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ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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FOREWORD

This edition of the *Nuclear Law Bulletin* is the first one in 10 years to have been produced without the dedicated involvement of one of its best editors, Ms. Fiona Geoffroy. As many of our readers know, Ms. Geoffroy left the OECD Nuclear Energy Agency last May to pursue her career with the nuclear industrial sector. The value of her contribution to the *Bulletin* during her tenure here cannot be overestimated and I take this opportunity, on behalf of the NLB Editorial Team, to publicly acknowledge that contribution, to express our sincerest thanks for her past efforts and to extend to her our best wishes for the future.

I would also like to take this opportunity to warmly welcome Ms. Selma Kuş to the NLB Editorial Team and convey my appreciation of her efforts to ensure that NLB 80 maintains the high standards established by her predecessors for earlier editions.

Julia Schwartz
Head of OECD/NEA Legal Affairs

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by Gunther Kühne*

I. The German Political Situation Regarding Nuclear Waste Repositories

The installation of final repositories for nuclear waste has been a most controversial topic on the German political agenda for decades. The beginning of efforts to solve this problem can be traced back to the 1970s when plans for the establishment of an Integrated Nuclear Waste Disposal Centre (*Integriertes Entsorgungszentrum*) in the State of Lower Saxony were developed. It was in this context that in 1976,[1] the Atomic Energy Act (AEA) of 1959[2] (the 2002 consolidated text is reproduced in Supplement to *Nuclear Law Bulletin* No. 70) was amended by inserting Section 9a, paragraph 3, sentence 1, which reads very succinctly: "The Federation shall establish installations for the safekeeping and final disposal of radioactive waste." Despite the subsequent AEA amendments of Section 9a, paragraph 3 and the addition of a paragraph 4 (1998)[3] that were to allow the Federation to transfer the exercise of its functions to third parties, these administrative provisions were never used. Accordingly, full responsibility of the Federation for the fulfilment of its obligation under Section 9a, paragraph 3 of the AEA remains intact today.

As is commonly known, in June 2001 the red-green federal government entered into an agreement with the four main electric utility companies, and at the same time nuclear power producers, on the phase-out abandonment of nuclear power production. This agreement was incorporated in toto into the 2002 amendment to the AEA.[4] Apart from a ban on the construction of new nuclear power plants, the amendment provides for a phase-out schedule for the (then) existing

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1. Federal Law Gazette 1976, Part I, p. 2573.

2. Federal Law Gazette 1959, Part I, p. 814 (original version).

3. Federal Law Gazette 1998, Part I, p. 694. See the Report in *Nuclear Law Bulletin* No. 61 (June 1998), p. 74.

4. Federal Law Gazette 2002, Part I, p. 1351.

19 nuclear power plants.[5] The future of waste repositories in Germany is also an element of the agreement. Despite the fact that a repository was already needed for those 19 operating nuclear power plants, the agreement that dealt with the Konrad and Gorleben repository projects had a delaying effect, especially upon the Gorleben project.

The future of the exploration and construction of nuclear waste repositories plays an important and crucial role in the present coalition government of Christian and Social Democrats that came into office in the fall of 2005. As is the case for nuclear policy as a whole, Christian Democrats and Social Democrats are deeply divided over the government's future orientation for nuclear waste repositories. The former advocate a moderate departure from the phase-out policies of the red-green coalition allowing, in particular, for extended life cycles of existing facilities, whereas the latter remain adamant on abiding by the nuclear policies adopted within the previous coalition. It is, therefore, no surprise that in the matter of general nuclear policy the coalition agreement of 2005 abides by the *status quo*, that is, the decisions of the previous government. In the area of final repositories, however, the coalition agreement is more dynamic; the question of final repositories is to be tackled "in a speedy and result-oriented manner".[6]

In order to give a more concrete picture of the present situation, an overview of the status of the three existing repository sites is appropriate.

II. The Status of the Existing Repository Sites

At present, there are three existing installations/sites for nuclear waste repositories.

1. Morsleben

Before 1990, Morsleben in the State of Sachsen-Anhalt, was the nuclear waste storage site in operation in the German Democratic Republic. After reunification in 1990, Morsleben, by way of transitional legislation, was transferred into the West-German nuclear licensing regime and operated as the only existing German final repository for low and medium level radioactive waste. In 1998, storage of new waste at that facility was discontinued for factual and legal reasons. Planning preparations for the issuance of a decommissioning licence are under way, but such a licence is not expected to be issued before 2011.

2. Gorleben

Gorleben, located in the State of Lower Saxony, is the site of a salt dome which is under exploration, according to procedures prescribed in the Federal Mining Law (*Bundesberggesetz* – FMA), as an eventual repository for high-level radioactive waste. Two shafts have been sunk into the dome and underground galleries have been constructed with costs as high as roughly 700 million euros (EUR). The agreement between the federal government and the utilities, initialled in 2000 and signed

5. See the text in Supplement to *Nuclear Law Bulletin* No. 70; for a discussion of the amendment see A. Vorwerk, "The 2002 Amendment to the German Atomic Energy Act Concerning the Phase-out of Nuclear Power", *Nuclear Law Bulletin* No. 69, p. 7 *et seq*.

6. See Section I.5.1. of the Coalition Agreement between CDU and SPD of 11 November 2005, www.bundesregierung.de.

in 2001 (see *Nuclear Law Bulletin* No. 66),[7] decreed an exploration moratorium of at least 3, and not more than 10 years, in order to allow for investigation into conceptual and safety issues. Exploration activities were suspended accordingly in 2000. Whether and when to resume exploration activities is one of the thorniest controversies the present government faces in the field of nuclear policy.[8]

3. Konrad

The Konrad ore mine, also located in the State of Lower Saxony, is the site under preparation for a final repository for low and medium level radioactive waste. Konrad comes closest to becoming Germany's first long-term final repository for radioactive waste. The way leading to this pole position has been long and arduous. As is the case in many other instances of realising industrial projects, judicial proceedings have played a key role in determining the fate of this project.[9]

III. The Konrad Adjudication Process

1. History

The Konrad mine is an old iron ore mine that was closed in 1976. Between 1976 and 1982, the mine was explored with regard to its suitability as a final repository for low and medium level radioactive waste with negligible heat. The application for a licence to establish the repository was filed in 1982. The administrative and judicial proceedings concerning Konrad were not, like in the case of Gorleben, significantly hampered or delayed by the 2001 Agreement on the Phase-out of Nuclear Power. On the contrary, it was agreed that administrative proceedings should continue according to the pertinent provisions. After the issuance of the licence (plan approval notice) in 2002 by the Lower Saxonian Authority, its legality was challenged by individual persons and several municipalities. The applicant, through the 2001 Agreement, was committed to withdraw an application for immediate enforcement (*Sofortvollzug*) of the licence in order to leave room for a substantive judicial review. The Higher Administrative Court of Lower Saxony (*Oberverwaltungsgericht*), in several judgements of 8 March 2006,[10] upheld the licence. In addition, the Higher Court denied the right to appeal to the Federal Administrative Court (*Bundesverwaltungsgericht*). The unsuccessful plaintiffs filed complaints against denial of leave to appeal – complaints that were decided upon by the Federal Administrative Court on 26 March 2007.[11] The court rejected the complaints in their entirety.

2. Basic Statutory Foundations

The decisions, handed down by the Lower Saxonian Higher Administrative Court and the Federal Administrative Court, constitute the first judicial analysis of the statutory provisions dealing

7. See *supra* No. 4.

8. See *infra* IV.

9. There also exists a fourth repository site: the decommissioned salt mine *Asse II*, which was opened in 1965 as an experimental repository. It was licensed under mining law. There are problems with the influx of water. The facility is presently prepared for closure under mining law provisions. There is public pressure to close the mine under nuclear law mainly because of enhanced public participation rules.

10. See the brief review of the court's reasoning in *Nuclear Law Bulletin* No. 77, p. 42.

11. See the short notice in *Nuclear Law Bulletin* No. 79, p. 57.

with the construction and operation of a final nuclear waste repository. The pertinent provision is Section 9b of the AEA. Under its paragraph 1, sentence 1, the construction and operation of the federal installations referred to in Section 9a, paragraph 3 of the AEA, that is, the final nuclear waste repositories, are subject to a plan approval procedure which, in essence, is a highly sophisticated and voluminous administrative licensing procedure specially designed to fit the requirements of complex infrastructural projects.

According to Section 9b, paragraph 4, sentence 1 of the AEA, the plan approval notice may only be issued if the requirements referred to in Section 7, paragraph 2, Nos. 1-3 and 5 have been complied with. Among those requirements imposed for the licensing of nuclear installations generally, No. 3 (necessary precautions in light of the state of the art in science and technology to prevent damage resulting from the construction and operation of the installation) and No. 5 (necessary protection against disruptive action or other interference by third parties) deserve special attention. In addition, under Section 9b, paragraph 4, sentence 2, the plan approval notice may not be issued if the construction or operation of the proposed installation suggests that the common welfare will be impaired and that such impairment cannot be prevented by collateral restrictions and obligations (No. 1), or if the construction or operation of the installation conflicts with other provisions of public law, in particular with respect to the environmental impact of the installation (No. 2). As a result of applicable transitional rules, the Konrad project did not require a formal environmental impact assessment because the application was lodged as early as 1982. For further detailed provisions of the plan approval procedure, Section 9b, paragraph 5, refers to the general rules that apply to plan approval procedures under the Federal Administrative Procedure Act (*Verwaltungsverfahrensgesetz*). This reference to the general rules of the plan approval procedure has sometimes invited erroneous conclusions to the effect that specific aspects of the plan approval procedure under Section 9b of the AEA were neglected and even overlooked.

3. The Character of the 2006 and 2007 Judgements

While analysing and evaluating the judgements of 2006 and 2007, one has to bear in mind the different functions they have to fulfil. The 2006 judgements of the Higher Court constitute decisions on appeals against the 2002 Plan Approval Notice. Their function was to comprehensively review the legality of the 2002 Notice. Accordingly, the Higher Administrative Court deals with all issues raised as to their substantive merits. The court discusses the respective arguments in an extremely thorough way and abundantly takes into account what has been written in legal literature.[12] On the other hand, the 2007 decision was much more limited in its function. The Federal Administrative Court or Supreme Administrative Court only had to review the legality of the lower court's decision not to grant further appeal. The 2007 decisions, consequently, are of a much more procedural character with frequent reference to the court's own established practice in comparable issues and with limited substantive argumentation. This all the more so as the 2007 court confirms the legality of the lower court's denial of leave to appeal.

The short summary of the 2006 judgements published in the *Nuclear Law Bulletin* No. 77, p. 42, already covers the main arguments and issues dealt with in the 2006 decisions. They encompass a wide range of problems. The 2002 Plan Approval Notice was attacked on various grounds, such as the lack of constitutionality of the basic provision of Section 9b of the AEA for not explicitly mentioning the concept of irretrievable final storage (alleged violation of the principle of legislative or

12. See G. Gaentzsch, Struktur und Probleme des atomrechtlichen Planfeststellungsverfahrens, in: F. Ossenbühl (ed.), *Deutscher Atomrechtstag* 2004, 2005, *Nomos-Verlag*, p. 115 *et seq.*; S. de Witt, *ibid.*, p. 125 *et seq.*

parliamentary reservation), lack of planning necessity for the project, lack of balancing essential factors such as alternative sites within the administrative procedure which is supposed to inherently require such balancing as an element of planning, insufficient regard for radiation exposure from the repository and transport risks, insufficient protection against airplane crashes in connection with a terrorist act or, finally, insufficient regard for long-term safety aspects.

These grounds popped up again in the 2007 proceedings. The Federal Administrative Court[13] dealt with them from a procedural angle: did the lower court deviate from a supreme court decision? Is the ground relevant to the case at hand? Did the plaintiff have standing? The 2007 decisions very rarely argue in substance. In this respect, the 2006 judgements rendered by the Higher Administrative Court remain uneclipsed as the principal judicial source of argument with regard to licensing of final nuclear waste repositories under German law.

Taking this into account, the present article will briefly address three aspects of the courts' reasoning: the legal character of the plan approval notice (act of discretion or strict execution of laws), the necessity of planning and safety aspects.

4. The Legal Character of the Plan Approval Notice (Act of Discretion or Strict Execution of Laws)

The Higher Court decisions deal extensively with the basic question of the legal character of the plan approval notice.[14] This issue may sound somewhat abstract on first impression, but it is closely connected to the very practical problem always appearing in site approval proceedings, namely, whether the competent authority has to examine the site in question in the light of alternative sites that may be equally or even more suitable.

Indeed, it is generally recognised by permanent judicial practice and legal scholars as a general feature of plan approval proceedings that the competent authority enjoys planning discretion and is under an obligation to use these discretionary powers properly.[15] An essential part of the proper use of discretion is the comprehensive composition of all factual elements relevant to the weighting process which is relevant to the decision-making process in planning matters. Identification and consideration of potential alternatives to the execution of a project are part of this process. During the proceedings in the Higher Court and in the Federal Administrative Court, the plaintiffs had pleaded that alternative sites had not been considered, which was true. Consequently, this procedural argument could only be dismissed if, for legal reasons, a consideration of alternative sites was not required in this particular case; in other words, the authority did not enjoy discretion in this kind of plan approval proceedings.

In its 2006 judgements, the Higher Court argued at length, and rightly so, that within the plan approval proceedings under Section 9b of the AEA, the authority does *not* enjoy planning discretion. This legal position had already grained ground in legal literature during recent years.[16] The argument was that the very wording of Section 9b shows that Parliament did not want to grant planning discretion to the competent authority: the section, in order to define the prerequisites of a plan

13. The decisions handed down by the Federal Administrative Court (BVerwG) are published in German in: *Neue Zeitschrift für Verwaltungsrecht* (NVwZ) 2007, p. 833 *et seq*.

14. The German expression is: "*Planfeststellungsbeschluss*".

15. See, for example, Decision of the Federal Administrative Court (*Bundesverwaltungsgericht* – BVerwG) vol. 97, 43 concerning plan approval proceedings with regard to waste management.

16. See G. Gaentzsch and S. de Witt, *supra*, at No. 12.

approval notice, simply refers to the catalogue of statutory requirements under Section 7, paragraph 2 necessary for the issuance of a licence to construct and operate nuclear installations where planning discretion undoubtedly does not apply. In the text of Section 9b, there is no clue to be found that the legislature intended to open up the decision-making process for planning discretion. It obviously wanted to structure this process as a normal licensing process based upon the execution of statutory norms.

But then, why did the legislature choose the plan approval proceedings as the applicable procedural tool? Most probably, the idea was to select the plan approval proceedings for two other features typical of these kinds of proceedings: extended public participation and the so-called "concentration effect" (*Konzentrationswirkung*). The latter means that all public interests relevant to and involved in a project, as well as the pertinent legal materials, are merged into the one plan approval proceedings, thereby replacing all separate licensing requirements. It is because of these two specific features, and not because of the other characteristics, let alone planning discretion, that Parliament subjected the construction and operation of final repositories for nuclear waste to plan approval proceedings.

In this context, the Higher Court refers to another situation of a similar kind: the plan approval proceedings for mining projects under the Federal Mining Act (*Bundesberggesetz* – FMA). Section 52, paragraph 2a of that Act also provides for plan approval proceedings for the licensing of mining projects with a major environmental impact. Generally, mining projects are licensed according to regular licensing proceedings with very little public participation and no concentration effect. It was the elements of enhanced public participation and the concentration effect that prompted the legislature to subject mining projects of a major environmental dimension to the plan approval proceedings.[17] The Higher Court, therefore, was right in establishing this parallel between nuclear law plan approval proceedings and mining law plan approval proceedings.

In a recent opinion, the Federal Administrative Court underlined the similarity between nuclear law and mining law in this respect, and it had good reason to do so; in December 2006, the same division that rendered the Konrad decision in March 2007, had handed down two leading opinions concerning plan approval notices for a large underground colliery.[18] In these opinions, the Federal Administrative Court had qualified the plan approval notice under mining law as an administrative act of a strict executive character without any discretionary power for the authority. Both nuclear waste repositories and mining projects have one aspect in common: their site dependency. In addition, the construction of a waste repository and the exploitation of a mineral deposit are both preceded by large-scale exploratory activities involving quite substantial financial investments. In mining law, it is self-evident that the application for a licence to exploit a mineral deposit cannot be denied on the ground that there may possibly be alternative deposits that are more economic to mine. This is also applicable to final waste repositories. As long as the site selected is suitable, it would make no sense to look for alternative sites in question.

Licensing procedures under mining law and under nuclear law, however, show one small difference. While licences in mining law are issued in strict application of statutory requirements, in nuclear law**,** courts and legal literature have always conceded a residual discretion to deny a licence for exceptional situations such as the existence of unknown risks connected to a certain nuclear

17. See G. Kühne, Obligatorische Rahmenbetriebsplanzulassung im Bergrecht und ihre Wirkungen, in: *Deutsches Verwaltungsblatt* (DVBl.) 2006, p. 662 *et seq*.

18. Decisions of 15 December 2006, 7C 1/06 and 7C 6/06, published in: *Neue Zeitschrift für Verwaltungsrecht* (NVwZ) 2007, p. 700 *et seq*., 704 *et seq*.

technology.[19] This exceptional situation does not apply here; even less so in light of the urgency to have an operative final repository to cope with waste that is certain to require treatment in the coming decades.

5. Necessity of Planning

Under the general law of plan approval procedure, it is recognised that projects concerning spatially relevant industrial objects which can have an expropriation effect on third parties may only be approved if there is a need, that is, a demand, for such a project. The judgements of the Higher Court discuss at length the question whether the Konrad project may have such an expropriation effect and whether, in that case, there is a sufficient statutory basis under nuclear and mining law for administrative decisions involving expropriations.[20] The 2006 judgement denies such exproprietory effects of the Konrad project but discusses the element of necessity in the event that there are expropriation effects connected to the realisation of the project.

The Higher Court's primary argument is Section 9a, paragraph 3, sentence 1 of the AEA, according to which the Federal Republic is under an obligation to install facilities serving as final repositories for nuclear waste. This statutory obligation in itself means that the legislature foresees such a demand. The statutory foundation of this obligation is not deficient because of its being unrelated to specific quantities of nuclear waste. In 1976, it could not have been expected that the legislature would foresee future demands in their quantitative dimensions. Incidentally, it is for the competent authorities to issue predictions of future demand for nuclear waste disposal capacities. The court rightly underlines the need to accept a considerable margin of prognosis for the authority in this respect. That is why the probable reduction of nuclear waste as a result of the abandonment policy under the red-green coalition Government (1998-2005) does not invalidate the prognostic basis for the Konrad repository.

There is, however, one element of insecurity in the demand that was caused by the policy shift of the former government. After 1998, the red-green coalition Government changed the basic concept of nuclear waste disposal. Until 1998, it was clear that two final repositories would be required in the future: one for low and medium level radioactive waste (Konrad) and another for high-level radioactive waste (Gorleben). The new Government, after 1998, overturned this concept in favour of a "single repository" policy. Since the Konrad repository is unsuitable for high-level radioactive waste and since the new federal Government had doubts about the suitability of the Gorleben site, the latter established a "Final Repository Working Group" (*Arbeitskreis Endlagerung*) with the mission to develop procedural criteria for the selection of sites to be explored as to their suitability to become the single repository. The Working Group published its final report in 2002.[21] In the Konrad litigation, the plaintiffs had contested the necessity of Konrad by invoking the "single repository" concept (*Ein-*

19. See Decision of the Federal Constitutional Court in BVerfGE 49, p. 89 (144) with extensive review of legislative history.

20. The Amendment to the AEA of 6 April 1998 (Federal Law Gazette 1998, Part. I, p. 694, see *Nuclear Law Bulletin* No. 61), had inserted provisions (Sections 9d-9g) for expropriation in connection with the exploration or construction of repositories. These provisions were abolished in the 2002 amendment. Possible bases for expropriation may be found in the Federal Mining Act, but it is unclear to what extent they apply; see decision of the Federal Administrative Court in the Gorleben II-case (Decision of 2 November 1995, BVerwGE 100, p. 1 *et seq*., 14).

21. Report of the working group (*AkEnd-Arbeitskreis Auswahlverfahren Endlagerstandorte*) – Forum, Edition 2/2002.

Endlager-Konzept). The 2006 Higher Court decision dismissed the argument by pointing out that even under the "single repository" strategy and in light of the uncertainties surrounding the future of the Gorleben site, an alternative repository would be operative only several decades later and, therefore, too late. The Federal Administrative Court, in its 2007 decision, did not take exception to the Higher Court's reasoning.

6. Safety Aspects

Both the 2006 and 2007 decisions deal with safety aspects in a broader sense and under different categories. The final result of both courts is that the Konrad repository does not encounter safety obstacles.

a) Principle of best possible danger prevention (Section 7, paragraph 2, No. 3 of the AEA)

This standard, in order to allow the issuance of nuclear licences under Section 7, paragraph 2, requires that, in light of the state of the art in science and technology, it appears practically impossible that the installation will cause damage to life, health and property of third parties. In order to determine whether this requirement is met, the authority is under an obligation to investigate even improbable causes and risks, and to evaluate these in keeping with the standards of science. The duty to take risk precautions ends only where dangers and risks are "practically non-existent". The threshold to the remaining residual risk which has to be borne by the public at large is determined by the standard of "practical reason".[22]

Courts can review such administrative decisions only as to whether the competent authority has observed proper methodological standards, in particular the postulate of a comprehensive ascertainment of all relevant facts. When evaluating court decisions concerning Section 7, paragraph 2, No. 3, one has to bear in mind that, in particular for purposes of determining whether third parties have standing to sue, courts distinguish between the realm of preventing danger to third parties (*Gefahrenabwehr*) and the realm of averting risks beyond the strict prevention of danger (*gefahrenunabhängige Risikovorsorge*). The duty to avert risks beyond the strict prevention of danger aims at risks which do not yet constitute a danger but have the potential of becoming one in the future. In the danger area standing to sue is accepted whereas in the risk area third parties are denied standing to sue.[23] This explains why the 2006 and the 2007 decisions could avoid discussing at length the substance of some arguments raised by the plaintiffs.

This distinction also applies to the aspect of exposure to radiation: statutory radiation limits are part of the "danger area". Beyond this there is the general statutory obligation to minimise radiation as belonging to the area of "risk aversion" in which individuals have no standing. The same is true of the aspect of long-term safety (100 000 years and beyond). Both courts rejected safety objections raised by the plaintiffs on either one or other of the two grounds.

In some instances, the plaintiffs' arguments were dismissed for factual insignificance. This was the case for their argument that the repository would be unsafe in case of an (accidental) plane crash

22. See Decisions of the Federal Constitutional Court, BVerfGE 49, 89, 143, and the Federal Administrative Court, BVerwGE 104, 36, 51.

23. See Decision of the Federal Administrative Court, BVerwGE 61, 256, 267.

into the facility. The courts dismissed that argument in view of the extremely low probability of such an incident.

During judicial proceedings, the plaintiffs had also invoked the dangers and risks related to the transport of nuclear material to the repository. The courts dismissed those arguments because transport to the site was not part of the project under examination. The transport of nuclear material requires a separate licence under the AEA.[24]

b) Necessary protection against disruptive action or other interference by third parties (Section 7, paragraph 2, No. 5 of the AEA)

According to Section 7, paragraph 2, No. 5, a licence may only be granted if the necessary protection has been provided against disruptive action or other interference by third parties.

Both the 2006 and the 2007 decisions, under this rubric, discuss at length the hypothetical situation – not so theoretical after 11 September 2001 – of a terrorist attack involving an intentional plane crash into the facility. Legal debate in this respect has been controversial.[25] The Higher Court argues that the term "disruptive action" cannot be interpreted as to encompass sources of disruption that – similar to war activities – are completely beyond control of the operator. Moreover, such disruptive action cannot be averted factually by the operator. This is beyond his technical possibilities. It is true that the Federal Administrative Court, in an earlier decision, had ruled that the operator is under an obligation to take precautionary measures against individuals from outside intruding into premises where nuclear facilities are located.[26] At the same time, however, the court said that the prevention of dangers and risks resulting from the general political situation or from a general trend in society towards a certain kind of criminal activity is a public duty to be typically fulfilled by police functions.[27]

Even assuming that averting such risks falls within the ambit of the AEA, the plaintiffs would not have standing to attack the plan approval notice on that ground. The reason is that taking such precautionary measures would involve complex intelligence investigation and political assessment with a high degree of prognostic elements which can only be realised by authorities in pursuit of the general public interest. The 2006 Court therefore denied standing to individual persons in this respect. The Federal Administrative Court saw no procedural need to invalidate that reasoning.

7. Other Areas of Law

The preceding review of the essential elements of the Konrad decisions of the Higher Court (2006) and the Federal Administrative Court (2007) might convey the impression that this exhausts the list of legal problems connected with final repositories. Such an inference, however, would be wrong.

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24. See Section. 4, paragraph 1, sentence 1 and Section 16, paragraph 1, sentence 1 of the AEA.

25. See, for example, F. Ossenbühl, Terroristische Angriffe auf Kernkraftwerke – aus rechtlicher Sicht, in: *Neue Zeitschrift für Verwaltungsrecht 2002*, p. 290 *et seq*. (AEA not applicable); H. J. Koch/M. John, Atomrechtliche Fragen der Sicherheit und Sicherung von Kernkraftwerken nach den Terroranschlägen vom 11. September in den USA, in: *Deutsches Verwaltungsblatt* (DVBl.) 2002, p. 1578 *et seq*. (AEA applicable).

26. Decision of the Federal Administrative Court, BVerwGE 81, 185.

27. Decision of the Federal Administrative Court, *supra* No. 26, 188.

A subject other than nuclear law that is of particular importance is mining law. As explained above, the legislature, in Section 9b, paragraph 1 of the AEA chose the plan approval proceedings because it wanted the plan approval notice to exercise the so-called concentration effect. But Section 9b, paragraph 5, No. 3 makes one exception to this effect in favour of mining law. This means that final repositories are subject not only to licensing requirements under nuclear law but also to licensing requirements under the Federal Mining Act (*Bundesberggesetz* – FMA). This, consequently, also applies to Konrad. As a result of the specific character of mining operations (especially their spatially dynamic character), the FMA requires a staged licensing system of operations plan procedures with normally the skeleton operations plan (*Rahmenbetriebsplan*) as the initial licence. Under mining law, skeleton operation plan proceedings for nuclear waste repositories also have to be conducted as plan approval proceedings.[28] It is not quite clear how these two proceedings are to be co-ordinated. It is clear, however, that a duplication of identical proceedings has to be avoided. Section 57b, paragraph 3, sentence 2 of the FMA gives "priority" to Section 9b of the AEA. The meaning of "priority", however, is not beyond doubt. In the Konrad approval notice, the skeleton operations plan approval under mining law is a part of this notice. One could argue as well that the licence under mining law would have to be issued separately without the specific qualifications of a plan approval notice.[29] This may suffice as evidence that the law that relates to final repositories in general and to Konrad in particular holds in store many more legal delicacies.

IV. Konrad and its Impact on the Issue of Final Repositories in Germany

The Konrad decisions rendered by the Federal Administrative Court in March 2007 constitute the first court decisions with *res judicata* effect on the construction of a final repository for radioactive waste in Germany. This circumstance has not terminated the political controversy but has at least tempered passions. Legal skirmishes continue, however, because both the municipality of Salzgitter and an individual person have lodged constitutional complaints against the 2007 decisions with the Federal Constitutional Court.

On 30 May 2007, the Federal Ministry for the Environment (*Bundesumweltministerium* – BMU) instructed the Federal Office for Radiation Protection (*Bundesamt für Strahlenschutz*) to start preparations for establishing Konrad as a final repository. According to existing schedules, the facility could be operative by 2013. During this preparatory phase new legal issues may arise. The Plan Approval Notice was issued in 2002. In the meantime alterations and modifications of the project may turn out to be necessary in order to keep abreast with technical progress. For licensing purposes, Section 9b, paragraphs 1 and 2 of the AEA distinguish three categories of alterations: insubstantial ones (basically no new licensing procedure), substantial ones with no detrimental effects upon interests protected under environmental law (planning licence, a smaller version of the plan approval procedure) and substantial ones with such detrimental effects (plan approval procedure). In all

28. See Section 1, No. 7 of the "*Verordnung über die Umweltverträglichkeitsprüfung bergbaulicher Vorhaben* (UVP-V Bergbau)" ("Ordinance on the Environmental Impact Assessment of Mining Projects"), Federal Law Gazette 1990, Part I, p. 1420.

29. As to this problem, see more specifically G. Kühne, Genehmigung von Endlagern für radioactive Abfälle: Planerische Gestaltungsfreiheit oder Gesetzesvollzug?, in Norbert Pelzer (ed.), *Bausteine eines globalen Atomrechtsregimes* (Elements of a Global Nuclear Regime), *Tagungsbericht der* AIDN/INLA-*Regionaltagung* in Goslar 2006, 2007 p. 75 *et seq*., 86.

likelihood, the categorisation of future modifications within the context of Section 9b, paragraph 1, will give rise to both legal and political controversies.[30]

With Konrad being prepared to become a federal repository for low and medium level radioactive waste the "single repository" strategy pursued by the Federal Government since 1998 becomes obsolete. The centre of political and legal controversies in the field of final repositories will shift to the issue of selecting a suitable site for a repository for high-level radioactive waste. In this respect, differences between the political parties that form the present coalition appear to be irreconcilable. The Social Democrats insist upon a new round of exploration of the best-suitable site on the basis of a new statute to be enacted by Parliament which would contain procedural rules for such exploration activities. In this concept, Gorleben is reduced to being just one of the options. The Christian Democrats insist on accomplishing the Gorleben exploration and on looking for alternatives only if Gorleben should turn out to be unsuitable. It will be a thrilling experience to watch whether and how the present coalition will overcome this dilemma during the present legislative period.

V. Final Observation

The Konrad decisions signal a noticeable progress in the resolution of the dispute over final nuclear waste repositories. The very high quality of those decisions, especially of the 2006 Higher Court opinions, has shown some convincing strength and contributed to reducing the bias that traditionally characterises such debates in Germany. Politically, it has foiled the "single repository" concept. It remains to be hoped that the ongoing debate over the site for the high-level nuclear waste repository will also embark on a less biased course in the (near) future.

30. See the discussion by H. Näser, Konrad und kein Ende – alte und neue Rechtsprobleme, in Norbert Pelzer (ed.), *supra* No. 28, p. 91 *et seq*., 101 *et seq*.

Critical Reflections on the Treaty on the Non-Proliferation of Nuclear Weapons

by Quentin Michel*

The announcement by American President G.W. Bush and Indian Prime Minister Singh on 18 July 2005 of an agreement on civil nuclear co-operation marked a fundamental change in three decades of American policy on trade in nuclear equipment and applied technology which brooked no exceptions.

Following the detonation of a nuclear device in 1974, described as "peaceful" by the Indian authorities, the United States imposed a particularly restrictive policy on its trade, both domestically, with the Nuclear Non-Proliferation Act of 1978, and abroad, with the creation of the Nuclear Suppliers Group (NSG). This trade policy was presented as the only policy consistent with the non-proliferation principles set out in the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (NPT). Essentially, these principles meant a commitment by all States Parties not to transfer material, equipment or technology to any state unless the recipient state accepts in its territory the application of the so-called comprehensive system of safeguards. These safeguards, which are assumed contractually by the International Atomic Energy Agency (IAEA), seek to ensure, by regular on-site inspections, that all the state's nuclear facilities are used exclusively for peaceful purposes.

In addition to the application of the NPT, in 2003 the United States also put forward a proposal aimed at restricting trade in certain applications related to the processing of civil nuclear fuel. This proposal, presented by the American President in his speech of 11 September announcing new measures to reduce the threat of weapons of mass destruction, invited the 40 nations of the NSG to refuse to sell enrichment and reprocessing equipment and technologies to any state that does not already possess full-scale, functioning enrichment and reprocessing plants. More specifically, the American proposal consisted of limiting the transfer of facilities, equipment or technology for enrichment or reprocessing to only those states which, as of 1 December 2003, were parties to the NPT and possessed an enrichment or reprocessing facility, which had not been permanently shut down and which was subject to the IAEA safeguards. In other words, this would have had the effect of limiting trade to the five nuclear-weapon states within the meaning of the NPT (China, France, Russia, United Kingdom and United States), as regards reprocessing and enrichment, as well as Japan, and, for enrichment facilities only to Argentina, Brazil, Germany and the Netherlands.

Despite this background of constant reinforcement of the principles of non-proliferation, the announcement by the United States of potential collaboration in the field of civil nuclear applications with India, a state not party to the NPT, officially possessing nuclear weapons and not subject to a comprehensive system of safeguards, appeared to be a radical shift in the nuclear non-proliferation policy of the United States.

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The present contribution does not address the motives which led to the change of policy nor the domestic institutional process leading to the implementation of this agreement by the two states concerned, but focuses primarily on an analysis of certain commitments by the two states which impose conditions on the effective implementation of the co-operation agreement.

1. Commitments required for the implementation of the co-operation agreement

In a nutshell, the commitments entered into by the Indian authorities can be summarised as follows:

- identification and separation of its civil nuclear facilities from those facilities with a military purpose;
- conclusion of an agreement with the IAEA subjecting the identified civil facilities to a system of safeguards;
- maintenance and observance of a unilateral moratorium on nuclear tests;
- development of a national export control system in accordance with current international systems (NSG and MTCR);
- conclusion of a multilateral agreement to stop production of fissile material for military purposes (Fissile Material Cut-off Treaty);
- restriction of transfers of reprocessing and enrichment technology to states which do not possess such technology.

In return, the United States undertakes in particular, to:

- develop civil nuclear co-operation with India;
- adapt domestic policy and legislation to make such co-operation legally possible;
- actively support and promote the adoption of the necessary amendments to international export control arrangements to allow nuclear trade with India;
- consult its partners and allies to support India's participation in the ITER programme and the Generation IV International Forum.

The analysis of the commitments, in the co-operation agreement, raise two types of objections. First of all, there are objections regarding the principle of the compatibility of such an agreement with the commitments of the United States under various international non-proliferation arrangements, especially the NPT. Then, there are objections relating to the compatibility of the control measures and systems envisaged by the agreement with the rules established by international nuclear trade control arrangements.

2. Objections of principle

While the co-operation agreement between India and the United States in 2005 led in the following months to the adoption of similar co-operation agreements and declarations with the other

four nuclear-weapon states,[1] the fact remains that this determination to develop and intensify collaboration with a nuclear-weapon state outside the NPT is contrary to the very principles of that Treaty.

Indeed, Article I provides that

> "*Each nuclear-weapon State Party to the Treaty undertakes not to transfer to any recipient whatsoever nuclear weapons or other nuclear explosive devices or control over such weapons or explosive devices directly, or indirectly; and not in any way to assist, encourage, or induce any non-nuclear-weapon State to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices, or control over such weapons or explosive devices.*"

If the envisaged co-operation concerns only the transfer of material, equipment and technology for civil purposes, it should be considered to what extent such collaboration with a nuclear-weapon state, not party to the NPT, might not *in any way assist, encourage, or induce it* to develop its military nuclear programme. Thus, by authorising India to access the international market for nuclear fuel for its civil programme, is it not being allowed to reserve its domestic production of fissile material just for its military nuclear programme? Indeed, if the co-operation agreement is not implemented, faced with rapidly growing energy needs and the lack of domestic resources to satisfy them, the Indian authorities will have to make a choice between the fissile material needed for its military programmes (nuclear weapons and submarines) and those allocated to its civil nuclear energy programme.[2]

Given that Article I of the NPT states that the commitments of nuclear-weapon states concern transfers to a *non-nuclear-weapon state*, can India be included in that latter category? Objectively, by its actions, India has never ceased to demonstrate the contrary. Since the first test of a nuclear weapon in 1974, it has continued to develop its nuclear programme and, finally, after carrying out a series of tests in 1998, it officially announced that it possessed nuclear weapons and did not intend to give them up.

Although Article IX.3 of the NPT does not define non-nuclear-weapon states, it does define nuclear-weapon states. These are states which have manufactured and detonated a nuclear weapon or other nuclear explosive device prior to 1 January 1967, which automatically excludes India.

The NPT does not contemplate relations with nuclear-weapon states which are not covered by the above definition. The reasons are both historical and political. At the time of the negotiation of the NPT, there were no other states officially possessing nuclear weapons other than the five covered by the definition. It was the announcement of the Indian test that gave rise to a new category of state.

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1. Prime Minister Tony Blair "warmly welcomes" the signing of the agreement. (http://www.number-10.gov.uk/output/Page9124.asp). French President Jacques Chirac and the Indian Prime Minister Singh in February 2006 adopted a joint declaration on a co-operation agreement in the field of civil nuclear co-operation.

   http://www.diplomatie.gouv.fr/actu/bulletin.asp?liste=20060220.html#Chapitre9). In November 2006, China and India signed a similar co-operation agreement. Finally, in January 2007, Russian President Vladimir Putin also signed a co-operation agreement to strengthen civil nuclear co-operation with New Delhi (http://www.washingtonpost.com/wp-dyn/content/article/2007/01/25/AR2007012500182.html).

2. See on this point "Impact of the U.S.-Indian Nuclear Deal on India's Fissile Production Capacity" available on the Arms Control Association website. (http://www.armscontrol.org/pressroom/2006/20060726_India_House_Debate.asp).

Moreover, one of the essential aims of the NPT is to pursue effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament. It was therefore scarcely relevant to include specific provisions in the Treaty organising relations with future nuclear-weapon states not party to the NPT.

It should be noted, however, that this does not mean that the NPT does not envisage relations with states not party to the NPT but includes them in the more specific category of trade controls. Thus, Article III.2 states that:

> *"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."*

It can be inferred from the use of the word "any" in Article III.2 that it applies to transfers to non-nuclear-weapons states whether or not they are party to the NPT. By extension, it can be inferred that as the NPT clearly defines nuclear-weapon states, transfers to a nuclear-weapon state not party to the NPT is contrary to the spirit of the Treaty. It would be a travesty to rely on the absence of specific provisions to authorise the transfer.

It follows, therefore, that the co-operation agreement signed between the United States and India and also the planned co-operation envisaged by the other nuclear-weapon states parties to the NPT seem to conflict with the commitments undertaken by those same states under the NPT.

There is reason to fear, however, that in the name of a certain political and economic pragmatism, the nuclear-weapon states will override the objections of principle and implement their agreement and proposed nuclear collaboration with the Indian authorities. In this sense, there is no shortage of arguments. India is increasingly seen as a major geo-strategic partner whose behaviour with respect to third countries in the nuclear field is not one of proliferation. Moreover, the development of the Indian electronuclear market offers not inconsiderable potential for these states.

3. Objections relating to the rules established by international arrangements for control of nuclear trade

In terms of formal control of nuclear trade, there is only the one international treaty, the Treaty on the Non-Proliferation of Nuclear Weapons, the essential principles of which were examined above.

As regards transfer conditions, the NPT requires that in order for a state to authorise the transfer of nuclear equipment and technology to a third state, whether or not a party to the Treaty, the material transferred or used by the transferred equipment must be subject to the safeguards required under Article III.

The system of safeguards contemplated in this article has always been a source of controversy. The IAEA instituted two systems of safeguards the scope of which differ fundamentally. First, there was the initial system established in 1965 aiming at certifying the non-diversion of certain materials in one or more given facilities; then the system was established pursuant to the NPT aiming at the application of safeguards to all nuclear activities of non-nuclear-weapon states parties to the NPT.

The initial system of safeguards was developed by the IAEA to exercise the control over the peaceful use of nuclear material and equipment attributed to it by states in the context of their nuclear

trade.[3] This control, freely accepted by the recipient state, applies only to nuclear material supplied or used by equipment transferred under a bilateral or multilateral agreement between States Parties and non-parties to the NPT. In practice, this system is now only applied in three states, India, Israel and Pakistan.

The comprehensive system of safeguards (Second Safeguards Agreement), established in application of Article III.1 of the NPT, consolidates the commitment of non-nuclear-weapon states party to the Treaty to accept the application of safeguards on all source or special fissionable material in all peaceful nuclear activities within the territory of such state, under its jurisdiction, or carried out under its control anywhere. This system of safeguards has been supplemented in recent years by an additional protocol applicable to all non-nuclear-weapon states party to the NPT.[4] Parallel to this, the nuclear-weapon states agreed on a voluntary basis to make their peaceful facilities subject to a broadly equivalent system of safeguards.[5] The objective was to ensure a degree of parity between the two groups in the distribution of the industrial, administrative and financial costs imposed by IAEA inspections.

The controversy surrounding the interpretation of Article III focuses on whether transfers of nuclear material, equipment and technology to states not party to the NPT necessitate the supplier state requiring a comprehensive safeguards agreement between the recipient state and the IAEA along the lines of that imposed on States Parties, or a safeguards agreement between the IAEA and the recipient state applied only to the material transferred or used by the transferred equipment. In other words, is it acceptable for a state not party to the NPT to be subject to a less strict system of controls than States Parties themselves?

Although, Article III.2 is quite clear and refers to comprehensive safeguards, it has long been accepted by the majority of states that the application of safeguards only to the material transferred or used by the equipment transferred was consistent with the NPT. This approach was confirmed, in particular, by the Zangger Committee, an informal group on the interpretation of the provisions of the NPT comprising the principal nuclear states.[6]

At the 1975 NPT Review Conference, many delegations were in favour of a stricter interpretation, but came up against strong opposition from certain states. Nevertheless, the final declaration echoed this stricter interpretation by underlining that a considerable number of States Party to the Treaty consider that the safeguards required by Article III.2 should extend to all the peaceful nuclear activities of the importing state. The 1995 Review and Extension Conference on the NPT took a more formal position in favour of this interpretation by declaring that to obtain source or special fissionable material or equipment or material especially designed or prepared for the processing, use or production of special fissionable material, non-nuclear-weapon states should require, as a necessary precondition,

3. This standard model of the initial system of guarantees is published by the Agency under the reference INFCIRC/66.Rev 2.

4. The model of comprehensive safeguards is published by the agency under the reference INFCIRC/153 (Corr.) and the model of the additional protocol in INFCIRC/540 (Corr.).

5. These safeguards systems are published by the Agency under the following references: for the United States (INFCIRC 288), for the United Kingdom (INFCIRC 263), for France (INFCIRC 290), for China (INFCIRC 369) and for Russia (INFCIRC327).

6. See paragraph 3.b of INFCIRC209 (corr.).

acceptance of the agency's full-scope safeguards and internationally legally binding commitments not to acquire nuclear weapons or other nuclear explosive devices.[7]

The choice of the conditional tense shows, despite everything, that this requirement did not achieve consensus among the States Party to the NPT. While the legal force of the NPT Review Conference documents is open to debate, it is hard now to accept that a transfer of nuclear material, equipment and technology can be considered consistent with the NPT if the recipient state does not have a comprehensive safeguards agreement. Insofar, as the nuclear co-operation agreement between India and the United States envisages applying the safeguards only to civil facilities, it cannot be likened to a comprehensive safeguards system. Indeed, by taking its inspiration, as would appear to be the case from the system of safeguards applied to nuclear-weapon states party to the NPT, in particular the unilateral preparation by the Indian authorities of a plan to identify and separate civil facilities from those used for military purposes, the purpose of such a system is not to meet the objectives of non-proliferation. It should be recalled that the system of safeguards applied to nuclear-weapon states party to the NPT is not to detect diversion of the nuclear material used but rather to preserve the conditions of competition *vis-à-vis* the non-nuclear-weapon states party to the NPT. Thus, by applying such a safeguards system, the co-operation agreement would indirectly recognise India as having the status of a nuclear-weapon state within the meaning of the NPT which is clearly not allowed by Article IX.

Complementing the rules of international law contained in the NPT, control of nuclear trade is also and primarily organised by informal instruments more commonly known by the term soft law. On the one hand, there is the Zangger Committee, mentioned above, which was given the task of interpreting the provisions of Article III of the NPT by means of guidelines[8] and, on the other, the Nuclear Suppliers' Group, more commonly referred to by its acronym, NSG. It is especially the latter, comprising the majority of countries which export nuclear assets and technology, which determines the rules and conditions for international nuclear trade.[9] To that end, two guidelines were adopted by the NSG, one for nuclear equipment and technology, the other for dual-use equipment and technology in the field of nuclear energy.

These guidelines consist of a unilateral undertaking by the states participating in the NSG which is published by sending a communication to the Director General of the IAEA and informing him of the intention of the exporting state to align its policy on nuclear equipment and technology with the attached guidelines and requesting him to inform all the Member States.[10] It is chiefly under these guidelines that the United States has given undertakings to the Indian authorities to try and persuade the states participating in the informal group to adopt the necessary amendments to allow nuclear trade with India.

The majority of provisions determined by the NSG guidelines are evaluation criteria that the supplier state will have to consider when deciding whether or not to authorise the transfer. These

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7. Paragraph 12 of the Principles and objectives for nuclear non-proliferation and disarmament on the following UN website: http://disarmament2.un.org/wmd/npt/1995nptrevconf.html.

8. For more detailed information, especially concerning the conditions and list of equipment and technology subject to export controls, see: http://www.zanggercommittee.org/Zangger/default.htm.

9. The NSG has a website which can be accessed at: http://www.nsg-online.org/.

10. These guidelines are published by the IAEA under the reference INFRCIRC/254/Part I corr. for nuclear equipment and technology and INFCIRC/254/corr. Part II for dual-use equipment and technology.

criteria can sometimes be interpreted in different ways. This is the case of the principle of non-proliferation set out in Article 10 of the Guidelines for Nuclear Transfers which states that:

> *"suppliers should authorize transfer of items or related technology identified in the trigger list only when they are satisfied that the transfers would not contribute to the proliferation of nuclear weapons or other nuclear explosive devices or be diverted to acts of nuclear terrorism."*

It is clear that whether or not transfers to the Indian authorities are authorised depends on the approach adopted by the supplier state to evaluate the criteria.

It is more relevant to focus on the transfer conditions imposed by the guidelines which, in principle, offer little leeway to exporting states in making their assessments.

The chief condition imposed by the NSG is the obligation of the recipient state to conclude a comprehensive safeguards agreement with the IAEA along the lines of that imposed on non-nuclear-weapon states party to the NPT.[11] This agreement must be implemented for the transfers to be authorised by national authorities.

This condition is currently the chief obstacle to nuclear trade with India, but it suffers from two exceptions.

The first is a classic *grandfather clause* which consists of the non-application of this condition to transfer agreements concluded before 3 April 1992 or to new states participating in the NSG after the date of their joining.[12] The latter was invoked by certain states participating in the NSG to complete the execution of contracts concluded with the Indian authorities.

The second, known as the *safety clause* authorises states, participating in the NSG, to transfer nuclear equipment and technology to a non-nuclear-weapon state which does not have a safeguards agreement only in exceptional cases when they are deemed essential for the safe operation of existing facilities and if safeguards are applied to those facilities.[13]

The exact scope of this exception clause has been the subject of keen debate between the states participating in the NSG, especially the effect of the words *essential for the safe operation.* Some considered that this exception clause was not intended to ensure the safe operation of a nuclear facility but only as a precaution against any risk of failure. For these, if the facility was or could be stopped without risk, there was no need to resort to the exception clause. In 1999, Belgium contemplated and finally decided not to resort to this safety clause to authorise the limited export of material to the KANUPP nuclear power plant in Pakistan.

Other participating states take a broader view of this clause, especially Russia, which used it in 2000 and 2006 to transfer nuclear fuel to the Indian Tarrapur reactor. The use of this exception procedure by Russia in 2000 was considered inappropriate and was unanimously condemned by most of the states participating in the NSG and more particularly the United States. Conversely, the announcement of the second delivery of Russian fuel in 2006 aroused markedly less controversy.

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11. Paragraph 3(a) of INFCIRC/254/Rev.8/Part 1.

12. Paragraph 4(c) INFCIRC254/Rev.8/Part 1.

13. Paragraph 4(b) INFCIRC254/Rev.8/Part 1.

Once again, the interpretation which states give to this exception clause is more a case of political than legal assessment and, following Russia's example, some of the transfers of nuclear equipment and technology to existing Indian facilities could be invoked by the United States itself even though this interpretation is inappropriate.

Insofar, as the requirement for a comprehensive safeguards agreement applies only to non-nuclear-weapon states, one might also wonder if the concept of nuclear-weapon state is the same for the NSG as in the NPT. It should be recalled that the creation of the NSG in 1976 was intended as a response to the Indian nuclear explosion, but also to encourage France, at that time not a party to the NPT, to follow a concerted policy of export controls. For that reason, the guidelines on nuclear equipment and technology do not contain any reference to the NPT. Neither do they define what they mean by a nuclear-weapon state. Could it therefore be conceded that for the NSG it is up to participating states to define unilaterally the states which would enjoy that status? Granting India that status would spare it from the requirement for a comprehensive system of safeguards and allow co-operation. The question has not been discussed but NSG practice would tend to suggest the opposite to the extent that even the states traditionally most favourable to co-operation with the Indian authorities have so far always resorted to the exception clause.

Conclusion

In this analysis, it has been attempted, on the basis of a few aspects, to show that the formal and informal rules on the organisation of nuclear trade controls raise a number of difficulties concerning the implementation of the co-operation agreement between India and the United States and also, in all likelihood, the agreements envisaged by the other nuclear-weapon states. Indeed, to allow such co-operation, both the Treaty on the Non-Proliferation of Nuclear Weapons and the informal instruments which interpret it, such as the Zangger Committee or complement it, such as the NSG, would need not just mere modifications of a temporary nature but rather a number of structural adjustments. Such adjustments should be seen not merely as allowing collaboration with a non-party state but more generally as challenging one of the fundamental principles of non-proliferation, namely the clear division between states which can legally possess nuclear weapons and those which possess them but which are outside the rules with which collaboration can only rarely be envisaged. Allowing and organising collaboration with the latter inevitably means shaking the foundations of the international non-proliferation system based on the principle that only five states may possess such a weapon. This principle is considered universal and of indefinite duration by all the UN Member States with the exception of the principals concerned, namely India, Israel, North Korea and Pakistan.

The "Incentive" Concept as Developed in the Nuclear Safety Conventions and its Possible Extension to Other Sectors

by Tammy de Wright*

Introduction

On 26 April 1986, the international nuclear community experienced a dramatic "wake-up call" when the reactor core of the Chernobyl Nuclear Power Plant, situated in the former Ukrainian Republic of the Union of Soviet Socialist Republics, melted down. Due to the large volume of radioactive elements which were released into the atmosphere and spread around the globe, particularly across the northern hemisphere, the accident has been categorised as "by far the most devastating in the history of nuclear power".[1] The incident served to dramatically and vividly remind the world of the potentially devastating national and transboundary consequences which may follow a nuclear accident, and it dispelled the myth that nuclear incidents create predominantly national safety risks. Suddenly all countries, even those without nuclear power capacity or situated in relative geographic isolation from nuclear sites, were forced to realise the risks that could be thrust upon them by a nuclear accident, even one occurring in a far distant state. Chernobyl demonstrated that despite the stationary nature of such plants, thanks to global wind currents external damage could be considerable.

At the time of the accident, it was considered "the generally accepted rule – or real doctrine of international nuclear law – that the prime and ultimate responsibility for nuclear safety rests with the sovereign State having jurisdiction over the nuclear installation",[2] a view that exists still today to some extent. Although by the mid-1980s some internationalisation had taken place in nuclear law, particularly in the fields of radiological protection[3] and non-proliferation, it had not yet reached the

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* PhD candidate, Doctoral College for Law and Economics, University of Hamburg. This work is a revised version of a dissertation completed for the Diploma in International Nuclear Law following the International School of Nuclear Law 2006. A more detailed version was awarded the 2007 International Nuclear Law Association Prize. The author would like to thank Dr. Odette Jankowitsch-Prevor for the insightful and valuable comments she provided on the earlier draft and Dr. Norbert Pelzer for comments on the more recent version. The author alone is responsible for the facts and opinions expressed in this article.

1. See *Ten Years after Chernobyl: What Do We Really Know?* 1996: www.iaea.org/Publications/Booklets/Chernoten/facts.html.

2. Jankowitsch-Prevor, O., "The Need for a Binding International Safety Regime: The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (The Joint Convention)", 2003 Materials from the International School of Nuclear Law, p. 6 (hereinafter "Binding Regime").

3. Pelzer, N., "Learning the Hard Way: Did the Lessons Taught by the Chernobyl Nuclear Accident Contribute to Improving Nuclear Law?" in: *International Nuclear Law in the Post-Chernobyl Period,* OECD 2006, p. 73-118, www.nea.fr/html/law/chernobyl/nea6146-iaea-chernobyl.pdf. As he notes at

field of nuclear safety.[4] However, in the wake of Chernobyl, "the necessity of at least creating a common skeleton of nuclear safety was (finally) recognised".[5]

In the 20 years since Chernobyl, there have been considerable developments in the international regime governing and improving nuclear safety. Conventions have been implemented covering notification and assistance in the case of an accident, nuclear safety, waste and spent fuel management and liability and compensation. However, the process has been gradual. Even in the aftermath of such a disaster, eight years were required before a draft Convention on Nuclear Safety (CNS)[6] could be agreed upon. The reasons for this delay were varied; in addition to various technical and practical considerations,[7] there was widespread reluctance among states to accept substantive, binding and enforceable obligations in an area with such significance for national sovereignty as nuclear power production. Nuclear power is often both an important part of the national power supply and evidence of high technical and scientific qualification and capability;[8] interference in its operation is not just a matter of national security, but of energy independence and policy, economic policy and national pride.

This reluctance was finally overcome in the early 1990s, following the dissolution of the USSR and in particular the reunification of Germany. By this time, the safety plight of nuclear reactors in the former Soviet block countries, built to earlier standards, was becoming increasingly apparent. Additionally, there was also a great expansion in international environmental law instruments, which, seeing the gaps in coverage, threatened to take over and cover issues of nuclear safety.[9] These developments led to further calls for the creation of a nuclear safety convention, not just from Western States, but also from the Newly Independent States and the Central and Eastern European States, all of whom were keen to join active efforts to address safety problems.

The international acknowledgement of these considerations meant that the climate was ripe to embrace the idea that an international treaty governing nuclear safety should be adopted, not with strict standards and stringent obligations, but within the context of an "incentive" convention structure.

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p. 85: "Rather quickly the radiation protection law of States was based on international radiation protection standards".

4. *Ibid*, p. 87. As Pelzer, N., explains, "The nuclear law fundamental 'international co-operation principle' was only met at the lowest possible level: States co-operated in technical expert groups to draft non-binding nuclear safety codes and standards but maintained their discretion to use or not to use those recommendations".

5. *Ibid*, p. 87.

6. Convention on Nuclear Safety (1994*)* INFCIRC/449: www.iaea.org/Publications/Documents/Infcircs/Others/inf449.shtml.

7. Other factors have been identified, including the absence of a suitable model for the application of international safety standards; the reluctance of nuclear power States to accept the application of any international standard of safety; a great divergence internationally in nuclear power plant designs; and lastly, different national profiles in relation to nuclear risk, environmental protection and economic development. See Washington, M., "The Practice of Peer Review in the International Nuclear Safety Regime", *New York University Law Review,* Vol. 72 (1997), pp. 440-444, for a more complete discussion of these factors.

8. Pelzer, N., *op. cit.*, p. 87.

9. Jankowitsch-Prevor, O., *op. cit*., "Binding Regime", p. 7. For example, prior to the Joint Convention coming into force, provisions in the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal covered the transboundary movement of radioactive wastes.

The incorporation of this concept has, as hoped, overcome any reluctance by states to agree to binding international standards and has enticed all nuclear power states, including those with plants built to earlier standards, into joining first, the CNS and later, the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention).[10]

This paper seeks to analyse the "incentive" concept, initially adopted in the CNS and later developed in the Joint Convention, as the innovation credited with encouraging both participation in, and compliance with, the nuclear safety conventions. It then seeks to examine the possibilities for the introduction of that concept into other sectors of international law.

In the first part of the paper, the essential features of the concept and the mechanisms used in the conventions to bring it into effect will be discussed. The second part of the paper will focus on the different aspects of the conventions which have been described as integral to the concept. The third part of the paper will identify certain apprehensions regarding the effectiveness of such "soft" treaty provisions and explain why the "incentive" concept may be particularly well suited to certain specific situations. The final part of the paper will address the potential application of the concept and related treaty provisions to other fields of law, particularly to international environmental law. In addition, some suggestions will be made as to how provisions implementing the incentive concept into a treaty may be slightly modified to increase their effectiveness.

1) The Content and Implementation of the "Incentive" Concept

a) Introduction

In the past twenty years, five international instruments addressing matters of nuclear safety have entered into force: the Convention on the Physical Protection of Nuclear Material[11] (CPPNM) which is both safety and security related; the Convention on Early Notification of a Nuclear Accident[12] (Notification Convention); the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency[13] (Assistance Convention), the CNS and the Joint Convention. Of these Conventions, it is the two most recent, incorporating the "incentive" concept, which are the focus of this paper.

In the immediate aftermath of Chernobyl, and with remarkable speed in their drafting and adoption, the Notification Convention and the Assistance Convention were quickly ratified by the international community.[14] Despite containing welcome provisions creating a duty to notify nuclear accidents with actual or possible transboundary effects, and to co-operate in arranging for assistance in the case of an accident or emergency, these Conventions do not constitute a comprehensive regime outlining well defined rights, obligations and sanctions.

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10. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, (1997) INFCIRC/546: www.iaea.org/Publications/Documents/Infcircs/1997/infcirc546.pdf.

11. The Convention on the Physical Protection of Nuclear Material (1980) INFCIRC/274/Rev.1.

12. Convention on Early Notification of a Nuclear Accident (1986) INFCIRC/335.

13. Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (1986) INFCIRC/336/Add.1.

14. Both Conventions were adopted in September 1986, and they came into force on 27 October 1986 and 26 February 1987 respectively.

Acknowledging that what may be achieved in public international law may vary dramatically from what is desirable, and that the greater the number of parties to an agreement the more difficult it will be to reach a consensus, these treaties encourage their parties to enter into further bilateral and regional agreements[15] and challenge them to develop the general legal framework of the convention in the manner they deem fit. According to Dr. Pelzer "… the option to conclude complementing bilateral or regional agreements, as appropriate, is a most progressive element of the conventions", and that in so far as "the incentive convention encourages the Parties to develop … the measures necessary to achieve the (goals of the convention) … the Notification and Assistance Conventions may be seen as the still less developed precursors to the incentive convention".[16]

However, this position does not seem to be reflected elsewhere in the literature and arguably does not adequately take into account the vastly different dispute settlement mechanisms under the two groups of conventions,[17] nor the absence of a peer review mechanism under the earlier conventions.

b) The Convention on Nuclear Safety

i) Drafting History and the Development of the Incentive Concept

In order to understand the "incentive" concept as embodied in the nuclear safety treaties, it is important to first appreciate the difficulty in reaching consensus amongst states with disparate interests.[18] The CNS was the first internationally binding agreement covering the safety of nuclear reactors and its drafting was a laborious process. In contrast to the Notification and Assistance Conventions which were created in the wake of a disaster, the political motivation behind the CNS appears to have been prevention rather than cure.[19] This was a welcome development. As history attests, the term "incentive convention" was a product of the early drafting process, designed to encourage consensus and participation in the treaty, and strictly speaking, is a term without precise meaning or international law precedent.[20]

By 1991, the impetus was developing amongst all states, including the United States,[21] to introduce formally binding safety obligations. The 1991 IAEA General Conference passed a

15. Article 1(2), Assistance Convention; Article 9, Notification Convention.

16. Pelzer, N., *op. cit*., p. 83.

17. The Assistance Convention (Article 13) and the Notification Convention (Article 11) have much more traditional dispute settlement provisions than those found in the later "incentive" conventions.

18. For a more detailed description and analysis of the drafting history, see Jankowitsch, O., "The Convention on Nuclear Safety", in: *Nuclear Law Bulletin* No. 54 (1994), pp. 9-22 and for a commentary written during the drafting process, see de la Fayette, L., "International Environmental Law and the Problem of Nuclear Safety", *Journal of Environmental Law*, Vol. 5, No. 1, (1993) pp. 31-69.

19. Jankowitsch, O., *ibid*, p. 11.

20. Rautenbach, J., Tonhauser, W. and Wetherall, A., "Overview of the International Legal Framework Governing the Safe and Peaceful Uses of Nuclear Energy – Some Practical Steps" in: *International Nuclear Law in the Post-Chernobyl Period*, OECD, 2006, p. 14.

21. De la Fayette, L., *op. cit*., pp. 37-39. The author suggests five main reasons why, by the summer of 1991, the US had decided that the development of internationally binding obligations might now be advisable.

resolution[22] calling for the formation of an instrument covering the safety of nuclear plants, but it did not specify either its form or type. This task was left to the IAEA Director General who convened a group of 36 experts to advise on the structure and contents of a future convention. The 1991 document "Safety Fundamentals, The Safety of Nuclear Installations" (Safety Fundamentals) was accepted by the experts as the main technical reference for the convention since it represented an international consensus on the basic concepts required for the management, regulation, safety and operation of nuclear installations.[23] During this early stage, the majority of the experts favoured an instrument which, while having as its primary focus the safety of nuclear power plants, would cover all types of nuclear facilities and activities, including transportation and disposal of nuclear waste.[24]

Unfortunately, the Safety Fundamentals document, drafted from a national regulatory perspective, proved to be difficult to transpose directly into international treaty language and in February 1992, a new "open-ended" group of technical and legal experts was established to carry out the necessary and substantive preparation for the convention.[25]

At the time, rhetorical commitment to the principle of a CNS was nearly universal, the goal being to establish a convention by which the international community could assert its influence to create a uniformly high safety culture. Despite this, expectations and goals were not shared by all states, with different preferences as to how they should be accomplished soon becoming apparent.[26] As to content, states were only prepared to include obligations based on fundamental principles and were reluctant to include more substantive obligations in the treaty. It was recognised by the drafters, however, that a list of general obligations formulated as a single treaty document would, in itself, be insufficient. If the convention was to contribute to promoting "the highest level of nuclear safety worldwide", it required a mechanism commensurate with that objective.[27]

The difficulty was to find a mechanism which could verify compliance with obligations without infringing the international consensus that "responsibility for nuclear safety rests with the State having jurisdiction over a nuclear installation",[28] without exposing states to intrusive inspections and the costs accompanying an international regulatory bureaucracy and without the difficult task of codifying standards for disparate nuclear technologies which could rapidly become outdated or which could impede the development of civilian power.[29]

This problem of finding a suitable compliance mechanism was finally "resolved with the help of the convincing argument that enlightened self-interest of States in matters of nuclear safety would be

22. "Measures to Strengthen International Co-operation in Matters Relating to Nuclear Safety and Radiological Protection" IAEA General Conference Resolution GC(XXXV)/RES/533, 20 September 1991.

23. Jankowitsch, O., *op. cit*., p. 11.

24. De la Fayette, L., *op. cit*., p. 40.

25. Jankowitsch, O., *op. cit*., p. 11.

26. Barkenbus, J. and Forsberg, C., "Internationalising Nuclear Safety: The Pursuit of Collective Responsibility", *Annual Review of Energy and the Environment*, Vol. 20, (1995) p. 191.

27. Jankowitsch, O., *op. cit*., p. 12.

28. Preamble paragraph (iii), CNS.

29. Stoiber, C., "International Convention on Nuclear Safety: National Reporting as the Key to Effective Implementation" *Contemporary Developments in Nuclear Energy Law: Harmonising Legislation in CEEC/NIS*, 1999, p. 97.

stronger than any form of outside control devised under international law".[30] It was thought that if a mechanism could be developed to take advantage of this self-interest, particularly in conjunction with effective "peer group pressure", this might improve nuclear safety in all power plants. It was also thought that a "meeting of all Contracting Parties would be the appropriate method of focusing these "peer group" effects".[31] Within the spirit of this approach, it was agreed amongst the experts "(…) to establish a convention with an 'incentive character' to which a large number of States could adhere",[32] and the term "incentive" was subsequently inserted into the preamble of the convention.[33]

The "incentive" solution, previously unprecedented in international law, prompted the parties to resolve their differences regarding the scope of the convention and they eventually agreed upon an instrument covering only the safety of civilian nuclear power plants. The reason for the reluctance of certain major nuclear states to commit to more stringent controls is unclear. Writing at the time, de la Fayette observed that because "States" commitment to safety is already strong, and because they are already implementing all the provisions proposed, the convention would not impose any new burdens or constraints, but merely transform into conventional legal obligations what are already customary and moral duties.[34] Other commentators have suggested that those states did not wish their own nuclear industries to be subject to substantial international scrutiny or that the convention allow for financial claims by other states. States wanting a more stringent convention were forced to accept the weakened proposal; it "would not have made sense to adopt a convention the majors would have refused to join."[35]

The Convention was adopted on 17 June 1994 and entered into force on 24 October 1996. As of 4 April 2007, there were 65 Signatories and 60 Contracting Parties.[36] Following India's ratification in March 2005, all countries with operating nuclear power plants are now parties to the Convention.

ii) Provisions of the CNS

The objective of the CNS is to "achieve and maintain a high level of nuclear safety worldwide through the enhancement of national measures and international cooperation including, where appropriate, safety-related technical cooperation".[37] The desire to promote the creation of an effective safety culture is also stated[38], as are the additional objectives of protecting against radiological hazards and preventing and mitigating accidents with radiological consequences from land based civil nuclear power plants.[39]

30. Jankowitsch, O., *op. cit*., p. 13.

31. *Ibid*, p. 13.

32. *Ibid*, p. 13.

33. Preamble paragraph (vi) CNS. *Ibid*, p. 13.

34. De la Fayette, *op. cit*., p. 68.

35. Kamminga, M., "The IAEA Convention on Nuclear Safety", *International and Comparative Law Quarterly,* Vol. 44, (1995) pp. 879 and 881.

36. Status of Nuclear Safety Convention (last update 4 April 2007): www.iaea.org/Publications/Documents/Conventions/nukesafety_status.pdf (accessed 9 October 2007).

37. Article 1(i) CNS.

38. Preamble paragraph (iv) CNS.

39. Article 1 (ii) and (iii), Article 2(i) CNS.

There are two main types of obligation under the Convention. The first is a general obligation to take the legislative, regulatory and administrative measures required to implement obligations under the treaty. This obligation is often quite general in nature, only requiring that due care is employed in performing the obligation rather than that a specific result is achieved and not specifically enjoining IAEA standards as treaty obligations.

The second is the reporting obligation inherent in the effective operation of the peer review process. National reports under the CNS provide a unique opportunity for states to demonstrate that they are meeting their national responsibilities for nuclear installations.[40] Compliance with this process is the primary obligation of states under the treaty. The Convention objective of enhancing nuclear safety world-wide can "only be advanced if Contracting Parties produce a candid, objective and transparent record of issues affecting nuclear safety and how they are being addressed".[41] From both practical and theoretical perspectives, the importance of this requirement can not be underestimated.

The peer review process under the CNS consists of several elements: the duty to prepare national reports,[42] to review the reports of others and decide whether to submit questions in advance of peer review meetings,[43] to attend the review meeting of the Contracting Parties at least every three years[44] and to participate in a review of national reports.[45] Although the CNS and the rules of procedure and financial rules (Rules) are vague as to the form and content of the national report, the Guidelines Regarding National Reports (GNR) provide substantial detail.[46] Information provided by the parties in fulfilling their duty to report may be regarded as confidential if the party so requires, but this is discouraged in order to provide the "open, candid and transparent process" which will improve public confidence in the Convention.[47]

It is also important to highlight the near absence of enforcement or dispute resolution mechanisms under the treaty. Since the review process represents the sole "enforcement" feature of the CNS, a "failure to fulfil these procedural requirements would represent a serious breach of treaty obligations".[48] The review mechanism is in keeping with the pragmatic "peer group" approach devised by the negotiators. Disputes should be settled in an amicable manner within the existing structure and not be brought to any court.[49] Outside the envisaged peer review mechanism, the methods to bring an errant party into line are limited. This provision is remarkable in that it is contrary to most conventions which provide for reference to a permanent political or administrative body, a national court, the

40. Stoiber, C., *op. cit*., p. 113.

41. *Ibid*, p. 113.

42. Article 5 CNS, Rules 39 and 40. The procedural documents governing the conduct of the review meetings were developed subsequent to the mandate in Article 22(1)(i). They include the rules of procedure and financial rules (the rules), guidelines regarding national reports (GNR) and guidelines regarding the review process. See Stoiber, C., *op. cit*., p. 99.

43. Rule 43.1(b).

44. As required by Article 20 CNS.

45. Article 24.1 CNS.

46. Stoiber, C., *op. cit*., p. 101.

47. Article 27(2) CNS. *Ibid*, pp. 103-104.

48. *Ibid*, Stoiber, C., p. 101.

49. Jankowitsch, O., *op. cit*., p. 18.

International Court of Justice (ICJ) or an arbitral tribunal.[50] It also represents a departure from the structure of earlier conventions impacting upon nuclear safety, such as the CPPNM,[51] the Assistance Convention[52] and the Notification Convention,[53] all of which provide for recourse to international dispute settling mechanisms.

c) Joint Convention

i) Development of the Convention

Opened for signature three years after the drafting of the CNS, the Joint Convention represents a binding commitment by states to achieve and maintain a high level of safety in spent fuel and radioactive waste management worldwide. It was the first legally binding international instrument to address these issues on a global scale, and, like its "sister" convention, the CNS, it can also be described as an "incentive convention". Although, it was initially hoped by non-nuclear, Nordic and like-minded states that provisions governing nuclear waste would be incorporated into the CNS, this ultimately proved impossible. Instead, it was agreed that this subject should be left for separate negotiations and the preamble of the CNS affirms this agreement.[54]

Shortly after the adoption of the CNS, the IAEA's 1994 General Conference invited the Board of Governors and the Director General to commence preparations for a convention on the safety of radioactive waste management, and in February 1995, the Director General convened an open-ended meeting of experts to discuss the concept, scope, mechanisms and procedures for such a convention.[55]

In March 1995, the IAEA Board of Governors adopted the Safety Fundamentals document "Principles of Radioactive Waste Management", paving the way for the work of the experts and providing a basis for the obligations to be assumed under the new convention.[56] The first meeting of experts was held in July 1995; following five meetings and much debate and compromise, the French suggestion for the current format of a single convention with two parallel sets of requirements was agreed upon.[57]

The negotiation process lasted over two years, primarily due to considerable disagreement over the concept of spent fuel, considered by some countries to be waste and by others to be a useful and

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50. *Ibid*, p. 18.

51. Article 17 CPPNM; additionally the 2005 Amendment to the Convention in: GOV/INF/2005/10-GC(49)/INF/6 does not change this article: www.iaea.org/About/Policy/GC/GC49/Documents/gc49inf-6.pdf.

52. Article 13 Assistance Convention.

53. Article 11 Notification Convention.

54. Preamble paragraph (ix), CNS.

55. Tonhauser, W. and Jankowitsch, O., "The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management", *Nuclear Law Bulletin* No. 60, 1997, reproduced in: *International Nuclear Law in the Post-Chernobyl Period*, OECD, 2006, p. 201. www.nea.fr/html/law/chernobyl/nea6146-iaea-chernobyl.pdf.

56. *Ibid*, p. 207.

57. Tonhauser W. and Jankowitsch-Prevor, O., *op. cit*., p. 205.

re-usable resource.[58] Since the CNS blueprint had just been developed, this time the choice of treaty model was uncontroversial. In fact, at their first meeting, the experts rapidly agreed that the CNS model, an "incentive convention" be adopted for the new convention.[59] The draft convention was adopted and opened for signature on 29 September 1997 and it entered into force on 18 June 2001.[60]

ii) Provisions of the Joint Convention

Like the CNS, the objectives of the Joint Convention include nuclear safety, radiological protection and technical safety.[61] The desire to promote an effective safety culture is also included in the preamble.[62] The Joint Convention applies to spent fuel and radioactive waste resulting from civilian nuclear reactors and applications and to military or defence fuel or waste once transferred permanently to, and managed within, exclusively civilian programmes, or if declared as spent fuel or radioactive waste for the purposes of the convention by the Contracting Party.[63] It also applies to planned and controlled releases of liquid or gaseous radioactive materials from regulated nuclear facilities into the environment.[64]

The obligations to be undertaken by Contracting Parties are principally of two types. The first are general obligations, largely based on provisions of the CNS and "The Principles of Radioactive Waste Management." In particular, Contracting Parties are required to take appropriate legislative, regulatory and administrative measures to govern the safety of spent fuel and radioactive waste management. Additionally, they are to ensure that individuals, society and the environment are adequately protected against radiological and other hazards, by regulating the appropriate siting, design and construction of facilities and by making provisions for ensuring the safety of facilities both during operation and after their closure.[65]

As with the CNS, the second set of obligations regarding reporting and peer review are binding on the Contracting Parties.[66] The compliance system in the Joint Convention is more refined than that of the CNS and describes in detail the range of subjects to be encompassed by such reports.[67] The provisions on peer review and reporting are more adapted to the specific requirements of the Joint

58. See de Kageneck, A. and Pinel, C., "The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management", *The International and Comparative Law Quarterly,* Vol. 47, No. 2, (1998) pp. 409-425 for a more comprehensive discussion of both this aspect and the way in which gaps/overlaps between the CNS and the Joint Convention were handled; likewise Tonhauser, W. and Jankowitsch, O., *op. cit*., p. 201 discuss the drafting history of the Joint Convention.

59. Tonhauser, W. and Jankowitsch-Prevor, O., *ibid*, p. 206.

60. www-ns.iaea.org/conventions/waste-jointconvention.htm (last accessed 19 November 2006).

61. Article 1 Joint Convention, although as a more recent document it also incorporates recognition of the necessity of sustainable development in Article 1(ii).

62. Preamble paragraph (v) Joint Convention.

63. Article 3 (i)-(iii) Joint Convention.

64. Article 3 (iv) Joint Convention, as described at: www-ns.iaea.org/conventions/waste-jointconvention.htm (last accessed 19 November 2006).

65. For more details see: Tonhauser, W. and Jankowitsch-Prevor, O., *op. cit*., page 203; see also: www-ns.iaea.org/conventions/waste-jointconvention.htm (last accessed 19 November 2006).

66. *Ibid*, p. 203.

67. Article 32 Joint Convention.

Convention.[68] The obligation for States to attend reviews remains, as does the possibility of inviting competent intergovernmental organisations to attend as observers.

Although the primary mechanism for resolving disputes remains the same for the Joint Convention as for the CNS, the Joint Convention procedure allows for limited recourse to external dispute settlement.[69] The stringent amendment procedure outlined in the Convention is in keeping with the incentive nature of the Convention and the peer review mechanism. It requires the convening of a diplomatic conference and a two-thirds majority.[70]

3) Interpretation of the "Incentive" Concept in the Conventions

a) "Incentive Convention" in the Literature

The general consensus is that the CNS is an "incentive" convention because it "is intended to provide "incentives" for nations to improve nuclear safety, rather than to impose "regulatory" or "penal" measures to this end".[71] An excellent definition of the term is as follows: "Neologism used by the drafters to qualify the convention as *sui generis* as regards the obligations of its Parties: National legal obligations under the convention are to be implemented by the Contracting Parties *bona fide* without internal or external control mechanism, monitoring or sanction regime. The mechanism for *quasi* enforcement is the "meeting of the Contracting Parties" held in regular intervals in a peer review mode which each Party is under obligation to attend and submit a national report to be established in an agreed form on its implementation of the relevant obligations of the convention".[72]

The decision not to include sanctions is born out of the recognition that if they were included in the conventions, states would not have adhered to them. Unlike other legally binding international instruments, the effectiveness of an incentive convention "does not derive from specific obligations for non-compliance or reliance on dispute settlement provisions but rather it seeks to rely on a common interest amongst the Parties to achieve high levels of safety".[73] The mechanism of peer review is crucial.

Although some authors assumed, initially, that an "incentive" convention meant assisting and encouraging countries to join the convention through the provision of technological and financial incentives,[74] the general literature does not bear this out. The term was "not to be understood in a material sense" but rather to mean "incentive" in terms of providing "encouragement" or

68. Pelzer, N., *op. cit*., p. 93.

69. Article 38 Joint Convention provides that, "In the event that the consultations prove unproductive, recourse can be made to the mediation, conciliation and arbitration mechanisms provided for in international law".

70. Tonhauser, W. and Jankowitsch-Prevor, O., *op. cit*., p. 204.

71. Stoiber, C., *op. cit*., p. 113.

72. Jankowitsch-Prevor, O., "Glossary of Nuclear Legal Terms" Materials from International School of Nuclear Law, 2006, Second Edition at p. 9.

73. Rautenbach *et al*, *op. cit*., p. 14.

74. See Kamminga, M., *op. cit*., p. 879 where it is stated, "Although the Convention claims, in its preamble, to be an "Incentive Convention", initial drafts of the convention contained no reference whatsoever to technical assistance".

"emulation".[75] Additionally, there is no mechanism by which such assistance could be co-ordinated. Although it might be desirable for the concept to include other mechanisms for enticing compliance, such as financial or technical assistance,[76] the concept is restricted to providing incentives through creating expectations,[77] "encouragement", "emulation"[78] or "peer pressure".

It is also worth noting that compliance is generated through participation in the conventions and in this sense they can be described as in-progress instruments. "The Parties are not forced into an immediate full implementation of the convention's obligations. It is a step-by-step approach to achieving a high level of nuclear safety. Parties are allowed and invited to learn and get better successively. Parties will not lose face".[79] Being "part of the convention clearly demonstrates the national commitment to safety in the management of radioactive material, irrespective of the country's current situation".[80]

Other scholars view the encouragement of bilateral treaties to further develop the regime and the encouragement of a safety culture as integral to the "incentive" concept,[81] but both are only mentioned in the preamble of the conventions and their categorisation as essential aspects of the "incentive" concept is probably immature. Their role in generating a well-functioning safety regime should nevertheless not be underestimated and they may well become essential components of the concept in the future.

Given the increase in experience and different subject matter covered, it is only natural that there be some maturation of the incentive concept between its inception in the CNS and its development in the Joint Convention. Despite this, the essential provisions of the incentive convention remain uncontroversial: the use of non-binding fundamental safety principles rather than detailed standards, the provisions outlining the requirement to actively participate in the peer review mechanism both through the reporting requirements and participation in the review meetings, and the relative lack of a non-compliance procedure.

b) Criticism of the incentive concept

Reaction to the two conventions was initially mixed. Some scholars maintained the view that they are remarkable achievements and the "most effective instruments for enhancing nuclear safety world-wide considerably contribut[ing] to improving nuclear law".[82] Others have been more

75. Jankowitsch, O., *op. cit*., pp. 12-13.

76. The absence of such a mechanism is also criticised by Foss, N., "Nuclear Safety and International Governance: Russia and Eastern Europe" (1999) *Oxford Institute for Energy Studies* www.oxfordenergy.org/pdfs/SP11.pdf (last accessed 11 November 2007).

77. Boustany, K., "The Development of Nuclear Law-Making or the Art of Legal 'Evasion', *Nuclear Law Bulletin*, No. 61 (1998), pp. 39-53, p. 44, quoting Nguyen Quoc Dinh, Patrick Daillier, Alain Pellet, *Droit International Public*, LGDJ, Paris, 5th Edition, 1994, p. 383, paragraph 259.

78. Jankowitsch, O., *op. cit*., pp. 12-13.

79. Pelzer, N., *op. cit*., p. 98.

80. Risoluti, P., "The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management", presented at ANEAS 2004 Nuclear Energy Symposium www.osti.gov/bridge/servlets/purl/841407-viugF2/native/841407.pdf (accessed 27 November 2006), p. 5.

81. Pelzer, N., *op. cit*., pp. 82 and 89.

82. Ibid. p. 95.

disapproving, criticising them for being imprecise, insular and inward looking and in one case stating that "the convention contains neither the precise standards of the Convention on the Transboundary Effects of Industrial Accidents, the flexible amendment procedures of the Montreal Protocol on Substances that Deplete the Ozone Layer, nor the incentive provisions of the Convention on Climate Change".[83] Others with a greater flair for the dramatic have described the conventions as being prone to the art of legal evasion,[84] while yet other writers have been so unhappy with the conventions as to suggest a virtual discarding of the idea of an "incentive" convention.[85]

As Handl notes,[86] on first impression both conventions appear to be formulated rather weakly and to be subject to either normative indeterminacy or significant reservations. Provisions seem to start strongly then undermine themselves with qualifications such as "reasonably practical" and "as soon as practically possible". The ability for the peer review process to determine the real extent to which measures have been implemented or directly influenced country conditions has also been questioned.[87]

Although the failure of the "incentive" conventions to provide for independent verification of compliance was initially a cause for concern,[88] criticism prior to the implementation of the CNS review process and pessimism as to its effectiveness has clearly been proved ill founded. The results of the peer review mechanism have clearly been positive and early calls for reform of the process are now seen as having been premature.

c) Peer Review under the Conventions

The obligation to undergo peer review is both an innovative and dynamic aspect of the CNS.[89] The cornerstones of the peer review mechanism are the national reporting requirements[90] and the holding of meetings to review the performance of the Contracting Parties.[91] The national reports are the tools that "enable Parties to focus on the steps and measures already taken and the progress made in implementing the respective conventions' obligations".[92] They allow national authorities to review

83. Kamminga, M., *op. cit*., p. 881.

84. Boustany, K., *op. cit*., p. 37.

85. McMillan, K., "Strengthening the International Legal Framework for Nuclear Energy*", Georgetown International Environmental Law Review*, Vol. 13, (2001) pp. 983-1012.

86. See Handl, G., *op. cit*., pp. 11-12. He particularly identifies preamble paragraph (viii) which contradicts (ii), Article 6 of the CNS, and also Articles 5 and 12 of the Joint Convention.

87. Foss, N., *op. cit*., p. 68.

88. Kamminga, M., *op. cit*., p. 879.

89. For a discussion of peer review both within the context of the CNS and voluntary review, see Washington, M. "The Practice of Peer Review in the International Nuclear Safety Regime", *New York University Law Review,* Vol. 72 (1997) pp. 430-468. See also: www-ns.iaea.org/conventions/nuclear-safety.htm (last accessed 19 November 2006).

90. Article 5 CNS, Article 32 Joint Convention.

91. Articles 20 and 23 CNS, Articles 30-31 Joint Convention.

92. Rautenbach *et al*, *op. cit*., pp.14-15.

all national activities and develop plans for future actions that may be required and they facilitate an open exchange of information enabling Parties to decide if their performance requires improvement. [93]

Although there was initial apprehension about the effectiveness of the peer review mechanism, following the third review meeting of the CNS and the second review meeting of the Joint Convention those fears have largely dissipated. Instead, the "developments that have occurred during the application of the review process demonstrate not only significant progress towards safety-related improvements but also a willingness of the Parties to fully contribute to the process".[94]

The first review meeting of the CNS in 1999 provided a "snapshot" of the measures Parties had taken and were taking; the second in 2002 provided a more focused review, highlighting progress in individual States and concentrating on specific issues. At the last review meeting in 2005, it was concluded that all Parties in attendance were in compliance, a conclusion that led to the identification of the next problem – that of complacency. Likewise, the first review meeting under the Joint Convention was interpreted as contributing significantly to the achievement of the convention's objectives by prompting improvements by states and identifying deficiencies and enhancements for the future.[95]

Given its success, the process serves to implicitly refine, strengthen and progressively raise the normative threshold against which an assessment of compliance will be assessed. It has also been posited that the use of international standards as guidance within the context of the review process will assist in transforming these standards into "*de facto* legally binding mechanisms so long as the peer review mechanism functions as intended".[96]

The peer review process does not just generate obligations. Parties have the right to be informed about actions in other parties, thus gaining technical knowledge and assistance as to current safety levels.[97] The requirement that all states participate actively in the review process, not only those whose compliance is under question, may also increase goodwill and allow for best practices to be more easily identified and disseminated amongst states.

As we have seen, the peer review process is proving to be quite effective in raising levels of nuclear safety and earlier criticisms appear unfounded. Some scholars, however, still question whether the Joint Convention truly conforms to the "incentive" spirit since it incorporates recourse to external arbitration[98] even though in a limited manner. In response, it can be argued that since the most important aspect of an incentive convention is its peer review process, limited dispute resolution provisions should not be given undue weight.

93. *Ibid*, p. 14-15.

94. *Ibid*, p. 15.

95. *Ibid*, p. 16.

96. Handl, G., *op. cit*., p. 16.

97. Risoluti, P., *op. cit*., pp. 4-5.

98. De Kageneck, A. and Pinel, C., *op. cit*., p. 424.

4) Analysis from a Law & Economics Perspective

Given that the peer review processes under the CNS and the Joint Convention have been overwhelmingly positive thus far, one wonders whether these results are transferable to other international regimes, particularly those addressing environmental safety.

From a basic game theory perspective, international conventions can be useful tools to address problems between states where co-operation, although desirable in that it results in an overall increase in welfare, may not be sustainable in the absence of an agreement, due to incentives by any one player to defect and maximise their individual payoff.

Although treaties are entered into for various reasons, compliance with treaty obligations does not always have to be enforced. For example, where states have common interests and co-operation is easy to achieve (e.g. maintaining territorial integrity between peaceful bordering states), states are likely to respect that co-operation with or without a treaty; the treaty plays only a small role beyond generating goodwill and signalling good intentions. Similarly, although treaties may be created where co-operation requires co-ordination of action (e.g. common rail gauge between neighbouring states) they are often unnecessary; once the standard is decided upon, it is the interests of both states to comply.

However, the situations that the CNS and the Joint Convention address are not those of pure co-ordination. In both cases, once a bargain is struck regarding safety obligations, incentives are generated for states to "defect" from fulfilling their obligations. States recognise that by reducing safety standards they will benefit from reduced compliance costs and will bear only part of the cost of damage resulting from an accident, the remainder being externalised onto surrounding states. Meanwhile, they continue to enjoy the benefits of compliance by the other Contracting States, including the reduced likelihood of damage from accidents in those other States. This game, described as a prisoner's dilemma, is one in which the "parties can maximise their total joint payoff through mutual cooperation but each player does better by defecting".[99]

Provided that the game is an ongoing one where states make repeated decisions on compliance, co-operation can take place.[100] Parties have at least three reasons to co-operate. The first is reciprocity: a violation by one party will likely provoke a violation by another party but the reciprocal act is generally not taken with intent to sanction and is not costly to the reciprocating state. Secondly, both countries value their reputation as a state that honours commitments: a reputational sanction is the cost imposed on a state when its reputation is damaged. Finally, there is the threat of retaliation or punishment: although such an act is costly to the sanctioning state, if undertaken, it will further increase the cost of the breach to the non-complying party.[101]

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99. Guzman, A., How International Law Works: A Rational Choice Theory, Draft manuscript from author July 2007 forthcoming from *Oxford University Press* (2008), (hereinafter "How International Law Works"), Chapter 2, p. 23.

100. Guzman, A., explains in "A Compliance-Based Theory of International Law", *California Law Review* Vol. 90 (2002), 1824-1887 (hereinafter "Compliance-Based Theory"): Although a one-shot game may not generate compliance, once a State expects future interactions the threat of loss of reputational capital in the international area in the case of a breach of an agreement may be enough to alter the equilibrium in which non-compliance would normally occur, if only the other payoffs of defecting, including the threats of reputation and retaliation were taken into account. In such cases, a State may comply in order to avoid the reputational low that would accompany a violation of international law.

101. Guzman, A., *op. cit*., "How International Law Works", Chapter 2, pp. 26-27.

Although reputation is often an important consideration motivating states to comply with international obligations, and explains why compliance with international law is higher than would generally be predicted, two observations must be made. The first is that the "existence of a reputational effect impacts country incentives, but in some instances that impact will be insufficient to alter country behaviour".[102] The second is that it generally operates in the shadow of the possible use of the other enforcement mechanisms. Three key factors determine whether a particular action affects the associated reputation: the non-reputational sanctions the state will face, the state's existing reputation at the time of the action and the importance of the obligation to other states.[103]

Non Reputational Payoffs

Reputation can be an incentive to comply with international legal obligations even in the absence of formal enforcement mechanisms. However, it operates at the margins and is sometimes insufficient to effect state behaviour.[104] A vital part of compliance is generally the non-reputational payoffs a state will enjoy for non-compliance (defection). In the case of the CNS and Joint Convention, these payoffs are likely to be low because the defecting state is likely to suffer a large proportion of the damage generated by non-compliance (e.g. much of the harm from a nuclear accident will be domestic and not externalised onto neighbouring countries) or that sufficient harm will be prosecuted domestically (e.g. through liability rules). Aside from the externality aspect of the payoff structure, and particularly in the case of the CNS, states have an inherent interest in the provision of a safe and secure power supply; they will want to protect this interest, even in the absence of international obligations.

However, as the proportion of damage suffered domestically reduces and the proportion of damage externalised onto other states increases, the incentive to renege on an obligation is likely to be stronger, and in such cases the weak enforcement mechanisms provided by "reputation" may be defeated. It is quite likely that the "enlightened self interests of States",[105] to which the CNS is widely considered to appeal, corresponds quite closely with the non-reputational payoffs described here.

Identifying Non-compliance

What is important is that other parties are able to identify acts of non-compliance in order to sanction transgressions by withholding reputational esteem. An essential requirement for identification is accurate information about the behaviour of the other parties. Originally, the model described by Guzman assumes that states have complete information about existing non-reputational payoffs, legal rules and each other's actions.[106] Of course, in the real world this is never the case; however, the beauty of the peer review mechanism is that by requiring the submission of country reports and creating a forum in which information can be exchanged and discussed, a procedure is established which goes a long way towards reducing information asymmetries between the parties. This strengthens the incentive to comply by increasing the cost of violation, since the latter is more likely to be detected than in the absence of such a mechanism. By seeing the process as a means of increasing

102. Guzman, A., *op. cit*., "Compliance Based Theory", p. 1849.

103. Guzman, A., *op. cit*., "How International Law Works", Chapter 3, p. 62.

104. *Ibid*, Chapter 3, p. 95.

105. Jankowitsch, O., *op. cit*., p. 13.

106. Guzman, A., *op. cit*., "How International Law Works", Chapter 2, p. 33.

the cost of reputational sanction, support is lent to the statement that "Peer review is not at all a soft tool really".[107]

Also of importance to inducing compliance is the fact that not all treaty states have nuclear power plants. Non-nuclear states "may have a stronger interest in ensuring effective oversight of non-complying Parties than the nuclear powers who effectively dictated its terms"[108] and their presence reduces the incentives to weaken the regime or tolerate non-compliance on a *quid pro quo* basis. At the same time, other factors have contributed to the improvement of safety, including industry procedures such as those promoted by the World Association of Nuclear Operators,[109] the operational safety review team programme operated by the IAEA, the existence of other international legal obligations to prevent transboundary harm[110] and the imposition of liability for third party damage on nuclear operators.[111]

However, as Guzman observes, because "informational issues affect payoffs, States have an incentive to attempt to manipulate the information sets of others".[112] As the incentives to renege increase, there will need to be either better information regarding compliance, such as compulsory inspections, for sufficient reputational sanctions to be imposed or other dispute mechanisms incorporated into the treaty, so that the threat of reciprocal or retaliatory sanctions can also be taken into account, thereby altering the payoff structure.

Reputation in the Field of Nuclear Law

The term "reputation" normally refers to the reputation of being a good future treaty partner. In order for a reputational sanction to be effective, the prisoner's dilemma will require the benefits of defection (e.g. financial or political payoffs) to be low and the chances of non-compliance subject to reputational sanctions to be high. The extent to which a state's reputation for compliance with one international treaty is generalised by other states into a reputation for wider compliance with international law remains unclear. However, "the reality is that States have different reputations in different issue areas, but that these reputations are related to each other".[113] The existence of multiple related reputations means that within each area, there are fewer "compliance opportunities" and thus the reputational cost generated by any indiscretion will be higher. This explains why the regime may be more effective in the nuclear field; in trying to ensure compliance with the CNS and the Joint

107. Pelzer, N. *op. cit*., p. 95.

108. Birnie, P. and Boyle, A., *International Law and the Environment*, 2002, Second Edition, Oxford, p. 463.

109. www.wano.org.uk/WANO_Documents/WANO_Mission.asp (last accessed 30 November 2006).

110. Birnie, P. and Boyle, A., *op. cit*. p. 104. Even without the existence of the Conventions, general principles of international law, often expressed as *sic utere tuo ut alienum non laedas,* mean that States have a duty to prevent, reduce and control pollution and environmental harm beyond their national jurisdiction.

111. As required by the 1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy (as amended), the 1963 Brussels Convention Supplementary to the Paris Convention (as amended), the 1963 Vienna Convention on Civil Liability for Nuclear Damage, the 1997 Protocol to Amend the Vienna Convention or the 1997 Convention on Supplementary Compensation for Nuclear Damage.

112. Guzman, A., *op. cit*., "How International Law Works", Chapter 3, p. 80.

113. Downs, G. and Jones, M., "Reputation and Compliance in International Law", *The Journal of Legal Studies,* Vol. 31, (2002), pp. S95-S114 and Guzman, A., *op. cit*., "How International Law Works", Chapter 3, p. 83.

Convention, states may generate a reputation for compliance across the nuclear field, including with regard to conventions where non-reputational incentives to comply are reduced.

Both the CNS and the Joint Convention are treaties covering activities with relatively high negative effects in the case of non-compliance and with benefits for breach which are likely to be low. Since the chances of negative actions being picked up through the reporting and peer review process are high, the likelihood of being exposed to reputational sanctions in the case of non-compliance is also quite high. Additionally, because the field of nuclear law is quite limited, there are few opportunities for building reputational capital, thus increasing the burden of any transgression. These are all factors which go towards making the current "incentive" convention regime embodied in the CNS and the Joint Convention sufficient to generate meaningful compliance and successfully raise international safety standards.

5) Extension of "Incentive" Convention Concept to Other Areas

Although there have been some calls to adopt an "incentive instrument" modelled on the CNS for a biosecurity convention aimed at preventing unauthorised access to pathogens and regulating germ commerce,[114] there do not yet appear to be widespread calls to adopt this structure for other types of multilateral conventions. However, in the past decade, there has been considerable concern about state compliance with multilateral environmental agreements (MEA), a concern arising from the burden that the increasing number of international environmental obligations places on states, the growing demand for natural resources combined with a finite supply and the possible unfair economic advantages, states may enjoy by failing to comply with such obligations.[115]

This has lead to concerns about how to create institutional arrangements addressing the problems of implementation, enforcement and dispute settlement arising under MEAs and how to ensure that developing countries have the financial resources to enable them to meet their commitments under such agreements.[116] In this context, one can question whether the "incentive" concept and peer review structure might be useful in trying to address these concerns.

As the analysis in the previous section has shown, the "incentive" structure is highly appropriate for nuclear safety and would likely be appropriate for other environmental issues with similar payoff structures. The nuclear safety conventions are designed to increase safety in a sector with unique properties which facilitate the use of the mechanism. The most important of those properties are the risk of significant domestic harm in the case of an accident and national security. The incentives to defect are weak and can be overcome by the effective information exchange mechanism provided for in the treaties.

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114. Bartletta, M., Sands, A. and Tucker, J., "Keeping Track of Anthrax: The Case for a Biosecurity Convention", *Bulletin of the Atomic Scientists* Vol. 59, No. 3, (2002) p. 58 and Tucker, J., "Preventing Terrorist Access to Dangerous Pathogens: The Need for International Biosecurity Standards", *Disarmament Diplomacy* (2002), p. 66: www.acronym.org.uk/dd/dd66/66op2.htm (last accessed 26 November 2006).

115. Sands, P. and Linehan, J., "Compliance with Multilateral Environmental Agreements: the Climate Change Regime", in: *International Law and Organisation: Closing the Compliance Gap,* Doyle, M. and Luck, E., (eds) Rowman & Littlefield, Oxford, (2004), p. 94.

116. *Ibid*, p. 94.

The structure may, however, be less useful in cases where the non-reputational costs of non-compliance are low. For example, the more the harm is externalised, the greater will be the need for reciprocity and retaliation type sanctions to prompt compliance. If reliance is placed on reputation or peer pressure to generate compliance, then either stronger sanctions for non-compliance will be needed, such as limited recourse to outside arbitration, or the likelihood of being sanctioned will need to be increased, through more descriptive reporting procedures or greater participation of those without a vested interest in the review process.

If we look at the development of the CNS and the Joint Convention, we see that the latter's provisions are slightly stricter so as to take these effects into account. As more of the provisions in the Joint Convention pertain to preventing damage external to the Contracting Party, particularly for the transboundary movement of waste, there will be a greater externalisation of any damage. Additionally, the Joint Convention does not involve national security issues, such as power production, which in the case of the CNS provide strong incentives to maintain safety. These two factors may explain why we see that the enforcement mechanisms under the Joint Convention are stronger and that there is clearer enunciation of the review mechanism. Also, there are provisions allowing for the participation of inter-governmental organisations in the Joint Convention that, although also included, are perhaps less necessary in the CNS, since the role of impartial bystander is to some extent assumed by CNS non-nuclear States.

The extent to which damage is externalised and the importance of the treaty to state interests will likely remain useful for determining which subject areas will successfully benefit from an "incentive" structure. The more a subject area is removed from these factors, the more it will require traditional methods of ensuring compliance.

6) Conclusions

Although the incentive concept as embodied in the Convention on Nuclear Safety and the Joint Convention arose initially out of a limited set of circumstances and may even be interpreted as accidental, it has proved to be a very successful mechanism in promoting the improvement of nuclear safety. The essential features of this concept, as embodied in the conventions, are the relatively weak substantive obligations, the strong requirement to participate in the peer review mechanism and the lack of coercive enforcement provisions. Its success has largely been due to the peer review mechanism.

There are several factors which, in conjunction with the convention structure, promote and facilitate the effective operation of this mechanism in the case of nuclear safety. These factors have been identified as the nature of the harm that the treaties seek to address, the important role played by nuclear power in securing national energy supplies, the existence of other voluntary review mechanisms and the participation in the treaty by states both with and without civilian nuclear facilities. With regard to the nature of the harm, an important factor is that a large proportion of the harm is likely to be suffered domestically, thus reducing the tendency for states to externalise the damage. The coincidence of all these factors means that although there will still be mild incentives for states to escape from their treaty obligations, those incentives can be overcome relatively easily through the use of only a peer review mechanism without resort to stronger enforcement mechanisms.

The application of the concept to other areas, particularly environmental concerns, is more difficult. Since the mechanism is likely to succeed in situations where the incentives for defection are weak, such as where only a small proportion of the damage is externalised, it is unlikely to be effective for global environmental problems where much of the damage caused by any one state is externalised

onto all others (e.g. carbon dioxide emissions). However, if the external damage remains at low to moderate levels in comparison with the domestic damage, the mechanism may still be effective, with the addition of slightly stronger reporting and enforcement measures, such as those found in the Joint Convention. Nevertheless, it must be acknowledged that the concept is likely to enjoy success only in the context of narrowly defined situations, such as nuclear safety. In the absence of such situations, the mechanism is perhaps most appropriate only in cases where broad adherence is a priority and where a stronger agreement cannot be reached without the risk of jeopardizing that adherence.

Study

The International Systems of Radiological Protection: Key Structures and Current Challenges

by Edward Nicholas Lazo*

Introduction

Since the realisation, at the beginning of the 1900s, that exposure to ionising radiation could cause detrimental health effects, experts in the field have worked together to establish a scientific basis for describing radiation-related risks, to recommend practical principles for protection against radiation-related risks and to develop international standards and national regulations in this area.

In broad terms, the primary aim of radiological protection is to contribute to an appropriate level of protection for people and the environment against the detrimental effects of radiation exposure without unduly limiting the desirable human actions that may be associated with such exposure. To guide the implementation of this aim, three principles have been developed, namely the justification of activities, the optimisation of protection and the limitation of exposures. These three key principles have been elaborated by the International Commission on Radiological Protection (ICRP – which is described in more detail below) as follows:

The principle of justification

Any decision that alters the radiation exposure situation should do more good than harm.

The principle of optimisation of protection

The likelihood of incurring exposures, the number of people exposed and the magnitude of their individual doses should all be kept as low as reasonably achievable, taking into account economic and societal factors.

The principle of exposure limitation

The total dose to any individual from regulated sources in planned exposure situations other than medical exposure of patients should not exceed the appropriate limits.

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I. Institutional Framework

Today, several international organisations contribute significantly to the establishment of a scientific and legal framework in the field of radiological protection. Although there is no "process" formally defined, the organisations work in the following fashion:

- The United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) collects and assesses scientific literature regarding exposure to ionising radiation, assessing world-wide exposure trends.
- The International Commission on Radiological Protection (ICRP) uses the scientific data from UNSCEAR to develop pragmatic policy and application recommendations that can be used as a basis for the development of standards and regulations.
- The International Atomic Energy Agency (IAEA) develops international, broadly non-binding standards that may be adopted by its Member States and must be adopted by any state accepting the agency's assistance. These standards are based on the recommendations of the ICRP.
- The European Commission (EC) develops binding directives that must be transposed into national law by its Member States. These are based on the recommendations of the ICRP.
- The OECD Nuclear Energy Agency (NEA) explores new and emerging issues and challenges in the field of radiological protection, as identified and requested by its member countries, in order to share experience and develop approaches to addressing these issues. In particular, the NEA has worked in collaboration with the ICRP to "road-test" draft recommendations as to their implications for policy, regulation and application and thereby assisted the ICRP to develop recommendations that best address the needs of the radiological protection community.

This study presents a short history of the key organisations in this process and goes on to discuss their interactions and current issues in radiological protection.

1. The United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR)

In 1955, purportedly with the intention to deflect a proposal calling for an immediate end to all nuclear explosions, it was proposed to the General Assembly of the United Nations to establish a committee to collect and evaluate information on the levels and effects of ionising radiation. Subsequently on 3 December 1955, the General Assembly unanimously approved a Resolution[1] which established the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR). The original committee was composed of senior scientists from 15 designated UN Member States, namely Argentina, Australia, Belgium, Brazil, Canada, Czechoslovakia, Egypt, France, India, Japan, Mexico, Sweden, the United Kingdom, the United States and the USSR.

The first two substantive reports submitted to the General Assembly, in 1958 and 1962, presented comprehensive evaluations of the state of knowledge about the levels of ionising radiation to which human beings were exposed and of the possible effects of such exposures. Those reports laid the scientific grounds on which the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water (Partial Test-Ban Treaty) was negotiated and signed in 1963.

1. Resolution 913(X), dated 3 December 1955, the founding resolution.

Over the decades that followed this important first achievement, the UNSCEAR became the official international authority on the levels and effects of ionising radiation, used for peaceful as well as military purposes and derived from natural as well as man-made sources. In the first UNSCEAR report of 1955, it had been recognised that medical diagnostic and therapeutic exposures were a major component of artificial radiation exposure globally, a fact that remains true today. The Committee has systematically reviewed and evaluated global and regional levels and trends of medical exposure, as well as exposure of the public and workers. These reviews have prompted significant reductions in unnecessary radiation exposure worldwide and continue to influence the programmes of international bodies such as the IAEA, World Health Organisation (WHO), ICRP and the International Labour Organization (ILO).

The Committee has regularly evaluated the evidence for radiation-induced health effects from studies of the survivors of the atomic bombings in Japan and other exposed groups. It has also reviewed advances in scientific understanding of the mechanisms by which radiation-induced health effects can occur. These assessments have provided the scientific foundation used by the ICRP in developing its recommendations on radiological protection and by the relevant agencies in the UN system in formulating international protection standards.

Since its inception, the UNSCEAR has issued only 15 major publications, but these authoritative reports are principal sources of information. Twenty-one countries provide the present membership of the Committee and more than 50 national organisations as well as several international organisations provide considerable contributions in kind.

2. The International Commission on Radiological Protection (ICRP)

The International Commission on Radiological Protection (ICRP) was created in 1928, as the International X-ray and Radium Protection Committee, and restructured in 1950 in order to address protection from emerging health effects of radiation, mostly in researchers and patients from X-rays and radium treatments. The ICRP, which is registered as an independent charity and financed mainly by voluntary contributions from international and national bodies, is composed of a main commission and five standing committees, whose members are all elected (main commission) or appointed (committees) by the Commission itself under rules set out by the International Society of Radiology.

The ICRP works closely with the International Commission on Radiation Units and Measurements (ICRU), maintains important relations with various UN organisations (UNSCEAR, WHO, IAEA, ILO, UNEP) and works with the EC, OECD/NEA, the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). It also has strong links with the International Radiation Protection Association (IRPA).

The ICRP has, since its inception, issued recommendations regarding protection against the hazards of ionising radiation. Since its 1950 restructuring, the ICRP has issued approximately 100 recommendation documents. The most fundamental of these, called the Commission's general recommendations, are issued approximately every 10 to 15 years to take into account new scientific evidence and managerial experience. The first of these general recommendations was ICRP Publication 1 (1959), which was followed by Publication 6 (1964), Publication 9 (1966), Publication 26 (1977) and Publication 60 (1990).[2]

2. www.icrp.org.

Historically, national and international organisations and practitioners involved in activities that produce or use radiation and/or radioactive materials have taken the recommendations and principles issued by the ICRP as a key basis for their protective actions. As such, virtually all national regulations and international standards addressing radiological protection are based on the recommendations of the ICRP. Currently, most national regulations are based on the recommendations of ICRP Publication 60. International standards, such as the International Basic Safety Standards, various ILO labour conventions and European directives on radiological protection are also based on ICRP Publication 60.

The Commission's new general recommendations were approved in March 2007 and are expected to be published soon. The evolutionary changes introduced by the Commission in its new recommendations, and the challenges that their implementation will pose are briefly elaborated in Section II of this paper.

3. International Atomic Energy Agency (IAEA)

The IAEA was created in 1957 in response to the deep fears and expectations resulting from the discovery of nuclear energy. In the context of the international system of radiological protection, the IAEA plays a special role in establishing international standards. This role is specified in Article III.6 of the Agency's Statute:

> "*To establish or adopt, in consultation and, where appropriate, in collaboration with the competent organs of the United Nations and with the specialised agencies concerned, standards of safety for protection of health and minimisation of danger to life and property (including such standards for labour conditions), and to provide for the application of these standards to its own operation as well as to the operations making use of materials, services, equipment, facilities, and information made available by the Agency or at its request or under its control or supervision; and to provide for the application of these standards, at the request of the parties, to operations under any bilateral or multilateral arrangements, or, at the request of a State, to any of that State's activities in the field of atomic energy*".

Since its inception, the IAEA has issued many standards, the International Basic Safety Standards being among those having had the most impact. The International Basic Safety Standards were undertaken in 1960, at which point the Board of Governors of the IAEA stated that, "the Agency's basic safety standards will be based, to the extent possible, on the recommendations of the International Commission on Radiological Protection (ICRP)". The Board first approved basic safety standards in June 1962, published by the IAEA as Safety Series No. 92 and revised in 1967. A third revision was published as the 1982 Edition of Safety Series No. 94[3] which was jointly sponsored by the IAEA, the ILO, the OECD/NEA and the WHO.

In 1990, an important step towards international harmonisation of radiological protection and safety took place: an Inter-Agency Committee on Radiation Safety (IACRS) was constituted as a forum for consultation on, and collaboration in, radiation safety matters between international organisations. The IACRS initially comprised the European Commission (EC), the Council for Mutual Economic Assistance (CMEA);[4] the Food and Agriculture Organization (FAO), the IAEA, the ILO,

3. www.iaea.org.

4. Now defunct.

the OECD/NEA, the UNSCEAR and the WHO. The Pan American Health Organization (PAHO) joined subsequently.[5]

The objective of the IACRS is to promote consistency and co-ordination of policies with respect to the following areas of common interest:

- applying principles, criteria and standards of radiological protection and safety and translating them into regulatory terms;
- co-ordinating research and development;
- advancing education and training;
- promoting widespread information exchange;
- facilitating the transfer of technology and know-how; and
- providing services in radiological protection and safety.

Within this framework, the sponsoring organisations established a Joint Secretariat for the preparation of the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (standards), contained in this publication. The Joint Secretariat was co-ordinated by the IAEA. The standards supersede the previous basic international standards and reflect knowledge gained subsequently, developments in radiological protection, safety and related fields.

The standards are based primarily on the recommendations of the ICRP. However, based on implementational experience, on new scientific data and on the new ICRP recommendations, the International Basic Safety Standards are currently in the process of being updated and revised, with the new version expected to be approved by all co-sponsoring organisations, through their own institutional mechanisms, in the timeframe between 2010 and 2011.

4. European Atomic Energy Community

Article 2 (b) of the Treaty establishing the European Atomic Energy Community (Euratom Treaty) stipulates that "*in order to perform its task, the Community shall, as provided for in this Treaty establish uniform safety standards to protect the health of workers and of the general public and ensure that they are applied*".

The requirements for radiological protection are laid down in Title II, Chapter 3 "Health and Safety", Articles 30 to 39 of the Euratom Treaty. Pursuant to the Treaty, a comprehensive set of directives, regulations, recommendations and decisions has been elaborated and adopted.

In particular, the European Atomic Energy Community (Euratom) has established its basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation, known as the European BSS Directive.[6] It is a legislative act addressed to the Member States of Euratom. They must implement the directive into their national legislation.

5. The ICRP, the ICRU, the IEC, the IRPA and the ISO have observer status on the IACRS.

6. Council Directive 96/29/EURATOM of 13 May 1996 Laying Down Basic Safety Standards for the Protection of the Health of Workers and the General Public Against the Dangers Arising from Ionising Radiation.

However, directives are binding as to the result without dictating the means of achieving it and leave to the national authorities the choice of form and methods of implementation [Article 161 of the Euratom Treaty]. If the laws of a Member State already comply with the European BSS Directive the state would only be required to keep its laws effective. If the national legislation does not adequately comply with the aims of the directive, the EC may refer the matter to the European Court of Justice.

As with the IAEA International Basic Safety Standards, the European BSS Directive is currently under review, with the intention to develop a new, updated version that reflects implementational experience, new scientific data and the new ICRP recommendations. The new European BSS Directive is expected to be adopted after 2010 and is planned to be coherent with the International Basic Safety Standards being developed by the IAEA.

5. The NEA Committee on Radiation Protection and Public Health (CRPPH)

The Committee on Radiation Protection and Public Health (CRPPH) of the OECD/NEA has the responsibility to study various aspects of radiological protection issues and take actions to support national authorities in the adoption and maintenance of high standards of protection in the use of ionising radiation.

Under its mandate, the CRPPH is responsible for radiological protection studies and experience exchange in light of the goals to:

- provide its members with a high-level, visible forum for exchange and discussion;
- seek common understanding of identified issues;
- advance the "State-of-the-art" in radiological protection theory, regulation and practice;
- advance policies that bring the system of radiological protection more in line with modern societal needs; and
- promote international co-operative projects.

By addressing these goals, the CRPPH is helping to establish a safe working environment for nuclear power and waste management operations as well as for medical, research and other industrial uses of ionising radiation. This is accomplished, in part, through the application of the ALARA principle (as low as reasonably achievable) to effectively manage public and worker exposures.

Performing the work in close collaboration with other international organisations[7] assures that its efforts are complementary. The CRPPH is also helping to promote international co-operation and discussion leading to more efficient and cost-effective resolution of important radiological protection issues. The CRPPH publishes a document detailing its accomplishments and objectives,[8] and in 2007 celebrated its 50th anniversary with, amongst other things, a publication describing the Committee's history.[9]

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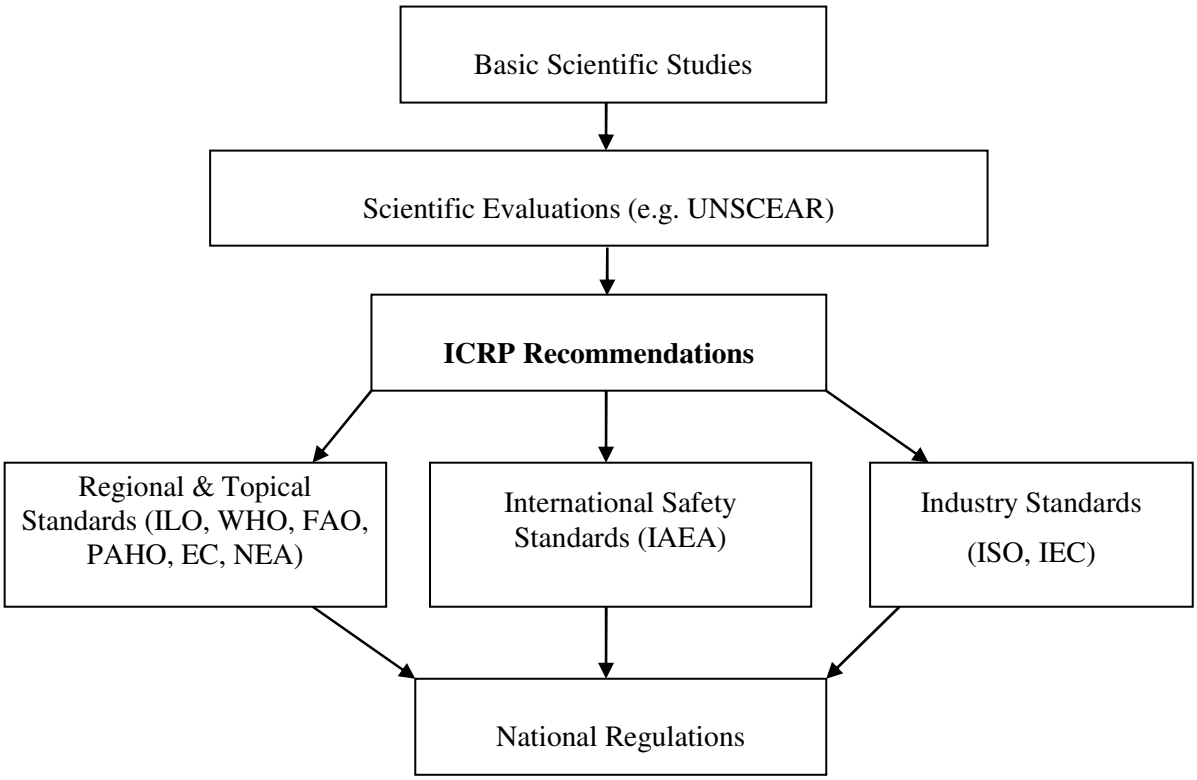
7. Particularly the IAEA, the EC and the ICRP, the IRPA, the ILO, the UNSCEAR, the WHO, the World Meteorological Organisation (WMO), the United Nations Office for the Co-ordination of Humanitarian Assistance (UN-OCHA) and the United Nations Development Programme (UNDP).

8. NEA/CRPPH(2007)5/REV1.

9. *Fifty Years of Radiological Protection*: *The CRPPH 50th Anniversary Commemorative Review*, OECD Nuclear Energy Agency, 2007.



II. The New ICRP Recommendations

As previously indicated, the ICRP reviews its recommendations periodically and issues updated general recommendations approximately every 10 to 15 years. Beginning in about 1999, nine years after the Commission had issued its last general recommendations as Publication 60, the ICRP Chair began to openly explore the evolution of the ICRP's recommendations, publishing a paper in the *Journal of Radiological Protection* titled, *"Control of low-level radiation exposure: time for a change?"*.[10] The evolution of the Commission's thinking was of great interest because most governments base their radiological protection policies and regulations at least in part on the recommendations of the ICRP.

The preliminary focus of the ICRP development has been on new general recommendations which will replace Publication 60 (see *Nuclear Law Bulletin* No. 77). As part of this process, the ICRP has also identified a need to clarify and update its views on the radiological protection of non-human species.

In 2000, based on national interest, the CRPPH began to actively focus on how the system of radiological protection could be made more responsive to decision makers, regulators, practitioners and the public. To achieve this, the relationship between the ICRP and the CRPPH was enhanced, with the CRPPH developing its thoughts as to how the system could be improved through the work of several expert groups.

10. *J. Radiol. Prot*., 19 No. 2, June 1999.

In a process that has been much more open than that for the development of the previous ICRP recommendations, the Commission has solicited input from a very broad spectrum of radiological protection stakeholders, ranging from government institutions and international organisations to NGOs. In this process, the NEA has also actively participated, primarily through the CRPPH, the expertise of its members and the Secretariat, by providing a fora and opportunities for interaction with interested authorities of member countries as well as the dialogue with other stakeholders. Since 1998, the CRPPH has organised eight international workshops,[11] performed four detailed assessments of ICRP draft texts[12] and has issued, in addition to conference proceedings documents, seven expert group reports proposing innovative approaches to the evolution of the ICRP's system of radiological protection.[13] These actions have been complemented by direct interactions with, and background briefings from the ICRP chairs and key members of the ICRP main commission and through the NEA Secretariat's expert participation in ICRP subcommittees and task groups.

The NEA's role has been to provide comments and feedback to the ICRP from key stakeholders such that the Commission's new recommendations adequately and appropriately address national issues and concerns, including those of policy makers, regulators and implementers. Several issues have been of particular concern to the NEA's constituency, and suggestions and comments from the NEA have resulted in significant changes in various draft ICRP recommendations. For example, as a result of NEA input the ICRP has maintained the concept of dose limits in its recommendations, has significantly and coherently clarified the nature and use of dose constraints and reference levels and has taken a much more "stepwise" approach to recommendations regarding the radiological protection of the environment.

In May 2003, the NEA Steering Committee for Nuclear Energy held a policy debate on the Evolution of the System of Radiological Protection, including a presentation by Prof. Roger Clarke, who was at that time the ICRP Chair. This policy debate concluded, *inter alia*, by appreciating the ICRP for its increased openness and encouraging continued efforts to work with OECD member countries to identify and address their concerns.

1. The current Radiological Protection Regulatory Scheme

Following the 1986 reassessment of exposures to victims of the Hiroshima and Nagasaki atomic bombs, the ICRP developed new recommendations in the form of Publication 60, implementing significant changes in dose limits and radiological protection policy.

Most importantly, worker dose limits were lowered from 50 mSv per year to 100 mSv over five years with a maximum of 50 mSv in any single year. Public dose limits had earlier been reduced from 5 mSv per year to 1 mSv per year. This was re-emphasised in the new recommendations.

The other significant change implemented in Publication 60 involved the management of radiological protection. Activities resulting in radiological exposures were divided into what the Commission called "practices", which increased exposures, and "interventions", which reduced exposures. The construction and operation of a nuclear power plant or a nuclear medicine clinic would be examples of practices, that is, new or ongoing activities that are subject to full regulatory processes

11. Taormina 2001; Tokyo 2002, 2004, 2006 and 2007; Lanzarote 2003; Washington D.C. 2006; Prague 2006, list of workshops see Annex.

12. In 2003, 2004, 2006 and 2007.

13. List of reports, see Annex.

and for which radiological protection decisions can be taken before an exposure is incurred. The post-accident situations or exposure to high natural levels of radon would be examples of interventions, where actions to protect exposed individuals are taken, but the situation already exists such that actions will, in effect, reduce exposures that would otherwise occur if no actions were taken.

Activities and protective actions were to be justified ("do more good than harm") and protection was to be optimised. Dose limits were applied only to practices and not to interventions because limits in intervention situations could have resulted in the need for protective actions that were excessively costly (i.e. not optimised).

Through various mechanisms, including national policies and regulations as well as international standards, the recommendations in Publication 60 have been broadly implemented in most countries, although in many countries they were only formally included in national regulations starting in 2001 and later.

2. Evolution of the Radiological Protection System in the New ICRP General Recommendations

The Commission had explained its decision to update its recommendations as being based on some evolution of scientific knowledge, but more broadly on the need to clarify and consolidate its older recommendations. It noted that, since Publication 60, it had issued approximately 40 other recommendation documents containing over 30 numerical criteria of varying bases and applications. Further, the Commission stated that the system based on practices and interventions had caused confusion and thus merited replacement.

In March 2007, as a result of discussions within the ICRP and with numerous other stakeholders, including the NEA, the Commission approved its new recommendations, which are expected to be published at the end of 2007.

The key aspects of the new recommendations that differ significantly from the 1990 Publication 60 recommendations are the following:

- **A situation-based approach**: Instead of organising the protection system based on the type of activity affecting the exposure (i.e. practices or interventions), the Commission now addresses radiological protection aspects based on the characteristics of the exposure situation, now defined as "planned, emergency or existing" and recommends that radiological protection be applied in the same way for each of these situations. Thus, in all exposure situations protection actions must be justified, protection must be optimised and exposures should be subject to appropriate limitation (dose limits, dose constraints, reference levels). The Commission says that these three exposure situations address all conceivable circumstances and defines them as follows:

  – *Planned exposure situations* are situations involving the deliberate introduction and operation of sources. Planned exposure situations may give rise both to exposures that are anticipated to occur (normal exposures) and to exposures that are not anticipated to occur (potential exposures).

  – *Emergency exposure situations* are situations that may occur during the operation of a planned situation or from a malicious act, or from any other unexpected situation and require urgent action in order to avoid or reduce undesirable consequences.

– *Existing exposure situations* are exposure situations that already exist when a decision on control has to be taken, including prolonged exposure situations after emergencies.

- **Dose constraints**: This concept intends to limit any inherent inequity that may be introduced when broadly optimising protection below the dose limit. Source-related dose constraints ensure that planning for protection will not allow the unequal distribution of doses among all those exposed. This concept has been very successfully used in practices, for example, in planning protection of workers at nuclear power plants. The Commission has now extended this to cover not just planned situations, but to cover all exposure situations.

  The dose constraint is not a regulatory guideline in the same sense as a dose limit. It is rather a planning tool for selecting protection options. Exceeding a dose constraint does not mean that a regulatory boundary has been passed, but that protective actions should be reviewed and modified if this would result in optimised protection under the circumstances at hand. In extending the application of dose constraints to emergency and existing exposure situations (called reference levels in these situations) as well as to planned exposure situations, the Commission now recommends a system of protection that is uniform in all situations.

- **More focus on optimisation**: The Commission states that its system applies equally to all exposure situations and that protection should always be optimised. By extending the concept of dose constraints to all exposure situations, the Commission is further emphasising that under all circumstances protection will be optimised. This does not mean that all exposures will be driven towards zero. Rather, it demonstrates the need to ensure that the benefits and detriments of any protective actions must be appropriately assessed in order to identify the "optimum" protection solution.

  It should also be noted that, for the first time, the Commission mentions the need to account for the views and concerns of stakeholders when optimising protection.

- **Updating risk estimation**: Based on the latest available scientific information of the biology and physics of radiation exposure, in particular from the Radiation Effects Research Foundation (RERF), the Commission's radiation and tissue weighting factors in the quantities equivalent and effective dose have been updated, as has the radiation detriment (relative risk per sievert of exposure). The detriment that radiation exposure can cause is in part a function of the type of radiation (e.g. alpha, beta, gamma, X-ray, neutron, proton, etc.) causing the exposure, with some radiation being more effective than others at causing an effect for an equal energy deposited. To account for this when assessing the total detriment caused by exposure to more than one type of radiation, radiation weighting factors are used so that all exposure components can be summed. Similarly, different body tissues (e.g. stomach, bone, thyroid, gonads, breasts, etc.) are more or less radiosensitive, such that the assessment of the "whole-body dose" requires the summation of effects on all organs and tissues. To do this, tissue weighting factors are used.

- **Radiological protection of the environment**: Although the new Commission recommendations do not include specific recommendations for the protection of the environment, they do include an approach for developing a framework to demonstrate radiological protection of the environment. Committee 5 of the ICRP, addressing protection of the environment, was recently created to develop specific recommendations

in this area. The proposed framework includes the definition of a small number of what the Commission calls "Reference Animals and Plants", or RAPs. These are stylised models of 12 creatures: ducks, frogs, rats, deer, pine trees, seaweed, earthworms, flatfish, trout, bee, crab and grass. The intention is that these can be modelled and exposures can be assessed based on environmental contamination (in air, water and soil). In addition, for these creatures there exists biological evidence of radiation-induced damage that can thus be used to assess overall detriment from a given, modelled exposure. This framework is presented by the ICRP as a "tool" that can be used when developing environmental impact assessments.

3. Questions concerning the Implementation of new ICRP Recommendations

The international community is now seeking to acquire a deeper understanding of the new ICRP recommendations so that they can be appropriately implemented. This will certainly involve an assessment of the possible impacts on existing radiological protection frameworks and practices as well as on subsequent regulatory implementation.

Although the Commission stresses its concern to "maintain stability in its recommendations", the new system does present some potentially significant changes that will need to be closely considered by regulatory authorities. These elements are described below.

Policy aspects

- The Commission is now focusing on the radiological protection of the environment. The new recommendations do not contain any specific recommendations in this area. However, the Commission states its "intention" to make recommendations in the future. National and international bodies that want to base or amend their framework accordingly will need to consider whether the Commission's current text on this subject and its intention to go further into this area, will affect current policies and regulations regarding the radiological protection of the environment.
- The implementation of the new ICRP recommendations will most likely entail the need for at least some modification of existing national regulations and international standards. NEA member countries have in the past implicitly insisted on the need to have only one broad approach to radiological protection, based on the recommendations of the ICRP. However, with the new ICRP recommendations, governments will need to decide whether the changes recommended by the ICRP will result in sufficient safety improvement to warrant the change of national regulations and international standards.
- The first practical application, in which the discussion will be of significance, is the development of the new IAEA International Basic Safety Standards (BSS). Currently being revised by a Secretariat of co-sponsoring organisations, led by the IAEA and including the NEA, the shift from the ICRP Publication 60 system to the new ICRP recommendations may entail changes that could affect many of the IAEA's safety standards documents. The NEA standing technical committees have pushed to have the new BSS as a complete, stand-alone document reflecting the new ICRP recommendations.
- The European Commission is also revising its BSS Directive and will thus need to consider how to implement the new ICRP recommendations.

- Finally, the implementation process will show whether there will be a discussion of a "graded approach" to applying the Commission's recommendations, such that some flexibility will be taken with regard to how the new ICRP recommendations are applied in the various national and international fora, particularly in NEA member countries versus in non-NEA member countries.

Practical aspects

- Switching from practice/intervention to a situation-based system raises several questions that will need to be answered or interpreted for implementation. These questions are similar for the three newly defined exposure situations (planned, emergency and existing), yet will still require individual attention.

  Planned exposure situations

  – What will be the regulatory interpretation and use of dose constraints and what will be the regulatory relationship between dose limits and dose constraints?

  – What effects will the new recommendations have on regulatory organisations and on the nuclear industry and on the non-nuclear industry?

  – What effects will the Commission's new focus on optimisation and stakeholder involvement have on current implementation of the ALARA principle?

  Emergency exposure situations

  – How will the newly recommended reference levels (20-100 mSv per year band) be used in emergency exposure situations?

  – How will the focus on optimisation of protection strategies, rather than single countermeasures, effect emergency response planning and implementation?

  – What effects will the Commission's new focus on optimisation and stakeholder involvement have on optimisation?

  Existing exposure situations

  – How will the newly recommended reference levels (1-20 mSv per year band) be used in existing exposure situations?

  – What effects will the Commission's new focus on optimisation and stakeholder involvement have on the ALARA principle, for example, in the release of contaminated sites after clean-up?

  – What effect will the new reference-level concept have on regulatory approaches to protect against domestic and occupational exposures to radon?

4. Emerging Challenges from Radiological Protection Science

The new radiation and tissue weighting factors will need to be implemented into dose assessment models. In that many countries use or reference specific dose assessment models in their

regulations, the work to incorporate the new weighting factors may require regulatory updates that could involve regulatory review processes. This would most likely be a burden to regulatory authorities, but also to licensees and expert bodies.

In addition to these new scientific results, which have been implemented in the new ICRP recommendations, several other aspects of radiological risk remain and continue to be studied, but have not as yet been the object of consensus. Regulatory authorities may wish to begin considering the potential impacts that these scientific developments could have. These include:

- new quantification of risk to the lens of the eye;
- new risks that ionising radiation may pose in terms of non-cancer effects, such as circulatory diseases;
- social and regulatory implications that could be posed by deeper scientific understanding of genetic susceptibility to radiation-induced diseases; and
- social and regulatory implication that could be posed by deeper scientific understanding of the age and gender-specific risks.

Many of these issues have been outlined in the NEA's report on *Scientific Issues and Emerging Challenges for Radiological Protection*.[14] Scientific challenges to the existing paradigm, like those listed above, will continue to arise as scientist's "do their job" of studying the causes and detrimental effects of ionising radiation. From the public health regulatory perspective, it will be important to continue following and sponsoring scientific developments so as to avoid, as best possible, being caught by surprise by new scientific results.

Conclusions

The system of radiological protection and the organisations that develop and implement it continue to evolve. This presents a challenge to the stability of regulation and to the smooth operation of regulated activities. In effect, the evolution of the system of radiological protection can be seen through the lens of the precautionary principle: changes, whether incremental or larger, occur when it is judged that changing will do more good than harm. Detailed interpretation of this will always remain in the hands of decision makers, who are advised by their legal and technical experts.

14. *Scientific Issues and Emerging Challenges for Radiological Protection*: *Report of the Expert Group on the Implications of Radiological Protection Science*, OECD Nuclear Energy Agency, 2007.

Annex

List of NEA Activities and Publications Related to the Development of New ICRP Recommendations

NEA Workshops

- *The Future Policy for Radiological Protection*, *A Stakeholder Dialogue on the Implications of the ICRP Proposals*, Prague, Czech Republic, 24-25 October 2006.
- *Evolution of the System of Radiological Protection*, *A Stakeholder Dialogue on the Draft 2006 ICRP Proposals*, Washington D.C., United States, 28-29 August 2006.
- *Evolution of the System of Radiological Protection*, *Third Asian Regional Conference*, Tokyo, Japan, 5-6 July 2006.
- *Evolution of the System of Radiological Protection*, Second Asian Regional Conference, Tokyo, Japan, 28-29 July 2004.
- *Asian Regional Conference on the Evolution of the System of Radiological Protection*, Tokyo, 24-25 October 2002.
- *The Future Policy for Radiological Protection*, *A Stakeholder Dialogue on the Implications of the ICRP Proposals*: 2nd NEA Forum in collaboration with the International Commission on Radiological Protection (ICRP), Lanzarote, Canary Islands, Spain, 2-4 April 2003.
- *Radiological Protection of the Environment*: *The Path Forward to a New Policy*? Taormina, Sicily, Italy, 12-14 February 2002.

NEA publications (available from www.nea.fr or www.oecdbookshop.org)

- *A Stakeholder Dialogue on the Implications of the ICRP Proposals* (Summary of the three 2006 NEA/ICRP conferences held in Tokyo, Washington D.C. and Prague), OECD/NEA (2008).
- *The Future Policy for Radiological Protection*, *A Stakeholder Dialogue on the Implications of the ICRP Proposals*, Prague, Czech Republic, 24-25 October 2006, Workshop Proceedings, OECD/NEA (2008).
- *Evolution of the System of Radiological Protection*, *A Stakeholder Dialogue on the Draft 2006 ICRP Proposals*, Washington D.C., United States, 28-29 August 2006, Workshop Proceedings, OECD/NEA (2008).
- *Evolution of the System of Radiological Protection*, *Third Asian Regional Conference*, Tokyo, Japan, 5-6 July 2006, Workshop Proceedings, OECD/NEA (2008).
- *Environmental Radiological Protection in the Law*: *A Baseline Study*, OECD/NEA (2007)
- *The Process of Regulatory Authorisation*: *A Report by the CRPPH Expert Group on the Regulatory Application of Authorisation*, OECD/NEA (2006).

- *Evolution of the System of Radiological Protection*, *Second Asian Regional Conference*, Tokyo, Japan, 28-29 July 2004, OECD/NEA (2005).
- *Optimisation in Operational Radiological Protection*: *A Report by the Working Group on Operational Radiological Protection of the Information System on Occupational Exposure*, OECD/NEA (2005).
- *The Future Policy for Radiological Protection*: *A Stakeholder Dialogue on the Implications of the ICRP Proposals*, Summary Report, Lanzarote, Spain, OECD/NEA (2004).
- *The Future Policy for Radiological Protection*: Workshop Proceedings, Lanzarote, Spain 2-4 April 2003, OECD/NEA (2003).
- *Possible Implications of Draft ICRP Recommendations*, OECD/NEA (2003).
- *Evolution of the System of Radiological Protection*, *Asian Regional Conference*, Tokyo, 24-25 October 2002, OECD/NEA (2003).
- *A New Approach to Authorisation in the Field of Radiological Protection*: *The Road Test Report*, OECD/NEA (2003).
- *Radiological Protection of the Environment*: *Summary Report of the Issues*, OECD/NEA (2003).
- *Radiological Protection of the Environment: The Path Forward to a New Policy?* – Workshop Proceedings, Taormina, Sicily, Italy, 12-14 February 2002, OECD/NEA (2003).
- *The Way Forward in Radiological Protection*, An Expert Group Report, OECD/NEA (2002).
- *A Critical Review of the System of Radiation Protection*: *First Reflections of the OECD Nuclear Energy Agency's Committee on Radiation Protection and Public Health*, OECD/NEA (2000).

Case Law

France

Judgement of the European Court of Human Rights on the Right to a Fair Trial, in the Litigation Collectif Stop MELOX and MOX* versus *France (2007)

On 12 June 2007, the European Court of Human Rights (ECHR) dismissed the claim of *Collectif Stop MELOX and MOX* against France, concerning a decree authorising increased production of nuclear fuels from mixed oxides uranium/plutonium ("MOX") at the plant Melox.

The applicant had appealed against this decree to the Council of State (*Conseil d'État* – Supreme Administrative Court) in 1999. This appeal was dismissed and the plaintiff was required to pay 5 000 francs (FRF) (750 euros) to Cogema, operator of the site, licensee and intervening party at the trial.

Before the ECHR, the applicant association claimed an infringement of the principle of "equality of arms", one of the constitutive elements of the fundamental concept of right to a fair trial under Article 6§1 of the European Convention on Human Rights, on account of the fact that the Council of State had not questioned the standing of a private-law company, Cogema, to intervene in an action against a ministerial decision and thus against the state. The ECHR held that there had been no violation of Article 6§1 and Cogema, a private-law company, was entitled to intervene in litigation concerning "an administrative decision which goes to the legal basis of one of an aspect of the economic activity of that company".

Decision of the Council of State Quashing a Decree Concerning a Nuclear Installation in Brennilis, for the Want of Public Information and Consultation (2007)

In its Decision of 6 June 2007, the Council of State (*Conseil d'État* – Supreme Administrative Court), on the application for annulment by the antinuclear association "*Le Réseau Sortir du Nucléaire*" revoked Decree No. 2006-147 of 9 February 2006 authorising *Électricité de France* to carry out final shut-down operations and full dismantling of the nuclear installation EL-4-D, a disposal facility for materials at the nuclear power plant Monts d'Arrée (Brennilis) in the Finistère.

The Council of State judged that the proceedings which led to the decision to grant a licence did not comply with the purposes required by European Law on Public Information and Consultation, notably Council Directive 85/337/EC of 27 June 1985 on the Assessment of the Effects of Certain Public and Private Projects on the Environment. The Council noted that "notwithstanding the absence of national legislation on this matter, the provisions of the decree must ensure that communication of information to the public is carried out in a way compatible with the purposes of the directive".

South Africa

Judgement of the Cape High Court in the Case of McDonald and Others* versus *Minister of Minerals and Energy and Others (2007)

On 12 June 2007, the Cape High Court (Cape Provincial Division) delivered its judgement in the case of McDonald and Others *versus* Minister of Minerals and Energy and Others. This matter dealt with an application concerning the legality of a regulation restricting development of property located within a 5 km radius of the Koeberg Nuclear Power Station (KNPS) and that of a delegation of authority by a Minister pursuant to safety regulations.

The applicants were owners of property located within a 5 km zone of the KNPS, who wished to sell their properties to a developer. Development of property within this zone was restricted pursuant to regulations made by the Minister under section 38(4) of the National Nuclear Regulator Act 47 of 1999 authorising regulations on development around a nuclear installation to ensure effective implementation of an applicable emergency plan (NNRA, see *Nuclear Law Bulletin* No. 65) and subsequent requirements laid down by the National Nuclear Regulator (Regulator) pursuant to the powers conferred upon it under Regulation 3 of the regulations.

The owner's application for rezoning properties for development was precluded by virtue of the above restriction. The applicants claimed invalidity of both Regulation 3 and the requirements laid down pursuant thereto. They challenged the validity of Regulation 3 on the basis of the maxim *delegates delegare non potest,* a functionary entrusted with powers by virtue of empowering legislation has to exercise those powers itself and may not delegate such powers to any other body unless authorised to do so.

The Court decided that the regulations made by the Minister neither dealt with the substance of the subject matter nor did they set objective criteria in respect thereof. Instead such matters are dealt with in the requirements which were made by the Regulator without the participation of the Minister. It further decided that the effect of Regulation 3 is to delegate the substance of the Minister's regulatory power to the Regulator. The Court held that, having regard to the provisions of the NNRA under consideration, such delegation by the Minister was clearly unauthorised and amounts to an impermissible abdication by the Minister of the power to regulate.

The Regulator asked the Court to suspend operation of the judgement for a period of a year so as to avoid a gap being created by the setting aside of the regulation and the requirements. The Court stated that development within the 5 km zone from KNPS is still governed by the terms of the Structure Plan (Guide Plan) which was approved in 1981 under the Physical Planning Act 88 of 1967. The Guide Plan has statutory force and effect independently of the NNRA. One of the provisions of the Guide Plan places a restriction on further development within a radius of 5 km from the KNPS unless such development is "truly place bound" (forms an integral part of KNPS). The Court therefore refused to suspend the operation of the judgement and held that the Guide Plan will continue to regulate all decisions relating to further developments surrounding KNPS until such time as the Minister has made new regulations.

United Kingdom

Decision of the Wick Sheriff Court Fining UKAEA for Plutonium Exposure (2007)

On 12 July 2007, the United Kingdom Atomic Energy Authority (UKAEA) was fined 15 000 pounds (GBP) by Wicks Sheriff Court after pleading guilty to charges of breaching Sections 2(1), 2(2) (a), (b) and (c) and 33(1) (a) of the Health and Safety at Work Act 1974 (see *Nuclear Law Bulletin* Nos. 14 and 15). Two workers at the Dounreay nuclear plant were exposed to radioactive plutonium (including one who received a plutonium intake of 1.7 millisieverts) as they were carrying out work related to the storage of lead bricks and their disposal as intermediate level waste. Following the exposure the UKAEA has implemented improvements required by the nuclear installations inspectorate.

United States

Judgement of the US Court of Appeals on Environmental Analysis of the Effects of Terrorism (2006)

A public interest group, the San Luis Obispo Mothers for Peace (SLOMFP), challenged two NRC adjudicatory decisions in a proceeding to licence an independent spent fuel storage installation (ISFSI) at the Diablo Canyon nuclear power plant, operated by the Pacific Gas and Electric Company (PG&E) in California.[1] The first NRC decision declined to suspend the ISFSI licensing proceedings to await NRC physical security enhancements. The second NRC decision rejected contentions filed by SLOMFP in the proceeding related to the NRC's analysis of the potential environmental consequences of a terrorist attack under the National Environmental Policy Act (NEPA). The NRC had previously determined in a separate adjudicatory proceeding involving the licensing of an ISFSI, *in the matter of private fuel storage,*[2] that NEPA did not necessitate an environmental analysis of the potential environmental consequences of terrorist attacks because there was no proximate cause between the licensing of a nuclear facility and a terrorist attack that would have environmental consequences.

On 4 June 2006, in San Luis Obispo Mothers for Peace v. NRC,[3] the United States Court of Appeals for the ninth circuit held that it was unreasonable for the NRC to refuse to categorically consider the environmental effects of a terrorist attack on nuclear facilities. The Court remanded the case to the NRC for further NEPA proceedings on the terrorist issue. The Court did, however, uphold the NRC's decision not to suspend its licensing proceeding and agreed with the NRC that a licensing proceeding was not an appropriate forum to revisit the validity of NRC security regulations.

PG&E filed a writ of *certiorari* in the United States Supreme Court. The United States Department of Justice, while agreeing with PG&E that the ninth circuit decision on the NEPA-terrorism issue was incorrect, did not support Supreme Court review at that time. On 16 January 2007, the Supreme Court denied *certiorari*.[4]

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1. *Pacific Gas & Electric Co.* (Diablo Canyon power plant independent spent fuel storage installation), CLI-03-12, 58 NRC 185 (2003).

2. CLI-02-25, 56 NRC 340, 348-349 (2002).

3. 449 F. 3d 1016 (ninth cir. 2006).

4. 127 S. Ct. 1124 (2007).

SLOMFP recently asked the Court of Appeals to award them approximately 162 000 U.S. Dollars (USD) in attorney's fees under the Equal Access to Justice Act, and the NRC is currently working with the United States Department of Justice in responding to that claim.

Subsequent to the Supreme Court's denial of *certiorari*, the NRC ruled that it would comply with the mandate of the ninth circuit Court of Appeals with respect to the Diablo Canyon licensing proceedings, but refused to alter its policy of not conducting environmental reviews on the potential effects of terrorism in other licensing proceedings currently underway.[5] In its supplemental environmental assessment for the Diablo Canyon ISFSI, issued on 31 August 2007,[6] the NRC staff determined that "the construction, operation, and decommissioning of the Diablo Canyon ISFSI, even when potential terrorist attacks on the facility are considered, will not result in a significant effect on the human environment. NRC security requirements, imposed through regulations and orders, and implemented through the licensee's security plans, in combination with the design requirements for dry cask storage systems, provide adequate protection against successful terrorist attacks on ISFSIs. Therefore, a terrorist attack that would result in a significant release of radiation affecting the public is not reasonably expected to occur."

Proceedings are still underway on Diablo Canyon's ISFSI. The interveners have filed contentions with respect to the supplemental environmental assessment, which now await a Commission decision as to their admissibility in the proceeding.

Vacatur of US Court of Federal Claims Decision Regarding Price-Anderson Compensation of Costs in a Private Tort Claim

In early 2007, the US Court of Federal Claims vacated a 2002 decision in which it held that plaintiffs were entitled to recovery of legal fees and costs under the Price-Anderson Act incurred in defending a private tort suit concerning the medical misuse of nuclear technology. The litigation involved three companion Price-Anderson lawsuits with millions of dollars in Price-Anderson claims at stake.

The underlying private tort suit, *Heinrich v. Sweet*, arose out of alleged medical misuse of an NRC-licensed research reactor at the Massachusetts Institute of Technology (MIT) performed by a number of doctors and institutions. The reactor was used by Dr. William Sweet in the 1950s and 1960s for "boron neutron capture therapy", which allegedly harmed rather than helped cancer patients. In 1999, a jury found Massachusetts General Hospital (MGH) and Dr. Sweet jointly and severably liable for wrongful death and negligence.[7] On appeal, the United States Court of Appeals for the first circuit ruled in 2002 that the plaintiffs were not entitled to damages and vacated the jury verdict.[8] The United States Supreme Court later denied *certiorari*. Dr. Sweet, MGH and MIT subsequently sought reimbursement from the United States Government in the US Court of Federal Claims for the

5. *Amergen Energy Co.* (license renewal for Oyster Creek Nuclear Generating Station), CLI-07-08, 65 NRC 124 (2007).

6. Notice of Availability of Supplement to the Environmental Assessment and Final Finding of No Significant Impact for the Diablo Canyon Independent Spent Fuel Storage Installation, 72 Fed. Reg. 51,687 (10 September 2007).

7. *Heinrich v. Sweet*, 118 F. Supp. 2d 73, 83 (D. Mass. 2000). MIT was found not liable on any of the claims.

8. *Heinrich v. Sweet*, 308 F. 3d 48 (first cir. 2002).

substantial legal fees and costs they incurred in defending the *Heinrich* lawsuit, invoking a 1959 Price-Anderson indemnity agreement between MIT and the Atomic Energy Commission.

In 2002, the Federal Claims Court had rejected the government's threshold argument, made in a summary judgement motion, that the Price-Anderson Act does not cover what are, in essence, medical malpractice claims, and held that plaintiffs MGH, MIT and Dr. Sweet were entitled to indemnification of litigation costs generated by the *Heinrich* litigation.[9] Subsequently (after discovery), the government settled all of the plaintiffs' claims for an amount the United States Department of Justice considered reasonable. On a motion by the government, the Federal Claims Court in January 2007 vacated its original liability ruling as moot, noting that "a determination regarding the proper scope of the indemnity provisions of the Price-Anderson Act should await another case in which the litigation triggering the act's indemnity provisions squarely address the parties' liability under that act."[10]

9. *Sweet, Massachusetts Institute of Technology & Massachusetts General Hospital v. United States*, 53 Fed. Cl. 208 (2002).

10. *Massachusetts Institute of Technology & Massachusetts General Hospital v. United States*, 75 Fed. Cl. 129, 133 (2007).

National Legislative and Regulatory Activities

Brazil

General legislation

Resolution of the National Council on Energy Policy on the Resumption of Construction of a Thermonuclear Plant (2007)

By Resolution No. 3 of 25 June 2007, published in the Official Journal on 7 August 2007, construction of the thermonuclear plant UTN Angra 3 was resumed. It will become part of the nuclear power plant complex, Almirante Alvaro Alberto – CNAAA, and it is scheduled to commence operation in 2013.

France

General legislation

Decree on Technical Enquiries in the Event of Incidents or Accidents Relating to Nuclear Activities (2007)

Decree No. 2007-1572 of 6 November 2007 provides that when the Nuclear Safety Authority decides to conduct a technical enquiry according to Article 4 of the Law on Nuclear Transparency and Safety (see *Nuclear Law Bulletin* No. 77), i.e. in the event of incidents or accidents relating to nuclear activities, it establishes an enquiry mission and specifies its composition. The Nuclear Safety Authority defines the purpose and the scope of investigations to be carried out, according to provisions of the Law No. 2002-3 of 3 June 2002 governing the security of infrastructures and systems of transport, technical enquiries and underground storage of natural gas, hydrocarbon and chemicals.

The decree includes a number of provisions on the implementation and progress of a technical enquiry.[1]

1. The text of this decree is available (in French) on the website of *Légifrance* at the following URL: www.legifrance.gouv.fr/WAspad/UnTexteDeJorf?numjo=DEVQ0767188D.

Organisation and structure

Order on the Organisation of the General Directorate of Enterprises (GDE) within the Ministry of Industry (2007)

This order, adopted on 6 April 2007, re-organises the Ministry of Industry to take account of the transformation of the Directorate-General for Nuclear Safety and Radiation Protection (DGSNR) into the Nuclear Safety Authority, which has, according to the Law on Nuclear Transparency and Safety (see *Nuclear Law Bulletin* No. 77), the status of an independent administrative authority.

Within the GDE, the Directorate of Regional Activity, Quality and Industrial Security proposes, together with the ASN, governmental policy concerning nuclear safety and radiological protection, with the exception of nuclear activities and installations for defence purposes and the protection of workers against ionising radiation.

Regime of nuclear installations

Decree on the Listing of Basic Nuclear Installations (2007)

Decree No. 2007-830 of 11 May 2007 on the Listing of Basic Nuclear Installations was adopted with a view to implementing Article 28-III of the Law on Nuclear Transparency and Safety (see *Nuclear Law Bulletin* No. 77). That law provides that basic nuclear installations (*installations nucléaires de bas*e – INB) are:

- nuclear reactors;

and, as defined by decree after consultation with the *Conseil d'État*:

- installations for the preparation, enrichment, manufacture, processing or disposal of radioactive waste;
- installations containing radioactive or fissile substances;
- accelerators.

This decree, published in the Official Journal of 12 May 2007, specifies the features of these four categories of INB. It repeals Article 2 of Decree No. 63-1228 of 11 December 1963 which defined previous categories of INB. However, Article 2 still applies to activities and nuclear installations for defence purposes.

Decree on Basic Nuclear Installations and Verifying the Nuclear Safety of Radioactive Materials Transport (2007)

Article 1 of Decree No. 2007-1557 of 2 November 2007 establishes an advisory commission on basic nuclear installations (*installations nucléaires de bas*e – INB) to assist ministers in charge of nuclear safety.

Ministers who are in charge of nuclear safety must submit draft decrees on licence requests for the construction, modification, dismantling or final shutdown of basic nuclear installations and the transition into the supervision phase to the advisory Commission for its opinion.

This decree contains a number of provisions relating to:

- the advisory Commission of INB;
- general provisions with regard to INB;
- creation and operation of INB;
- final shutdown and dismantling of INB;
- administrative measures and criminal sanctions; and
- transport of radioactive substances.

It contains provisions for the implementation of the Law on Nuclear Transparency and Safety (see *Nuclear Law Bulletin* No. 77) and, notably, specifies constitutive elements of the file to be sent by the operator to the Nuclear Safety Authority, with a view to commissioning a basic nuclear installation [Article 20].[2]

Italy

Radiological protection

Decree Implementing Council Directive 2003/122/Euratom of 22 December 2003 on the Control of High-activity Sealed Radioactive Sources and Orphan Sources (2007)

Decree No. 52 of 6 February 2007 was published in the Italian Official Gazette No. 95 on 24 April 2007. It implements Council Directive 2003/122/Euratom of 22 December 2003 whose purpose is to prevent the exposure of workers and the public to ionising radiation arising from inadequate control of high-activity sealed radioactive sources and orphan sources.

The decree, *inter alia,* designates the competent national authorities to carry out tasks relating to the Directive: the Minister for Economic Development, together with the National Sources and Holders Register Authority, is the contact point which Member States must designate. The National Agency for New Technologies, Energy and the Environment (ENEA) ensures that both management and workers in installations where orphan sources are most likely to be found or processed are informed, advised and trained. The ENEA also runs the integrated service for disused sources.

The decree sets out a number of requirements for holders of high-activity sources. They have to obtain prior authorisation for any practice involving a source; they have to ensure that suitable tests are undertaken regularly in order to control and maintain the integrity of each source and they have to verify that each source and equipment containing a source is in good condition at its place of use or of storage. The decree further requires holders to ensure that each source is subject to adequate documentation. They must prevent unauthorised access to, loss and theft of the source or damage to it by fire. The holders have to notify any loss or theft, return each disused source to the supplier or place it in a recognised installation. They shall ensure training of workers and keep records of all sources under their responsibility, their location and transfer. Finally, they shall provide the competent authority with an electronic or written copy of all parts of the records (a booklet for any source and a register of all sources).

2. The text of this decree is available (in French) on the website of *Légifrance* at the following URL: www.legifrance.gouv.fr/WAspad/UnTexteDeJorf?numjo=DEVQ0762539D.

A national authority will keep and update records of authorised holders and sources (National Sources and Holders Register) and will be designated by an inter-ministerial decree.

Environmental protection

Amendment to the Environmental Law Decree (2007)

On 13 September 2007, the Italian Government approved a proposal to amend the Decree on Environmental Law 2006.[3] The 2006 Decree[4] implements Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on Environmental Liability with Regard to the Prevention and Remedying of Environmental Damage (see *Nuclear Law Bulletin* No. 73).

The governmental proposal to amend the 2006 Decree aims to simplify part III and IV of the Decree concerning the environmental impact procedure and the regulation of wastes. In particular, Italian definition of "waste" was criticised by the European Court of Justice (ECJ) as too restrictive in respect of European Environmental Directive. Now, the new definition of "waste" is based on the considerations of the ECJ.

The 2006 Decree shall not apply to such nuclear risks or environmental damage or imminent threat of such damage as may be caused by the activities covered by the Treaty establishing the European Atomic Energy Community or caused by an incident or activity in respect of which liability or compensation falls within the scope of any of the international nuclear instruments, which are referred to in Annex IV of the directive.

Of particular interest is the definition of "environmental damage" which is defined as:

- damage to protected species and natural habitats, which is any damage that has significant adverse effects on reaching or maintaining the favourable conservation status of such habitats or species;

- water damage, which is any damage that significantly adversely affects the ecological, chemical and/or quantitative status and/or ecological potential, as defined in Directive 2000/60/EC, of the waters concerned;

- coastal water damage and those in the territorial sea by the actions aforesaid, even if carried out in international waters;

- land damage, which is any land contamination that creates a significant risk of human health being adversely affected as a result of the direct or indirect introduction, in, on or under land, of substances, preparations, organisms or micro-organisms.

The key consequences for the operator are the following:

- The operator must notify, without delay, a number of local and provincial authorities, of which the Prefect notifies the Minister of Environment. If there is an imminent threat of environmental damage, the operator must – after informing the competent authorities –

3. Decree No. 152 of 3 April 2006.

4. Decree published in the Italian Official Gazette No. 88 on 14 April 2006.

take the necessary preventive measures within 24 hours. The Minister of Environment can require information and the adoption of specific preventive measures by the operator.

- A mechanism of state intervention will be introduced for the remediation/restoration of environmental damage, as well as preventive measures that can be taken by non-governmental organisations, which promote the protection of the environment and other interested bodies.

- A more incisive mechanism for the compensation of the environmental damage will be introduced by an injunction decree of the Ministry of Environment, specific for each case that obliges the operator to take all practicable steps to immediately control, contain, remove or otherwise manage the relevant contaminants. If the operator does not comply with this injunction decree, the Ministry of Environment can order the payment of a sum as compensation for damage.

Japan

Radioactive waste management

Amendment to the Law on Final Disposal of High-level Radioactive Waste (2007)

In June 2007, the Diet adopted Law No. 84 of 2007 to Amend the Law on the Final Disposal of High-level Radioactive Waste (see *Nuclear Law Bulletin* No. 66). The law was promulgated in the Official Gazette on 17 June 2007 and will enter into force on 1 April 2008.

The amendment specifies additional wastes which are subject to disposal regulations and provides a framework for the formulation of disposal plans and the allocation of disposal costs. It is designed to ensure that the final disposal of these radioactive wastes is appropriately planned and carried out, this being essential to the promotion of the nuclear fuel cycle.

The nuclear fuel cycle consists of a series of processes to recycle (separate and collect) uranium, plutonium and other recyclable substances from spent fuel discharged from nuclear reactors and to reuse them as fuel. These processes generate radioactive wastes (high-level radioactive waste, trans-uranium waste known as TRU-waste, etc.) that need to be disposed of in deep geological formations.

With the amendment, transuranium waste, which is covered by the amended Enforcement Order for the Specified Radioactive Waste Final Disposal Act, and high-level radioactive waste acquired by substitution will be added to those subject to final disposal.

Lithuania

General legislation

Law on the Nuclear Power Plant (2007) (The text of the law is reproduced in the annex to this chapter)

Law No. X-1231 of 28 June 2007 aims at replacing the electricity generating capacity to be lost as a result of the decommissioning of the Ignalina Nuclear Power Plant (see *Nuclear Law Bulletin*

Nos. 66 and 68) and at creating the legal, financial and organisational preconditions for the construction of a new nuclear power plant in Lithuania.

A project implementing company, situated in the Republic of Lithuania shall be responsible for carrying out the required activities in compliance with the safety requirements imposed on nuclear activities and become the operator of the nuclear power plant. According to the new law, "project" shall mean a new nuclear power plant project being developed and implemented, involving the preparation of a feasibility study on a new nuclear power plant, as well as its design, construction, financing, operation, decommissioning and radioactive waste management.

The law allows for strategic partners to participate in the project implementing company provided they fulfil criteria laid down in Article 2(2) of the act. Investors shall participate in the implementation of the project on equal terms; their contributions, rights and obligations in implementing the project must be proportionate to their participation in the capital of the project implementing company.

Article 8(2) of the act ensures that "the national investor shall own a block of at least 34% of shares in the project implementing company carrying at least 34% of votes at the general shareholders' meeting of the project implementing company". In emergency situations as defined in Article 9 of the act, the operator of the new nuclear power plant must carry out the instructions issued by the Government of the Republic of Lithuania. In case the operator fails to carry out the instructions, the Government shall have the right "to take over the management of the project implementing company, suspend or revoke its licence or take other necessary measures to ensure nuclear safety, radiation protection and the operation of the project implementing company". The measures shall be applied only to the extent necessary to overcome the encountered difficulties and they shall not exempt the project implementing company from liability [Article 9 of the act]. The national investor is described in Article 10 of the act, meaning "independent private legal entity registered in the Republic of Lithuania, established and operated for an indefinite period of time under laws of the Republic of Lithuania, with the aim of gaining benefits for itself and all shareholders in a socially responsible manner". The law further determines that the "national investor shall be the public company Lietuvos Energija which has shown a private initiative to invest in the project and fulfils the requirements laid down in this law" [Article 10(1) of the act]. The Republic of Lithuania itself shall own a block of more than 50% of shares in the national investor carrying more than 50% of the votes at the general shareholders' meeting of the national investor.

Chapter V provides that the construction site for the nuclear power plant shall be designated in accordance with the procedure laid down by the Law on Territorial Planning, the Law on Environmental Impact Assessment of Planned Economic Activities, the Law on Nuclear Energy, this law and other legal acts, taking into account the recommendations of the International Atomic Energy Agency [Article 12 of the act].

Special security measures for ensuring national security interests in respect of the project shall be established by laws and other legal acts at a later stage.

The law does not interfere with the decommissioning works of the State Enterprise Ignalina Nuclear Power Plant which shall be carried out separately and independently from the project this law allows for, and the State Enterprise Ignalina Nuclear Power Plant shall not participate in the new nuclear power plant project. It is expected that the new plant will be constructed near the existing Ignalina plant and it is hoped that completion of this project will take place by 2015.

Luxembourg

Radiological protection

Grand-ducal Regulations on the Protection of the Public Against the Risks Resulting from Ionising Radiation (2006)

Grand-ducal Regulations of 21 July 2006 Governing the Protection of the Public Against the Risks Resulting from Ionising Radiation modifies a number of provisions of the Grand-ducal Regulations of 14 December 2000 on the same subject (see *Nuclear Law Bulletin* No. 67).

New regulations establish, *inter alia*, provisions on transport of radioactive materials and also set out rules concerning radiological emergency situations resulting from orphan sources.

Law on Approving the Agreement Between Luxembourg and Belgium Relating to Information Exchange in the Event of an Incident or Accident (2006)

This law, adopted on 27 April 2006, reinforces the agreement concluded by Luxembourg and Belgium on 28 April 2004, whose purpose is to ensure a mutual exchange of information:

- in the event of an incident or accident which occurs on the territory of one of the parties and results or may result in a release of radioactive materials, involving respective nuclear and radiological emergency plans; and
- which results or may result in a transboundary release of radioactive materials, which may be significant in terms of the radiological safety of the other party.

The agreement provides that implementation arrangements and events covered by the agreement will be specified by an exchange of letters between the parties. The mutual information exchange system, introduced by the agreement, aims explicitly to complement current international and European plans, by maintaining a more direct communication between parties.

People's Republic of China

Regime of nuclear installations

Regulations on the Management and Monitoring of Nuclear Safety Equipment for Civilian Use (2007)

Regulations on the Management and Monitoring of Nuclear Safety Equipment for Civilian Use were adopted by the State Council on 4 July 2007 and will become effective as of 1 January 2008.[5]

The regulations include provisions on licensing, design, manufacture, installation, non-destructive testing, import and export, surveillance and inspection, legal liability and supplementary provisions.

5. Adopted at the 183rd Executive Meeting of the State Council, promulgated by Decree No. 500 of the State Council of the People's Republic of China on 4 July 2007.

Third party liability

Official Reply of the State Council to Questions on the Liabilities of Compensation for Damages Resulting from Nuclear Accidents (2007) (The text of the reply is reproduced in the annex to this chapter)

The "Official Reply of the State Council to Questions on the Liabilities of Compensation for Damages Resulting from Nuclear Accidents" of 30 June 2007 (2007 Reply) was published in the State Council Gazette No. 23 Serial No. 1238 on 20 August 2007.

In the 2007 Reply [Section 2], the State Council stipulates that the operator shall be liable to compensate personal injuries, property losses or environmental damage arising out of nuclear accidents and that no person other than the operator shall be liable. Where a nuclear accident causes transboundary damage, such damage shall be compensated in accordance with the treaty or protocol between the People's Republic of China and the relevant country. If there is no such treaty or protocol, transboundary damage shall be compensated according to the principle of reciprocity [2007 Reply Section 3]. The maximum amount of compensation payable for damages caused by any one nuclear accident is limited to 300 million[6] Yuan Renminbi (CNY) for operators of nuclear power plants and of spent fuel storage facilities, transportation and spent fuel post-treatment facilities. Other operators shall be liable up to a maximum amount of CNY 100 million.[7] Where the total amount of damages exceeds the maximum amount of compensation payable by an operator, the state shall provide a financial indemnity of up to CNY 800 million.[8] The only exonerations from liability lie in the case of damage caused by a nuclear accident directly resulting from armed conflict, hostile action, war or riot.

The State Council Reply further provides that an operator shall make appropriate financial arrangements to ensure timely and effective performance of its liabilities for compensation for damage, and that before "operating a nuclear power station or carrying out the storage, transportation or post-treatment of spent fuels, an operator must purchase sufficient insurance to cover its limits of liability" [2007 Reply Section 8].

In 1986, the State Council had issued a Reply, entitled "Written Reply of the State Council of the People's Republic of China on Handling the Question of Third Party Nuclear Liability" to the Ministry of Nuclear Industry, the State Nuclear Safety Bureau and the State Council Leading Group on Nuclear Energy (1986 Reply, see *Nuclear Law Bulletin* No. 61). This Reply incorporated principles which are similar to those forming the basis of the international nuclear liability regimes. With respect to a nuclear accident occurring at a nuclear installation or in connection with nuclear materials coming to or from a nuclear installation, the operator of that installation:

- is "strictly" liable for nuclear damage suffered by third parties as a result thereof;
- is "exclusively" liable for nuclear damage suffered by third parties as a result thereof;
- is liable for such nuclear damage only up to an imposed maximum amount;
- is liable for such nuclear damage only where claims are brought within a specified time period following the accident; and
- has the benefit of unity of jurisdiction rules for all nuclear damage claims.

6. Approximately 40.1 million US Dollars (USD) or 27.9 million euros (EUR).

7. Approximately USD 13.4 million or EUR 9.3 million.

8. Approximately USD 107 million or EUR 74.3 million.

The two Replies vary in a number of provisions.

Compared to the 1986 Reply, the compensation amounts for damage caused by a nuclear accident have increased significantly. The maximum compensation payable by the operator to victims has increased from CNY 18 million[9] to CNY 300 million. The state obligation to provide compensation amounted CNY 300 million while the 2007 Reply provides for a state intervention of CNY 800 million. Furthermore, the 2007 Reply introduces the term "extraordinary nuclear accident" and stipulates that for damage arising from such accidents the increased amount of indemnity required from the state shall be decided upon after appraisal by the State Council. The 2007 Reply further introduces the obligation of the operator to maintain financial security for the amount of its liability [2007 Reply Section 8, *supra*], a principle which was not alluded to in the 1986 Reply.

Both Replies stipulate the exclusive liability of the operator; however only the 1986 Reply provides for the operator's strict liability.

With respect to the definition of damage, the 2007 Reply specifies damage as "personal casualties, property losses or environmental damages" [2007 Reply Section 2] while the 1986 Reply makes no specifications at all. Another difference between the two Replies is that the 2007 Reply does not exempt the operator from liability for damage caused by nuclear accidents directly resulting from a "catastrophic natural disaster" [see 2007 Reply Section 6 and 1986 Reply Section 5]. Finally, unlike the 1986 Reply, the latest Reply addresses the issue of transboundary nuclear damages [Reply Section 2, *supra*].

On the other hand, the 1986 Reply had introduced two principles governing nuclear liability on which the 2007 Reply remains silent. The first one is the time limit of 10 years within which victims have the right to claim damages and the "discovery rule" requiring claims to be filed within 3 years of the date upon which victims discovered the damage [1986 Reply Section 6]. The second principle concerns the applicable laws and the unity of jurisdiction [1986 Reply Section 7], which finds no equivalent in the latest Reply of the State Council.

At the end of the 2007 Reply, it is indicated that the Atomic Energy Law of the People's Republic of China shall be drafted to expressly provide for the foregoing matters as well as the limitation of actions, jurisdiction, etc.

Romania

Radiological protection

Government Decision on the Monitoring of the Health of Personnel (2007)

Government Decision No. 355 of 11 April 2007 Regarding the Monitoring of the Health of Personnel was published in the Official Gazette, Part I, No. 332 on 17 May 2007.

The decision sets the minimum requirements for the monitoring of professionally exposed personnel in relation to any health and safety risks, in order to prevent occupational health disorders caused by any hazardous chemical, physical, physic-chemical or biological exposure associated with their workplace, as well as overtaxing of different organs or body systems during work. Monitoring is performed by doctors specialising in occupational medicine.

9. Approximately USD 2.4 million or EUR 1.7 million.

Under the government decision every employer, regardless of its business and regardless of whether it operates in the public or private sector (including employers in the nuclear field), shall comply with current health monitoring regulations. Employers shall provide the funds and furnish the necessary conditions to enable such monitoring to be carried out.

Transport of radioactive materials

Order on Physical Protection of Nuclear Materials During Transport (2007)

Order No. 303 approves the Guideline on the Physical Protection of Nuclear Materials During Transport. It was issued on 29 August 2007 by the President of the National Commission for Nuclear Activities Control and published in Official Bulletin No. 657 on 26 September 2007.

This guideline establishes the measures which have to be taken by the licence holder to ensure physical protection of nuclear materials during transport. The principles in this guideline are the following:

- The authorisation for the transport of nuclear materials is issued only if physical protection against attacks or other interventions which, directly or indirectly, are a danger for the public health or safety are ensured;
- The responsibility for physical protection against attacks or other interventions which, directly or indirectly, are a danger for the public health or safety, is incumbent on the licence holder.

By numerous measures on the physical protection of nuclear materials during transport, the licence holder has to make sure that:

- it is permanently informed on the location of the transported material;
- the carrier and the accompaniment can communicate;
- the carrier can notify the response force in case of an attack and can keep the contact with the response force until this takes the protection over the transport.

This guideline establishes that the measures for physical protection of nuclear materials during a transport are different from the surveillance measures, constructive measures, other technical measures as well as organisational and personnel measures. Likewise, this act provides general and special requirements for the road transport of nuclear materials from the first to the third category.

Regime of radioactive materials (including physical protection)

Order on Preventive Protection of Nuclear Installations (2007)

Order No. 304 approves the Guideline on Preventive Protection of Nuclear Installations. It was issued on 29 August 2007 by the President of the National Commission for Nuclear Activities Control and published in Official Bulletin No. 636 on 17 September 2007.

This guideline is to be used by the licence holder as a basis for the assessment of the supplementary physical protection measures. It is based on the principle that the supplementary measures taken by the licence holder have to consider the construction characteristics, the technical and administrative-organisational issues, the alarming plans and the risks and vulnerabilities analysis.

Likewise, the guideline provides for the supplementary measures which have to be taken by the licence holder for situations, in which the nuclear installation is attacked and jeopardised and in which the nuclear installation is attacked but not jeopardised. The licence holders are to issue procedures for the threat situations.

Order on the Verification of the Physical Protection System of Nuclear Installations (2007)

Order No. 305 approves the Guideline on Periodic Verification of the Physical Protection Systems of Nuclear Installations. It was issued on 29 August 2007 by the President of the National Commission for Nuclear Activities Control and published in Official Bulletin No. 652 on 25 September 2007.

This guideline includes provisions for the verification of the physical protection systems and aims at the establishment of measures which have to be taken by the licence holder regarding construction and technical, administrative-organisational and personnel issues.

By means of a periodical verification system of physical protection measures, the efficient functioning of the system and its objections shall be ensured.

For the periodic verification of the physical protection system, the licence holder has to send to CNCAN:

- the system vulnerabilities analysis;
- the probable consequences of vulnerabilities analysis;
- the proposed measures for the elimination of the vulnerabilities.

Radioactive waste management

Ordinance on the Safe Management of Radioactive Waste (2007)

Ordinance No. 11 of 30 January 2003 on the Management of Spent Fuel and Radioactive Waste, including final disposal (see *Nuclear Law Bulletin* No. 71), was re-published in the Official Gazette of Romania No. 289 on 2 May 2007. Under the ordinance, the safe management of radioactive waste is to be carried out in accordance with the national norms and regulations, as well as in accordance with the provisions of the international agreements and conventions to which Romania is a party.

The objective of this ordinance is to regulate the responsibilities of bodies, which are involved in different stages of the management of radioactive waste and to allocate financial resources necessary to sustain activities relating to the management of radioactive waste generated during the operation and decommissioning of nuclear and radiological installations. It aims at the radiological protection of workers at risk, the general public, the environment and property, without jeopardising the needs and expectations of future generations.

The ordinance is equally applicable to the safe management of radioactive waste from the nuclear fuel cycle and radioactive waste from the applications of nuclear processes and technologies in industry, medicine, agriculture and other fields of socio-economical interest, including those from the decommissioning of nuclear and radiological facilities. The provisions of the ordinance do not apply to the management of radioactive waste arising from mining and processing of uranium and/or

thorium ores, to the decommissioning of mining and processing installations for uranium and/or thorium ores. They further do not apply to any controlled release of effluents into the environment.

Under the ordinance, the licensees have the obligation to safely manage the radioactive waste resulting from the operation of nuclear and radiological installations over their entire useful life-span, including radioactive waste arising after their decommissioning, with the view of final storage of such waste. Any activity relating to the safe management of radioactive waste is to be carried out in accordance with the medium and long term national strategy regarding the safe management of spent nuclear fuel and radioactive waste that is part of the nuclear development strategy.

This strategy is to be drafted by the National Agency for Radioactive Waste (ANDRAD), after consultations with the licensees. ANDRAD is the competent authority to co-ordinate nationwide the safe management of radioactive waste. It is in charge of the final storage of spent nuclear fuel and radioactive waste, including those from the decommissioning of nuclear and radiological installations.

ANDRAD is a public institution having legal personality subordinated to the Ministry of Economy and Finances.

ANDRAD's activities include siting, designing, construction, commissioning, operation and maintenance, upgrading, shutting-down and follow-up operations in connection with spent nuclear fuel and radioactive waste final storage facilities. ANDRAD's activities further include the radiological protection of the population and the environment in the vicinity of final storage facilities, monitoring the radioactivity in the environment around final storage facilities, and informing and ensuring participation of the public in the vicinity of a final storage facility in order to achieve consensus for the construction and operation of such facilities. Finally, ANDRAD will engage in the promotion of national and international activities related to the safe management of radioactive waste.

The financial resources that are to sustain ANDRAD's activities shall consist of the annual direct contributions of the licensees due for its activities. In addition, ANDRAD is to receive funds from the state budget for some types of activities, and finally, ANDRAD may have any other sources of funds as prescribed by law.

The licensees are responsible for the decommissioning of the nuclear and/or radiological installations and the management of the radioactive waste resulting from the operation and decommissioning of nuclear and radiological installations up to their final storage. Any liability related to decommissioning may be transferred by the licensee to the ANDRAD at the end of the operational phase.

Under the ordinance, the import of spent nuclear fuel and radioactive waste for the purpose of their final storage is forbidden and legal sanctions are provided in case of infringement. Any spent nuclear fuel and radioactive waste resulting from co-operation programmes and international partnerships to which Romania is a party shall be managed by the state on whose territory they have been generated, provided no special agreement provides otherwise.

Government Decision Regarding Financial Resources Necessary for the Safe Management of Radioactive Waste (2007)

Governmental Decision No. 1080 addresses the creation and management of financial resources required for the safe management of radioactive waste and the decommissioning of nuclear and

radiological installations. It was approved on 5 May 2007 and published in the Official Bulletin No. 636 on 17 September 2007.

This decision establishes the amount of contribution due by a licensee for carrying out nuclear activities and the manner of setting aside the financial resources necessary to cover the costs of decommissioning, and the safe management of radioactive wastes produced by the operation and decommissioning of nuclear and radiological installations. The decision also sets out the manner in which those financial resources shall be administrated and managed. Furthermore, it establishes the method of payment for the radioactive waste disposal services which the National Agency for Radioactive Waste (ANDRAD) carries out for small producers of radioactive waste. The decision is neither applicable to the disposal of radioactive waste resulting from the operation and decommissioning of uranium and/or thorium mines nor to installations for the purification and filtering of uranium.

Licensees that are owners of nuclear power plants are obliged to pay two types of contribution:

- an annual contribution to provide the funds required for the decommissioning of each nuclear power plant; and
- direct annual contributions to provide the funds required for the final storage of radioactive waste generated by the operation and decommissioning of nuclear power plants.

The rates of contribution are to be set following estimates of decommissioning costs for each nuclear power plant and for the cost of final storage of the radioactive waste resulting from their operation and decommissioning. Contribution rates are based on the net amount of electric power estimated to be generated over the following year by each nuclear power plant.

The annual contributions for decommissioning costs are due over the entire useful life-span of the nuclear power plant units. The direct annual contributions for final storage costs are due over the operation of the nuclear power plant units.

Third Party Liability

Amendment of the Law on Civil Liability for Nuclear Damage (2007)

Law No. 115 was adopted on 27 April 2007 and published in the Official Bulletin No. 298 on 4 May 2007. It amends Article 41 of Law No. 703 of 2001 on Civil Liability for Nuclear Damage by providing for compensation for nuclear damage from state funds where such damage is:

- the direct and immediate result of a terrorist act; or
- the direct and immediate result of a nuclear accident for which the operator of the nuclear facility is unable to obtain coverage for civil liability for nuclear damage from the national and/or international insurance market or any other appropriate form of financial guarantee, and which inability must be proved by the operator to the competent authorities.

In such cases, compensation for nuclear damage is provided by the state from public funds in the amount prescribed by law (see 2001 Law on Civil Liability for Nuclear Damage, *Nuclear Law Bulletin* No. 69, text of the law is reproduced in the Supplement to No. 69; see also 2003 Norms of

Enforcement of the Law, *Nuclear Law Bulletin* No. 72 and 2004 Amendment, *Nuclear Law Bulletin* No. 75).

Russian Federation

Organisation and structure

Reform of the Russian Nuclear Power Industry (2007)

On 27 April 2007, the President of the Russian Federation signed the Decree on Restructuring the Atomic Energy Industry Complex of the Russian Federation. Pursuant to this decree, the part of the Federal Atomic Energy Agency (Rosatom) in charge of the civil nuclear power programme, will be reformed.

A state-owned holding company, *Atomenergoprom* (AEP) will be established (see *Nuclear Law Bulletin* No. 79) for all enterprises involved in the Russian civil nuclear industry. Together with its affiliates, AEP will be responsible for a wide range of activities related to nuclear industry, including research and development, uranium mining, nuclear power plant construction and radioactive waste management. The new state-owned company will incorporate:

- nuclear power plant operator – *Rosenergoatom*;
- nuclear fuel producer and supplier – TVEL;
- uranium trader – Tenex;
- nuclear facilities constructor – *Atomenergomash*; and
- nuclear constructor for overseas projects – *Atomstroyexport*.

It is expected that AEP will be created by January 2008, constituting one of the biggest nuclear companies in the world, encompassing the full nuclear fuel cycle, nuclear design, construction, engineering and the key business of power generation itself.

The charter of AEP was approved by Governmental Order No. 432 of 6 July 2007. In addition, the Prime Minister has approved the members of the AEP's Board of Directors. The Head of Rosatom, Sergei Kirienko, has been appointed as Chair, while his Deputy, Vladimir Travin, has been appointed as a Director of AEP.

A new state atomic energy corporation "Rosatom" will also be established in the form of a non-commercial organisation and it will control 100% of AEP's shares and its property on behalf of the state. It will also manage both AEP and the nuclear weapons complex. The state corporation will be created by re-organisation of the Federal Atomic Energy Agency.

On 4 October 2007, the President of the Russian Federation submitted the draft Law on the State Atomic Energy Corporation (Rosatom) for consideration to the State Duma. Pursuant to the President's order, the creation of a vertically-integrated civil nuclear complex AEP and the state corporation "Rosatom" should be completed during the first quarter of 2008. According to this draft law, a newly created state corporation with the same name "Rosatom" shall take the place of Rosatom, to which AEP, nuclear weapons complex facilities, institutes of fundamental science and the entities working in the sphere of nuclear and radiological protection will be subordinated. The state corporation will be created by the re-organisation of the Federal Atomic Energy Agency.

Slovak Republic

General legislation

Atomic Act Amendment on Alternative Financing of the Nuclear Regulatory Body (2007)

In February 2007, the National Council adopted the new Act No. 94/2007 Coll., which introduces major changes to the 2004 Atomic Act (see *Nuclear Law Bulletin* No. 74) with respect to the financing of the regulatory body. This act will enter into force on 1 January 2008. The basic aim of the act is to change the source of financing substantially, whereupon the Nuclear Regulatory Body (UJD) will be financed both from the state budget and by all licence holders. The amount of annual contribution will depend on the authorisation type, as well as the type of the licensed nuclear installation. As a result, it is expected that the budged of UJD will increase. The consolidated version of the atomic act including the last amendment is published on UJD web site.[10]

Slovenia

Radiological protection

Decree on the Control of Radioactive Contamination in the Shipment of Scrap Metal (2007)

A Decree on the Control of Radioactive Contamination in the Shipment of Scrap Metal was adopted on 6 September 2007 by the Slovenian Government and published in the Official Gazette No. 84/07. It shall enter into force on 1 January 2008.

The basic provision of this decree is that every shipment of scrap metal with its final destination in Slovenia shall be subject to the measurement of radioactivity which has to be paid by the consignee. The results of the measurement must be presented to the recipient, and to custom officers in the case of import. The measurement can be performed only by organisations authorised by the Slovenian Nuclear Safety Administration (SNSA) and which fulfil a minimum set of prescribed criteria (measurement devices, training, reporting forms and procedure), which may include the consignee. In the case of increased radiation of more than 50% above natural background levels the SNSA shall be informed, and corrective measures will be assigned by the SNSA inspectors. Radiological protection measures should be stricter if the maximum dose rate is 50 times higher than natural background. Where elevated radiation is noticed in shipments of scrap metal in transit, the shipments shall be returned to the country of origin.

The decree covers also the inner control, in particular in those facilities where recycling of metals occurs (e.g. melting). The measurement in these cases should also be performed in order to prevent radioactivity in metal stream.

10. www.ujd.gov.sk.

Spain

Third party liability

Amendment to the Nuclear Energy Act (2007)

In July 2007, new transitory provisions have been approved to amend the nuclear liability regime and introduce parts of the revised Paris Convention and Brussels Supplementary Convention. The purpose of the amendment is to:

- Increase the amount of liability and coverage for existing heads of nuclear damage, up to 700 million euros (EUR), with no less than EUR 30 million in the case of transport of nuclear substances or low risk installation, subject to the approval of the Ministry of Industry, Tourism and Trade.
- Introduce a new head of damage, namely the environmental damage which might arise within the national territory. This damage will be covered up to EUR 700 million, with no less than EUR 30 million in the cases mentioned above. The sum is separate from the above-mentioned increase for existing damage and is dedicated only to environmental damage. That means that nuclear operators will have to face separately – and therefore cumulatively – the liability for each type of nuclear damage ("conventional" and environmental).

While nuclear damage of persons and properties is being covered through private insurance (still during the prescription period of 10 years), a new mechanism has been established to cover nuclear environmental damage. The electricity tariff will guarantee this coverage, thus being a service rendered by the state. The payment for this service will take place in the form of premiums to be paid by nuclear operators to the Spanish Energy Regulator (*Comisión Nacional de la Energía*). The concrete amount of the so called *nuclear environmental liability premiums* has not been determined yet; it will be established by the government upon the recommendation of the Ministry of Industry, Tourism and Trade.

Although the question of how to cover nuclear environmental liability has been addressed in this manner, other aspects of the revised liability conventions have not been implemented yet, e.g. the extension of prescription and extinction periods to 30 years for claims for personal damage. Therefore, it is important to stress that this amendment is a transitory regime until the revised Paris Convention and Brussels Supplementary Convention are fully implemented.

These provisions have been included in the act which amends, in a much wider frame, the Law of the Electricity Sector [Act 17/2007 of 4 July 2007, modifying Act 54/1997, of 27 November, of the Electricity Sector, to adapt it to Directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 Concerning Common Rules for the Internal Market in Electricity and Repealing Directive 96/92/EC].

The first additional provision of this act amends Article 57 of the Nuclear Energy Act, Law 25/1964 (see *Nuclear Law Bulletin* No. 2) so that it will now read as follows:[11]

> "In the case of nuclear facilities, the coverage that may be demanded, in accordance with Article 55 of the present Law, shall be EUR 700 million. Nevertheless, the Ministry of Industry,

11. Unofficial translations provided by the Spanish correspondent.

Tourism and Trade may impose some other limit, of no less than EUR 30 million, in the case of the transport of nuclear substances or of any other activity whose risk does not require higher coverage in the opinion of the Nuclear Safety Council. These figures may be modified by the Government, on proposal by the Ministry of Industry, Tourism and Trade, in order to take into account the evolution of the international agreements subscribed by the Spanish State and the passing of time or variation in the consumer price index, in order to maintain the same level of coverage."

The second additional provision includes a new provision to the Nuclear Energy Act, Law 25/1964, worded as follows:

"Nuclear civil liability for environmental damage"

1. Without prejudice to what is set out in the present law in relation to the civil liability arising as a result of nuclear damage, the licensees of nuclear facilities and the transport of nuclear substances shall be responsible for whatever environmental damage of nuclear origin might arise within the national territory as a result of the accidental release of ionising radiations to the environment having their origin in such facilities or transport operations, such damage being understood as that defined in Section 3 of this additional provision. For this purpose, the said licensees shall avail themselves of coverage for risk to the sum of EUR 700 million, although the Ministry of Industry, Tourism and Trade may impose some other limit, of no less than EUR 30 million, in the case of the transport of nuclear substances or of any other activity whose risk does not require higher coverage in the opinion of the Nuclear Safety Council.

2. In order to address this responsibility, the said licensees shall deposit in the specific account of the National Energy Commission referred to in point 1.9 of Annex I of Royal Decree 2017/1997, of 26 December, an environmental liability premium in order for the electricity tariff to guarantee the coverage indicated in the previous section, which shall be independent from the coverage established in the first paragraph of article 57 of this law. The sum of this premium shall be established by the Government in response to a proposal from the Ministry of Industry, Tourism and Trade.

3. The damage established in the first section of this additional provision includes the following categories:

   a) the cost of the measures for restoration of the degraded environment, except in those cases in which such degradation is insignificant, if such measures have been effectively adopted or are to be adopted;

   b) the loss of profit directly relating to the use or enjoyment of the environment and resulting from significant degradation thereof;

   c) the cost of preventive measures and any loss or damage caused by such measures.

   For these purposes the following terms shall be understood as set out below:

   "*Restoration measures*"*:* all reasonable measures approved by the Ministry of the Environment, following a report from the Nuclear Safety Council, tending to restore or re-establish the elements of the environment damaged or destroyed or to introduce into the environment, whenever reasonable, the equivalent of such elements.

"*Preventive measures*"*:* all reasonable measures adopted by any person, in the wake of a nuclear accident or of any event creating a serious and imminent threat of nuclear damage, in order to prevent or reduce to a minimum the aforementioned nuclear damage, subject to approval by the Ministry of the Environment, following a report from the Nuclear Safety Council.

4. Claims against the licensees of facilities and transport operations for compensation for the damages established in Section 3 shall be made before the civil jurisdiction, the proceedings to be jointly directed against the National Energy Commission.

5. The right to claim for nuclear environmental damages shall expire if the corresponding action is not initiated within a period of 10 years as from the date on which the emission occurred.

6. The Government shall, within its realm of competence, issue whatever provisions might be required for the execution and enactment of what is established in the present additional provision."

Sweden

Organisation and structure

Decision on the Merger of Regulatory Authorities (2007)

The Swedish Government has decided that the Swedish Nuclear Power Inspectorate (SKI) and the Swedish Radiation Protection Authority (SSI) shall be merged into one authority, in charge of nuclear safety and radiation protection.

The Government has appointed Ms. Ann-Louise Eksborg as Chairman of the Government Commission that will investigate how the new authority shall be structured and organised. Ms. Eksborg will also be the Director General of the new authority. According to the government directives to the Commission, the new authority will commence its operation in July 2008, when SKI and SSI will be terminated.

A merger of SKI and SSI has been investigated a number of times over the years, but the previous governments have not concluded that the benefits of a merger would outweigh the possible downsides. The present Government has expressed a general desire to reduce the number of authorities and also concluded that there are substantial co-ordination benefits to gain from a merger of the two authorities.

Turkey

General Legislation

Law Concerning the Construction and Operation of Nuclear Power Plants and the Sale of Energy Generated from Those Plants (2007) (The text is reproduced in the annex to this chapter)

The act was adopted by the Turkish Parliament on 9 November 2007 and signed by the President on 21 November 2007. It is published in the Turkish Official Gazette No. 26707 of

21 November 2007. The aim of the law is to provide, within the energy plan and policy, the procedures and principles for the construction and operation of nuclear power plants and the sale of energy generated from those plants.

The law sets up steps and deadlines for the realisation of the nuclear power plant project. Within one month following the coming into force of the law, the Turkish Atomic Energy Authority (TAEK) shall publish the criteria which constructing and operating enterprises will have to fulfil. Two months after the day on which the law comes into effect, a decree with the procedures and principles regarding, *inter alia*, the:

- selection criteria of the competing enterprises;
- site selection and licensing conditions;
- incentives regarding the infrastructure;
- duration of the selection;
- fuel supply and generating capacity;
- amount, duration and cost of the energy;

shall be issued by the Ministry of Energy and Natural Resources with the approval of the Council of Ministers. Not later than a month after the publication of the regulation, the Turkish Electricity Trade and Contract Corporation (TETAŞ) shall call for tenders.

According to Section 5(4) of the law, the enterprise must obtain insurance for third party liability during the construction of the nuclear power plant for compensation of any damage. With respect of transport of nuclear fuel, radioactive material or radioactive waste and with regard to incidents that could occur at the nuclear installation, the 1960 Paris Convention on Nuclear Third Party Liability, its additional amendments and other national and international liability regimes shall apply.

The law provides that a public enterprise could also realise the nuclear installation, invest in similar projects abroad or participate in investments. For this purpose, the Council of Ministers can decide to establish a corporation, subject to private law, and entitled to establish, commission the establishment, operate and/or commission the operation and perform the sales of electricity. Private participation in the corporation will be permitted.

United States

General legislation

Final Rule Amending Regulations Applicable to the Licensing of New Nuclear Power Plants (2007)

On 28 August 2007, the Nuclear Regulatory Commission (NRC) issued a final Rule Amending its Regulations Applicable to the Licensing and Approval Processes for New Nuclear Power Plants.[12] Primarily, the revisions affected the NRC's "combined licensing" process contained in 10 CFR Part 52. The NRC originally issued its combined licensing regulation in 1989 to reform the NRC's

12. Final Rule, Licenses, Certifications, and Approvals for Nuclear Power Plants, 72 Fed. Reg. 49,352 (28 August 2007).

licensing process for future nuclear power plants. The combined licensing process provides an alternative to the "two step" licensing process previously used by the NRC, through which an applicant would first apply for a construction permit and later for an operating licence. A combined licence (COL) authorises construction of the facility in a manner similar to a construction permit but also authorises the holder to operate the facility, subject to certain approvals, after construction is complete. The COL regulations require the applicant to specify in the application the inspections, tests, and analyses that the applicant must perform prior to being authorised to operate. The application must also specify acceptance criteria that are necessary to provide reasonable assurance that the facility has been constructed and will be operated in conformity with the licence and the applicable regulations.

The regulations in 10 CFR Part 52 also contain provisions for the issuance of design certifications for standard nuclear reactor designs, which can be referenced in a COL application by any applicant intending to use that design at a site. Reliance on a design certification promotes standardisation and can aid the efficiency of the review process for a COL application. Part 52 also allows applicants to obtain early site permits, through which an early review of the environmental characteristics and site suitability can be obtained before a full commitment to construct a plant is made. The early site permit can be later referenced in a COL application.

The most recent revision to the rule reflects the NRC's continuing efforts to enhance the NRC's regulatory effectiveness and efficiency in implementing its licensing and approval processes. By mid-2007, the NRC had been informed that it might receive applications for about 32 new plants over the next few years.

Final Rule Implementing a National Source Tracking System (2006)

In November 2006, the Commission issued a final Rule Implementing a National Source Tracking System (NSTS) to enhance controls for certain radioactive materials used in industry, academia and medicine.[13] The tracking system is a secure web-based system to allow NRC licensees to record certain types of radioactive source transfers directly over the internet, and was developed through close co-operation with other federal and state agencies as part of the NRC's efforts to enhance controls over radioactive materials. The final rule closely follows recommendations of a joint NRC-Department of Energy report on Radiological Dispersion Devices (RDDs, or "dirty bombs") published in May 2003 and is based upon an interim database of radiological sources initiated in 2004 and currently in use by the NRC. The rule also implements provisions of the Energy Policy Act of 2005.[14]

The NSTS will apply to radioactive sources that fall in category 1 or category 2 of the International Atomic Energy Agency's "Code of Conduct for the Safety and Security of Radioactive Materials." There are an estimated 44 000 sources in these categories (considered to be of the greatest concern from a security standpoint) in approximately 16 000 devices in use in the United States. They are typically used in devices such as irradiators, radiography cameras, well-logging devices, Gamma Knife® surgical devices and radioisotope thermoelectric generators.

The final rule requires licensees to report to the NSTS the manufacture, transfer, receipt, disassembly and disposal of nationally tracked sources. Basic information to be collected will include

13. Final Rule, *National Source Tracking of Sealed Sources*, 71 Fed. Reg. 65,686 (8 November 2006).

14. See Pub. L. 109-58 § 651(d), 119 Stat. 594, 802 (2005).

the manufacturer, model number, serial number, radioactive material, activity and manufacture date of each source. Information on the facilities involved in any transaction will also be included.

Once fully operational, the NSTS will enhance the accountability of radioactive sources by helping the NRC and Agreement States (the 34 states that have been given authority by the NRC to regulate the medical, industrial and academic uses of radioactive material) conduct inspections and investigations, communicate nationally tracked source information to other government agencies and verify legitimate ownership and use of nationally tracked sources.

Final Rule on Design Basis Threat (2007)

In March 2007, the Commission issued a final Rule to Enhance its Security Regulations Governing the Design Basis Threat (DBT) applicable to all nuclear power plants and to certain materials licensees.[15] The NRC's DBT regulation provides a general description of the attributes of potential adversaries who might attempt to commit radiological sabotage or theft or diversion of strategic special nuclear material. Certain NRC licensees, including nuclear power plants, are required to use the DBT as the design basis for their physical protection systems. The revised rule modified and enhanced the DBT based on experience and insights gained by the Commission from its assessment of security requirements and implementation of security orders following the September 2001 terrorist attacks, as well as extensive consideration of 12 factors specified in the Energy Policy Act of 2005.[16]

The final rule provides a general description of the modes of attack, weaponry, capabilities and intentions of the adversary. It contains provisions related to multiple, co-ordinated groups of attackers, suicide attacks, active and passive insiders and cyber threats.

The revised DBT rule is the first of several planned security-related rules that will enhance the NRC's regime for the protection of nuclear power plants. Other rules being developed by the NRC include proposals to revise and update requirements for physical protection at existing and new reactors and proposals to establish how technical requirements, including those related to security, are to be examined in applications for NRC review of new reactor designs and operations.

15. Final Rule, Design Basis Threat, 72 Fed. Reg. 12, 705 (19 March 2007).

16. Pub. L. 109-58 §651(a), 119 Stat. 594, 799 (2005).

Republic of Lithuania

Law on the Nuclear Power Plant

28 June 2007 No X-1231

Vilnius

PREAMBLE

The Seimas of the Republic of Lithuania,

IMPLEMENTING the National Energy Strategy and having regard to the energy policy strategy of the European Union;

SEEKING to secure supplies of energy from diverse, secure, sustainable energy sources which do not emit greenhouse gases, and to promote future economic growth;

SEEKING to protect the vital interests and national security of the Republic of Lithuania;

EMPHASISING the importance of implementing the principles of European and transatlantic integration when developing energy sectors of Lithuania and ensuring the country's energy security;

CONSIDERING the experience accumulated through secure and reliable operation of the Ignalina Nuclear Power Plant for many years;

EVALUATING the initiative of private legal entities which may form a basis for preparing, developing and implementing a regional nuclear power plant project in Lithuania;

AIMING at substituting for the electricity generating capacities to be lost as a result of the decommissioning of the Ignalina Nuclear Power Plant and creating legal preconditions for the construction of a new nuclear power plant in Lithuania with the capacity to be established in the light of the results of environmental impact assessment and investors' agreements;

TAKING into account the favourable economic environment for the construction of a nuclear power plant;

TAKING into consideration nuclear safety requirements and Lithuania's obligations under international treaties;

PASSES this Law on the Nuclear Power Plant.

CHAPTER 1

General Provisions

Article 1. Purpose and Objective of the Law

The purpose and objective of this law shall be to lay down provisions and to create legal, financial and organisational preconditions for the implementation of a new nuclear power plant project.

Article 2. Decision on a New Nuclear Power Plant

The Seimas shall give its approval for the construction of a new nuclear power plant in the Republic of Lithuania.

Article 3. Definitions for the Purposes of this Law

Nuclear power plant shall mean a complex of equipment and buildings intended for generating electricity or electricity and heat by using nuclear fuel.

Investors shall mean the national investor and strategic partners.

National investor shall mean the private legal entity referred to in Chapter Four of this Law.

Project shall mean a new nuclear power plant project being developed and implemented, involving the preparation of a feasibility study on a new nuclear power plant, as well as its design, construction, financing, operation, decommissioning and radioactive waste management.

Project implementing company shall mean a private legal entity established for implementing the project.

Reserve capacity shall mean the potential of electricity capacity and power generation necessary for regulating frequency and power flows and generating electricity in cases of unexpected decrease in generation or increase in consumption.

Strategic partners shall mean legal entities that satisfy the criteria laid down in paragraph 2 of Article 6 and have entered into agreements with the national investor on participation in the project.

Article 4. Establishment of Special Security Measures

(1) Special security measures for ensuring the national security interests (hereinafter referred to as special security measures) in respect of the project shall be established by laws and other legal acts.

(2) The Government of the Republic of Lithuania shall establish the procedure for implementing special security measures.

CHAPTER 2

Implementation of the Project

Article 5. Project Implementing Company

(1) A project implementing company shall be established, registered and operated in accordance with the procedure laid down by laws of the Republic of Lithuania. Its registered office shall be situated in the Republic of Lithuania.

(2) The project implementing company shall be responsible for carrying out project implementation activities in compliance with the safety requirements imposed on nuclear activities. Having fulfilled the requirements laid down in legal acts and having received authorisations and licences, the project implementing company shall become the operator of the nuclear power plant and expand electricity generating capacities in accordance with the procedure laid down by legal acts.

(3) The project implementing company and the new nuclear power plant shall have particular strategic importance to the national security of Lithuania and its vital national interests.

(4) The project implementing company shall be subject to the special security measures established by laws and other legal acts of the Republic of Lithuania.

Article 6. Participants in the Project Implementing Company

(1) The project implementing company may be established on the initiative of the national investor, with the opportunity being provided for strategic partners to participate in it.

(2) Investors shall be entities satisfying the following criteria:

1) complying with the special security measures established by laws and other legal acts;

2) having financial, legal and technical capabilities to discharge all their obligations during the period of the design, construction, operation and final decommissioning of the nuclear power plant;

3) having their liability secured by guarantees and obligations the conditions whereof are acceptable to the Government of the Republic of Lithuania;

4) undertaking obligations, by concluding respective agreements with the Lithuanian transmission system operator, to provide reserve capacity acceptable to the Lithuanian electricity transmission system operator and enabling the latter to guarantee the stability and security of electricity transmission, or undertaking obligations to cover the costs of reserve capacity.

(3) Investors shall participate in the implementation of the project on equal terms: their contribution, rights and obligations in implementing the project must be proportionate to the future participation of each investor in the capital of the project implementing company. The stakes of investors in the capital of the project implementing company shall be established by mutual agreements, subject to the requirements laid down in this Law.

(4) Each investor shall finance or ensure financing of that portion of the project costs (including costs associated with the project implementation, the operation of the project implementing company, the decommissioning of the nuclear power plant and radioactive waste management) which is proportionate to its stake in the capital of the project implementing company.

(5) The rights and duties of the national investor in the management of the project implementing company shall be established by taking into account the vital national interests.

(6) The state control and supervision of compliance with the criteria laid down in paragraph 2 of this Article shall be ensured through the licensing of the activities of the future operator of the nuclear power plant.

Article 7. Procurement of Goods, Services and Works Required for the Implementation of the Project

The procurement of goods, services and works required for the implementation of the project shall be carried out in accordance with the procedure laid down by laws and other legal acts, subject to the national security criteria, vital national interests and special security measures established by the Republic of Lithuania.

CHAPTER 3

Management

Article 8. Management

(1) The rights attached to the shares owned by the State in the national investor company shall be exercised in accordance with the procedure established by the Government of the Republic of Lithuania. The manager of the State-owned shares or persons authorised by the manager shall exercise the property and non-property rights of the State as a shareholder in the national investor company in accordance with the said procedure. The manager of the State-owned shares or persons authorised by the manager may vote in the bodies of the national investor company on the agreement of shareholders in the project implementing company only pursuant to resolutions of the Government of the Republic of Lithuania, with the approval of the Seimas of the Republic of Lithuania to the material terms and conditions of this agreement.

(2) The national investor shall own a block of at least 34%of shares in the project implementing company carrying at least 34% of votes at the general shareholders' meeting of the project implementing company.

Article 9. Emergency Situation

Upon the declaration of a state of emergency in the energy sector in accordance with the provisions of the Law on Energy, in the event or under threat of a nuclear accident, under threat of damage to the environment or in the event of imminent danger to human health or safety, the operator of the nuclear power plant must carry out the instructions issued by the Government of the Republic of Lithuania or institutions authorised by it. Where, in the event of an emergency in the energy sector, in the event or under threat of a nuclear accident, under threat of damage to the environment or in the event of imminent danger to human health or safety, the operator of the nuclear power plant fails to carry out such instructions, the Government of the Republic of Lithuania or an institution authorised by it shall have the right, for the duration of the emergency in the energy sector or until the threat or consequences of the nuclear accident are eliminated, the threat of environmental damage or the danger to human health or safety is averted, to take over the management of the project implementing company, suspend or revoke its licence or take other necessary measures to ensure nuclear safety, radiation protection and the operation of

the project implementing company; these measures, however, shall be applied only to the extent necessary to overcome the difficulties encountered. The takeover of the management of the project implementing company, the suspension or revocation of licences shall not exempt the project implementing company from liability.

CHAPTER 4

National Investor

Article 10. National Investor

(1) The national investor shall be an independent private legal entity registered in the Republic of Lithuania, established and operated for an indefinite period of time under laws of the Republic of Lithuania, with the aim of gaining benefits for itself and all shareholders in a socially responsible manner. The registered office of the national investor shall be situated in the Republic of Lithuania. The national investor shall be the public company Lietuvos Energija which has shown a private initiative to invest in the project and fulfils the requirements laid down in this law.

(2) The Republic of Lithuania shall own a block of more than 1/2 of shares in the national investor carrying more than 1/2 of votes at the general shareholders' meeting of the national investor. Other entities may participate in the authorised capital of the national investor, manage, use and dispose of the shares of the national investor and the rights attached to these shares in accordance with the conditions and procedure laid down by the Law on Enterprises and Facilities of Strategic Importance to National Security and Other Enterprises Important for Ensuring National Security, as well as other laws and legal acts of the Republic of Lithuania.

(3) The national investor and its subsidiaries shall make a group of companies of the national investor. The major activity of the national investor must be that of the parent company of the group of companies of the national investor. The national investor may also engage in other activities that do not contradict the purpose of activities of the national investor.

(4) Companies from the group of companies of the national investor shall carry out the activities of electricity generation, transmission, distribution, supply, market operator and other activities unbundled in accordance with the procedure laid down by legal acts. A company from the group of companies of the national investor may also engage in other activities that do not contradict the purpose of activities of that company.

(5) The bodies of the national investor shall be the general shareholders' meeting, the supervisory board, the board and the manager.

(6) Decisions taken by the Government of the Republic of Lithuania or an institution authorised by it concerning the voting at the general shareholders' meeting of the national investor must create the necessary preconditions for public trading in the shares of the national investor on the regulated market as defined in the Law on Markets in Financial Instruments. This provision shall not bind the Government of the Republic of Lithuania or an institution authorised by it to take any decision on the sale or other transfer of the shares of the national investor.

(7) Agreements providing for the rights, obligations and liability of members of the board shall be concluded with the members of the board of the national investor. The terms and conditions of agreements with each member of the board shall be established and the person authorised to sign these agreements on behalf of the national investor shall be appointed by the supervisory board.

Article 11. Increase of the Authorised Capital of the National Investor

(1) The Government of the Republic of Lithuania and the shareholder of the controlling stake in the public company VST shall have the right to invest the shares held in the public company Rytų Skirstomieji Tinklai (Eastern Distribution Networks) or in the public company VST respectively, amounting to more than 1/2 of shares of each company and carrying more than 1/2 of votes at the general shareholders' meeting, in the authorised capital of the national investor, the public company Lietuvos Energija, in accordance with the procedure laid down by this law and other laws.

(2) The Government of the Republic of Lithuania shall have the right to:

1) negotiate with the shareholder of the controlling stake in the public company VST on the investment of all the shares owned by that shareholder in the public company VST, or part thereof amounting to more than 1/2 of the shares of the public company VST and carrying more than 1/2 of votes at the general shareholders' meeting, as well as on the acquisition of newly issued shares of the public company Lietuvos Energija in the manner set forth in paragraph 3 of this Article and, having agreed to that effect, make respective decisions provided for in this law and other laws and conclude respective transactions;

2) make respective decisions on the investment of all the shares owned by the State in the public company Rytų Skirstomieji Tinklai, or part thereof amounting to more than 1/2 of the shares of the public company Rytų Skirstomieji Tinklai and carrying more than 1/2 of votes at the general shareholders' meeting in the manner set forth in paragraph 3 of this Article.

(3) Upon reaching the agreement referred to in subparagraph 1 of paragraph 2 of this Article, the Government of the Republic of Lithuania shall have the right to take decisions on the voting at the general shareholders' meeting of the public company Lietuvos Energija that are necessary for implementing the provisions of this Article, as well as on the increase of the authorised capital of the public company Lietuvos Energija by additional contributions under the following terms and conditions:

1) the issue price of the part of newly issued shares of the public company Lietuvos Energija proportionate to the nominal value of the shares owned by the State on the day of the general shareholders' meeting shall be paid for by non-pecuniary contributions – shares in the public company Rytų Skirstomieji Tinklai amounting to more than 1/2 of the shares of the public company Rytų Skirstomieji Tinklai and carrying more than 1/2 of votes at the general shareholders' meeting, as well as shares in the public company VST amounting to more than 1/2 of the shares of the public company VST and carrying more than 1/2 of votes at the general shareholders' meeting;

2) the right to acquire the remaining newly issued shares of the public company Lietuvos Energija shall be granted to other shareholders of the public company Lietuvos Energija in proportion to the nominal value of the shares owned by them on the day of the general shareholders' meeting, by paying the issue price in cash.

(4) When newly issued shares of the public company Lietuvos Energija are paid for by non-pecuniary contribution, the shares of the public company Lietuvos Energija, the public company Rytų Skirstomieji Tinklai and the public company VST, respectively, must be evaluated by an independent property assessor in accordance with the procedure laid down by legal acts, as well as an opinion on the valuation of shares must be received from a financial institution having the long-

term borrowing rating not lower than "A-" according to the rating assigned by the international rating Agency Fitch Ratings, or "A3" according to the rating assigned by the international rating Agency Moody's, or "A-" according to the rating assigned by the international rating Agency Standard & Poor's. The procurement of services relating to the valuation of shares, the expression of an opinion on the valuation of shares and other expert services shall be carried out by the Government of the Republic of Lithuania or an institution authorised by it in accordance with the procedure laid down by legal acts, using financial resources of the Privatisation Fund for payment.

(5) The Government of the Republic of Lithuania shall have the right to take a decision on the sale of the State-owned shares in the national investor to other persons or on the assignment or waiver for the benefit of other persons of the pre-emption right of the State to acquire newly issued shares of the national investor, in all cases ensuring that the Republic of Lithuania shall own a block of more than 1/2 of shares in the national investor carrying more than 1/2 of votes at the general shareholders' meeting of the national investor.

(6) Should the Government of the Republic of Lithuania decide to sell a part of the State-owned shares in the national investor following the increase of the authorised capital of the public company Lietuvos Energija provided for in Article 11 of this law, such sale must be carried out publicly, providing non-discriminatory conditions for nationals and legal entities of the Republic of Lithuania to acquire them, in all cases ensuring that the Republic of Lithuania shall own a block of more than 1/2 of shares in the national investor carrying more than 1/2 of votes at the general shareholders' meeting of the national investor. With the view of ensuring wider and adequate representation of the Republic of Lithuania and other shareholders of the national investor in the bodies of the national investor, the number of members of the supervisory board may be higher than specified in the Law on Companies, but not more than 25.

(7) The Government of the Republic of Lithuania or an institution authorised by it shall inform the Seimas about the progress and results of negotiations referred to in subparagraph 1 of paragraph 2 of this Article. The agreements referred to in subparagraph 1 of paragraph 2 of this Article shall not be confidential (they shall be public). The Government of the Republic of Lithuania or an institution authorised by it shall publish the text of the agreements referred to in this paragraph on the website of the Government.

CHAPTER 5

Site of Construction

Article 12. Designating the Construction Site

The construction site for the nuclear power plant shall be designated in accordance with the procedure laid down by the Law on Territorial Planning, the Law on Environmental Impact Assessment of Planned Economic Activities, the Law on Nuclear Energy, this Law and other legal acts, taking into account the recommendations of the International Atomic Energy Agency.

Article 13. Allotment of Land for the Construction of the New Nuclear Power Plant

(1) The project shall be an economic project of national significance responding to the public needs.

(2) The land needed for the construction of the new nuclear power plant shall, in accordance with the procedure laid down by laws and other legal acts, be transferred, leased or allotted for use on other grounds specified in legal acts to the project implementing company or the national investor.

(3) The land required for the implementation of the project may be taken for public needs from private land owners or contracts for the use or lease of State-owned land may be terminated for this purpose before their expiry in accordance with the procedure laid down by the Law on Land and other legal acts.

CHAPTER 6

Final Provisions

Article 14. Decommissioning Fund

Resources to guarantee the decommissioning of the new nuclear power plant shall be accumulated in the nuclear power plant decommissioning fund. Such decommissioning fund shall be established by law.

Article 15. Financing of Control and Supervisory Authorities

The activities of nuclear energy regulatory, control and supervisory authorities shall be financed from the sources specified in laws and other legal acts, as well as from sources of financing provided for in international treaties.

Article 16. Protection of Investments

Investors shall be ensured the investment protection measures established by the Law on Investments, international treaties and other legal acts.

Article 17. Separation of the Ignalina Nuclear Power Plant from the Project

(1) The decommissioning works of the State Enterprise Ignalina Nuclear Power Plant shall be carried out separately and independently from the project. The State Enterprise Ignalina Nuclear Power Plant shall not participate in the nuclear power plant project.

(2) Without prejudice to the security of the Ignalina Nuclear Power Plant, the infrastructure of the State Enterprise Ignalina Nuclear Power Plant and other assets necessary for implementing the project may be leased or provided on other grounds specified in legal acts to the project implementing company without tendering in accordance with the procedure laid down by laws of the Republic of Lithuania.

Article 18. Provision of Information to the Public

The project implementing company and the Government of the Republic of Lithuania or an institution authorised by it shall provide regular information to the public regarding the progress of the implementation of the project, the measures ensuring the nuclear power plant safety, and the benefits brought by the nuclear power plant to Lithuania and the entire Baltic region.

Article 19. Implementation of the Law

When implementing the provisions of Chapter Four of this law, the provisions of the Law on the Privatisation of State-Owned and Municipal Property shall not apply.

Article 20. Proposals to the Government

(1) To propose to the Government of the Republic of Lithuania to:

1) approve a procedure for exercising the rights attached to the State-owned shares in the national investor company during the implementation of the project;

2) approve a procedure for implementing special security measures;

3) draft and approve a national programme for the training of nuclear energy specialists intended to ensure the preparation of necessary nuclear energy specialists, as well as establish measures for the implementation of this programme;

4) no later than within three months from the entry into force of this law, draw up and submit to the Seimas a draft Law Amending the Law on Nuclear Energy, a draft Law Amending the Law on Enterprises and Facilities of Strategic Importance to National Security and Other Enterprises Important for Ensuring National Security and other draft laws required for the implementation of this law;

5) seek to ensure that investors in choosing power plant parameters take into account the conditions for the stable synchronous operation of the Lithuanian electricity transmission system with the Union for the Co-ordination of Transmission of Electricity – UCTE system.

(2) To propose to the Government of the Republic of Lithuania or an institution authorised by it to draw up and approve other legal acts required for the implementation of the provisions of this law.

I promulgate this law passed by the Seimas of the Republic of Lithuania.

President of the Republic **Valdas Adamkus**

State Council of the People's Republic of China

Official Reply of the State Council to Questions on the Liabilities of Compensation for Damages Resulting From Nuclear Accidents*

China Atomic Energy Authority:

We hereby give our official reply as follows to your questions regarding the liabilities of compensation for damages from nuclear accidents:

1. The organizations within the territory of the People's Republic of China which have obtained legal personality according to law, and operate nuclear power stations, civil research reactors and/or civil engineering test reactors, or engaged in the production and transportation of civil nuclear fuels and the storage, transportation and post-treatment of spent fuels and have nuclear installations, are the operators of such nuclear power stations or nuclear installations.
2. The operators shall be liable to compensate for the personal casualties, property losses or environmental damages arising out of nuclear accidents, while no persons other than the operators shall be liable to compensate therefore.
3. Where a nuclear accident causes damages across the border of the People's Republic of China, such damages shall be handled in accordance with the treaty or protocol between the People's Republic of China and the relevant country. If there is no such treaty or protocol, such damages shall be handled in the principle of reciprocity.
4. If one operator operates several nuclear installations at one site, these nuclear installations shall be deemed as one nuclear installation.
5. Where the damages caused by nuclear accident involve two or more operators and the liabilities that should be assumed by each of these operators cannot be clearly determined, the relevant operators shall be jointly and severally liable for the damages.
6. With regard to the damages caused by a nuclear accident directly resulting from armed conflict, hostile action, war or riot, the relevant operator shall not be liable to compensate for such damages.
7. For the operators of nuclear power stations and the operators of spent fuel storage, transportation and post-treatment, the maximum amount of compensation for the damages caused by one nuclear accident is RMB 300 million; and for other operators the maximum amount of compensation for the damages caused by one nuclear accident is RMB 100 million. Where the total amount of compensation payable for the damages caused by a nuclear accident exceeds the relevant maximum amount of compensation specified above, the State shall provide a financial indemnity up to RMB 800 million.

* Unofficial translation by the Beijing office of EDF. This translation does not engage the responsibility of the author.

As to the compensation for damages resulting from an extraordinary nuclear accident where the amount of financial indemnity from the State needs to be increased, the amount to be increased shall be decided after appraisal by the State Council.

8. An operator shall make appropriate financial guarantees and arrangements to ensure, when nuclear accident causes damages, timely and effective performance of its liabilities of compensation for such damages.

   Before operating a nuclear power station or carrying out the storage, transportation or post–treatment of spent fuels, an operator must purchase sufficient insurance to cover its limits of liability.

9. If a written contract between an operator and another person provides for the right of recourse, the operator may, after compensating the victim, exercise its right of recourse against such person in accordance with the provisions of the contract.

   If a damage caused by nuclear accident is due to a natural person's willful act or omission, the relevant operator may, after compensating the victim, exercise its right of recourse against this natural person.

10. The natural persons, legal persons and other organizations that have suffered from damages caused by nuclear accidents are entitled to claims compensation for damages resulting from nuclear accidents.

    The Atomic Energy Law of the People's Republic of China (Draft) shall be drafted to expressly provide for the foregoing matters as well as the limitation of actions, jurisdiction, etc.

    State Council of the People's Republic of China (Seal)

    30 June 2007

Keywords: Industry, nuclear industry, compensation, official reply

Copy: National Development and Reform Commission, Ministry of Finance, State Environmental Protection Administration, Legislative Affairs Office, China National Nuclear Corporation, China Guangdong Nuclear Power Holding Co., Ltd., China Power Investment Corporation and State Nuclear Power Technology Co., Ltd.

Republic of Turkey

Unofficial Translation[1] of the Turkish Law No. 5710[2] Concerning the Construction and Operation of Nuclear Power Plants and the Sale of Energy Generated from Those Plants

Date of acceptance: 9 November 2007

PART 1

Goal, scope, definitions and abbreviations

Goal and scope

Article 1

(1) The aim of this law is to provide, 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 generated from those plants.

Definitions and abbreviations

Article 2

(1) The following abbreviations stand for:

a) Ministry: Ministry of Energy and Natural Resources;

b) EPDK: Energy Market Regulatory Authority;

c) EÜAŞ: Electricity Generation Company, Inc.;

d) İÇH: Decommissioning accounts;

e) Retail and/or wholesale licence: Licences for energy retail and/or wholesale activities granted by EPDK;

f) Power Plant: Nuclear power plants generating electricity;

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1. By the OECD/NEA Secretariat. Official translation is expected to be published on the Website of the NEA Legal Affairs Section and in the next issue of the *Nuclear Law Bulletin*.

2. Published in the Turkish Official Gazette No. 26707 on 21 November 2007.

g) Enterprise: company or companies which construct power plants, produce and sell electricity;

h) TAEK: Turkish Atomic Energy Authority;

i) TEİAŞ: Turkish Electricity Transmission Company;

j) TETAŞ: Turkish Electricity Trade and Contract Corporation;

k) URAH: National Radioactive Waste Account.

PART 2

Procedures and principles regarding the construction of nuclear power plants and the energy production and its trade

Designation of the enterprise

Article 3

(1) The selection period regarding the construction of nuclear power plants shall be commenced by the Ministry in application of the procedures laid down in this law.

(2) Within one month from the day on which the law comes into force, TAEK shall publish the constructing and operating criteria which the enterprises have to fulfil.

(3) Within two months from the day on which the law comes into force, the procedures and principles regarding the selection criteria for competing enterprises, the selection of the enterprise, site selection, licensing conditions, incentives regarding the infrastructure, the duration of the selection process, fuel supply, generating capacity and the amount, duration and unit cost of the energy shall be prepared by the Ministry and set up in a regulation which shall come into force with the approval of the Council of Ministers.

(4) Not later than one month after the publication of the regulation under the terms of paragraph 3 for the construction of nuclear power plants foreseen by this law, TETAŞ shall call for bids.

(5) From amongst the bids, TAEK shall document the enterprises that meet the criteria it set up and allow them to compete, and the enterprises that do not meet those criteria shall remain out of consideration. TETAŞ shall assess the received bids on the basis of this law and the provisions of regulations to be released, and determine the most appropriate bid, and submit it to the Council of Ministers' to seek approval to sign the contract with the specified enterprise. Provided the suggested bid by TETAŞ is seen as appropriate, the Council of Ministers shall authorise the signing of the contract between the enterprise and TETAŞ. EPDK shall grant a licence to the enterprise which has been seen as appropriate to sign the contract within the framework of specified legislation. Subsequent to the issuance of the licence by EPDK, an agreement between the concerned enterprise and TETAŞ will be signed arranging for energy sales within a timeframe not exceeding 15 years after the power plant has started its operation.

Application principles

Article 4

(1) The principles laid down below shall apply for the sale of electricity, produced within the scope of this law:

a) The energy that the selected enterprise will produce according to the agreement shall be purchased by TETAŞ under the conditions of the contract signed by the enterprise and TETAŞ. After the power plant commences its operation, the energy will be sold every year to operating legal persons with a retail and wholesale licence under bilateral agreements. The energy that legal persons with a retail and wholesale licence can purchase will be determined annually according to the share of these legal entities in Turkey's energy consumption in the previous year. The provisions regarding the electricity sale which shall be assumed under bilateral agreements by legal persons with a wholesale and retail sale licence shall be included in their licences in accordance with this law.

b) The principles and procedures regarding energy sales which TETAŞ shall impose on wholesale and retail enterprises and the obligations of the parties shall be determined in a regulation issued by the Ministry.

(2) However, enterprises that do not demand to enter into agreements with TETAŞ may, provided they abide by the laws regarding electricity market and nuclear facilities, be subject to the rules of this law, except for the provisions of Article 3(1), (3), (4) and (5) and Article 4(1) regarding enterprise selection and bilateral agreements.

Licence, permission and liability

Article 5

(1) The enterprise is obliged to obtain all kinds of permissions, approvals and licences required by this law and the other legislation.

(2) URAH and İÇH shall be constituted by an arrangement formed by the Ministry and the Treasury to meet the costs of waste management by determining the temporary storage or final storage, the construction, licensing, operation and decommissioning of the storage facility, the transportation and processing of used fuel or the high-level radioactive waste which shall be stored in the temporary storage site or disposed of in the final storage site, the research which will ensure the management of radioactive waste, the development activities and the cost of dismantling operations of the nuclear power plant. The operations relating to URAH and İÇH are all exempted from taxation. The procedures and principles regarding the establishment, accretion and management of these accounts shall be prepared jointly by the Ministry and Treasury and come into force with the approval of the Minister of Energy and Natural Resources and the Treasury State Secretary and after publication in the Official Gazette. The provisions of Law No. 6183 of 21 July 1953 Regarding the Collection of Public Debts are applied to those who do not pay their contributions on time. The revenues collected in the name of URAH and İÇH may only be used within their purpose.

(3) At the end of the fuel procurement and the operation period, the enterprise is obliged to decommission and dismantle the power plant under the criteria to be issued by TAEK.

(4) The enterprise must obtain insurance for the compensation of any damage that can arise during the construction of the power plant. Additionally, the enterprise is obliged to pay a contribution of 0.15 cent/kWh (in US Dollars) to meet all kind of financial costs concerning the transportation, the storage and/or the disposal of waste caused during the operation of the power plant and the costs of decommissioning at the end of the operational period of the power plant for each of the accounts to be formed.

(5) In case of an accident in the course of transport of radioactive material or radioactive waste or at the nuclear power plant, the 1960 Paris Convention on Nuclear Third Party Liability, its additional amendments and other national and international liability provisions shall apply.

(6) The enterprise that constructs the power plant must allocate 1% of its annual revenue to research and development activities.

Public participation and investment

Article 6

(1) The enterprise which is entitled to benefit from this law and a public enterprise may establish a cross shareholding relationship within the terms of Law No. 233 of 8 June 1984 on Public Economic Enterprises.

(2) In case of an assignment by the Ministry, public enterprises may build power plants within the scope of this law, make similar investments abroad or participate in investments. To this end, the Council of Ministers may adopt a decision on the establishment of an enterprise subject to provisions of private law, and entitled to construct, commission construction, operate and/or to commission operation of power plants within national territory and abroad and to sell the electricity produced. Private sector companies may be authorised to hold shares in the enterprise established within this scope. The auditing of the enterprise which will be established shall be performed in accordance with the Law No. 3346 of 2 April 1987 on the Regulation of Auditing the State Economic Enterprises and Funds by the Grand National Assembly of Turkey.

PART 3

Other provisions

Incentives

Article 7

(1) The Council of Ministers may provide incentives for investments in technology regarding the power plant to be constructed and the training of operation personnel.

(2) Should the Treasury be the owner of the premises on which the power plants shall be constructed within the framework of this law or should these be under state authority and administration, the Ministry of Finance can set up a right of access in favour of the enterprise or,

should the premises be owned by other public institutions or bodies, the Council of Ministers shall grant the enterprise a licence to utilise the premises free of charge. At the end of the agreement period, the nuclear power plant must be decommissioned. The enterprise is responsible of the decommissioning works and the return of the premises to the Treasury in a state consistent with environmental provisions. The decommission costs will be covered by the İÇH to be established according to Article 5 paragraph 2. Should İÇH resources prove to be insufficient, the Treasury will cover an amount up to 25% of the funds collected by İÇH, and should this also prove to be insufficient the enterprise shall cover the excess costs.

The co-ordination of execution

Article 8

(1) The Ministry shall perform the co-ordination required for the execution of this law.

Sanctions

Article 9

(1) EPDK may take legal action against those legal entities with a wholesale and/or retail sale licence that violate the provisions of this law within the framework of Article 11 of the Electricity Market Act No. 4628 of 20 February 2001.

Regulatory institution

Temporary Article 1

(1) TAEK shall carry out its duty in accordance with the Turkish Atomic Energy Authority Act No. 2690 of 9 July 1982 until a new institution which will execute the duty of regulating and inspection of nuclear activities is founded. TAEK, in carrying out its duties, may employ suitably qualified nationals and foreign persons for tasks requiring special knowledge and expertise as non-permanent staff. Their payments and other financial benefits shall be determined by the Ministry.

Incentives for national coal-fired power plants

Temporary Article 2

(1) With a view to the construction of national coal-fired power plants, EÜAŞ may call for a coal allocation bid (royalty).

(2) Provided the power plants to be constructed as a result of the bidding have a power of 1 000 megawatt (MW) or more and the complete plant commences operation by the end of 2014, the provisions below shall apply:

a) The interested parties shall propose the royalty covering more than a one-year period and per unit electricity sales prices and the minimum generating commitments for a period of 15 years. The bid selection will be made after assessing the proposed royalty and the sales price of electricity according to their reduced value of the date on which the bid was made considering the principles set out in the terms and conditions

b) Within three months from the conclusion of the bidding, the selected enterprise or enterprises and TETAŞ shall sign an agreement on the electricity sales prices and the minimum amount of electricity to be generated, as defined as a result of the bids, for a period of 15 years after the commencement of operation. The rules and procedures regarding the energy purchase by TETAŞ shall be set up in the terms and conditions. The energy which TETAŞ will purchase in the framework of this law will pursuant to the foreseen bilateral agreements, each year after the commencement of operation of the plant, be sold to operating legal persons with retail and wholesale licences. The energy that legal persons with a licence for retail and wholesale can purchase will be determined annually according to the share of these legal entities in Turkey's energy consumption in the previous year. The provisions regarding the electricity sale which shall be assumed under bilateral agreements by legal entities with a wholesale and retail sale licence shall be included in their licences in accordance with this law. Within two months from the day on which this law is published, the Ministry shall issue regulations setting up the procedures and principles with respect to the energy sales by TETAŞ to wholesale and retail companies.

c) EÜAŞ will conduct the expropriation and compensation of land, except for the land of the plant, in order to realise the mineral land and the land for the necessary dam and water supply, within the principles set up in the terms of contract. The housing of the expropriated shall be performed according to Law No. 5543 of 19 September 2006 regarding settlements.

d) The terms of the agreements concerning the plants to be constructed shall include sanctions for the case that the plant cannot commence operation within the envisaged timeframe.

e) TEİAŞ will construct the necessary electricity grid in accordance with the agreement that the enterprise and TEİAŞ will conclude regarding the operation programme of the power unit. TEİAŞ shall cover the damage caused by delays.

f) For the plants under the framework of the bidding, the Ministry for Environment and Forest shall re-define the air quality limits, set up in regulation on the conservation of the air quality, with a view to enabling the realisation of the project and under the condition that the limits set up in the regulations on air pollution resulting from industrial facilities are met.

(3) Provisional Article 5 of Law No. 5686 on the Geothermic Sources and Natural Mineral Waters of 3 June 2007 shall not apply after the publication of this law.

Enforcement

(1) The law shall come into force on its publication day.

Execution

Article 11

(1) The Council of Ministers shall execute the provisions of this law.

International Regulatory Activities

European Union

Council Decision Authorising the Republic of Slovenia to Ratify the 2004 Protocol Amending the Paris Convention (2007)

Council Decision [2007/727/EC] of 8 November 2007 authorises the Republic of Slovenia to ratify, in the interest of the European Community, the Protocol of 12 February 2004 Amending the Paris Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy.[1]

In 2003[2] and in 2004,[3] the Council had authorised the Member States which are Contracting Parties to the Paris Convention to sign and ratify, in the interest of the Community, the Protocol amending the Paris Convention, or to accede to it (see *Nuclear Law Bulletin* Nos. 72 and 73; unofficial consolidated text of the Paris Convention reproduced in Supplement to *Nuclear Law Bulletin* No. 75). An authorisation by the Council was necessary because the 2004 Protocol to amend the Paris Convention contains provisions which affect the rules laid down in the Council Regulation on jurisdiction and the recognition and enforcement of judgements in civil and commercial matters, a field in which the Community has exclusive competence.[4]

The two decisions were addressed to Member States which are Contracting Parties to the Paris Convention, to the express exclusion of Austria, Denmark, Ireland and Luxembourg. Denmark is neither bound by Regulation (EC) No. 44/2001 (see *Nuclear Law Bulletin* Nos. 72 and 73) nor subject to its application, in accordance with Articles 1 and 2 of the Protocol on the Position of Denmark annexed to the Treaty on European Union and to the Treaty establishing the European Community. In addition, Austria, Ireland and Luxembourg, which are not parties to the Paris Convention, have been expressly exempted from applying the decisions. They will continue to be governed by the rules in Regulation (EC) No. 44/2001 and apply them in the field covered by the Paris Convention and the 2004 Protocol.

The Member States addressed by the above decisions signed the Protocol to that Convention in the interest of the European Community on 12 February 2004. Under Article 2(1) of the Decision 2004/294/EC they "shall take the necessary steps to deposit simultaneously their instruments of ratification of the Protocol, or accession to it, with the Secretary-General of the Organisation for Economic Co-operation and Development within a reasonable time and, if possible before 31 December 2006".

1. Official Journal of the European Union L 294 of 13 November 2007.
2. Council Decision 2003/882/EC of 27 November 2003.
3. Council Decision 2004/294/EC of 8 March 2004.
4. Council Regulation (EC) No. 44/2001 of 22 December 2000.

Since the Republic of Slovenia was not a Member State at the time of the 2003 and 2004 decisions, the Council decision authorises the Republic of Slovenia to ratify, in the interest of the Community, the 2004 Protocol amending the Paris Convention and to take the necessary steps to deposit its instrument of ratification, if possible simultaneously with the Member States addressed by the 2004/294/EC.

Council Decision Approving the Accession of the European Atomic Energy Community to the Amended Convention on the Physical Protection of Nuclear Material (2007)

Council Decision 2007/513/Euratom of 10 July 2007[5] is a declaration by the European Atomic Energy Community ("Community") under Articles 18(4) and 17(3) of the Convention on the Physical Protection of Nuclear Material (CPPNM).

The CPPNM was adopted on 26 October 1979 (see *Nuclear Law Bulletin* No. 23) and entered into force in 1987. As of 17 September 2007, 130 states, including all Member States of the Community, are parties to the CPPNM. An Amendment to the CPPNM, which has not yet entered into force, was adopted on 8 July 2005. The final act regarding the Amendment to the CPPNM (see *Nuclear Law Bulletin* Nos. 71, 75 and 76) was signed by the European Commission on behalf of the Community on 8 July 2005.

International and regional organisations, when becoming a party to the Convention, must communicate to the depositary a declaration indicating which articles of the CPPNM do not apply to them [Article 18(4) of the CPPNM]. Pursuant to this provision, the Community declares that Articles 8 to 13 of the CPPNM do not apply to it. These provisions relate to prosecution and extradition of alleged offenders. The Community also declares that Article 14 paragraphs (2) and (3) of the CPPNM, relating to the communication between states prosecuting an alleged offender, states directly concerned and all other states, do not apply to the Community.

The Community furthermore specifies, pursuant to Article 17(3) of the CPPNM, that since only states may be parties in cases before the International Court of Justice, the Community is bound only by the arbitration procedure referred to in Article 17(2) of the CPPNM.

Council Decision Establishing the European Joint Undertaking for ITER and the Development of Fusion Energy and Conferring Advantages upon it (2007)

Council Decision 2007/198/Euratom of 27 March 2007 establishes a European Joint Undertaking for the International Thermonuclear Experimental Reactor (ITER) and the Development of Fusion Energy for a period of 35 years, starting on 19 April 2007. The Joint Undertaking will be based in Barcelona.

On 24 May 2006, Euratom, the People's Republic of China, India, Japan, the Republic of Korea, Russia and the United States concluded an Agreement on the Establishment of the ITER International Fusion Energy Organisation for the Joint Implementation of the ITER Project (ITER Organisation) with its headquarters in France (see *Nuclear Law Bulletin* No. 77). The ITER Agreement requires all parties to provide contributions to the ITER Organisation through appropriate legal entities referred to as "domestic agencies".

5. Official Journal of the European Union L 190 of 21 July 2007.

In addition, on 5 February 2007, Euratom and Japan concluded a bilateral agreement for the joint implementation of the "broader approach" fusion research activities, geared towards the rapid realisation of fusion energy. The Broader Approach Agreement envisages that such activities should be carried out by Euratom through its "domestic agency".

According to Article 1(2) (a) to (c) of the decision, the tasks of the Joint Undertaking shall be:

- to provide the contribution of Euratom to the ITER International Fusion Energy Organisation;
- to provide Euratom's contribution to broader approach activities with Japan for the rapid realisation of fusion energy;
- to prepare and co-ordinate a programme of activities in preparation for the construction of a demonstration fusion reactor and related facilities including the international fusion materials irradiation facility.

The Joint Undertaking shall have the following members: Euratom (represented by the Commission), the Member States of Euratom and third countries which have concluded co-operation agreements with Euratom in the field of controlled nuclear fusion, which associate their respective research programmes with Euratom programmes and which have expressed their wish to become members of the Joint Undertaking.

The Joint Undertaking shall have legal personality. It may, in particular, conclude contracts, obtain licences, acquire or dispose of movable and immovable property, take out loans and be a party to legal proceedings. The indicative total resources deemed necessary for the Joint Undertaking amount to 9 653 million euros (EUR), pursuant to Article 4(3) of the decision.

International Atomic Energy Agency

Convention for the Suppression of Acts of Nuclear Terrorism (2007)

In its Resolution A/RES/59/290 of 13 April 2005, the General Assembly of the United Nations adopted the International Convention for the Suppression of Acts of Nuclear Terrorism (the Convention). The Convention was opened for signature by all states from 14 September 2005 until 31 December 2006 at United Nations headquarters in New York. It entered into force on 7 July 2007, the 30th day following the date of the deposit of the 22nd instrument of ratification, acceptance, approval or accession.

The preamble to the Convention explicitly refers to the Convention on the Physical Protection of Nuclear Material (CPPNM), which was adopted under the auspices of the IAEA and entered into force on 8 February 1987. An amendment to the CPPNM, which has not yet entered into force, was adopted on 8 July 2005. As of 1 October 2007, 12 out of 130 States Parties have accepted the amendment.

On 11 September 2007, the IAEA's Board of Governors approved the functions specifically assigned to the IAEA under the Convention and authorised the Director General to implement them, subject to the availability of resources.

Resolution on the Exclusion of Small Quantities of Nuclear Material from the Application of the Vienna Convention (2007)

On 11 September 2007, the Board of Governors adopted the Resolution on the Establishment of Maximum Limits for the Exclusion of Small Quantities of Nuclear Material from the Application of the Vienna Conventions on Nuclear Liability. In operative paragraph 12 of its Resolution GC(51)/Res/11, the General Conference welcomed the Board's aforementioned resolution.

Three legal instruments on civil liability for nuclear damage, adopted under the auspices of the IAEA, namely, the Vienna Convention on Civil Liability for Nuclear Damage (the 1963 Vienna Convention), the Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage (the 1997 Vienna Convention) and the Convention on Supplementary Compensation for Nuclear Damage (the 1997 CSC), provide for the Board of Governors to establish maximum limits for the exclusion of small quantities of nuclear material from their respective scope of application. With respect to the 1963 Vienna Convention, the IAEA Board of Governors established maximum limits in September 1964 and again in September 1978 in line with the then current Edition of the IAEA's Regulations for the Safe Transport of Radioactive Material (the IAEA's Transport Regulations). No maximum limits have been established so far for the 1997 Vienna Convention or the 1997 CSC.

During the course of its meetings in 2006 and 2007, INLEX considered the possible need for the Board to establish new maximum limits in line with the current edition of the IAEA's Transport Regulations and to establish limits with respect to the 1997 Vienna Convention and the 1997 CSC. INLEX recommended that the proposed limits should be examined by the IAEA's Transport Safety Standards Committee (TRANSSC) and the Radiation Safety Standards Committee (RASSC) to ensure their technical adequacy prior to their submission to the Board. On 14 March 2007 and 11 April 2007, TRANSSC and RASSC, endorsed the proposed maximum limits and accordingly a new draft resolution was submitted to the Board for its consideration and adoption [GOV/2007/39 (Corrected)].

International Expert Group on Nuclear Liability (2007)

The International Expert Group on Nuclear Liability (INLEX) established by the Director General in 2003, held its seventh meeting in June 2007. During the course of its meeting the Group, *inter alia*, continued its work on addressing possible gaps and ambiguities in the existing nuclear liability regime, in particular, by identifying further steps to address them. The Group also considered gaps in insurance coverage and considered the possible ways of increasing the amounts of nuclear liability coverage through voluntary international pooling of operators' funds. In discussing the issue of the amount of liability limit in the 1963 Vienna Convention on Civil Liability for Nuclear Damage Vienna Convention (the 1963 Vienna Convention), the Group concluded that the unit of account was "35 US Dollars (USD) per one troy ounce of fine gold" as provided in Article V(3). Accordingly, the Group concluded that the correct minimum amount of liability under the 1963 Vienna Convention was dependent on the day-to-day price of gold, and that it was currently equivalent to approximately USD 93 million. INLEX's work is still ongoing and the third Regional Workshop on Liability for Nuclear Damage, is scheduled to be held in South Africa, in February 2008 and the eighth meeting of the Group is scheduled to be held in May 2008.

Code of Conduct on the Safety and Security of Radioactive Sources and its Supplementary Guidance (2007)

An open-ended meeting of technical and legal experts for sharing of information as to states' implementation of the Code of Conduct on the Safety and Security of Radioactive Sources (the Code) and its supplementary Guidance on the Import and Export of Radioactive Sources (the Guidance), was held from 25 to 29 June 2007 at the IAEA Headquarters in Vienna under the chairmanship of Mr. S. McIntosh of Australia. The objective of the meeting was to promote a wide exchange of information on national implementation of the Code and Guidance. The meeting was open to all Member and non-Member States of the IAEA, whether or not they had made a political commitment to the Code and/or to the Guidance.

The key issues discussed at the meeting include: infrastructure for regulatory control, facilities and services available to the persons authorised to manage radioactive sources, training of staff in the regulatory body, law enforcement agencies and emergence service organisations, experience in establishing a national register of radioactive sources, national strategies for gaining or regaining control over orphan sources including arrangements for reporting loss of control and encouraging awareness of, and monitoring to detect orphan sources, approaches to managing sources at the end of their life cycles and experience with implementation of the import and export provisions of the Code and the Guidance on the Import and Export of Radioactive Sources.

There is widespread international support for the Code and the import/export Guidance. States that have not yet made a political commitment to the Code or the Guidance were encouraged to consider doing so. The adoption and implementation of the Code by states and the IAEA's technical co-operation programme have produced significant improvements in regulatory infrastructure and capability in many states. In relation to the import and export of category 1 and 2 sources, many states have already provided national points of contact (POC) to the Secretariat, and this information is available on the IAEA webpage dedicated to the Code. This information is of mutual benefit to both importing states and exporting states, and all states are encouraged to provide their POC's to the Secretariat. The establishment of a national registry of sources is an essential element of the regulatory control process and it should be given high priority. Orphan sources detected at national borders need to be managed in a safe and secure manner. This area of concern would benefit from further multilateral discussions.

51st IAEA General Conference

The 51st regular session of the IAEA General Conference was held in Vienna, from 17 to 21 September 2007 with the participation of delegates from Members States and representatives of various international organisations. In addition to its regular work, the 51st anniversary session involved a special event:

Special event – 10th Scientific Forum

The 10th Scientific Forum took place from 18 to 19 September 2007 focusing on the theme *Global Challenges and the Development of Atomic Energy: The Next 25 Years*. The objective of the discussion was to envisage how the world's nuclear energy future might unfold over the next 25 years, and how in this context the IAEA might best advance in its mission of ensuring the peaceful, safe and secure use of that energy source. The presentations consisted of four major sessions on the future of nuclear power in meeting the world's energy needs; new roles for nuclear technology in food,

agriculture and health; meeting the challenge of safety and security in nuclear infrastructure; and most challengingly, holding the line against weapons breakout through effective safeguards and verification.

The Forum found that since public confidence in effective nuclear verification was likely to be a precondition for the significantly expanded use of nuclear energy, it was important that the IAEA continue to fulfil its verification responsibilities credibly by perfecting its safeguards system and applying it in an impartial and objective manner. States with relevant non-proliferation undertakings were encouraged to support the IAEA's work by bringing into force safeguards agreements to which they had committed and by concluding Additional Protocols in order to provide the IAEA with the required legal authority for its verification work. The Forum concluded that the expansion of the use of nuclear energy will only be possible if the proliferation risk created by the further spread of sensitive nuclear technology, such as enrichment and reprocessing, is minimised. The Forum discussed the need for the IAEA to continue its work in building consensus on the establishment of an international fuel bank or the development of other acceptable international arrangements aimed at guaranteeing nuclear fuel supply and avoiding the need for the development at the national level of a full fuel cycle capability with the inherent proliferation risks that poses.

Resolutions of the Conference

A number of resolutions were adopted by the General Conference. The following takes note of two Resolutions: GC(51)/RES/11 Relating to Nuclear, Radiation and Transport Safety and Waste Management and GC(51)/RES/12 Relating to Nuclear Security. The relevant sections of Resolution 11 and Resolution 12 can be summarised as follows:

Measures to strengthen international cooperation in nuclear, radiation and transport safety and waste management [GC (51)/RES/11]

In Part A.1 of the Resolution, the Conference requested the Director General to continue the current programme to assist Member states in improving their national infrastructures for nuclear installation, radiological, transport and waste safety, including their legislative and regulatory frameworks.

Nuclear installation safety

In Part A.3 of the Resolution, the General Conference noted with satisfaction that all states currently operating nuclear power plants are now Contracting Parties to the Convention on Nuclear Safety (CNS), and urged all Member States constructing or planning nuclear power plants, or considering a nuclear power programme, to become parties to the Convention as part of the establishment and maintenance of the requisite nuclear power infrastructure. The Fourth Review Meeting under the CNS will take place in April 2008.

The Conference also continued to endorse the principles and objectives of the non-legally binding Code of Conduct on the Safety of Research Reactors and encouraged Member States constructing, operating or decommissioning research reactors or with research reactors in extended shutdown to apply the guidance in the Code. The Conference also acknowledged the efforts of the Secretariat in organising three regional meetings on the application of the Code, and looks forward to the outcome of the International Meeting on the Application of the Code to be held in Vienna in 2008.

The safety of radioactive waste management

In Part A.5 of the Resolution, the General Conference welcomed the increase in the number of contracting parties to the Joint Convention from 32 at the first review meeting in 2003, to 45 in 2007, and appealed to all Member States which have not yet become party to the Joint Convention to do so. The Conference also welcomed the continuing efforts of the Contracting Parties to the Joint Convention to enhance the transparency, efficiency and effectiveness of the review process, including the creation of a website to facilitate the sharing of information between review meetings. The review meeting will be held in 2009.

Nuclear and radiological incident and emergency preparedness and response

In Part A.8 of the Resolution, the General Conference again urged all Member States to become parties to the Convention on Early Notification of a Nuclear Accident (the Early Notification Convention) and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (the Assistance Convention), thereby contributing to a broader and improved basis for international emergency response, to the benefit of all Member States.

The Conference also continued to encourage all Member States to enhance, where necessary, their own preparedness and response capabilities for nuclear and radiological incidents and emergencies, by improving capabilities to prevent accidents, to respond to emergencies and to mitigate any harmful consequences. It encouraged the Secretariat to assist Member States in developing national capabilities consistent with international standards.

Safety and security of radioactive sources

In Part A.9 of the Resolution, the General Conference continued to endorse the principles and objectives of the non-legally-binding Code of Conduct on the Safety and Security of Radioactive Sources (the Code) and welcomed the high level of global support for the Code. The Conference noted that, as at 12 July 2007, 89 states had made a political commitment to it in line with Resolutions GC(47)/RES/7.B and GC(48)/RES/10.D and it urged other states to do so as well.

The Conference underlined the important role of the Guidance on the Import and Export of Radioactive Sources for the establishment of continuous, global control of radioactive sources and noted that, as at 12 July 2007, 43 states had notified the Director General, pursuant to Resolution GC(48)/RES/10.D, of their intention to act in accordance with the Guidance. The Conference reiterated the need for states to implement the Guidance in a cooperative, harmonised and consistent fashion, noted that the Guidance is supplementary to the Code, encouraged those states which have not already notified the Director General to do so and encouraged the Secretariat to make available information to facilitate states' implementation of the Guidance, subject to the consent of the states concerned.

In addition, the Conference welcomed the progress made by many Member States in working towards implementing the Code and the Guidance, and encouraged other states to do the same. The Conference noted the report of the Chairman of the open-ended meeting of technical and legal experts for sharing of information as to states' implementation of the Code and Guidance held in Vienna in June 2007. The Conference noted the conclusions of the meeting, particularly those relating to sustainability of implementation of the Code and the value of regional meetings and regional

partnerships and requested the Secretariat to take these conclusions into account in developing its future programmes in this area.

Transport safety

In Part B of the Resolution, the General Conference stressed the importance of having effective liability mechanisms in place to insure against harm to human health and the environment as well as actual economic loss due to an accident or incident during the maritime transport of radioactive materials. It noted the establishment by the Board of Governors of new maximum limits for the exclusion of small quantities of nuclear material from the scope of the relevant conventions on nuclear liability. The Conference again welcomed the continuing valuable work of the INLEX (see also operative paragraph 11 of the Resolution), including the examination of the application and scope of the IAEA's nuclear liability regime and the consideration and identification of further specific actions to address any gaps in scope and coverage of the regime. Additionally, the Conference reiterated that it looked forward to the continuation of INLEX's work, and requested the Secretariat to report on INLEX work at appropriate times.

Nuclear security – Measures to protect against nuclear terrorism [GC (51)RES/12]

The General Conference again reaffirmed the importance of the Convention on the Physical Protection of Nuclear Material (CPPNM), as the only multilateral legally binding instrument dealing with the physical protection of nuclear material.

The Conference recalled that other international agreements negotiated under the auspices of the IAEA are relevant to nuclear security and the physical protection of nuclear and other radioactive materials, including the Early Notification and Assistance Conventions, the Convention on Nuclear Safety and the Joint Convention.

The Conference reaffirmed the importance of the Code of Conduct on the Safety and Security of Radioactive Sources for enhancement of safety and security of radioactive sources while recognising that the Code is not a legally binding instrument. The Conference also noted the central contribution of IAEA safeguards systems, and of states' systems of accounting for and control of nuclear materials, to preventing illicit trafficking and to deterring and detecting diversion of nuclear materials.

The Conference welcomed the adoption of an important Amendment to the CPPNM which substantially strengthens the Convention, extending its scope to cover the physical protection of nuclear facilities and the domestic transport, storage and use of nuclear material. The Conference called on States Parties to the Convention to accelerate the ratification of the Amendment and to act in accordance with the object and purpose of the Amendment until such time as it enters into force. It called on all states that have not done so to adhere to the CPPNM and adopt the Amendment as soon as possible.

The General Conference expressed its deep satisfaction at the entry into force on 7 July 2007 of the International Convention for the Suppression of Acts of Nuclear Terrorism, recalled the functions assigned to the IAEA by the Convention, and called upon all states that have not yet done so to ratify the Convention as soon as possible. It welcomed the unanimous adoption in September 2006 of the General Assembly Resolution on the United Nations Global Counter-Terrorism Strategy encouraging the IAEA to help states to build capacity to prevent terrorists from accessing nuclear materials, ensure security at related facilities and respond effectively in the event of an attack using such materials.

OECD Nuclear Energy Agency

Decision on the Exclusion of Small Quantities of Nuclear Substances from the Application of the Paris Convention (2007)

At its 115th meeting on 18 October 2007, the OECD Steering Committee for Nuclear Energy adopted the Decision on the Exclusion of Small Quantities of Nuclear Substances outside a Nuclear Installation from the Application of the Convention on Third Party Liability in the Field of Nuclear Energy (Paris Convention). The decision ensures continued harmonisation between the Paris Convention and the conventions adopted under the auspices of the IAEA[6] with respect to the exclusion of small quantities of such substances from the application of those conventions.

Under the terms of Article 1 (b) of the Paris Convention, the Steering Committee may, if in its view the small extent of the risks involved so warrants, exclude any nuclear installation, nuclear fuel, or nuclear substances from the application of the convention.

Soon after the adoption of the Paris Convention in 1960, it was recognised that within certain defined limits, nuclear substances which are in transport or are in use outside a nuclear installation should be excluded from the application of that convention, given the small extent of risks involved. Accordingly, on 26 November 1964, the Steering Committee adopted a Decision on the Exclusion of Small Quantities of Nuclear Substances from the Application of the Paris Convention. It subsequently revised that decision on 27 October 1977. The revised decision established the activity levels below which nuclear substances being transported or used outside a nuclear installation are excluded from the Paris Convention by referring, in the decision's Annex, to the 1973 Revised Edition of the IAEA Regulations for the Safe Transport of Radioactive Material (IAEA Transport Regulations). In the latest edition of the IAEA Transport Regulations (2005), the *formula* for calculating "A_2" (the value of activity of radioactive material) is different from that used in the 1973 edition. As a result, depending on which edition is used, the "A_2"calculation for the same radioactive material might differ, meaning that the same radioactive material might qualify for exclusion under one edition of the IAEA Transport Regulations, but not under the other.

To avoid any such confusion, the revised decision of the Steering Committee for Nuclear Energy now incorporates the relevant provisions of the most recent version of the IAEA Transport Regulations (2005).

6. Vienna Convention on Civil Liability for Nuclear Damage; Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage; Convention on Supplementary Compensation for Nuclear Damage.

News Briefs

European Atomic Energy Community

Adoption of the Nuclear Illustrative Programme (PINC)

Following a favourable opinion of the Economic and Social Committee, the European Commission adopted the Communication of a Nuclear Illustrative Programme (PINC) on 4 October 2007.

PINC reviews the investments in nuclear energy over the last 10 years, providing a description of the economics of nuclear power generation, its impact on the overall EU energy mix as well as its conditions for public and political acceptance.

The main aspects of PINC are the following:

- It is for each Member State to decide whether or not to rely on nuclear power for the generation of electricity. Decisions to expand nuclear energy were recently taken in Finland and in France. Other EU countries, including the Netherlands, Poland, Sweden, Czech Republic, Lithuania, Estonia, Latvia, Slovakia, the United Kingdom, Bulgaria and Romania have re-launched a debate on their nuclear energy policy.
- With 152 reactors spread over the EU 27, nuclear power contributes 30% of Europe's electricity today – however, if the planned phase-out policy within some EU Member States continues, this share will be significantly reduced. To meet the expected energy demand and to reduce European dependency on imports, decisions could be made on new investments or on the life extension of some plants.
- Reinforcing nuclear power generation could also represent one option for reducing CO_2 emissions and play a major role in addressing global climate change. Nuclear power is essentially carbon emissions-free and forms part of the Commission's carbon reduction scenario including the objective of reducing CO_2 emissions. This could also feature as an important consideration when discussing future emissions trading schemes.
- The most crucial factor affecting the prospect of growth of nuclear power is its underlying economics as a nuclear plant involves an up front investment ranging from 2 euros (EUR) to EUR 3 billion. Nuclear energy generation incurs higher construction costs in comparison to fossil fuels, yet operating costs are significantly lower following the initial investments. Furthermore, nuclear power generation is largely immune to changes in the cost of raw material supplies, as a modest amount of uranium, which comes largely from stable regions of the world, can keep a reactor running for decades. Therefore, in most industrialised countries new nuclear power plants offer an economic way to generate base-load electricity.
- The nuclear industry has made considerable investments since 1997. The EU recognises the importance of maintaining a technological lead in the field of nuclear power and supports the further development of the most advanced framework for nuclear energy, including non-proliferation, waste management and decommissioning. Since the

establishment of the Euratom Treaty, nuclear safety and the radiological protection of the public have been one of the main concerns of the European Community and are issues that have gained further importance in view of the past and the present enlargement.

- At EU level, the role should be to develop further the most advanced framework for nuclear energy in those Member States that choose nuclear power, in conformity with the highest standards of safety, security and non-proliferation as required by the Euratom Treaty. This should include nuclear waste management and decommissioning.

Establishment of the High Level Group – Council Conclusions on Nuclear Safety and Safe Management of Spent Nuclear Fuel and Radioactive Waste (2007)

The High Level Group on Nuclear Safety and Waste Management (HLG) was established by Commission Decision of 17 July 2007 [2007/530/Euratom] and held its first meeting on 12 October 2007. It comprises senior officials from national regulatory or nuclear safety authorities from the 27 Member States. The first meeting was opened by EU Energy Commissioner Andris Piebalgs, followed by discussions on the working method and the purpose of the HLG.

According to the Commission Decision, the HLG shall assist the EU institutions in progressively developing common understandings and eventually additional European rules in the fields of the safety of nuclear installations and the safe management of spent fuel and radioactive waste. The HLG may set up working groups or subgroups to study specific subjects and every two years it shall submit a report of its activities to the Commission, the European Parliament and the Council.

The Council Conclusions of 8 May 2007 on Nuclear Safety and Safe Management of Spent Nuclear Fuel and Radioactive Waste[1] paved the way for the creation of the HLG. The Conclusions were adopted based on the results of the Council's ad hoc Working Party on Nuclear Safety, which submitted its final report to the Council in December 2006. They set out a list of possible actions, acknowledging that any new initiative at the EU level should be assessed against their potential contribution to the whole system of existing efforts. The actions concern the safety of nuclear installations, the safe management of spent fuel and radioactive waste as well as the financing of both the decommissioning of nuclear installations, and the safe management of spent fuel and radioactive waste.

With its actions the HLG is to optimise the efforts and results which Euratom and its Members States achieve, *inter alia*, at the International Atomic Energy Agency and the OECD Nuclear Energy Agency. In principle, the Group will convene several times a year to discuss and follow up the agreed work programme.

Seminar on the Transposition of Council Directive 2006/117/Euratom on the Supervision and Control of Shipments of Radioactive Waste and Spent Fuel (2007)

On 28 September 2007, the European Commission organised a seminar in Luxembourg on the transposition of Council Directive 2006/117/Euratom (see *Nuclear Law Bulletin* No. 79). The seminar aimed to establish a harmonised approach and facilitate a timely transposition of the Shipment Directive into national legislation by providing a forum for information exchange on transposition

1. Adopted at the 2798th meeting of the Council of the European Union (Economic and Financial Affairs).

difficulties experienced, encountered or expected by Member States, focusing on individual provisions of the Directive and possible different transposition approaches.

European Nuclear Energy Forum Inaugurated in Bratislava (2007)

On 26/27 November 2007, the first European Nuclear Energy Forum (ENEF) was held in Bratislava, Republic of Slovakia. ENEF was initiated by the European Commission in order to create a discussion forum on energy that would allow all the stakeholders to hold an open and transparent debate on nuclear energy. The European Council supported the proposal suggesting that a broad discussion takes place among all relevant stakeholders on the opportunities and risks of nuclear energy.

European Commission President José Manuel Barroso's speech stressed the role which nuclear energy can have in meeting growing concerns about security of supply and CO_2 emission reduction. He reiterated the willingness of the Commission to help launch a transparent debate on nuclear energy and to ensure that the public receives relevant and reliable information on the different options available. Commissioner for Energy Andris Piebalgs also referred to public acceptance as the second important pillar after a high level of safety, security and non-proliferation which he described as the absolute condition for the use of nuclear energy.

ENEF is co-hosted by two countries – the Republic of Slovakia and the Czech Republic – and will meet twice a year. [2]

European Parliament Report on Assessing Euratom – 50 Years of European Nuclear Energy Policy

The European Parliament's "Report on Assessing Euratom – 50 Years of European Nuclear Energy Policy" was drafted by the Parliament's Committee on Industry, Research and Energy and adopted on 4 April 2007.[3] According to the Report, the European Atomic Energy Community (Euratom) Treaty, which was signed 50 years ago on 25 March 1957, continues to provide a sound legal framework to govern the supervision of the use of nuclear energy in the European Union (No. 7 of the Report).

The Report states that the provisions laid out in the Euratom Treaty are still applicable, are continually enriched as legislation is adopted on the basis of the Euratom Treaty, and make an important contribution to the safe operation of nuclear facilities in Europe (No. 5 of the Report).

However, the European Parliament also expresses regret about the "unacceptable democratic deficit" of the Euratom Treaty and that the Parliament is almost completely excluded from the Euratom legislative process (No. 28 of the Report). It further regrets the absence of a legislative corpus on harmonised standards with real added value, particularly in comparison with the existing international framework for nuclear safety, the management of radioactive waste and the decommissioning of nuclear plants (No. 31 of the Report).

The European Parliament Report formulates guidelines for the future, highlighting areas that need to be somewhat reformed, calling especially for a rejuvenation of the decision-making

2. This information is partly taken from Press Release IP/07/1767 of 26 November 2007, http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/1767&format=HTML&aged=0&language=EN&guiLanguage=en.

3. Rapporteur E. Maldeikis, final A6-0129/2007.

procedures which would enable the Parliament to be closely involved in legislative procedures. In one statement, the legislative body considers "that the absence of the legal framework provided by the Euratom Treaty would lead to the renationalisation of nuclear policy in Europe, which would be a setback for the acquis communautaire, and would give rise to a risk of legal uncertainty for all the 27 Member States" (No. 37 of the Report).

G8 Heiligendamm Statement on Non-Proliferation and G8 Report of the Nuclear Safety and Security Group

The annual summit of the Group of Eight Leading Industrialised Nations (G8) was held in Heiligendamm, Germany from 6 to 8 June 2007. The key issues addressed were climate change and Africa policies. The heads of state and government also agreed on a statement on non-proliferation which reiterates their resolute commitment to counter the global proliferation challenge and to the multilateral treaty system which provides the normative basis for all non-proliferation efforts (Treaty on the Non-Proliferation of Nuclear Weapons, the Chemical Weapons Convention and the Biological and Toxin Weapons Convention). It also addresses regional proliferation challenges, assuring G8 commitment to resolve the proliferation concerns posed by Iran's nuclear programme and continue to support the Six-party Talks regarding the Korean Peninsula.

The Report of the G8 Nuclear Safety and Security Group (NSSG) to the G8 Summit 2007 in Heiligendamm covers the areas:

- nuclear regulatory infrastructure;
- national nuclear safety and security infrastructure and partnerships;
- Chernobyl commitments;
- nuclear safety of the nuclear power plant Medzamor, Armenia;
- safety and security of radioactive sources;
- global nuclear safety network; and
- nuclear and radiological emergency response.

The NSSG was established after the G8 Kananaskis Summit in 2002. According to its mandate, the NSSG shall provide technically informed, strategic policy advice on issues that could impact safety and security in the peaceful use of nuclear energy, in close co-operation with multilateral organisations.

Global Nuclear Energy Partnership

Sixteen governments signed the Global Nuclear Energy Partnership Statement of Principles during the second ministerial meeting, held on 16 September 2007 in Vienna.

The five original members of the Global Nuclear Energy Partnership (GNEP) the US, France, Russia, Japan and China first convened at a ministerial meeting on 21 May 2007. Prior to the second ministerial meeting**,** Australia, Bulgaria, Ghana, Hungary, Jordan, Kazakhstan, Lithuania, Poland,

Romania, Slovenia and Ukraine became official partners in GNEP.[4] Another 22 countries attended the meeting as "candidate partners" or "observer countries".

In the Statement, the signatories recognise "the need for a variety of approaches and technical pathways in achieving a long-term vision of the future global civilian nuclear fuel cycle, which will help ensure that nuclear energy makes a major contribution to global development in the 21st century consistent with non-proliferation and safety objectives".

The Statement of Principles points out that co-operation will be carried out under existing and, where appropriate, new bilateral arrangements as well as existing multilateral arrangements such as the Generation IV International Forum.

GNEP is a comprehensive strategy to increase US and global energy security, reduce the risk of nuclear proliferation, encourage clean development around the world and improve the environment (see *Nuclear Law Bulletin* No. 79).

International Nuclear Law Association

2007 Nuclear Inter Jura Biennial Congress in Brussels

The 2007 Nuclear Inter Jura Congress was held in Brussels, Belgium from 1 to 4 October 2007, followed by a technical visit which was organised on 5 October 2007.

The Congress addressed a wide variety of legal issues in the context of the latest political and economic climate as well as the future. After an inaugural session with reputable and interesting speakers, legal issues were presented and discussed in seven sessions:

- Nuclear Safety – New Regulatory Directions.
- Nuclear Liability and Insurance – The Post-revision Agenda.
- Radiological Protection and Radioactive Sources.
- Radioactive Waste Management and Environmental Issues.
- Nuclear Security.
- Euratom Treaty – 50th Anniversary.
- International Nuclear Trade.

The session on the 50th anniversary of Euratom was opened by EU Energy Commissioner *Andris Piebalgs* who addressed the participants on the achievements and the future of nuclear energy in the European Union, highlighting challenges such as the need for investments, public acceptance as a key factor, waste issues and the need for harmonisation in the field of nuclear liability. Keynote speeches were delivered by André-Claude Lacoste, President of the French nuclear safety authority (ASN), Roland Dussart-Desart, Chairman of the OECD/NEA – Nuclear Law Committee, M.L.E. Holm, President of the International Commission on Radiological Protection, Dominique Ristori, European Commission, Deputy Director General DG TREN and Roland Kobia, Member of the Cabinet of EU Energy Commissioner. A special feature of this year's Congress was the Panel on "New Build" – Questions for the Global Legal Regime – A Hypothetical, in which a panel, together

4. On 13 November 2007, Italy joined GNEP, becoming the 17th member of the partnership.

with the audience discussed the steps and challenges in building a new nuclear power plant on the basis of a fictional case.

The Congress was the 18th in a series of biennial meetings of the International Nuclear Law Association (INLA) which was created in 1972 to promote the study of legal issues associated with the peaceful uses of nuclear energy and to encourage the exchange of information in this field. The next Nuclear Inter Jura Congress will be held in Canada in 2009.

World Nuclear University

The third Summer Institute of the World Nuclear University (WNU-SI) took place in *Cheongju, Korea* in July 2007. The aim of the WNU-SI is to provide a unique educational experience aimed at building future global leadership in fields of nuclear science and technology. Apart from a technical tour to nuclear facilities and industries, the 6-week programme focuses on presentations from leading world experts on the full range of topics relevant for the future of nuclear energy. This year's programme was attended by 102 young professionals coming from industry and regulatory authorities from all over the world.

As part of the WNU-SI, the Legal Affairs Offices of the OECD Nuclear Energy Agency and of the International Atomic Energy Agency had jointly prepared a 4-day session focusing on general nuclear law questions, liability and environmental concerns, public participation in decision-making, non-proliferation and safeguards. A case study was also developed to analyse legal issues affecting the construction of a new nuclear power plant.

The next WNU-SI will be held at McMaster University, Canada from 5 July through 15 August 2008.

The WNU also organised its first regional session in Beijing, China in July 2007. This 1-week orientation course aimed to inform an audience of Chinese graduate students and nuclear professionals on the key issues in the nuclear energy sector. The emphasis was placed on such items as the nuclear fuel cycle, design management, project management and financing, nuclear law, nuclear economics, nuclear transport, radiation protection and radioactive waste management. OECD/NEA Legal Affairs participated in this Seminar.

The WNU is a global partnership of leading institutions committed to enhancing education and leadership in the nuclear domain. It is supported by the World Nuclear Association, the OECD Nuclear Energy Agency, the World Association of Nuclear Operators and the International Atomic Energy Agency. Further information is available at the WNU website: www.world-nuclear-university.org.

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