclear facilities, radiation sources and storage facilities due to be sited and built

Nuclear facilities, radiation sources and storage facilities must be sited and built on the basis of the regulations and rules concerning the use of atomic energy and the regulations and rules concerning environmental protection, with regard being had to the requirements of town planning laws.

(part one as amended by Federal Law No.232 of 18.12.2006)

Decisions on the siting and construction of nuclear facilities, radiation sources and storage facilities shall be taken with regard being had to:

the number of them needed to meet the economic and defence needs of the Russian Federation and its individual regions;

whether or not the conditions necessary to site these facilities, in accordance with the regulations and rules concerning the use of atomic energy, are met;

the absence of any threats to the safety of the nuclear facility, radiation source or storage facility posed by nearby civilian or military facilities;

the possible social and economic consequences of siting these facilities which use atomic energy for the industrial, agricultural, social and cultural development of the region.

Documents assessing the radiation impact of nuclear facilities, radiation sources or storage facilities on the environment shall be submitted by the relevant authority which manages the use of atomic energy or the operating organisation as part of the planning documentation for these facilities which use atomic energy for state assessment in accordance with the town planning laws of the Russian Federation.

(part three as amended by Federal Law No.232 of 18.12.2006)

During construction, reconstruction or major repair works on nuclear facilities, radiation sources and storage facilities, state construction oversight shall be conducted by the Federal authority empowered to conduct state construction oversight in accordance with the town planning laws of the Russian Federation.

(part four added by Federal Law No.232 of 18.12.2006)

Article 31. Establishment of health protection zones and observation zones

To protect the public in areas where nuclear facilities, radiation sources or storage facilities are located, special territories known as health protection zones and observation zones shall be established.

The radiation situation within health protection zones and observation zones must be monitored.

The size and boundaries of a health protection zone shall be determined in the plan for the health protection zone in accordance with the regulations and rules concerning the use of atomic energy, which shall be agreed with the state disease and epidemiological control authorities and approved by the local authorities of municipal regions or urban districts.

(as amended by Federal Law No.122 of 22.08.2004)

Siting residential and public buildings, childcare centres, health institutions which are not related to the operation of a nuclear facility, radiation source or storage facility, public eateries, industrial facilities, auxiliary and other structures and facilities for which provision is not made by the approved plan for the health protection zone within health protection zones is prohibited.

Existing facilities and structures located within a health protection zone may be used for business purposes by changing the nature of their use at the request of the operating organisation with permission from the state safety regulatory authorities.

Part six repealed. – Federal Law No.122 of 22.08.2004.

The need to establish an observation zone and its size and boundaries shall be established in the plan on the basis of the safety characteristics of facilities which use atomic energy and agreed with the state disease and epidemiological control authorities.

Within an observation zone, the state disease and epidemiological control authorities may impose restrictions on business activity in accordance with the laws of the Russian Federation.

Losses caused by the establishment of a health protection zone or observation zone shall be compensated by the operating organisation in accordance with the laws of the Russian Federation.

In the case of certain facilities which use atomic energy, according to the safety characteristics of these facilities, health protection zones and observation zones may be limited by the boundaries of the territory of the facility, building or premises.

Article 32. Approval for operation and commissioning of nuclear facilities, radiation sources and storage facilities

Nuclear facilities, radiation sources and storage facilities must be approved for operation as a whole together with all industrial and domestic facilities stipulated in the plans for these facilities which use atomic energy.

Nuclear facilities, radiation sources and storage facilities shall be commissioned where the operating organisations hold permits (or licences) to operate them which have been issued by the relevant state safety regulatory authorities.

Radiation sources whose composition solely includes radionuclide sources belonging to the fourth and fifth radiation hazard categories shall be commissioned after the organisation has been registered in accordance with article 36.1 of this Federal Law.

(part three added by Federal Law No.93 of 25.06.2012)

Article 33. Decommissioning and restriction of the operating parameters of nuclear facilities, radiation sources and storage facilities

The procedure and measures for decommissioning nuclear facilities, radiation sources and storage facilities must be stipulated in the plan for the facility which uses atomic energy in accordance with the regulations and rules concerning the use of atomic energy.

The procedure for creating sources of finance for works in relation to the decommissioning of nuclear facilities, radiation sources and storage facilities shall be established by the Government of the Russian Federation and must be determined before they are commissioned.

Proposals to decommission nuclear facilities, radiation sources and storage facilities before the resource specified in the plan for the facility which uses atomic energy has been exhausted or proposals regarding the restriction of the planned technical and economic indicators for their operation may be made by the state authorities of the Russian Federation, the state authorities of constituent entities of the Russian Federation and local authorities and non-government organisations (or associations) where adequate grounds exist.

Decisions to decommission nuclear facilities, radiation sources and storage facilities ahead of schedule shall be taken by the state authorities, the State Atomic Energy Corporation "Rosatom" or the local authorities, within the limits of their powers, which took the decisions to build them, or by their assigns, and shall be communicated to the operating organisation in advance with regard being had to the technological and ecological capacities of the operating organisation.

(as amended by Federal Laws No.122 of 22.08.2004 and No.318 of 01.12.2007)

Where a decision is taken to decommission or restrict the operating parameters of a nuclear facility, radiation source or storage facility ahead of schedule on grounds other than of a technical or environmental nature, losses caused by the

taking of this decision shall be compensated with funds from the relevant bodies or the State Atomic Energy Corporation "Rosatom" which took this decision. Decisions to compensate losses (in the event of a dispute) shall be taken by way of judicial proceedings.

(as amended by Federal Law No.318 of 01.12.2007)

Chapter VII.

LEGAL POSITION OF ORGANISATIONS OPERATING IN THE FIELD OF THE USE OF ATOMIC ENERGY

Article 34. Operating organisations active in the field of the use of atomic energy

An operating organisation is an organisation created in accordance with the laws of the Russian Federation and recognised, in accordance with the laws and on the terms established by the Government of the Russian Federation, by the relevant authority which manages the use of atomic energy as being fit to operate a nuclear facility, radiation source or storage facility and to pursue, independently or with the involvement of other organisations, activity in relation to the siting, design, construction, operation and decommissioning of a nuclear facility, radiation source or storage facility, and also activity in relation to the handling of nuclear materials and radioactive substances. To perform these types of activity, an operating organisation must hold permits (or licences) issued by the relevant state safety regulatory authorities to perform work in the field of the use of atomic energy. (as amended by Federal Law No.318 of 01.12.2007)

Operating organisations must have adequate powers and financial, material and other resources to fulfil their functions.

Together with the relevant authorities managing the use of atomic energy, operating organisations shall create a special fund to finance expenditure in relation to the decommissioning of nuclear facilities, radiation sources or storage facilities and the handling of spent nuclear fuel, and also to finance research and development work in order to analyse and increase the safety of these facilities. (as amended by Federal Laws No.13 of 05.02.2007 and No.318 of 01.12.2007)

The procedure and sources for the creation, and the procedure for using, this fund shall be established by the Government of the Russian Federation.

Interference in the activity of an operating organisation in relation to the operation of a nuclear facility, radiation source or storage facility other than in the situations for which provision is made by this Federal Law, other laws and other enactments of the Russian Federation is not permitted.

Article 35. Responsibility and duties of an operating organisation in relation to ensuring the safety of nuclear facilities, radiation sources and storage facilities

The operating organisation shall be solely responsible for the safety of the nuclear facility, radiation source or storage facility, and also for the proper handling of nuclear materials and radioactive substances. In the event that an operating organisation loses its permit (or licence) to operate a nuclear facility, radiation source or storage facility, it shall continue to be responsible for the safety of the nuclear facility, radiation source or storage facility until these facilities are handed over to another operating organisation or until it has received a new permit (or licence). In the event that the operating organisation is unable to ensure the safety of these facilities, responsibility for safety and proper handling shall lie with the relevant atomic energy management authority, which must ensure the safety of these facilities until a new operating organisation is created.

The operating organisation shall devise and implement measures to maintain the safety of the nuclear facility, radiation source or storage facility, shall set up special departments to monitor safety where necessary, and shall submit

information about the safety status of the nuclear facility, radiation source or storage facility to the state safety regulatory authorities.

The operating organisation shall:

ensure that the nuclear facility, radiation source or storage facility is used only for the purposes for which it is intended;

organise and coordinate the development and implementation of programmes to assure quality at all stages during the creation, operation and decommissioning of the nuclear facility, radiation source or storage facility, and monitor the implementation of these programmes;

(as amended by Federal Law No.347 of 30.11.2011)

devise and implement measures to prevent accidents at the nuclear facility, radiation source or storage facility and to mitigate their adverse effects for workers at these facilities, the public and the environment;

handle and store nuclear materials and radioactive substances in a manner which is safe for workers at facilities which use atomic energy and the public;

uphold the rights of workers at facilities which use atomic energy to social compensation;

(as amended by Federal Law No.122 of 22.08.2004)

record individual levels of irradiation of workers at facilities which use atomic energy;

devise and implement, within the limits of its powers, measures to protect workers and the public in the event of an accident at a nuclear facility, radiation source or storage facility;

record and monitor nuclear materials and radioactive substances;

ensure that the nuclear facility, radiation source, storage facility, nuclear materials and radioactive substances are physically protected;

devise and implement fire safety measures;

conduct radiation monitoring within the health protection zone and observation zone;

select, train and maintain the skill level of workers at the nuclear facility, radiation source or storage facility and create the necessary social and living conditions for them at work;

inform the public of the radiation situation within the health protection zone and observation zone;

exercise other powers enshrined in legislation and regulations.

Article 36. Duties of the operating organisation in relation to the protection of workers at facilities which use atomic energy, the public and the environment in the event of an accident at a nuclear facility, radiation source or storage facility

In the event of an accident at a nuclear facility, radiation source or storage facility which leads to a discharge of radioactive substances in excess of the established limits into the environment, the operating organisation must provide up-to-date information about the radiation situation to the relevant state authorities, local authorities and the public in the areas most at risk, the authorities which manage the use of atomic energy, the state safety regulatory authorities, the state radiation situation monitoring service, the departments of the system of state monitoring of the radiation situation, state monitoring of the radiation situation within the Russian Federation and the Russian Emergency Prevention and Response System.

(as amended by Federal Law No.331 of 21.11.2011)

When performing work intended to prevent the progression of an accident or to remedy its consequences, workers (including those who have been sent on a temporary work assignment) may only be exposed to radiation in excess of the established limits (but not in excess of the statutory potentially dangerous radiation level) where it is not possible to take measures other than such irradiation, and may

be justified only where this saves lives or prevents mass irradiation or where there is a threat of significant radioactive contamination of the environment. The management of the operating organisation must inform workers involved in this work of the possible risk of irradiation in excess of the established limits and obtain their consent for this, as well as permission from the relevant health authorities of the Russian Federation.

The obligations and operating procedure of the operating organisation, and the procedure for its cooperation with state authorities, local authorities and authorities which manage the use of atomic energy in relation to measures to protect workers at facilities which use atomic energy and the public in the event of an accident, including during the transportation of nuclear materials and radioactive substances, must be stated in the plans regarding these measures. The procedure for drafting and approving such plans shall be established in the regulations and rules concerning the use of atomic energy.

**Article 36.1. Aspects of the regulation of activity in relation to the operation of radiation sources which contain radionuclide sources
(as amended by Federal Law No.93 of 25.06.2012)
(added by Federal Law No.347 of 30.11.2011)**

Activity in relation to the operation of radiation sources which contain radionuclide sources shall be regulated in accordance with this Federal Law.
(as amended by Federal Law No.93 of 25.06.2012)

For the purposes of this article, radionuclide sources shall be deemed to be items containing a limited detected level of a radioactive substance which are intended to be used as part of radiation sources.

Activity in relation to the operation of radiation sources which only contain radionuclides belonging to the fourth and fifth radiation hazard categories in accordance with the regulations and rules concerning the use of atomic energy shall not be subject to licensing in accordance with this Federal Law.
(as amended by Federal Law No.93 of 25.06.2012)

Organisations which pursue activity in relation to the operation of radiation sources whose composition solely includes radionuclide sources belonging to the fourth and fifth radiation hazard categories shall not be deemed to be operating organisations under this Federal Law.
(as amended by Federal Law No.93 of 25.06.2012)

Organisations which pursue activity in relation to the operation of radiation sources whose composition solely includes radionuclide sources belonging to the fourth and fifth radiation hazard categories shall be obliged to register in accordance with the procedure established by the Government of the Russian Federation.
(as amended by Federal Law No.93 of 25.06.2012)

Article 37. Organisations which perform work and provide services for an operating organisation

Organisations which undertake scientific investigation and surveying, perform design activity, build and operate nuclear facilities, radiation sources or storage facilities, design and manufacture equipment for them, perform other work and provide other services in the field of the use of atomic energy shall ensure that their work is performed and their services are provided in a quantity and to a level of quality which comply with the regulations and rules concerning the use of atomic energy, and shall be responsible for the quality of the work performed and the services provided throughout the design life of the nuclear facility, radiation source or storage facility or the manufacturing of equipment for it.

The authority which manages the use of atomic energy shall recommend an organisation which shall be responsible for drawing up the design of the nuclear facility or storage facility.

The manager of the organisation (or state unitary enterprise) responsible for drawing up the design of the nuclear facility or storage facility shall be appointed by decision of the authority which manages the use of atomic energy on the basis of the powers conferred on it by the Government of the Russian Federation.

Equipment, items and technologies for nuclear facilities, radiation sources or storage facilities must undergo conformity assessment in accordance with the laws of the Russian Federation.

(as amended by Federal Law No.248 of 19.07.2011)

In the event that organisations which perform work and provide services in the field of the use of atomic energy for an operating organisation cease their activity, the responsibility for all types of activity of such organisations shall pass to another organisation recognised by the relevant authority which manages the use of atomic energy.

**Article 37.1. Organisations which provide scientific and technical support to the empowered state safety regulatory authority
(added by Federal Law No.347 of 30.11.2011)**

Organisations which provide scientific and technical support to the empowered state safety regulatory authority shall pursue their activity for the purposes of:

scientific and technical facilitation of the state regulation of safety in the use of atomic energy, including the performance and coordination of research and development and the performance of expert evaluations, including safety assessments;

developing and improving the legislative framework in the field of the use of atomic energy, and other activity intended to improve the state regulation of safety in the use of atomic energy.

Juridical persons shall be classed as organisations which provide scientific and technical support in accordance with the procedure established by the Government of the Russian Federation.

Article 38. Employment relations and discipline of workers whose activity is connected with the use of atomic energy

Employment relations and the discipline of workers whose activity is connected with the use of atomic energy shall be regulated by the employment laws of the Russian Federation.

For organisations with particularly hazardous facilities, employment regulations and worker discipline shall be regulated by disciplinary regulations in conjunction with the employment laws of the Russian Federation.

The nature of the terms of employment and social welfare provision for individual categories of workers at nuclear facilities, radiation sources and storage facilities shall be determined by the Government of the Russian Federation and the provisions of the relevant contract of employment.

(as amended by Federal Law No.122 of 22.08.2004)

**Article 39. Public events on the premises of nuclear facilities and storage facilities
(as amended by Federal Law No.347 of 30.11.2011)**

Holding unauthorised gatherings, meetings, demonstrations and other unauthorised public events (hereinafter – public events) on the premises of a nuclear facility or storage facility or within the associated health protection zones is prohibited.

(as amended by Federal Law No.347 of 30.11.2011)

It is forbidden to organise and hold public events off the premises of nuclear facilities and storage facilities, or strikes, where they may cause disruption to the operation of the nuclear facility or storage facility, or where the performance by

workers at nuclear facilities or storage facilities of their duties will be hindered, or where other threats to the safety of the public, environment, health, rights and legal interests of other individuals may arise. Protests over the disallowance and prohibition of such actions shall be permitted in accordance with the procedure laid down in the laws of the Russian Federation.

(as amended by Federal Law No.347 of 30.11.2011)

Losses caused to an operating organisation as a result of the aforementioned actions which hinder the safe operation of a nuclear facility or storage facility shall be compensated by the individuals and organisations responsible (in the event of a dispute) by way of judicial proceedings.

Chapter VIII.

SPECIAL PROVISIONS CONCERNING THE MANUFACTURE AND OPERATION OF SHIPS AND OTHER FLOATING STRUCTURES WITH NUCLEAR FACILITIES AND RADIATION SOURCES

Article 40. Special requirements applicable to ships and other floating structures with nuclear facilities and radiation sources

When designing, manufacturing, operating and decommissioning ships and other floating structures with nuclear facilities and radiation sources, the regulations and rules concerning the use of atomic energy, state standards, Register of Shipping rules and environmental and other legislation of the Russian Federation must be complied with.

The compliance with these requirements of ships and other floating structures with nuclear facilities and radiation sources must be confirmed by way of the relevant documents.

Responsibility for the safety of ships and other floating structures with nuclear facilities and radiation sources shall lie with the primary design organisation and the shipbuilding organisation during the manufacture and commissioning stages, and with the operating organisation after operation has been approved.

The captain and crew of ships and other floating structures with nuclear facilities and radiation sources must have undergone special training on the use of atomic energy and must also hold permits to operate them issued by the relevant state safety regulatory authorities.

The commissioning of ships and other floating structures with nuclear facilities and radiation sources shall be permitted where the operating organisation holds the relevant permits.

Article 41. Calls made at ports of the Russian Federation by ships and other floating structures with nuclear facilities and radiation sources

The list of ports of the Russian Federation at which ships and other floating structures with nuclear facilities and radiation sources, including those in distress, are permitted to call shall be established by the Government of the Russian Federation.

The procedure for calls at ports of the Russian Federation made by ships and other floating structures with nuclear facilities and radiation sources shall be established by means of legislative instruments and rules agreed with the state safety regulatory authorities.

The authorities of ports of the Russian Federation where ships and other floating structures with nuclear facilities and radiation sources are permitted to call must have an action plan in order to protect workers at the port and other individuals on the premises of the port and within its waters in the event of accidents involving such ships and floating structures and implement it where necessary. Responsibility for implementing an action plan to protect the public within the area adjoining the

port in the event of such accidents shall lie with the relevant Federal government agencies.

(as amended by Federal Law No.122 of 22.08.2004)

Ships and other floating structures with nuclear facilities and radiation sources which are in distress may call at ports of the Russian Federation only where prior notice has been given to the relevant port authority and the local authorities.

Article 42. Prevention of radioactive contamination of the environment by ships and other floating structures with nuclear facilities and radiation sources

The discharge of nuclear materials and radioactive substances into the waters of oceans, seas and other bodies of water from ships and other floating structures with nuclear facilities and radiation sources in quantities which exceed the limits set by the regulations and rules concerning the use of atomic energy is not permitted. When carrying out repair work on the aforementioned ships and floating structures, and also after the nuclear facilities and radiation sources are shut down and before they are decommissioned, provision must be made for measures to prevent radioactive contamination of the marine environment and other aquatic environments.

(as amended by Federal Law No.118 of 14.07.2008)

In the event of a leakage of radioactive substances in excess of the established limits from ships and other floating structures with nuclear facilities and radiation sources, the captains or crew managers of these ships and floating structures must take all measures within their power to prevent or limit the leakage of radioactive substances and their spread through the environment and immediately report the incident to the state safety regulatory authorities, the state authorities which perform state monitoring of the radiation situation within the Russian Federation, other ships, nearby inhabited localities and ports within the zone of possible radiation exposure, and also the relevant local authorities.

(as amended by Federal Law No.331 of 21.11.2011)

States located within the zone of possible radiation exposure as a result of radiation accidents on ships and other floating structures with nuclear facilities and radiation sources shall be alerted in accordance with the international agreements entered into by the Russian Federation and the laws of the Russian Federation.

Chapter IX.

SPECIAL PROVISIONS CONCERNING THE OPERATION OF SPACECRAFT AND AIRCRAFT WITH NUCLEAR FACILITIES AND RADIATION SOURCES

Article 43. Safety of spacecraft and aircraft with nuclear facilities and radiation sources

The regulations and rules concerning the use of atomic energy and environmental protection requirements must be complied with when designing, constructing and operating spacecraft and aircraft with nuclear facilities or radiation sources, and also those which use energy from radioactive substances.

In the event of a defect on board a spacecraft or aircraft with a nuclear facility or radiation source which may lead to an unscheduled return of nuclear materials or radioactive substances to the Earth, the states concerned shall be alerted and, if necessary, assisted in accordance with the international agreements entered into by the Russian Federation and the laws of the Russian Federation.

Local authorities and safety regulatory authorities shall be alerted, and assistance shall be provided to the public if necessary, in accordance with the procedure established by the Government of the Russian Federation and the authorities of the constituent entities of the Russian Federation.

Chapter X.**HANDLING OF NUCLEAR MATERIALS, RADIOACTIVE SUBSTANCES AND RADIOACTIVE WASTE****Article 44. State policy on the handling of nuclear materials, radioactive substances and radioactive waste**

State policy on the handling of nuclear materials, radioactive substances and radioactive waste must offer an integrated solution to the problems of regulating their receipt, creation, use, physical protection, collection, registration and recording, transportation, storage and burial.

(as amended by Federal Law No.190 of 11.07.2011)

State policy on the handling of nuclear materials, radioactive substances and radioactive waste shall be established by this Federal Law and other laws regulating activity in relation to the handling of nuclear materials, radioactive substances and radioactive waste.

Article 45. Transportation of nuclear materials and radioactive substances

Nuclear materials and radioactive substances must be transported in accordance with special rules, rules concerning the transportation of particularly hazardous loads, the regulations and rules concerning the use of atomic energy, and the environmental protection laws of the Russian Federation.

The rules concerning the transportation of nuclear materials and radioactive substances must make provision for the rights, obligations and responsibilities of the sender, the carrier and the recipient, safety and physical protection measures, a system of agreed measures to avert transport incidents and accidents when nuclear materials and radioactive substances are being transported, requirements concerning packaging, marking and means of transport, and measures to contain and remedy the consequences of possible accidents when these materials and substances are transported. The rules concerning the transportation of nuclear materials and radioactive substances must cover all possible forms of transport.

Carriers of nuclear materials and radioactive substances must hold a permit (or licence) to perform work in the field of the use of atomic energy issued by the relevant state safety regulatory authority.

Foreign organisations which hold the relevant permits (or licences) to perform work in the field of the use of atomic energy issued by Federal government agencies or the State Atomic Energy Corporation "Rosatom" may transport (or carry) nuclear materials when undertaking international transfers by sea or air.

(part four added by Federal Law No.318 of 01.12.2007)

Article 46. Prevention of transport incidents and accidents when transporting nuclear materials and radioactive substances

When transporting nuclear materials or radioactive substances, transport organisations must, jointly with senders and recipients of the aforementioned items, operating organisations, and where necessary local authorities, the relevant state safety regulatory authorities, including state disease and epidemiological control authorities, internal affairs authorities and civil defence units, take measures to prevent transport incidents and accidents and to remedy their consequences, as well as measures to protect workers at facilities which use atomic energy, the public, the environment and valuable property.

In order to remedy the consequences of accidents during the transportation of nuclear materials and radioactive substances, regional emergency teams of operating organisations shall also be used. The procedure for the creation, operation and financing of regional emergency teams of operating organisations shall be established by the Government of the Russian Federation.

**Article 47. Storage and processing of nuclear materials and radioactive substances
(as amended by Federal Law No.190 of 11.07.2011)**

When storing and processing nuclear materials and radioactive substances, workers at facilities which use atomic energy, the public and the environment must be properly protected against exposure to radiation and radioactive contamination which is unacceptable pursuant to the regulations and rules concerning the use of atomic energy. Temporary technical storage of irradiated nuclear reactor fuel assemblies in order to increase safety and reduce cost when they are subsequently handled and processed in order to extract valuable components from them shall occur in accordance with the laws of the Russian Federation. The processing of spent nuclear fuel in order to extract valuable components from it must occur in accordance with the laws of the Russian Federation.

(as amended by Federal Laws No.94 of 10.07.2001 and No.190 of 11.07.2011)

Article 48. Storage or burial of radioactive waste

When radioactive waste is stored or buried, it must be properly isolated from the environment and the present and future generations and biological resources must be protected against exposure to radiation levels which exceed the levels stipulated in the regulations and rules concerning the use of atomic energy.

Radioactive waste may only be stored or buried at special-purpose storage facilities. The storage or burial of radioactive waste must be covered by the design or technical documentation as a mandatory stage of any nuclear technology cycle. Radioactive waste must be stored and buried in accordance with the Federal Law "On the handling of nuclear waste and amendments to certain pieces of Russian Federal legislation", other Federal laws, the laws of the constituent entities of the Russian Federation, the enactments of the President of the Russian Federation, the enactments of the Government of the Russian Federation, and the enactments of Federal government agencies and organisations responsible for the statutory regulation of the use of atomic energy.

(as amended by Federal Law No.190 of 11.07.2011)

Chapter XI.

PHYSICAL PROTECTION OF NUCLEAR FACILITIES, RADIATION SOURCES, STORAGE FACILITIES, NUCLEAR MATERIALS AND RADIOACTIVE SUBSTANCES

Article 49. Physical protection of nuclear facilities, radiation sources, storage facilities, nuclear materials and radioactive substances

The physical protection of nuclear facilities, radiation sources, storage facilities, nuclear materials and radioactive substances entails a single system for the planning, coordination, monitoring and implementation of a package of technical and organisational measures intended:

to prevent trespassing on the premises of nuclear facilities, radiation sources and storage facilities, to prevent unauthorised access to nuclear materials and radioactive substances, and to prevent them from being misappropriated or damaged;

to promptly detect and rectify any impediments to the integrity and safe keeping of nuclear materials and radioactive substances, and to promptly detect and stop acts of sabotage and terrorism which endanger the safety of nuclear facilities, radiation sources and storage facilities;

to locate and return nuclear materials and radioactive substances which have disappeared or been misappropriated.

The physical safety of nuclear facilities, radiation sources, storage facilities, nuclear materials and radioactive substances shall be maintained during all stages of the design, construction, operation and decommissioning of the aforementioned

facilities which use atomic energy, and also during the handling of nuclear materials and radioactive substances, including the transportation of nuclear materials and radioactive substances.

The physical protection of nuclear facilities, radiation sources, storage facilities, nuclear materials and radioactive substances shall be ensured by operating organisations and the relevant Federal government agencies within the limits of their powers; on operational ships and floating structures with nuclear facilities and radiation sources, spacecraft and aircraft with nuclear facilities, it shall be ensured by their crews.

(as amended by Federal Law No.122 of 22.08.2004)

The maintenance of the physical protection of nuclear facilities, radiation sources, storage facilities, nuclear materials and radioactive substances shall be overseen by the state safety regulatory authorities.

Internal affairs authorities and safety service authorities may be asked to perform duties in relation to the maintenance of the physical protection of facilities which use atomic energy.

Article 50. Requirements concerning the maintenance of the physical safety of nuclear facilities, radiation sources, storage facilities, nuclear materials and radioactive substances

The requirements concerning the maintenance of the physical safety of nuclear facilities, radiation sources, storage facilities, nuclear materials and radioactive substances shall be established by the regulations and rules concerning the use of atomic energy.

Nuclear facilities, radiation sources, storage facilities, nuclear materials and radioactive substances must be physically protected in accordance with the international obligations of the Russian Federation with regard to the use of atomic energy.

It is forbidden to operate nuclear facilities, radiation sources or storage facilities and undertake any work in relation to the use of nuclear materials and radioactive substances of any form and at any stage of their production, use, processing, transportation or storage if no measures have been taken to meet the requirements concerning the physical safety of the aforementioned facilities which use atomic energy.

Article 51. Restriction of the rights of individuals on the premises of a nuclear facility, radiation source, storage facility or organisation which handles nuclear materials or radioactive substances

In the interests of maintaining the physical protection of a nuclear facility, radiation source, storage facility or organisation which handles nuclear materials or radioactive substances, on the premises where they are located, workers at the aforementioned facilities which use atomic energy and citizens who visit facilities which use atomic energy for informative purposes, and their belongings and vehicles, may be inspected, including by means of special equipment.

Article 52. Permission for individuals to work at nuclear facilities, radiation sources or storage facilities or with nuclear materials or radioactive substances

Permission to work at nuclear facilities, radiation sources and storage facilities and with nuclear materials and radioactive substances shall be granted to individuals who meet the relevant skill requirements and also individuals who have been given permission to perform such work connected with the protection of state secrets, in accordance with state safety requirements pursuant to the laws of the Russian Federation.

Permission to work shall not be granted to individuals subject to restrictions on working at a nuclear facility, radiation source or storage facility or with nuclear materials or radioactive substances which are stipulated in the list of medical contraindications.

Chapter XII.

LIABILITY FOR LOSSES AND HARM CAUSED TO JURIDICAL PERSONS AND INDIVIDUALS AND THE HEALTH OF CITIZENS BY EXPOSURE TO RADIATION

Article 53. Liability for losses and harm caused to juridical persons and individuals and the health of citizens by exposure to radiation

Civil liability for losses caused to juridical persons and individuals by exposure to radiation during the performance of work in the field of the use of atomic energy shall be borne by the operating organization in accordance with the procedure laid down in the laws of the Russian Federation.

Compensation shall be payable for harm caused to the life and health of citizens due to exposure to radiation or a combination of exposure to radiation and toxic, explosive or other hazardous forms of exposure.

If other losses which cannot reasonably be separated from losses caused by exposure to radiation are caused in addition to losses caused by exposure to radiation, such losses shall be compensated on the basis of this Federal Law.

Article 54. Grounds of civil liability for losses and harm caused by exposure to radiation

The operating organisation shall be liable for losses and harm caused by exposure to radiation in accordance with this Federal Law regardless of whether the operating organisation is at fault.

The operating organisation shall be exempt from liability for losses and harm caused by exposure to radiation which arise as a result of force majeure, warfare or armed conflicts or by design of the injured party.

If the operating organisation proves that the aforementioned losses and harm were wholly or partly caused by design of the individual to whom the losses and harm were caused, the operating organisation shall be wholly or partly exempt from liability for compensating said individual for the losses and harm. Exemption from compensation for losses and harm shall be granted by way of judicial proceedings.

Article 55. Types and limits of liability for losses and harm caused by exposure to radiation

The types and limits of the operating organisation's liability for losses and harm caused by exposure to radiation according to the type of facility which uses atomic energy shall be established by the laws of the Russian Federation.

The maximum levels of liability for losses and harm caused by exposure to radiation in any one incident cannot be greater than the amount established by the international agreements entered into by the Russian Federation.

Article 56. Financial security for civil liability for losses and harm caused by exposure to radiation

The operating organisation must make financial security for the liability limit laid down by article 55 of this Federal Law. The financial security to be made by the operating organisation in the event of compensation for losses and harm caused by exposure to radiation is made up of the state guarantee or other guarantee, its own funds and its insurance policy (or contract).

Documentary proof of the aforementioned financial security is an essential requirement for the operating organisation to obtain a permit (or licence) to operate the nuclear facility, radiation source or storage facility issued by the relevant state safety regulatory authority.

The terms of and procedure for civil liability insurance against losses and harm caused by exposure to radiation, the procedure for setting up an insurance fund and the sources of funding, and the procedure for paying out social compensation shall be established by the laws of the Russian Federation.

(as amended by Federal Law No.122 of 22.08.2004)

Neither the insurer nor any other individual who makes financial security for the aforementioned liability in accordance with this article may suspend or terminate the insurance or other financial provision without giving the state safety regulatory authorities three months' written notice before suspending or terminating the insurance or other financial provision, or during transportation of nuclear material and radioactive substances, where such insurance or other financial security relates to the transportation of nuclear material and radioactive substances.

Article 57. State participation in compensation of losses and harm caused by exposure to radiation

The Government of the Russian Federation provides payment of compensation of losses and harm caused by exposure to radiation for which an operating organisation is liable to the extent that the losses and harm caused exceed the liability limits laid down in article 55 of this Federal Law for that operating organisation by granting the necessary amounts until the losses and harm have been fully compensated, and also in the cases stipulated in the laws of the Russian Federation.

Article 58. Time-limit for claiming compensation for losses and harm caused by exposure to radiation

No time-limit shall exist for filing claims for losses and harm caused to the life and health of citizens by exposure to radiation. The time-limit for filing claims for compensation for losses and harm caused to property or the environment by exposure to radiation shall be three years from the day when the individual became aware, or ought to have become aware, that his right had been violated.

Article 59. Compensation for harm caused to the environment by exposure to radiation

The operating organisation shall be liable for harm caused to the environment by exposure to radiation in accordance with this Federal Law, Federal Law No.7 of 10 January 2002 "On protection of the environment", the laws and other enactments of the Russian Federation, and the laws and other enactments of the constituent entities of the Russian Federation.

(as amended by Federal Law No.309 of 30.12.2008)

Claims for compensation for losses shall be brought against the operating organisation by the state authorities, the relevant local authorities and specially-empowered state environmental protection authorities.

Article 60. Compensation for harm caused by exposure to radiation to workers at nuclear facilities, radiation sources and storage facilities in connection with performance of their duties

Harm caused to the life and health of workers (including those who have been sent on a temporary work assignment) by exposure to radiation at nuclear facilities, radiation sources and storage facilities, and to the life or health of workers engaged in any other work with nuclear materials or radioactive substances in connection

with the performance of their duties shall be compensated in accordance with the laws of the Russian Federation.

Chapter XIII.

LIABILITY FOR BREACHES OF THE LAWS OF THE RUSSIAN FEDERATION CONCERNING THE USE OF ATOMIC ENERGY

Article 61. Liability of officers of state authorities, local authorities, authorities which manage the use of atomic energy, state safety regulatory authorities, operating organisations, organisations which perform work and provide services for operating organisations, organisations which pursue activity involving the use of radiation sources which contain radionuclide sources belonging to the fourth and fifth radiation hazard categories, workers at nuclear facilities, radiation sources and storage facilities, workers employed by organisations which pursue other activities in the field of the use of atomic energy, and citizens for breaches of the laws of the Russian Federation concerning the use of atomic energy (as amended by Federal Law No.347 of 30.11.2011)

Breaches by officers of state authorities, local authorities, authorities which manage the use of atomic energy, state safety regulatory authorities, operating organisations, organisations which perform work and provide services for operating organisations, organisations which pursue activity involving the use of radiation sources which contain radionuclide sources belonging to the fourth and fifth radiation hazard categories, workers (including those who have been sent on a temporary work assignment) at nuclear facilities, radiation sources and storage facilities, workers (including those who have been sent on a temporary work assignment) employed by organisations which pursue other activities in the field of the use of atomic energy, and citizens shall incur liability in accordance with the laws of the Russian Federation.

(as amended by Federal Laws No.122 of 22.08.2004 and No.347 of 30.11.2011)

Such breaches include:

- breaches of the regulations and rules concerning the use of atomic energy;
- breaches of the terms of permits (or licences) to perform work in the field of the use of atomic energy;
- non-fulfilment or improper fulfilment of the instructions of state safety regulatory authorities;
- carrying out work at a nuclear facility, radiation source or storage facility or handling nuclear materials or radioactive substances without a permit;
- issue of a permit (or licence) or instructions by officials of a state safety regulatory authority in violation of the established procedure;
- non-compliance with the requirements concerning the siting of a nuclear facility, radiation source or storage facility;
- delivering, assembling or putting into service defective equipment at a nuclear facility, radiation source or storage facility;
- approving the operation of a nuclear facility, radiation source or storage facility without all of the aforementioned facilities envisaged in the plan having been built and placed into service;
- approving the operation of a nuclear facility, radiation source or storage facility without taking measures to protect workers and workers sent on temporary work assignments at the aforementioned facilities which use atomic energy, the public in adjoining areas and the environment;
- failure by workers at a nuclear facility, radiation source or storage facility to fulfil their duties;
- unauthorised abandonment of a nuclear facility, radiation source or storage facility by workers who are on duty;

failure by the individuals specified in the first paragraph of this article to fulfil their duties in critical situations which have, or could have, resulted in fatalities, unwarranted exposure of individuals to radiation or radioactive contamination of the environment;

allowing workers who do not hold the relevant documents certifying their qualifications, workers for whom working at the aforementioned facilities is medically contraindicated, or individuals under the age of 18 to work at a nuclear facility, radiation source or storage facility;

the aforementioned officers directly or indirectly forcing workers to breach regulations and instructions when operating a nuclear facility, radiation source or storage facility;

acts of violence which hinder the aforementioned officers and workers employed by operating organisations from carrying out their duties;

officers and other workers evading their obligations under the applicable plan to protect workers at facilities which use atomic energy and the public in the event of an accident;

officers sending workers at facilities which use atomic energy into areas posing a radiation hazard where the principal radiation dose limits and the permitted radiation exposure levels may be exceeded without the consent of these workers and without informing them of the possible radiation levels, and also in violation of the regulations, rules and instructions applicable to these conditions;

creating obstacles to the performance by officials from the state safety regulatory authorities of their duties;

unwarranted or intentional release or discharge of radioactive substances into the atmosphere, bodies of water or the ground in quantities which exceed the maximum permissible levels;

concealing an accident or breach of the established procedure for reporting an accident at a nuclear facility, radiation source or storage facility, concealing information concerning the state of radioactive contamination of the environment, and knowingly providing false information about the radiation situation of these facilities;

refusing to provide information, deliberately distorting or concealing information concerning safety issues in relation to the use of atomic energy;

breaching requirements concerning the physical protection of a nuclear facility, radiation source, storage facility, nuclear materials or radioactive substances;

breaching the established procedure for recording and monitoring nuclear materials and radioactive substances;

misappropriating, illegally using, acquiring, storing, transferring, selling or destroying nuclear materials, radioactive substances and radiation sources, or concealing details of such acts which are known, are being prepared for or have been committed;

demanding or compelling the carrying-out of certain acts (or inaction) accompanied by a threat to use nuclear materials or radioactive substances for criminal purposes;

commercialisation of products contaminated with radioactive substances in excess of the established limits with a view to their use and consumption by the public, or manufacturing and selling products containing radioactive substances without permission from the Russian Federal healthcare authorities which are empowered to this end;

breaching the established procedure for exporting and importing nuclear facilities, equipment, technologies, nuclear materials, radioactive substances, special nuclear materials and services in the field of the use of atomic energy;

participating in the organisation and staging of unauthorised public events on the premises of a nuclear facility, radiation source or storage facility; (as amended by Federal Law No.347 of 30.11.2011)

organising and holding meetings or other public events off the premises of a nuclear facility, radiation source or storage facility where the organisation and holding of such public events may impair the operating capacity of the nuclear facility, radiation source or storage facility, or will hinder the performance by workers at these facilities of their duties, or will pose other threats to the safety of the public and the environment. The laws of the Russian Federation may make provision for other breaches which shall entail liability under this article if committed;

(as amended by Federal Law No.347 of 30.11.2011)

breaching the procedure and requirements for the recognition of an organisation as fit to operate a nuclear facility, radiation source or storage facility and pursue, independently or with the involvement of other organisations, activity in relation to the siting, design, construction, operation and decommissioning of a nuclear facility, radiation source or storage facility, and activity in relation to the handling of nuclear materials and radioactive substances.

(paragraph added by Federal Law No.318 of 01.12.2007)

Article 62. Repealed. - Federal Law No.196 of 30.12.2001.

Chapter XIV.

EXPORTATION AND IMPORTATION OF NUCLEAR FACILITIES, EQUIPMENT, TECHNOLOGIES, NUCLEAR MATERIALS, RADIOACTIVE SUBSTANCES, SPECIAL NUCLEAR MATERIALS AND SERVICES IN THE FIELD OF THE USE OF ATOMIC ENERGY

Article 63. Principles for the exportation and importation of nuclear facilities, equipment, technologies, nuclear materials, radioactive substances, special nuclear materials and services in the field of the use of atomic energy

The exportation and importation of nuclear facilities, equipment, technologies, nuclear materials, including nuclear fuel, radioactive substances, special nuclear materials used to produce nuclear materials, and radiation sources and services in the field of the use of atomic energy shall occur in accordance with the international obligations of the Russian Federation with regard to the non-proliferation of nuclear weapons and the international agreements on the use of atomic energy entered into by the Russian Federation.

Exportation and importation comprise the transfer, sale or purchase of nuclear facilities, equipment, technologies, nuclear materials, radioactive substances, special nuclear materials for commercial purposes and the non-commercial transfer thereof (for display at exhibitions, carrying out joint work, etc.).

Article 64. Procedure for the exportation and importation of nuclear facilities, equipment, technologies, nuclear materials, radioactive substances, special nuclear materials and services in the field of the use of atomic energy

The exportation and importation of nuclear facilities, equipment, technologies, nuclear materials, radioactive substances, special nuclear materials and services in the field of the use of atomic energy shall occur in accordance with the procedure laid down in the laws and other enactments of the Russian Federation.

Nuclear reactor fuel assemblies shall be taken out of the Russian Federation and brought into the Russian Federation on the basis of civil-law agreements. The procedure for taking nuclear reactor fuel assemblies out of the Russian Federation and bringing them into the Russian Federation shall be established by the Government of the Russian Federation.

(part two added by Federal Law No.94 of 10.07.2001)

The exportation and importation of nuclear facilities, equipment, technologies, nuclear materials, radioactive substances, special nuclear materials and services in

the field of the use of atomic energy shall occur in accordance with the laws of the Russian Federation concerning export control on the basis of issued permits (or licences) to perform work in the field of the use of atomic energy.

The importation from foreign states into the Russian Federation of spent nuclear fuel for the purposes of temporary storage and/or processing shall be established in accordance with the procedure laid down in the laws of the Russian Federation and the international agreements entered into by the Russian Federation.

(as amended by Federal Law No.94 of 10.07.2001)

The importation into the Russian Federation of irradiated nuclear reactor fuel assemblies produced on the territory of a foreign state (or foreign-manufactured irradiated fuel assemblies) shall occur on the basis of a positive assessment by a special committee set up by the President of the Russian Federation. This committee shall include the chairman of the committee and twenty members of the committee (five members representing the President of the Russian Federation, five representing the Federation Council of the Federal Assembly of the Russian Federation, five representing the State Duma of the Federal Assembly of the Russian Federation and five representing the Government of the Russian Federation). (part five added by Federal Law No.33 of 28.03.2002)

The procedure for submitting proposals regarding appointments of representatives for the Federation Council and the State Duma shall be established by the relevant chamber of the Federal Assembly of the Russian Federation. (part six added by Federal Law No.33 of 28.03.2002)

The special committee shall submit annual reports to the President of the Russian Federation and the chambers of the Federal Assembly of the Russian Federation on the state of affairs in relation to the importation into the Russian Federation of irradiated foreign-manufactured fuel assemblies.

(part seven added by Federal Law No.33 of 28.03.2002)

The regulations applicable to the special committee shall be approved by decree of the President of the Russian Federation.

(part eight added by Federal Law No.33 of 28.03.2002)

Chapter XV.

INTERNATIONAL AGREEMENTS CONCERNING THE USE OF ATOMIC ENERGY ENTERED INTO BY THE RUSSIAN FEDERATION

Article 65. International agreements concerning the use of atomic energy entered into by the Russian Federation

If the international agreements entered into by the Russian Federation establish rules which contradict those laid down in this Federal Law, the rules of the international agreement entered into by the Russian Federation shall apply.

Article 66. Notification of accidents at nuclear facilities, radiation sources or storage facilities

Notifications of accidents at nuclear facilities, radiation sources and storage facilities which have resulted in the release or discharge of radioactive substances into the environment and have resulted, or may result, in a spread of radioactive substances across national boundaries which may have safety implications for a foreign state shall be issued by the specially-empowered authorities in accordance with the international obligations of the Russian Federation.

Article 67. Assistance in the event of an accident at a nuclear facility, radiation source or storage facility

Assistance in the event of an accident at a nuclear facility, radiation source or storage facility in order to minimise the impact of the accident and protect public

health, the environment and valuable property from exposure to radiation shall be given in accordance with the international obligations of the Russian Federation.

Article 68. Exchange of information with foreign states in the field of the use of atomic energy

Information concerning the use of atomic energy shall be exchanged with foreign states in accordance with the international agreements entered into by the Russian Federation.

Chapter XVI.

FINAL PROVISIONS

Article 69. Entry of this Federal Law into force

This Federal Law shall enter into force with effect from the day on which it is officially published.

Article 70. Bringing legislation into line with this Federal Law

A proposal is hereby made to the President of the Russian Federation and an order is hereby given to the Government of the Russian Federation to bring its legislation into line with this Federal Law.

Within three months, the Government of the Russian Federation shall, in accordance with the established procedure, submit proposals to the State Duma within the Federal Assembly of the Russian Federation to bring the legislation of the Russian Federation into line with this Federal Law.

President
of the Russian Federation
B. YELTSIN

Moscow, Kremlin
21 November 1995
No.170-FZ

Uruguay

LAW No.19.056

On the Radiological Protection and Safety of Persons, Property and the Environment*

The Senate and the Chamber of Representatives of the Eastern Republic of Uruguay,

meeting in General Session,

Decree

Article 1.

This law will apply to all situations involving exposure or potential exposure to ionising radiation, including all activities relating to the holding, use, development, production, application, marketing, transport, distribution, repair, import, export and management of sources of ionising radiations and radiation generators conducted within the territory of the Eastern Republic of Uruguay.

Those expressly excluded through a decision by the National Radioprotection Regulatory Authority¹ will be excepted.

Article 2.

The substantial purpose of this law is to ensure radiological protection and safety with regard to the protection of occupationally exposed persons, the public in general, property and the environment from the adverse effects of radiation, avoiding risks and radio-induced damage or mitigating the same, likewise ensuring the physical protection of sources and facilities.

Article 3.

The following definitions apply for the purposes of this law:

Radiological protection and safety: Protection of persons against exposure to ionising radiation or radioactive materials, as well as the technological safety of radiation sources, including means to achieve this protection and technological safety, together with means for preventing accidents and attenuating the consequences of the same should they occur.

Nuclear technological safety: The achievement of suitable operating conditions, the prevention of accidents or the mitigation of their consequences, the result of which will be the protection of workers, the public and the environment against excessive hazards caused by radiation.

* This document is an unofficial translation of the official Uruguayan text of the "Ley N° 19.056 Dictanse normas tendientes a asegurar la protección y la seguridad radiológica de personas, bienes y medio ambiente". The law was published in Spanish in the *Diario Oficial* 17 ene/013 (Official Journal of 17 January 2013), N° 28.639, which is available at: www.parlamento.uy/leyes/AccesoTextoLey.asp?Ley=19056&Anchor=. In the event of any discrepancy between this translation and the original Uruguayan version, the latter will take precedence. A short summary of this text is available in this edition of the *Nuclear Law Bulletin*, p.117.

1. Autoridad Reguladora Nacional en Radioprotección (ARNR).

Radioactive material: Any material, which includes elements or materials, which spontaneously emit ionising radiation. In the context of radioactive material the containers thereof are included.

Nuclear material: Plutonium-239, uranium-233, uranium-235, uranium enriched with 235 or 233 isotopes, uranium containing an isotope mixture identical to that found in nature, uranium depleted in isotope 235, thorium of nuclear purity or any material containing one or more of the above.

Ionising radiation: Radiation capable of producing pairs of ions when interacting with matter.

Equipment generating ionising radiation: Any type of equipment which emits ionising radiation when it is in operation.

Dosimetry: Method for the measurement of radiological quantities either directly, indirectly or by means of calculations, and other associated techniques.

Installation: Location or environment of any type in which radioactive or nuclear materials and equipment generating ionising radiation is extracted, produced, marketed, handled, stored, managed or used.

Source of ionising radiation: Equipment or material emitting or capable of emitting ionising radiation.

Safeguards: Activities intended to organise and maintain a system for recording and controlling all nuclear materials and fuels for the purposes of ensuring that no deviations from the peaceful use of the same occur.

Radioactive wastes: Materials, regardless of their physical form, which remain as wastes from practices or actions and for which no subsequent use is envisaged.

Article 4.

The National Radioprotection Regulatory Authority created through Articles 173 and 174 of Law No.17.930 of 19 December 2005 as executive unit 011 of Subsection 08 “Ministry of Industry, Energy and Mining” will be the authority having jurisdiction for application of this law and its regulations.

Article 5.

The powers of the National Radioprotection Regulatory Authority will be as follows:

- A) To promote and disseminate regulations relating to radiological protection and safety, the activities of the Regulatory Authority within the scope of this law, and the benefits of the peaceful uses of ionising radiation to users and society in general.
- B) To prepare and supervise compliance with all regulations relating to radiological protection and safety.
- C) To prepare standards, technical regulations, codes of practice and safety codes for activities in which nuclear technology is applied, updating these periodically in accordance with technological progress and the recommendations of the International Atomic Energy Agency (IAEA).
- D) To authorise the import, export and transport of radioactive sources, radioisotopes or equipment generating ionising radiation in accordance with current regulations.
- E) To supervise compliance in all matters concerning the Agreement for the Application of Safeguards made between Uruguay and the AIEA (Decree-Law

No.14.541 of 20 July 1976) and the Additional Protocol thereto (Law No.17.750 of 26 March 2004), which came into force for Uruguay with effect from the 30 April 2004.

- F) To issue licences for operating facilities and personal authorisations for those providing evidence of technical capacity to work with radioactive materials and generators of ionising radiation, and to issue authorisations to operate inspected equipment.
- G) To revoke and suspend licences or authorisations, with the power to shut down facilities temporarily or permanently and to seize radioactive material when it is established that current regulations have been breached.
- H) To regulate and control compliance in services provided by third parties relating to applications of ionising radiations.
- I) To provide workers occupationally exposed to ionising radiation with information about annual dose quantities, including if appropriate the cumulative quantity if they perform functions in more than one institution.
- J) To promote and disseminate regulations relating to radiological protection and safety, as well as the activities of the Regulatory Authority in connection with this law, to users and society in general.
- K) To act as a counterpart for projects relating to regulatory infrastructure financed by the IAEA or by other national or international institutions.
- L) To supervise the work of the Radiological Emergencies Response Unit² (Article 299 of Law No.16.736 of 5 January 1996) and to be included in the framework of the National Emergencies System³ when a response to radiological incidents and accidents is required.
- M) To supervise and monitor the management and storage of decommissioned radioactive sources and radioactive wastes, which might be generated as a product of various authorised practices. The institution responsible for this management and storage must have the corresponding operating licence issued by the Regulatory Authority.
- N) To maintain contact with regulatory authorities in other countries and appropriate international organisations for the exchange of information and multilateral and bilateral co-operation.
- O) To ensure compliance with the terms laid down in national regulations and international regulations approved and ratified by the country.
- P) To establish appropriate mechanisms for informing the public and users about the regulatory process and the radiation safety aspects of regulated practices.

Article 6.

The following are prohibited without authorisation from the National Regulatory Authority:

- A) All activities involving ionising radiation.
- B) The import, export and transport of radioactive sources, radioisotopes or equipment generating ionising radiation.

2. Grupo de Intervención ante Emergencias Radiológicas.
3. Sistema Nacional de Emergencias.

Article 7.

Without prejudice to the radiological protection safety measures established by Article 167 of Law No.15.903 of 10 November 1987, in the version provided by Article 225 of Law No.16.320 of 1 November 1992, an additional rate of 200 IU (200 indexed units) is created for the grant of authorisations for the import and export of radioactive material.

Article 8.

The financial resources necessary for the regulatory authority to fulfil its duties will be those corresponding to executive unit 011 in Subsection 08 “Ministry of Industry, Energy and Mining”.

Article 9.

The Regulatory Authority will be the sole authority in the country for controlling the emission of ionising radiation, it will have technical independence and technical/professional autonomy, remaining institutionally separate from all other activities promoting or developing nuclear technology or providing related services, with the sole exception of those services, which are essential to the safety and inspection of exposed personnel and the public, which are not provided by other public or private institutions.

Article 10.

In order to ensure compliance with the provisions relating to inspection in this law the Regulatory Authority may, when necessary, obtain the assistance of the public authorities.

Inspectors authorised by the Regulatory Authority will have free access to premises and facilities in which sources of radiation are located or are thought to be located in order to check compliance with the regulatory requirements.

Article 11.

Breaches of the regulations will be penalised by the Regulatory Authority through the following penalties:

- A) Warning.
- B) Temporary closure for up to 180 days.
- C) Fines in amounts fixed between 1 850 IU (one thousand eight hundred and fifty indexed units) and 92 750 IU (ninety two thousand seven hundred and fifty indexed units).
- D) Revocation of licences or authorisations, shutdown of installations and decommissioning of radioactive material in accordance with the provisions of subsection.
- G) Of Article 5 of this law.

When determining the penalty applicable, previous history and the repetition or recurrence of the breach established will be borne in mind, and penalties will be applied gradually.

The Regulatory Authority will formally notify users of the grounds for any measure adopted in all circumstances. These will be subject to appeal as specified in Article 317 of the Constitution of the Republic.

In the case of the temporary or permanent closure of a facility, the administrative order must be issued by the Ministry for Industry, Energy and Mining, on the advice of the Regulatory Authority.

Article 12.

The Executive Authority will issue regulations under this law within a period of not more than 180 days following its publication.

Assembly Room of the Chamber of Representatives in Montevideo, the 20 December 2012.

[signature]

JOSÉ PEDRO MONTERO

Secretary

[signature]

JORGE ORRICO

President

Montevideo, 4 January 2013

[signature]

JOSÉ MUJICA

President of the Republic

Japan

Third Supplement to Interim Guidelines on Determination of the Scope of Nuclear Damage resulting from the Accident at the Tokyo Electric Power Company Fukushima Daiichi and Daini Nuclear Power Plants (concerning Damages related to Rumour-Related Damage in the Agriculture, Forestry, Fishery and Food Industries)*

30 January 2013

Dispute Reconciliation Committee for Nuclear Damage Compensation

Part 1. Introduction

1. Situation with regard to government instructions in relation to the accident, etc.

In the “Interim Guidelines on Determination of the Scope of Nuclear Damage resulting from the Accident at the Tokyo Electric Power Company Fukushima Daiichi and Daini Nuclear Power Plants” (hereinafter “Interim Guidelines”) finalised and published on 5 August 2011 by the Dispute Reconciliation Committee for Nuclear Damage Compensation (“the Committee”), the Committee indicated its thinking on the scope of damage associated with shipping restriction orders, etc. on agricultural, forestry and fishery products, etc. issued by the government, etc. and on the scope of damage associated with rumour-related damage in relation to the accident at the Tokyo Electric Power Company Fukushima Daiichi and Daini nuclear power plants (“the accident”).

From August 2011 onwards, the government set provisional safety limits, etc. on agricultural, forestry and fishery products other than food, including animal feed (limits had already been set on cattle roughage in April 2011), fertilizer including manure made from livestock excrement, firewood/charcoal and mushroom logs. Moreover, in order to further ensure food safety and security, new reference values were established to replace the provisional regulatory limits on radioactivity levels in food (“new reference values”). These were published on 22 December of the same year and enforced from 1 April 2012. Further, the provisional safety limits for animal feed, mushroom logs, etc. were also revised along with the establishment of the new reference values for food.

After formulation of the Interim Guidelines, “Instructions, etc. issued by the government in relation to the accident (including those carried out by local authorities in connection with the accident based on rational grounds and by producer groups in connection with the accident with the involvement of the government or local authorities, based on rational grounds; likewise hereinafter)” were newly issued based on the provisional regulatory limits, new reference values and provisional safety limits pertaining to these agricultural, forestry and fishery products, etc., and in particular after the provisional safety limits, etc. and new reference values (“new reference values, etc.”) had been established, government instructions, etc. were issued for numerous items and districts.

In certain districts, etc. where there have been government instructions pertaining to applicable items, it is recognised that in some cases it is inevitable that consumers and trading partners will avoid trading, etc. in relation to the applicable items and identical types of agricultural, forestry and fishery products, due to concern about the risk of contamination with radioactive material. For this reason, in the agriculture, forestry, fishery and food industries not only damage associated with government instructions, etc., but also

* This document is an unofficial English translation of the original Japanese text. In the event of any discrepancy between this version and the original version, the latter will take precedence.

rumour-related damage has spread compared with the time at which the Interim Guidelines were drawn up.

2. Basic approach

Based on the above situation with regard to government instructions, etc. in relation to the accident, the scope of damage, etc. has been reviewed in the present supplement to the Interim Guidelines ("Third Supplement") to the extent possible at the present time in relation to rumour-related damage in the agriculture, forestry, fishery and food industries, supplementing Part 7-2 of the Interim Guidelines.

Further, concerning damage pertaining to government instructions, etc. in relation to the accident, the basic approach is indicated in Part 5 of the Interim Guidelines, and it is considered that a similar approach is still appropriate after formulation of the Interim Guidelines. In addition, it is appropriate to consider that measures based on the provisional safety limits for agricultural, forestry and fishery products other than food established by the government after the formulation of the Interim Guidelines are also included in the "instructions, etc. given by the government in relation to the accident."

With regard to rumour-related damage, Part 7-1 of the Interim Guidelines indicates the general criteria, and Part 7-2 indicates the damage for which there is a particularly high probability that a sufficient causal relationship is established, and the matters to be taken into consideration when assessing whether there is a sufficient causal relationship with regard to rumour-related damage in the agriculture, forestry, fishery and food industries.

On the other hand, the existence of damage resulting from reluctance to purchase occurred across a wide regional area and a wide range of products as compared to when the Interim Guidelines were formulated, based on a survey of trends in trading prices and volumes, specific examples of reluctance to purchase, cessation of trading, etc. in the agriculture, forestry, fishery and food industries following formulation of the Interim Guidelines.

For this reason, concerning rumour-related damage in the agriculture, forestry, fishery and food industries, certain types of damage have been added to the list of damage to be compensated indicated in Part 7-2 of the Interim Guidelines in line with the principle set forth in Part 7-1 III) (1) of the Interim Guidelines, based on the situation after formulation of the Interim Guidelines.

Moreover, whether there is a sufficient causal relationship between the accident and the damage should ultimately be decided on a case by case basis, and where the specific region or product is not explicitly stated in the Interim Guidelines or Third Supplement, it may be possible for damage to be recognised as having a sufficient causal relationship based on the individual, specific circumstances, rather than immediately disallowing compensation.

Therefore, a rational and flexible approach is required of TEPCO, also with regard to damage that does not correspond to the types set forth in Part 7-1 III) (1) of the Interim Guidelines, such as allowing compensation for all damage or a certain range of damage in individual cases or types, according to the nature of the damage, based on the general intent of these guidelines, etc.

Part 2. Rumour-related damage in the agriculture, forestry, fishery and food industries

Guidelines

I) In addition to the types of damage indicated in Part 7-2 I) of the Interim Guidelines, the types of damage listed below are also recognised in principle as damage warranting compensation, being the types set forth in Part 7-1 III) (1) of the Interim Guidelines.

- (1) In the agriculture, forestry and fishery industry, those damage resulting from reluctance to purchase, etc. that actually arose after formulation of the Interim Guidelines, where pertaining to the products listed below:
- i) Agricultural products (when used in food, excluding tea and livestock products) produced in the prefectures of Iwate and Miyagi.
 - ii) Tea produced in Miyagi prefecture or Tokyo.
 - iii) Forestry products (when used in food) produced in the prefectures of Aomori, Iwate and Miyagi, Tokyo, and the prefectures of Kanagawa, Shizuoka and Hiroshima (limited to *shiitake* mushrooms from Hiroshima).
 - iv) Milk/dairy products produced in the prefectures of Iwate, Miyagi and Gunma.
 - v) Fishery products (when used in food and animal feed) produced in the prefectures of Hokkaido, Aomori, Iwate and Miyagi.
 - vi) Livestock feed and firewood/charcoal produced in the prefectures of Iwate, Miyagi and Tochigi.
 - vii) Manure made from livestock excrement produced in the prefectures of Iwate, Miyagi, Ibaraki, Tochigi and Chiba.
 - viii) Processed products where the main ingredient is the agricultural, forestry and fishery products listed in i) to vii).
- (2) In the agricultural, forestry and fishery processing and food manufacturing industries, those damage resulting from reluctance to purchase, etc. that actually arose after formulation of the Interim Guidelines, where pertaining to agricultural, forestry and fishery products and food products where the main ingredient is an agricultural, forestry or fishery product listed in (1) i) to vii) (hereinafter "products, etc.").
- (3) In the distribution industry for agricultural, forestry and fishery products and food (including the distribution industry for agricultural, forestry and fishery processed products; likewise hereinafter), those damage resulting from reluctance to purchase, etc. that actually arose after formulation of the Interim Guidelines where pertaining to the products, etc. listed in (1) and (2) which were purchased by a business operator that had continuously handled the said products, etc.

II) In the agricultural, forestry and fishery industries, the processing industry for agricultural, forestry and fishery products, the food manufacturing industry and the distribution industry for agricultural, forestry and fishery products as well as food, if a business operator itself abandons shipment, operation, planting, processing, etc. in advance, either wholly or partially, due to concern about possible damage resulting from the reluctance to purchase, etc. set forth in I), as a general rule the damage arising therefrom is considered as damage warranting compensation, provided that the operator's decision is judged to be unavoidable.

Notes

1. From August 2011 onwards, following the establishment of provisional safety limits for animal feed, fertilizer including manure made from livestock excrement, firewood/charcoal and mushroom logs, etc. as well as new reference values on food products, a survey carried out based on the issuance of instructions by the government in relation to the accident, etc. with respect to regions and products not explicitly stated in the Interim Guidelines found that reluctance to purchase on the part of consumers and trading partners due to concern about the risk of contamination with radioactive material was reasonable based on the understanding of an average, ordinary person, within the scope of I) and II).
2. In addition, as indicated in Part 7-2 (Notes) of the Interim Guidelines, with regard to certain districts where there have been government instructions, etc. pertaining to applicable items in relation to the accident, it was found that as well as the applicable items, it was reasonable, from the understanding of an average, ordinary person, for consumers or trading partners to avoid trading, etc. in the same type of agricultural, forestry and fishery products grown in the same district due to concern about the adherence of radioactive material and exposure to this inside the body, etc., including a certain period after the lifting of the said instructions, etc. Moreover, it was found that even outside the districts subject to these instructions, etc., in some cases it is inevitable that similar sentiments arise in certain regions, due to their geographical characteristics and the circumstances in which the regional products were distributed, etc.

Further, with regard at least to items of the same type as the items subject to instructions, etc., damage arising from reluctance to purchase, etc. within a certain geographical range, such as districts adjoining other districts subject to instructions, etc. should be considered as damage warranting compensation.

3. It has been confirmed that radioactive material exceeding the provisional safety limits has been detected from pasture grass, etc., and that this has given rise to damage resulting from reluctance to purchase, etc. in relation to milk and dairy products. In this instance, with regard to milk and dairy products produced in prefectures where pasture grass, etc. contaminated with radioactive material was used in cattle feed, etc. (specifically where radioactive material exceeding the provisional safety limits was detected), it can be considered that reluctance to purchase on the part of consumers and trading partners due to concern about the risk of contamination with this radioactive material is reasonable based on the understanding of an average, ordinary person.
4. The approach set forth in Part 7-2 (Notes) 4) through 7) of the Interim Guidelines also applies in relation to I) and II).
5. In Part 7-2 III) of the Interim Guidelines concerning examination costs, “carried out, of necessity, on the demands, etc. of trading partners” is not necessarily limited to a written request from the trading partner, and also includes cases where it can be reasonably deemed that an examination was necessary from an objective perspective.
6. Concerning case-by-case assessments pertaining to rumour-related damage, whether there is a sufficient causal relationship to the accident should be determined taking into consideration the characteristics, etc. of the said product, etc. For example, it should be noted that products produced using a special cultivation technique, such as organic products, have the characteristic of being sold with added value such as higher quality and safety than standard products, and therefore they are more prone to rumour-related damage than standard products and in some cases are subject to rumour-related damage across a wider regional area than is the case with standard products.

Q&A on Third Supplement to the Interim Guidelines: Contents

1. General

- Q1. *What is the positioning and content of the Third Supplement to the Interim Guidelines?*
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- Q3. *This is the third supplement to the Interim Guidelines. Are there any plans to draw up a new supplement in the future? If so, what kind of items will be considered?*

2. Particulars

- Q4. *The Third Supplement to the Interim Guidelines mentions damage that has arisen since the Interim Guidelines were drawn up. Does this mean that damage that occurred prior to the formulation of the Interim Guidelines will not be compensated?*
- Q5. *Is rumour-related damage arising in regions that are not explicitly mentioned in the guidelines not eligible for compensation?*
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- Q8. *Will examination costs for agricultural, forestry and fishery products be eligible for compensation even if there is no written request from the trading partner?*

1. General

Q1. What is the positioning and content of the Third Supplement to the Interim Guidelines?

(Answer)

The approach to the scope of “rumour-related damage to agriculture, forestry, fishery and food industries”, etc. was indicated in the Interim Guidelines drawn up on 5 August 2011, and subsequently new reference values were established concerning radioactive material in food; thus instructions, etc. issued by the government in relation to the accident were given for numerous items and districts.

For this reason, the Third Supplement to the Interim Guidelines clearly sets out new products and regions that have been added to “rumour-related damage to agriculture, forestry, fishery and food industries” as indicated in the Interim Guidelines, based on the results of a survey concerning rumour-related damage associated with these instructions, etc.

Furthermore, even damage for which the specific product or region was not explicitly stated in the Interim Guidelines or Third Supplement to the Interim Guidelines will be eligible for compensation if it is found that there is a sufficient causal relationship in the light of the general intent of these guidelines, based on the individual, specific circumstances.

Q2. Will the publication of the Third Supplement to the Interim Guidelines in any way affect the handling of compensation for rumour-related damage as set out in the previous Interim Guidelines?

(Answer)

The Third Supplement to the Interim Guidelines clearly sets out new products and regions that have been added to “rumour-related damage to agriculture, forestry, fishery and food industries” as indicated in the Interim Guidelines, based on changes in the situation following the formulation of the Interim Guidelines.

Consequently, there has been no change whatsoever concerning the approach to the handling of compensation, etc. pertaining to the rumour-related damage indicated in the Interim Guidelines.

Q3. This is the third supplement to the Interim Guidelines. Are there any plans to draw up a new supplement in the future? If so, what kind of items will be considered?

(Answer)

In order to provide prompt, fair and appropriate relief, wherever possible, for those people who have incurred damage, the guidelines indicate those damage items, etc. which have been categorised into certain types and which should be compensated, to the extent possible at the current time.

Therefore, with regard to the drawing up of new guidelines, consideration will be given again, as necessary, in line with future changes in circumstances.

2. Particulars

Q4. The Third Supplement to the Interim Guidelines mentions damage that has arisen since the Interim Guidelines were drawn up. Does this mean that damage

that occurred prior to the formulation of the Interim Guidelines will not be compensated?

(Answer)

The Third Supplement to the Interim Guidelines indicates the approach, etc. concerning the scope of damage based on the situation with regard to instructions, etc. issued by the government in relation to the accident after the formulation of the Interim Guidelines, but this does not mean that damage prior to the formulation of the Interim Guidelines will not be compensated.

Concerning the period in which damage arose, decisions will be made after considering the situation with regard to instructions, etc. issued by the government in relation to the concerned product, the status of shipment of the product and the occurrence of specific reluctance to purchase, etc.

Q5. Is rumour-related damage arising in regions that are not explicitly mentioned in the guidelines not eligible for compensation?

(Answer)

Whether there is a sufficient causal relationship between the accident and the damage should ultimately be decided on a case by case basis, and where the specific region or product is not explicitly stated in the Interim Guidelines or Third Supplement, compensation will not immediately be disallowed.

Compensation will be made if it is found that there is a sufficient causal relationship in the light of the general intent of the Interim Guidelines or the Third Supplement to the Interim Guidelines, etc., based on the individual, specific circumstances.

Q6. Among those items that were subject to shipping restriction orders, etc., will there be no compensation for items that are not explicitly mentioned in the guidelines?

(Answer)

Concerning items that are subject to shipping restriction orders, etc., it is stated that “with regard at least to items of the same as the items subject to instructions, etc., damage arising from reluctance to purchase, etc. within a certain geographical range, such as districts adjoining other districts subject to instructions, etc. should be considered as damage warranting compensation”. (Third Supplement to the Interim Guidelines, (Notes #2).

Q7. Organic products have been much more affected by rumour-related damage than standard agricultural products, so shouldn't it be clearly stated that they are eligible for compensation?

(Answer)

In the Third Supplement to the Interim Guidelines, it is stated that with regard to damage for which the specific product or region was not explicitly stated, “concerning case-by-case assessments pertaining to rumour-related damage, whether there is a sufficient causal relationship to the accident should be determined taking into consideration the characteristics, etc. of the said product, etc.”.

In addition, with regard to organic products it states as follows: “it should be noted that products produced using a special cultivation technique, such as organic products, have the characteristic of being sold with added value such as higher quality and safety than standard products, and therefore they are more prone to

rumour-related damage than standard products and in some cases are subject to rumour-related damage across a wider regional area than is the case with standard products". (Third Supplement to the Interim Guidelines, (Notes #6)

Q8. Will examination costs for agricultural, forestry and fishery products be eligible for compensation even if there is no written request from the trading partner?

(Answer)

Concerning examination costs, the Third Supplement to the Interim Guidelines states as follows: "carried out, of necessity, on the demands, etc. of trading partners' is not necessarily limited to a written request from the trading partner, and also includes cases where it can be reasonably deemed that an examination was necessitated from an objective perspective". [Third Supplement to the Interim Guidelines, (Notes #5)].

In addition, in Part 7-2 III) of the Interim Guidelines, it is stated, "Examination costs, in the agricultural, forestry and fishery industries, the processing and food production industries for the agricultural, forestry and fishery products and the distribution industry for agricultural, forestry and fishery products and foods, and in other food production industries, relating to testing of agricultural, forestry and fishery products (including processed goods) or foods (including the water used in the course of processing or manufacturing) carried out, of necessity, on the demands, etc. of trading partners at the time of the accident onwards, in prefectures under instructions from the Government to carry out testing in connection with the accident, in relation to products of the same type as the products affected by those instructions, can in principle be recognised as damage warranting compensation.". This approach has not changed since the present Third Supplement to the Interim Guidelines was drawn up.

Outline of the “Third Supplement to Interim Guidelines on Determination of the Scope of Nuclear Damage resulting from the Accident at the Tokyo Electric Power Company Fukushima Daiichi and Daini Nuclear Power Plants (concerning Damages related to Rumour-Related Damage in the Agriculture, Forestry, Fishery and Food Industries)”

30 January 2013

Dispute Reconciliation Committee for Nuclear Damage Compensation

After the Interim Guidelines were released in August 2011, shipping restriction orders, etc. were issued for new items and districts along with the establishment of new reference values of maximum acceptable radioactivity levels on food, as well as provisional safety limits, etc. for agricultural and forestry products other than food.

As a result, damage caused by the reluctance to purchase, etc. was recognised as rumour-related damage across a wide geographical area and for a wide range of products, besides the items and districts expressly indicated in the Interim Guidelines, as follows:

- Agricultural products (when used in food, excluding tea and livestock products): Iwate, Miyagi
- Tea: Miyagi, Tokyo
- Forestry products (when used in food): Aomori, Iwate, Miyagi, Tokyo, Kanagawa, Shizuoka, Hiroshima (limited to shiitake mushrooms from Hiroshima)
- Milk/dairy products: Iwate, Miyagi, Gunma
- Fishery products (when used in food and animal feed): Hokkaido, Aomori, Iwate, Miyagi
- Livestock feed and firewood/charcoal: Iwate, Miyagi, Tochigi
- Manure made from livestock excrement: Iwate, Miyagi, Ibaraki, Tochigi, Chiba

Notes

- In addition to the above-mentioned items, items which are of the same type as items subject to shipping restriction orders, etc., should be compensated when reluctance to purchase, etc. occurs within a determined geographical area.
- It should be noted that agricultural products with safety added value, etc., such as organic products, may also be subject to rumour-related damage, including in case of reluctance to purchase across a wider than usual geographical area.
- Regarding the eligibility of examination costs for compensation, although the Interim Guidelines only refer to the examination “carried out, of necessity, on the demands, etc. of trading partners”, the costs relating to examinations that were necessary from an objective perspective are also compensated, even in the absence of any written request.

France and the United States

Joint Statement on Liability for Nuclear Damage*

Recognising the importance of the nuclear liability principles, including channeling all liability for nuclear damage exclusively to the operator on the basis of strict liability, embodied in the Paris Convention on Third Party Liability in the Field of Nuclear Energy, the Vienna Convention on Civil Liability for Nuclear Damage and the Convention on Supplementary Compensation for Nuclear Damage (CSC);

Recognising the value of recent enhancements to the nuclear liability principles that are embodied in the revised Paris Convention, the revised Brussels Convention Supplementary to the Paris Convention, the revised Vienna Convention, and the CSC (the enhanced international nuclear liability instruments), which provide for increased compensation to victims of a nuclear accident, broader definition of nuclear damage, and jurisdiction over accidents in the exclusive economic zone;

Acknowledging that the Joint Protocol related to the Application of the Vienna Convention and the Paris Convention was developed to link the Paris Convention and the Vienna Convention and has resulted in treaty relations among a number of countries, which provide a contribution to the development of a global nuclear liability regime, and that France views a system based on the revised Paris Convention (together with the revised Brussels Convention Supplementary to the Paris Convention), the revised Vienna Convention and the Joint Protocol as providing an appropriate basis for the compensation of nuclear damage;

Acknowledging that the CSC was designed to provide a basis for establishing a global nuclear liability regime by allowing adherence by countries that adhere to the Paris Convention or the Vienna Convention, including those countries that are linked by the Joint Protocol, and by countries with national laws that fully comply with the nuclear liability principles embodied in the Annex to the CSC and that the United States views the CSC as the only existing international nuclear liability instrument to which the United States can adhere;

Acting in support of the IAEA Action Plan on nuclear safety, including in particular the call for establishing a global nuclear liability regime that addresses the concerns of all the States that might be affected by a nuclear accident with a view to providing appropriate compensation for nuclear damage;

Desiring to closely work together and with other countries for establishing such a global nuclear liability regime,

The UNITED STATES and FRANCE hereby declare that they:

* This document is an unofficial reproduction of the original text. In the event of any discrepancy between this version and the original version, the latter will take precedence. The English text is available at: <http://energy.gov/downloads/united-states-and-france-sign-joint-statement-civil-liability-nuclear-damage>.

Are committed to:

- Promote efforts to achieve a global nuclear liability regime based on treaty relations among France, the United States and other countries that might be affected by a nuclear accident;
- Co-ordinate their actions in encouraging adherence to the enhanced international nuclear liability instruments, including, as appropriate, the revised Paris Convention (together with the revised Brussels Convention) or the revised Vienna Convention, which may be linked by the Joint Protocol, and the CSC, with an initial step being the entry in to force of the CSC:
- Urge countries to adopt national laws that incorporate:
 - the nuclear liability principles and recent enhancements to those principles; and
 - the best practices of ensuring that:
 - a) liability limits and financial security requirements are sufficiently high to make adequate funds available to compensate all victims of a nuclear accident, without discrimination;
 - b) compensation is available for nuclear damage wherever suffered, including countries with no nuclear installations;
 - c) compensation is available in the event of an accident directly due to a grave natural disaster;
 - d) compensation for latent injuries is available over a period of at least thirty years;
 - e) all claims resulting from a nuclear accident are dealt with in a single forum, and in a prompt, equitable and non-discriminatory manner, with a minimum of litigation, and with only one court being competent to hear claims arising from the accident;
- Continue to work together in this area and welcome the participation of other countries in achieving these objectives; and

Believe such actions by them and other countries will ensure adequate and equitable compensation for victims of nuclear damage arising from a nuclear accident, and will create the worldwide trust necessary for the development of nuclear energy and associated industrial activities.

Mr. Ernest Moniz, Secretary of Energy

Mr. Philippe Martin, Minister of Ecology,
Sustainable Development and Energy

[signature]

[signature]

Washington

Paris

13 August 2013

28 August 2013

Franco-Russian Nuclear Power Declaration*

1 November 2013

Moscow

France and Russia note that nuclear energy brings a significant contribution to security of supply, as well as to the limitation of greenhouse gas emissions.

France and Russia declare they want to make this energy source an important part of the energy mix of their respective countries in the best conditions of competitiveness and safety.

France and Russia note in this regard the useful contribution of the International Ministerial Conference on “Nuclear Power in the 21st Century” held by the IAEA (Saint Petersburg, 27-29 June 2013).

France welcomes the accession of Russia, on 1 January 2013, to the OECD Nuclear Energy Agency (OECD/NEA).

Taking into account lessons learnt from the accident at the Fukushima Daiichi nuclear power plant, France and Russia declare that they want to jointly act, in the general interest, in order to prevent the risk of occurrence of such events through the continuous improvement of nuclear safety, the protection of people and the environment, as well as through efficient crisis management.

France and Russia express their full support of the IAEA’s Action Plan on Nuclear Safety and commit to actively promote the enhancement of the international framework for nuclear safety in international forums.

France and Russia are undertaking all necessary measures to ensure the highest level of safety in their nuclear plants and installations and reaffirm their commitment to build only Generation III reactors on all markets henceforth.

France and Russia call upon States, which have not yet done so, to sign and ratify existing international legal instruments regarding safety, in particular the Convention on Nuclear Safety, the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency.

France and Russia are convinced that development of nuclear energy must be accompanied by enhancing non-proliferation and nuclear security regimes and commit to promote the responsible development of nuclear energy in accordance with the best conditions of safety, security and non-proliferation.

* The XVIII session of the Russian-French Intergovernmental Commission on the Issues of the Bilateral Cooperation at the level of Heads of Governments was held at the beginning of November 2013. The session was attended by Dmitry Medvedev, Chairman of the Russian Government, and Jean-Marc Ayrault, Prime Minister of France. Among the documents signed as a result of the meeting was a declaration on nuclear power, which is reproduced here in an unofficial English translation. In the event of any discrepancy between this version and the original version, the latter will take precedence. The Russian text is available at: www.rosatom.ru/resources/b598d78041ba14e7883edc0bb97c3242/rus_fr_declaration.pdf.

France and Russia also call upon States which have not yet done so to become parties to the International Convention for the Suppression of Acts of Nuclear Terrorism, as well as to the Convention on the Physical Protection of Nuclear Material, and to ratify as soon as possible the Amendment to this Convention in order to allow for its prompt entry into force.

France and Russia attach high importance to the development of a global nuclear liability regime, which would provide for equitable compensation in case of nuclear damage and call upon all those countries, which have not yet done so, to adhere to the relevant international instruments.

France and Russia encourage efforts to train skilled personnel and create the necessary infrastructure in countries gaining access to nuclear energy.

France and Russia continue to work co-operatively on innovative nuclear reactors, in a bilateral or multilateral framework, especially within the International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) of the IAEA and within the Generation IV Forum on nuclear systems for the future.

France and Russia confirm their mutual interest in developing collaborative projects on the atomic energy cycle for peaceful purposes, including in the framework of projects currently being discussed between their enterprises concerned.

They note, in this regard, the dynamic development of relations between Areva and Rosatom regarding the fuel cycle and the provision of material and services in nuclear power plants.

They also note that projects are currently being discussed between EDF and Rosatom in order to bring together respective skills and expertise in the shared interest of each party, in particular, in the fields of uranium resources, operational costs and plant maintenance.

France and Russia very much welcome the close industrial co-operation between Rosatom and Alstom through their jointly-owned subsidiary AAEM (Alstom-Atomenergomash) for the supply of turbines.

France and Russia welcome the growing momentum of recent years as well as the extension of the bilateral co-operation in the field of nuclear energy for peaceful purposes and invite the industries of both countries to propose joint projects in the field of nuclear technologies.

News briefs

ENSREG National Action Plans Workshop, 22-26 April 2013, Brussels

The Workshop on National Action Plans was organised by the European Nuclear Safety Regulators Group (ENSREG) on 22-26 April 2013 in Brussels, as a follow-up of the stress tests of the European nuclear power plants that were undertaken in the aftermath of the Fukushima Daiichi nuclear power plant accident on 11 March 2011.

In accordance with the action plan agreed by ENSREG after the completion of the stress tests, each participating country had been invited to submit a National Action Plan in response to the findings of the stress tests, in order to describe the actions that were taken, planned or implemented to improve the safety of nuclear power plants operated in Europe and the schedule for these actions.

The ENSREG National Action Plan Workshop was held to conduct a peer review of the contents and status of implementation of the National Action Plans. The scope of the workshop focused on the topics of European Union (EU) stress tests (natural external hazards, loss of safety systems, design issues, and management of severe accidents). Sixty-eight experts from 21 EU member states, the European Commission, Switzerland and Ukraine, as well as 11 observers from three additional countries (Armenia, Canada and Taiwan) and the IAEA participated. The workshop supported the consistency of these plans, as well as promoted sharing of commendable practices, experiences and challenges within European countries.

Further information is available on the ENSREG website: www.ensreg.eu/news.

24th Plenary meeting of ENSREG – 28 May 2013, Luxembourg

At its 24th plenary meeting, ENSREG approved the summary report resulting from the National Action Plan Workshop held on 22-26 April 2013 and endorsed a follow-up peer review in 2015. ENSREG had also held a preliminary discussion on the European Nuclear Energy Forum's proposal on EU-wide design pre-licensing measures and considered that further detailed consideration of this issue would be required. Lastly, ENSREG exchanged views on its draft third report on its activities and approved it for transmission to the Council of the European Union and the European Parliament.

Further information is available on the ENSREG website: www.ensreg.eu/news.

8th Plenary meeting of the European Nuclear Energy Forum (ENEF), 30-31 May 2013, Prague

The 8th Plenary meeting of ENEF took place in Prague on the 30 and 31 May 2013. About 250 high-ranking participants discussed the competitiveness of nuclear energy in the framework of the global energy system and how this might evolve in the period 2030-2050 from the perspective of a low carbon economy. Mitigation of risks was also discussed, in particular, concrete developments related to the nuclear safety and waste management at EU level. The need for more transparent communication was highlighted with a particular emphasis on the need to develop an understanding of global energy system effects.

In the context of the economic crisis, the forum underlined the importance of affordable and reliable energy in addition to the sustainability dimension. The European Commission was asked to develop a framework providing coherence for longer term energy policy at EU level, while respecting member states' freedom of choice in selecting an energy mix.

The next plenary ENEF meeting will be held in Bratislava in 2014.

Further information is available on the Europa Energy website at: http://ec.europa.eu/energy/nuclear/forum/forum_en.htm.

Nuclear Safety in Europe, 2nd Regulatory Conference, 11-12 June 2013, Brussels

The 2nd Conference of ENSREG on Nuclear Safety provided an overview of the main initiatives and actions carried out by ENSREG after the Fukushima Daiichi accident and discussed forthcoming challenges for nuclear safety in Europe. Almost 350 participants, including national regulators, non-governmental organisations, licensees, utilities and academics took part in the discussion sessions during the event.

The key themes and messages emerging from the presentations and discussions covered:

Independence, with the need to demonstrate to the public how the regulators implement safety reference levels;

Transparency, with the need to improved access to information for the public and to achieve better transparency, e.g. explanation of information and safety assessments;

Peer review, which gives added value to improving nuclear safety by sharing findings;

Co-operation, with the need for improved co-operation among safety authorities and improved levels of harmonisation, e.g. the new project on emergency preparedness and response.

Further information is available on the ENSREG website at: www.ensreg.eu/ensreg-conferences.

Nuclear Transparency Watch (NTW) initiated in European Parliament on 7 November 2013

Nuclear Transparency Watch (NTW), a European-wide network of civil society bodies, was launched after the General Assembly held on 7 November 2013 at the European Parliament in Brussels. The objective of NTW is to enhance the level of civil society vigilance and public participation in nuclear-related decision-making processes, such as siting and life extension decisions, waste management, and emergency preparedness and response.

NTW focuses on transparency as a means to guarantee safety and the protection of human health and the environment, and it has set European convergence on the highest standards of nuclear safety as the goal for itself. As a first step, a working group has been established to address emergency preparedness and response. Its task is to carry out an evaluation of the existing European and national emergency preparedness and response provisions and to produce a report by mid-2014.

NTW emerged from a five-year process entitled "ACN" ("Aarhus Convention and Nuclear") initiated by ANCCLI (Association nationale des Comités et Commissions locales d'information – a French federation of Local Commissions of Information),

during which a series of national and European roundtables were convened¹. The process was supported by the Directorate-General for Energy of the European Commission, the European Economic and Social Committee, and the European Nuclear Energy Forum, and took place in the context of the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention), which has been ratified by all participating countries and the EU.

The countries participating in NTW through civil society organisations and elected representatives, including members of the European Parliament, are so far: Belgium, Bulgaria, Czech Republic, France, Germany, Hungary, Ireland, Luxembourg, Ukraine, Sweden and Slovenia.

For more information on NTW, including a press release containing the list of its management board members and founding members, see: www.anccli.fr/Europe-International/Nuclear-Transparency-Watch-english-version.

International Nuclear Law Association Congress

The International Nuclear Law Association (INLA) is organising its next biennial congress in Buenos Aires, Argentina, from 20-23 October 2014. Among the topics which will be addressed are the following:

- nuclear safety and regulation;
- environmental protection;
- radiological protection;
- radioactive waste management and decommissioning;
- transport of nuclear material;
- radioactive sources management;
- nuclear liability and insurance;
- non-proliferation;
- nuclear security;
- legal issues relating to nuclear energy, including new construction and refurbishment;
- international nuclear trade.

While most presentations will be delivered in English, interpretation in Spanish will be provided. INLA has issued an initial call for contributions to the congress and interested persons are invited to submit abstracts for proposed papers before 15 January 2014. Submissions must be sent to the Secretariat of INLA: brigitte@aidn-inla.be. More generally, requests for further information on the congress must be referred to the same address.

An INLA Prize competition for studies devoted to nuclear law is also organised on the occasion of the congress; Information can be found on the INLA website: www.aidn-inla.be/.

1. For more information on the ACN process and ANCCLI, see: www.anccli.fr/EuropeInternational/ACN-Convention-d-Aarhus-et-nucleaire-Aarhus-Convention-Nuclear.

The purpose of the International Nuclear Law Association, a private association which was created some 40 years ago, is to promote the study of legal issues associated with the peaceful use of nuclear energy and to encourage the exchange of information and education in this domain. INLA membership now exceeds 600 people.

Next session of the World Nuclear University Summer Institute 5 July-16 August 2014

The World Nuclear University (WNU) is a partnership, which was created in 2003 on the 50th anniversary of US President Dwight D. Eisenhower's "Atoms for Peace" initiative. The UN Commission on Sustainable Development recognised the WNU as a "Partnership for Sustainable Development".

The Summer Institute is an annual intensive six-week programme for potential leaders. The next session will be held between 5 July and 16 August 2014 at Christ Church, a leading college of the Oxford University, United Kingdom. The application deadline is 31 January 2014.

The WNU is a not-for-profit organisation, which runs a series of training programmes throughout the world under the mission to enhance international education and leadership in peaceful applications of nuclear science and technology. The programmes include nuclear law and regulatory aspects and emphasise nuclear safety, security and non-proliferation aspects. WNU has as founding supporters the OECD/NEA, the International Atomic Energy Agency (IAEA), the World Nuclear Association (WNA), and the World Association of Nuclear Operators (WANO). The WNU Coordinating Centre is in London, with administrative support from the WNA. Over 2 300 nuclear professionals from more than 60 countries have participated in WNU programmes until now.

The WNU also offers short courses, such as the School on Radiation Technologies, a two-week programme aimed at future leaders in the radiation and radioisotope field, and Key Topics in the World Nuclear Industry Today, which is a 3 to 5 day programme, tailored for local country needs, to enhance nuclear knowledge, while encouraging an expansive view of where nuclear is likely to go in the future.

During the training courses, participants enjoy the opportunity to develop a worldwide network of contacts of unique value to their current and long-term careers. For an in-depth insight into the WNU programmes, please visit: www.world-nuclear-university.org.

Recent publications

The Law of Nuclear Energy (2013) by Helen Cook¹

The Law of Nuclear Energy is a three-part volume, which is designed to provide an overview of international and national nuclear energy law in a practical context. The book develops certain themes throughout its contents, such as the benefits of enhanced global nuclear co-operation in all areas, implementation of lessons learnt from the Fukushima accident and the need to develop solutions for subjects, such as nuclear liability, nuclear waste and human resource requirements. The book also considers the commercial challenges involved in the construction of new nuclear power plants, including the sourcing of financing, and the ways in which legal mechanisms can be usefully employed to manage nuclear project risks.

Part one covers the legal and regulatory framework for a nuclear power programme. It describes the most relevant international treaties and conventions in the nuclear sphere and the ways in which the primary obligations can be implemented by states in national nuclear law. The chapter dedicated to national nuclear law considers the International Atomic Energy Agency's *Handbook on Nuclear Law, Implementing Legislation*, particularly in the context of drafting a new nuclear law for a country that is embarking on a nuclear power programme for the first time. Nuclear regulation is primarily considered in relation to nuclear new build and the licensing of new nuclear power plants, as a precursor to part two of the book.

Part two of the book is dedicated to the construction of new nuclear power plants. This part commences with a chapter considering preparedness for nuclear new build and then a separate chapter on the procurement process for a nuclear power plant. The chapter on the construction phase presents different contracting mechanisms, including engineering, procurement and construction (EPC) contracting, and provides a discussion of the primary contractual provisions in a nuclear power plant construction contract. The financing of new nuclear power plants is addressed, primarily from the perspective of identifying and mitigating the primary project risks associated with nuclear power projects.

Finally, part three discusses subjects of importance for the future of nuclear law, such as post-Fukushima lessons learnt, technological advances, human resource shortages and subjects of continued international concern, such as nuclear non-proliferation and nuclear liability. Part three includes a chapter dedicated to small modular nuclear reactors ("SMRs") and identifies some of the particular benefits and challenges presented by SMRs.

The author is an attorney in the nuclear energy group at the law firm Pillsbury Winthrop Shaw Pittman. Now based in Washington DC, Helen Cook also brings the perspective of four years working on energy and infrastructure projects in the Middle East, including working on the new nuclear programmes of emerging nuclear countries. Since joining the Pillsbury firm, the author has worked closely with the book's editor, George Borovas, Partner and Head of Pillsbury's International Nuclear Projects Team.

1. Cook, H. (2013), *The Law of Nuclear Energy*, Sweet & Maxwell, London, 648 pages, ISBN: 978-0-414-02315-4. It is available only in English.

Droit public et nucléaire (2013) by Olivier Guézou and Stéphane Manson

*Droit public et nucléaire*² is the outcome of the collaboration of 22 researchers, academics and practitioners under the direction of Olivier Guézou and Stéphane Manson of the Centre de recherche VIP de l'Université de Versailles - Saint-Quentin.

The idea for undertaking this study came about from the nuclear accident at the Fukushima Daiichi nuclear power plant. The aim of the project was to contribute to a better understanding of legal issues involved in the nuclear field with a public law study. The contributors have sought to present these issues in a manner as balanced as possible.

The first section of the book, roughly translated as “Collision: nuclear in public law”, covers both the “actors” and “sources” relevant to nuclear activity. In this context, the means deployed, the objectives pursued and even the very nature of nuclear activity and that of public law respond quite well to each other. At its conclusion, it appears public law and nuclear activity join mutual drives to enrichment and reinforcement, in effect accomplishing the fusion of both.

However, the second section of the book – “Reaction: the public law of nuclear” – reveals certain complexities in the relationship between public law and nuclear activity. Public law establishes the framework and limits within which nuclear activity must operate. To this end, public law adapts not only to scientific and technical aspects of nuclear activity but to political and economic peculiarities as well. Public law, therefore, does more than just regulate activity, it establishes regulatory mechanisms and authorities as well. In the nuclear field, national, European and international administrative authorities are numerous and significant, even if administrative courts obviously still have a role to play. In this respect, the meeting of public law and nuclear activity leads to a divergence or fission of different components that remain in tension with each other.

2. Guézou, O. and Manson, S. (2013), *Droit public et nucléaire*, Bruylant, Brussels, 306 pages, ISBN: 978-2-8027-4051-3. It is available only in French.

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