

Learning the Hard Way: Did the Lessons Taught by the Chernobyl Nuclear Accident Contribute to Improving Nuclear Law?

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1. Reactions of the International Community to the Accident

1.1. International Treaty Making

The statistics are impressive. The Chernobyl nuclear accident happened on 26 April 1986,¹ and it triggered immediate comprehensive and continuous actions of the international community of states and of competent international governmental organisations.² They resulted in a considerable number of new international instruments aimed at doing away with, or mitigating the shortcomings of the 1986 international nuclear law regime which became evident through the accident.³

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1. There is rich documentation and literature available on the accident and its consequences. Reference shall here only be made to the following IAEA and OECD Publications: Summary Report on the Post-Accident Review Meeting on the Chernobyl Accident, Vienna 1986 (Safety Series No. 75-INSAG-1); The International Chernobyl Project. Proceedings of an International Conference held in Vienna 21-24 May 1991, Vienna 1991; The Chernobyl Accident: Updating of INSAG-1, Vienna 1992 (Safety Series No. 75-INSAG-7); One Decade after Chernobyl. Summing up the Consequences of the Accident. Proceedings of an International Conference held in Vienna 8-12 April 1996, Vienna 1996 (Proceedings Series); Material Relating to the Chernobyl Accident submitted by Belarus, 11 June 1996 [IAEA Doc. INFCIRC/511]; OECD/NEA, *Chernobyl: Assessment of Radiological and Health Impacts. 2002 Update of Chernobyl: Ten Years On*. Paris 2002.
2. See the Tokyo Summit Declaration on the Implications of the Chernobyl Nuclear Accident of 5 May 1986 [IAEA Doc. INFCIRC/333]; Special Session of the IAEA General Conference 24-26 September 1986 [IAEA Doc. GC(SPL.I)/RES/1 and RES/2]; IAEA Response to Chernobyl, in: *IAEA Bulletin* 61 (Summer 1986) p. 62-65. Under the auspices of the OECD/NEA the International Nuclear Emergency Exercise (INEX) Programme was launched and, as of 1991, has been implemented by a number of exercises [OECD/NEA, Chernobyl (footnote 1) p.126]; Brian Ahier, "Over a Decade of Nuclear Emergency Management at the NEA", in: *NEA News* 23 (2005) No. 2 p. 21 *et seq.*
3. For a general overview of international actions taken, see from a legal point of view: Günther Handl, "Après Tchernobyl : Quelques réflexions sur le programme législatif multilatéral à l'ordre du jour", in: *Revue générale de Droit international public* 92 (1988) p. 5 *et seq.* This treatise is also published in English: "Transboundary Nuclear Accidents: The Post-Chernobyl Multilateral Legislative Agenda", in: *Ecology Law Quarterly* 15 (1988) p. 203 *et seq.* Relevant international agreements and other documents are reproduced in: Mohamed M. ElBaradei, Edwin I. Nwogugu, John M. Rames (eds.), *The International Law of Nuclear Energy*. Basic Documents. Parts 1 and 2, Dordrecht etc. 1993.

International Nuclear Law in the Post-Chernobyl Period

- 26 September 1986: adoption of the Convention on Early Notification of a Nuclear Accident;⁴
- 26 September 1986: adoption of the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency;⁵
- 21 September 1988: adoption of the Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention;⁶
- 17 June 1994: adoption of the Convention on Nuclear Safety;⁷
- 5 September 1997: adoption of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management;⁸
- 12 September 1997: adoption of the Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage;⁹
- 12 September 1997: adoption of the Convention on Supplementary Compensation for Nuclear Damage;¹⁰
- 12 February 2004: adoption of the Protocol to Amend the Convention on Third Party Liability in the Field of Nuclear Energy of 29 July 1960, as Amended by the Additional Protocol of 28 January 1964 and by the Protocol of 16 November 1982;¹¹
- 12 February 2004: adoption of the Protocol to Amend the Convention of 31 January 1963 Supplementary to the Paris Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy, as Amended by the Additional Protocol of 28 January 1964 and by the Protocol of 16 November 1982;¹²
- 8 July 2005: Adoption of the “Amendment to the Convention on the Physical Protection of Nuclear Material”.¹³

4. IAEA Doc. INFCIRC/335.

5. IAEA Doc. INFCIRC/336.

6. IAEA Doc. INFCIRC/402.

7. IAEA Doc. INFCIRC/449.

8. IAEA Doc. INFCIRC/546.

9. IAEA Doc. INFCIRC/566; unrevised Vienna Convention: INFCIRC/500.

10. IAEA Doc. INFCIRC/567.

11. Not yet officially published. An unofficial consolidated text of the Paris Convention as revised in 2004 is reproduced in the Supplement to *Nuclear Law Bulletin* No. 75 (2005/1) p. 3. The 1960 Paris Convention as last revised in 1982 is available at www.nea.fr/html/law/nlparis_conv.html.

12. Not yet officially published. An unofficial consolidated text of the Brussels Supplementary Convention as revised 2004 is reproduced in the Supplement to *Nuclear Law Bulletin* No. 75 (2005/1) p. 21. The 1963 Brussels Supplementary Convention as last revised in 1982 is available at www.nea.fr/html/law/nlbrussels.html.

13. Attachment p. 3 to IAEA Doc. Nuclear Security – Measures to Protect Against Nuclear Terrorism. Amendment to the Convention on the Physical Protection of Nuclear Material. Report by the Director General [IAEA Doc. GOV/INF/2005/10-GC(49)/INF/6]. The unamended Physical Protection Convention of 3 March 1980 is published in IAEA Doc. INFCIRC/274/Rev.1.

All treaties listed are multilateral and binding international instruments, and all of them have entered into force, with the exception of the 1997 Convention on Supplementary Compensation, the 2004 Protocols to Amend the Paris and the Brussels Conventions and the 2005 Amendment to the Physical Protection Convention. Although the Amendment to the Physical Protection Convention may not be qualified as a direct reaction to the Chernobyl accident because it is mainly designed to fight the increased threat of terrorism, the instrument shall still be included in this enumeration. There is an interface between safety and security that calls for attention. Safety and security are siblings; they complement and support each other. Physical protection measures, as a side effect, strengthen nuclear safety and vice versa. Consequently, the Physical Protection Convention is part of the so-called Family of Nuclear Safety Conventions, the other members of which are the 1986 Conventions on Early Notification and on Assistance, the 1994 Nuclear Safety Convention, and the 1997 Joint Convention.¹⁴

1.2. *Developing International Codes and Standards*

In addition to those binding international treaties, numerous non-binding international instruments have been developed since 1986, in intensified continuation of efforts performed already since the foundation of the International Atomic Energy Agency (IAEA) and other competent organisations. There are, in particular, technical recommendations in the field of nuclear safety, radiation protection and transportation which either up-dated existing recommendations or have been newly developed. This article is not the place to deal with those technical recommendations in greater detail. They have been developed by expert groups such as the International Nuclear Safety Advisory Group (INSAG) and are published by the IAEA in its various publication series. Although these instruments are of a non-binding character, they may become binding if states incorporate them into their national legislation. Moreover, they are the internationally recognised yardsticks to assess the appropriateness of national legislation and national practice.

Because of their major importance, two of those non-binding instruments shall be mentioned here, namely the following Codes of Conduct.¹⁵

The first one is the Code of Conduct on the Safety of Research Reactors, as adopted by the IAEA Board of Governors on 8 March 2004.¹⁶ The scope of application of the 1994 Nuclear Safety Convention is known to be limited to land-based civil nuclear power plants [Articles 3, 2(i)] and consequently, the large number of research reactors worldwide is not covered. There is no need to elaborate in greater detail on the reasons for this exclusion. They are mainly of a political nature; one of them certainly is that research reactors often serve a dual-use purpose. The instrument of a non-binding code offers a compromise to also attract those states that are not willing to subject their

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14. The members of the Nuclear Safety Family are listed in Paragraph vi of the Preamble of the Nuclear Safety Convention and in Paragraph xiii of the Preamble of the Joint Convention.
 15. On the legal concept of the Codes of Conduct see Anthony Wetherall, "Normative Rule Making at the IAEA: Codes of Conduct", in: *Nuclear Law Bulletin* No. 75 (2005/1) p. 71 *et seq.* For an early assessment of Codes and Standards see Ha Vinh Phuong, "IAEA Safety Standards, their legal status and implementation", in: *Experience and Trends in Nuclear Law*, Vienna 1972 (IAEA Legal Series, 8), p. 3 *et seq.*; M. Joslin *et al.*, "The Role of Codes and Standards in Achieving Safe, Dependable and Economic Nuclear Power", in: UN/IAEA, *Peaceful Uses of Atomic Energy, Proceedings of the 4th International Conference held in Geneva 6-16 September 1971, New York/Vienna 1972*, p. 437 *et seq.*
 16. Reproduced in *Nuclear Law Bulletin* No. 75 (2005/1) p. 151. See on the history of the code and for an overview Norbert Pelzer, *The Year in Review. V. Energy. 1. Nuclear Energy. A. Power Safety*, in: *Yearbook of International Environmental Law* 14 (2003), Oxford 2005, p. 308 *et seq.* (309-313).

research reactors to a binding international regime. The code therefore is a necessary complement to the 1994 Nuclear Safety Convention.

The other code¹⁷ is the Code of Conduct on the Safety and Security of Radioactive Sources as approved by the IAEA Board of Governors on 8 September 2003.¹⁸ Radioactive sources are not part of the nuclear fuel cycle, which means that there is no direct link to the Chernobyl accident. On the other hand, radioactive sources repeatedly have been involved in major radiation accidents, the most famous of which was the 1987 Goiânia (Brazil) accident.¹⁹ The scenario is similar or parallel to the scenario after the Chernobyl accident albeit on a lower level of risk. Since, with regard to radioactive sources, at national and international level there was, or still is, an apparent gap in the legal regime, this situation also required international action. The code is the international response to this challenge and therefore it needs to be referred to here.

1.3. *Improving National Legislation*

Finally, the Chernobyl accident entailed changes and improvements of national nuclear legislation. Quite obviously, the newly adopted international treaties and other instruments needed to be implemented by national legislations. The accident created additional momentum for states to reassess existing laws and regulations and to introduce amendments as deemed necessary in the light of the Chernobyl experience.

The national legal regimes were made more severe with a view to minimising nuclear risk and preventing nuclear accidents. Some states passed a moratorium on the construction of new nuclear power stations, others even decided to totally phase out the use of nuclear energy for electricity generating purposes, such as Sweden,²⁰ Germany²¹ and Belgium.²² In short, Chernobyl initiated not only a broad awareness of the potential risks of nuclear energy but also a major reconstruction of nuclear legislation in many countries.²³

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17. There is a third code: the Code of Practice on the International Transboundary Movement of Radioactive Waste of 21 September 1990 [IAEA Doc. INFCIRC/386]. This code, however, is overruled more or less by Article 27 of the Joint Convention.
 18. IAEA Doc. IAEA/CODEOC/2004. The document replaces IAEA/CODEOC/2001 of March 2001. See on the 2001 Code Katia Boustany, "The IAEA Code of Conduct on the Safety of Radiation Sources and on the Security of Radioactive Materials – A Step Forwards or Backwards", in: *Nuclear Law Bulletin* No. 67 (2001/1) p. 9 *et seq.* On the 2003 Code see Pelzer (footnote 16) p. 313-316.
 19. See Goiânia, Ten Years Later, Vienna: IAEA 1998; Ayrton Caubit, "Radiological Accident in Goiânia – Six Years Later", in: *Proceedings of the Nuclear Inter Jura '93 Rio de Janeiro 1993, Rio de Janeiro 1995*, p. 523 *et seq.*
 20. Lag (1997:1320) *om kärnkraftens avveckling*; see also *Nuclear Law Bulletin* No. 61 (June 1998) p. 86.
 21. *Gesetz zur geordneten Beendigung der Kernenergienutzung zur gewerblichen Erzeugung von Elektrizität* of 22 April 2002 [*Bundesgesetzblatt* 2002 I p. 1351]. See also Axel Vorwerk, "The 2002 Amendment to the German Atomic Energy Act concerning the Phase-out of Nuclear Power", in: *Nuclear Law Bulletin* No. 69 (2002/1) p. 7 *et seq.*
 22. *Loi du 31 janvier 2003 sur la sortie progressive de l'énergie nucléaire à des fins de production industrielle d'électricité* [*Moniteur belge* of 28 February 2003]. See also *Nuclear Law Bulletin* No. 70 (2002/2) p. 28.
 23. The status of national legislation can be taken from various publications, see in particular the OECD/NEA publication *Nuclear Legislation: Analytical Study. Regulatory and Institutional Framework for Nuclear*

As shortly after the Chernobyl accident the Soviet Union and the entire socialist bloc system collapsed, the newly independent states and other former socialist states faced the immense challenge of dealing with the Soviet nuclear heritage, which particularly included reactors of the Chernobyl type. Moreover, they quickly had to replace most of their former socialist legislation and develop new and democratic legislation to cope with the nuclear risk. This article, which aims at documenting and appraising the legal developments in the post-Chernobyl period, certainly is the place to express satisfaction with, and admiration for, how fast and successfully most of the respective states learned and did their homework: today most of them have either issued, or are in an advanced stage of preparing, adequate nuclear legislation.²⁴

Last but not least, an additional consequence of the Chernobyl accident shall be stressed here. While in the first years after its foundation in 1957, the IAEA did not play a major role in nuclear energy affairs, two events mark the turning points of the Agency's way to its current leading position: the conclusion of the 1968 Treaty on the Non-Proliferation of Nuclear Weapons,²⁵ which entrusted the IAEA with safeguards verification, and the Chernobyl accident, which made the Agency the centre of international endeavour to tackle the problems raised by the accident.²⁶

2. Guidelines for Assessing the Post-Chernobyl Activities

The impressive statistics of actions taken by the international community after the Chernobyl accident seem to indicate that substantial improvements of the nuclear law regime have been achieved, too. But is that really the case, or were the international activities just "Much Ado about Nothing" meant to calm down the general public? This critical question is not at all entirely unjustified. On the contrary, in connection with multilateral agreements aiming at worldwide participation it is always advisable to carefully look at the substance of the instrument: it may be the result of a compromise based on the lowest common denominator and consequently, does not contain much substance. A closer look at the instruments listed above is necessary.

In doing so, one has to take into account the concept and the objectives of nuclear law. The numerous post-Chernobyl legal activities are only apt to improve the existing regime if they are not in

Activities, Loose Leaf Collection as last updated 2002 and 2003; "Third Party Liability", 1990. Reports on a regular basis are published in the *Nuclear Law Bulletin*.

24. See: OECD/NEA, *Nuclear Legislation in Central and Eastern Europe and in the NIS*, Paris 2000. It should also be mentioned that individual states, the IAEA, the OECD/NEA and the EU granted and still grant legislative assistance to those states if requested. The assistance confirmed the saying "learning by teaching", which means that the exercise was to the benefit of the teachers as well. There is an overview of assistance in the chapter "Assistance Programmes" with articles by Horbach, Brands, Newburg, Reyners, Brown II in: Nathalie L. J. T. Horbach (ed.), *Contemporary Developments in Nuclear Energy Law*, The Hague etc. 1999, p. 377-556. On the problems and difficulties of assistance see: Norbert Pelzer, "Die Beseitigung rechtlicher Hindernisse bei der Verbesserung der nuklearen Sicherheit in den ehemals sozialistischen Staaten", in: *Recht – Staat – Gemeinwohl*, Festschrift (Liber amicorum) für Dietrich Rauschnig, ed. by Jörn Ipsen and Edzard Schmidt-Jortzig, Köln etc. 2001 p. 551 *et seq.*
25. UNTS vol. 729 p. 161.
26. See on this issue Norbert Pelzer, "The Impact of the Chernobyl Accident on International Nuclear Energy Law", in: *Archiv des Völkerrechts* 25 (1987) p. 294 *et seq.* (298 *et seq.*); Norbert Pelzer, "IAEA – International Atomic Energy Agency", in: Rüdiger Wolfrum, Christiane Philipp (eds.), *United Nations: Law, Policies and Practice*, vol. 1, München/Dordrecht 1995, p. 646 *et seq.* (654).

conflict with the nuclear law concept and objectives, and if they “add value” to the existing nuclear law.

Nuclear law has been defined as follows: “The body of special legal norms created to regulate the conduct of legal or natural persons engaged in activities related to fissionable materials, ionizing radiation and exposure to natural sources of radiation.” Its objective is “to provide a legal framework for conducting activities related to nuclear energy and ionizing radiation in a manner which adequately protects individuals, property and the environment.”²⁷ Nuclear law has to provide a proper balance between the risks and the benefits of the use of nuclear energy and ionising radiation notwithstanding the requirement that in case of a conflict the protection against risks shall prevail. Nuclear law encompasses a number of basic concepts or fundamental principles, such as the safety principle, the security principle, the permission principle, the continuous control principle, the compensation principle, and the international co-operation principle.²⁸

In the following parts of this article the subject-matters addressed in the post-Chernobyl agreements will be more closely looked at in order to find out whether they contribute to improving nuclear law.

3. International Emergency Response

The two 1986 Conventions on Early Notification and on Assistance²⁹ were negotiated and adopted within a period of approximately one month. Although states could build their agreement on preparatory work particularly done by the IAEA,³⁰ the result was nevertheless outstanding: in the history of public international law such speedy and successful finalisation of international negotiations

27. Carlton Stoiber, Alec Baer, Norbert Pelzer, Wolfram Tonhauser, *Handbook on Nuclear Law*, Vienna 2003, p. 4 *et seq.* See also Norbert Pelzer, “The Hazards Arising out of the Peaceful Use of Nuclear Energy”, in: The Hague Academy for International Law. 1993 Centre for Studies and Research in International Law and International Relations, Dordrecht etc. 1994, p. 207 *et seq.*; Pierre Strohl, “The Originality of Nuclear Law and its Future”, in: *Le Droit nucléaire du XXe au XXIe Siècle*, Proceedings of the Nuclear Inter Jura '97 in Tours, Paris 1998, p. 571 *et seq.* (573-574).

28. Stoiber *et al.* (footnote 27), p. 5-11 enumerate and describe eleven principles; likewise: Pelzer (footnote 27), p. 210-219. See also Diane de Pompignan, “Law on the Peaceful Uses of Nuclear Energy: Key Concepts”, in: *Nuclear Law Bulletin* No. 76 (2005/2) p. 47 *et seq.* According to the author’s comparative study, “key concepts” derive either from nuclear law principles or from principles of general law. That obviously means that, in the legal hierarchy, they are ranked below the principles and may serve as tools for their implementation. Furthermore: Katia Boustany, “Reflection on the Development of Nuclear Law”, in: *Nuclear Law Bulletin* No. 51 (June 1993) p. 7 *et seq.* with additional references especially to French authors.

29. See footnotes 4 and 5.

30. See the references in: Paul Szasz, “The Law and Practice of the International Atomic Energy Agency”, Vienna 1970 (IAEA Legal Series, 7), p. 716 *et seq.*; Norbert Pelzer, “Legal Problems of International Danger Protection and of International Emergency Assistance in the Event of Radiation Accidents”, in: UN/IAEA, Peaceful Uses of Atomic Energy. Proceedings of the 4th International Conference held in Geneva 6-16 September 1971, vol. 3, New York/Vienna 1972, p. 451 *et seq.*; G. E. Swindell, Ha Vinh Phuong, “Mutual Emergency Assistance Arrangements at the International Level”, in: *Nuclear Law Bulletin* No. 24 (December 1979), p. 50 *et seq.* The IAEA particularly published a number of relevant documents which were helpful for the conference.

among 62 states³¹ is extremely rare, and it has been called a “landmark in the multilateral treaty making process”.³²

3.1. Early Notification

After the Chernobyl accident, the Soviet Union gave relevant information on the accident belatedly, if at all. Because of lack of information, affected states could not take timely measures to mitigate the radiological consequences. From a legal point of view, it was most difficult to identify an obligation of the Soviet Union to provide timely and appropriate information to other states. Under international custom, the principle of good neighbourliness could be a basis for requesting information but it is a vague concept which, in practice, requires readiness to co-operate. The same applies to possible rights and obligations under the Convention on Long-Range Transboundary Air Pollution of 13 November 1979 (in particular its Article 5), to which the Soviet Union was a Party.³³ There are doubts as to whether this convention covers air pollution by radioactivity. However, the convention in Paragraph 5 of its Preamble confirms and broadens the 1941 Trail-Smelter-Arbitration principle³⁴ that there is “the responsibility (of States) to ensure that activities under their jurisdiction or control do not cause damage to the environment of other States or areas beyond the limits of national jurisdiction”.³⁵ This principle certainly also is too vague to serve as a legal basis for establishing a right on the notification of a nuclear accident.

The 1986 Convention on Early Notification of a Nuclear Accident aims at filling this gap in international law.³⁶ Article 2 of the convention establishes an obligation of the Parties, “in the event of an accident specified in Article 1” to notify, directly or through the IAEA those states which are or may be physically affected, and the Agency of the nuclear accident, its nature, the time of its occurrence and its exact location where appropriate. The states and the Agency shall also be promptly provided with such available information relevant to minimising the radiological consequences in the

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31. IAEA Newsbrief vol. 1 no. 1 (1 October 1986) p. 1 “Nuclear Safety Convention to Enter into Force“.
 32. A. O. Adede, *The IAEA Notification and Assistance Conventions in Case of Nuclear Accidents – A Landmark in the Multilateral Treaty Making Process*, London etc. 1987; the book presents an exact article-by-article history of the negotiations. For an overview of both conventions see Berthold Moser, “The IAEA Conventions on Early Notification of a Nuclear Accident and on Assistance in the Case of a Nuclear Accident or Radiological Emergency”, in: *Nuclear Law Bulletin* No. 44 (December 1989) p. 10 *et seq.*
 33. UNTS vol. 1302 p. 217. The convention entered into force in 1983. It is complemented by a number of protocols that were successively concluded and contain provisions on specific hazardous substances; there is no protocol on radioactive substances.
 34. RIAA III (1949) p. 1905 *et seq.*(1965).
 35. See on the public international law problems in greater detail and with references: Michael Silagi, “Völkerrechtliche Verpflichtungen des Genehmigungsstaates bei Stör- und Unfällen”, in: Norbert Pelzer (ed.), *Friedliche Kernenergienutzung und Staatsgrenzen in Mitteleuropa*, Tagungsbericht der AIDN/INLA Regionaltagung 1986 in Regensburg, Baden-Baden 1987, p. 150 *et seq.* (162 *et seq.*); Norbert Pelzer, “Grenzüberschreitende Haftung für nukleare Schäden”, in: *Deutsches Verwaltungsblatt* 101 (1986) p. 875 *et seq.* (880-881).
 36. The Governmental Expert Group convened to consider a Draft Convention on Early Notification in July/August 1986, based its work on material submitted to the Group by the IAEA Secretariat, namely “Guidelines on Reportable Events, Integrated Planning and Information Exchange in a Transboundary Release of Radioactive Materials [IAEA Doc. INFCIRC/321] and a respective Working Draft Agreement (without symbol).

respective states. The type and the extent of information to be provided are specified in Article 5. The Parties undertake to make known to each other their competent authorities and points of contact [Article 7]. The role and the functions of the IAEA are defined in Articles 4 and 8. Article 9 encourages Parties “in furtherance of their mutual interests” to consider, where appropriate, the conclusion of bilateral or multilateral arrangements relating to the subject-matter of the convention.

The principally sound regime of the convention unfortunately has a major weak point, namely the definition of its scope of application in its Article 1, paragraph 1. According to this provision, the convention shall apply to facilities and activities under the jurisdiction or control of a Party, as defined in paragraph 2 of the article, “from which a release of radioactive material occurs or is likely to occur and which has resulted or may result in an international transboundary release that could be of a radiological safety significance for another State”. This language clearly stipulates that it is for the accident state to decide whether there is a release of radioactive material and whether the release has a transboundary effect of “radiological safety significance for another State”. Only if the accident state decides that the accident has a transboundary safety significant effect in another state, there is an obligation to notify the accident. After Chernobyl the Soviet Union asserted that there was no radioactive release with detrimental effects for other states. If the convention had been in place at that time, the Soviet Union would probably not have notified the accident and the non-notification would have been in line with the discretion granted to the accident state under Article 1 paragraph 1.³⁷

It follows that the Early Notification Convention establishes obligations for the willing only, who probably would anyway inform about radiological accidents occurring under their jurisdiction. Other states, for which the convention primarily is designed, may use the loophole of Article 1 to evade the obligation to notify if they deem fit. A stronger obligation apparently could not be achieved during the negotiations. The result without any doubt marks a weakness of the convention, but it is a weakness that is very often inherent in public international law.

3.2. *Emergency Assistance*

Mutual assistance in the case of catastrophes and emergencies is a classic topic of international relations and international law. Yet there are no generally applicable instruments and principles available. Again, one could refer to the principle of good neighbourliness as a possible basis for mutual assistance. That principle apparently provided momentum for concluding numerous agreements at bilateral or regional level to cover conventional emergencies. Mutual assistance is a more complex issue than early notification. It implies problems of state sovereignty, immunities and privileges, liability and last but not least of money. Consequently, it is not at all surprising that at the time of the Chernobyl accident there was no instrument on assistance available to be applied to the accident if assistance had been requested.³⁸ The 1986 Convention therefore filled a gap that was perhaps more relevant and that was more difficult to close than the gap regarding early notification.

37. See Franz Zehetner, “*Grenzüberschreitende Hilfe bei Störfällen und Unfällen*”, in: Pelzer (ed.), *Kernenergienutzung und Staatsgrenzen* (footnote 35) p. 118 *et seq.* (120-122); Pelzer, *Impact* (footnote 26) p. 303.

38. See on this issue: Werner Bischof, “*Rechtsgrundlagen der internationalen Hilfeleistung bei Katastrophen und Unglücksfällen, unter besonderer Berücksichtigung des Atomrechts*”, in: Volkmar Götze, Dietrich Rauschning, Gottfried Zieger (eds.), *Wirtschaft und Technik im Völkerrecht*, Köln etc. 1982, p. 227 *et seq.*; Thomas Bruha, “*Internationale Regelungen zum Schutz vor technisch-industriellen Umweltunfällen*”, in: *Zeitschrift für ausländisches öffentliches Recht und Völkerrecht* 44 (1984) p. 1 *et seq.* (47 *et seq.*); Heinhard Steiger, “*Catastrophes naturelles ou technologiques dans les zones*

Within the IAEA, the discussion on assistance in the event of a nuclear accident goes back to the year 1958, which means it is as old as the Agency itself.³⁹ The 1958 discussion resulted in the Nordic Mutual Emergency Assistance Agreement in Connection with Radiation Accidents of 17 October 1963 between the Scandinavian states and the IAEA.⁴⁰ In the following time the IAEA continued its work on this subject and drafted four unpublished model agreements.⁴¹ An expert group in 1983/1984 prepared the “IAEA Guidelines for mutual emergency assistance arrangements in connection with a nuclear accident or radiological emergency”.⁴² The Guidelines formed the basis for a Working Draft Agreement submitted by the IAEA Secretariat to the group of governmental experts, which was convened to consider a Draft Convention on Mutual Assistance in July/August 1986.⁴³

The 1986 Assistance Convention consists of a preamble and 19 articles. In Article 1 “General Provisions”, the Parties undertake to co-operate mutually and with the IAEA in accordance with the convention “to facilitate prompt assistance in the event of a nuclear accident or radiological emergency to minimize its consequences and to protect life, property and the environment from the effects of radioactive releases”. To facilitate such co-operation Parties may agree on bilateral or multilateral arrangements or, where appropriate, a combination of these in order to prevent or minimise injury and other damage.

Article 2 contains the key provisions on assistance. If a Party needs assistance, it may call for it from another Party, directly or through the Agency, and from the Agency or from other intergovernmental organisations. The requested Party shall promptly decide and notify the requesting Party whether it is in a position to render the assistance. According to Article 3, the overall direction, control, co-ordination and supervision shall lie with the requesting state. The Parties shall make known to each other the competent authorities and points of contact [Article 4]. Assistance may be agreed upon without or with reimbursement of costs [Article 7]. The requesting Party shall afford privileges and immunities to the personnel of the assisting Party [Article 8]. The Parties shall seek to facilitate the transit through its territory of duly notified personnel, equipment and property involved in the assistance to and from the requesting Party.⁴⁴

Is the Assistance Convention less vague than its twin, the Early Notification Convention? Unfortunately, the answer is no. The main target of criticism is Article 2. According to that provision, a Party “may” request assistance and the requested Party shall promptly decide whether it will render assistance. That result can also be achieved without an agreement. The convention does not establish any claim to render or to accept assistance. The final text of the convention is even weaker than the IAEA Working Draft Agreement, which reads: “Each State Party to this Agreement to whom a request

frontalières, Colloque sur les risques naturels et technologiques majeurs”, in : *Droit et Ville* 11 (1986), p. 101 *et seq.* ; Franz Zehetner, “*Tschernobyl*”, in: *Umwelt- und Planungsrecht* 7 (1986) p. 201 *et seq.* ; Pelzer (footnote 30).

39. Szasz (footnote 27) p. 716-721.

40. IAEA Doc. INFCIRC/49. The agreement entered into force on 19 June 1964.

41. See Pelzer (footnote 30) p. 458-459.

42. IAEA Doc. INFCIRC/310.

43. See the authors referred to in footnotes 32, 37, 38.

44. A certain inaccuracy of drafting has to be noted. According to Article 2 only a “State Party” may request assistance. The term State Party is used also in the operative Articles 1, 4, 5, 12, while Articles 3, 6, 7, 8, 9 and 11 use the term “requesting state”. Does that mean that non-Contracting States shall also be entitled to request assistance under the convention? That would obviously be in conflict with Article 2. Drafting error?

for such assistance is directed shall use its best endeavours to render promptly and within the limits of its capability the assistance requested.”[draft Article 2(2)].⁴⁵ As a consequence, the convention has been strongly criticised in legal literature.⁴⁶

3.3. *Appraisal of the 1986 Conventions*

In light of the critical assessment of both the 1986 Early Notification Convention and the 1986 Assistance Convention, one could be inclined to answer the question of the title of this article in a negative way. That would perhaps be the answer of a merely theoretical lawyer. In real life and particularly in the practice of public international law the distinction between what is desirable and what is achievable is of vital importance.

In international treaty making there is a rule: the more participants take part in the negotiations the greater will be the risk that a less binding and vaguer instrument will be the result of the negotiations. In our particular case, we also have to take into account that in 1986 there still existed the East-West confrontation, which made the conclusion of agreements a more difficult task. Early notification and mutual assistance in the field of the use of nuclear energy were highly sensitive subjects. In short, the conventions reflect what was achievable.

Irrespective of the special situation at the time of the negotiations, one has to ask whether the overall criticism of the scholars is convincing in every regard. As a matter of fact, it is a major advantage that there is no longer a need to base notification and assistance on the much vaguer international customary law. There is now a general legal framework in the form of two binding conventions, which have been accepted by 97 states⁴⁷ and 94 states respectively.⁴⁸ Both conventions suggest concluding bilateral or regional complementing agreements [Article 9 Early Notification Convention, Article 1 Assistance Convention]. That is a most appropriate approach because it allows solutions specifically tailored for two countries or for a region, and a very great number of states already made use of this option.⁴⁹

Since the conventions do not provide a comprehensive and perfect regime including well defined rights, obligations and respective sanctions, the encouragement of Parties to consider the conclusion of bilateral or regional agreements as appropriate implies the key concept of the instruments. Parties may effectively enhance the general legal framework of the conventions by specifically designed complementing agreements, as they deem fit. The initiative of the Parties is challenged. This is an approach that was further developed and refined by the 1994 Nuclear Safety

45. Pelzer, Impact (footnote 26) p. 305-306 with references. Director General Blix in his opening address on 21 July 1986 commented on this issue as follows: “The question has been raised whether ‘using best endeavours’ in Article 2.2 of the assistance agreement is purely discretionary. My answer would be no. It is a *bona fide* obligation – but it does not go very far.” [quoted according to Zehetner (footnote 37) p. 125 footnote 22].

46. See in particular the article-by-article commentary by Zehetner (footnote 37), Silagi (footnote 35) and the other authors referred to in footnote 38.

47. Early Notification Convention [IAEA Reg. No. 1532] (November 2005).

48. Assistance Convention [IAEA Reg. No. 1534] (November 2005).

49. See Bilateral, Regional and Multilateral Agreements relating to Co-operation in the Field of Nuclear Safety, Vienna 1990 (IAEA Legal Series, 15) and the more recent regular status reports in the *Nuclear Law Bulletin*.

Convention and the 1997 Joint Convention and has resulted in the so-called “incentive convention”.⁵⁰ Such type of convention refrains from establishing precisely formulated rights and obligations protected by mandatory dispute settlement instruments. It rather contains provisions that outline the safety programme or the safety goal. The incentive convention encourages the Parties to develop, in their own best interest, the measures necessary to achieve that goal. It describes an ongoing process rather than a status that has already been reached. In this sense, the option to conclude complementing bilateral or regional agreements, as appropriate, is a most progressive element of the conventions. It is an elegant means to overcome the difficulties of multilateral negotiations in drafting “hard” rights and obligations. The Notification and the Assistance Conventions may be seen as the still less developed precursors to the incentive convention.

If we look from this angle at the two 1986 Conventions, there is no doubt that they improved the unsatisfactory situation under international custom with regard to reacting to nuclear accidents with transboundary effects and thus contributed to the improvement of nuclear law.⁵¹

4. Nuclear Safety

4.1. *Internationalisation of Nuclear Law*

One of the characteristics of nuclear law is its high degree of “internationalisation”. That means that international obligations, recommendations, standards and other international instruments have been taken into account in the national law-making process or have influenced national nuclear law in some other way. National legislators are tied up in various and manifold forms of international nuclear co-operation and are bound by numerous international obligations in the nuclear field. Such approach necessarily entails an approximation or even a harmonisation of individual national legal regimes. Broad international harmonisation of laws is to the benefit of all of the stakeholders in the use of nuclear energy and ionising radiation. Harmonisation provides for identical yardsticks to assess the legal framework of a certain activity, irrespective of the country of the activity. Identical yardsticks are strongly needed when potentially hazardous activities, their benefits and their risks are involved. This holds particularly true if we consider the potential of nuclear energy to cause transboundary damage.

50. The concept “incentive convention” is taken from Paragraph vii of the Preamble of the Nuclear Safety Convention and Paragraph ix of the Preamble of the Joint Convention, which, however, do not define it. According to Odette Jankowitsch, “The Convention on Nuclear Safety”, in: *Nuclear Law Bulletin* No. 54 (December 1994) p. 9 *et seq.* (13), it shall be understood as synonymous with “encouragement” or “emulation”. Günther Handl, “The IAEA Nuclear Safety Conventions: An Example of Successful ‘Treaty Management’?”, in: *Nuclear Law Bulletin* No. 72 (2003/2) p. 7 *et seq.* (8 footnote 12) gives a more elaborate definition: “...it is generally understood to imply a convention, not designed to ensure fulfilment of obligations by parties through control and sanction, but based on the parties’ enlightened self-interest in enhanced levels of safety to be developed co-operatively and promoted through regular ‘peer review’ meetings.”

51. As for the practical implementation of the two conventions at international level, special reference has to be made to the IAEA Emergency Notification and Assistance Technical Operations Manual, Vienna 2000 [EPR-ENATOM (2000)], which has the objective to provide guidelines for the IAEA Member States, for Parties to the two conventions and for others in order that they may develop suitable mechanisms to interface with the IAEA within the framework of the Conventions (*ibidem* p. 2 No. 1.2.). See also the IAEA-OECD/NEA “International Nuclear Event Scale” (INES) for prompt communication of safety significance, 1990 (Annex to an Information Letter of the OECD/NEA Director General of 16 May 1990-EN/S/1031).

Quite correctly, the international co-operation principle has been identified as one of the basic concepts or fundamental principles of nuclear law.⁵²

Nuclear law covers various branches. Obviously, the extent of internationalisation may be different from branch to branch. As the legal regime of nuclear safety without any doubt is part of the very core of nuclear law, a closer look into the concept of internationalisation will be helpful to discern if and to what extent the law of nuclear safety is governed by the international co-operation principle.

The internationalisation of nuclear law goes back to the very beginning of the use of nuclear energy.⁵³ The first attempt to establish an internationalised legal regime of nuclear energy took place at the first session of the UN Atomic Energy Commission on 14 June 1946 when the US delegate Bernard M. Baruch presented his plan to erect an international authority to be entrusted with all phases of the development and use of nuclear energy.⁵⁴ As is well known, the project was aimed at monopolising the *status quo ante* and it failed.⁵⁵ US President Eisenhower's famous Atoms-for-Peace speech of 8 December 1953 to the UN General Assembly⁵⁶ marked the beginning of the peaceful use of nuclear energy world wide, which was to be based on international co-operation. The speech initiated the creation of the IAEA, entailed a liberalisation of the US atomic energy legislation⁵⁷ and launched the US programme of concluding bilateral agreements on supply and co-operation in the field of the peaceful use of nuclear energy.⁵⁸

States needed international co-operation to make use of the benefits, and to cope with the risks, of nuclear energy. With the exception of the few advanced states, no state was in a position to pursue a nuclear programme without the help of others. International co-operation, however, entails international influence on national decisions including national legislation. In its bilateral agreements the US, for example, required its partners not to use materials supplied for purposes other than the agreed ones, particularly not for military purposes.

Rather quickly the radiation protection law of states was based on international radiation protection standards. The recommendations of the – private – International Commission on Radiological Protection (ICRP) became most influential. International governmental organisations promoted the conclusion of relevant agreements and developed and issued radiation protection recommendations, which were based on the ICRP Recommendations. This applies, for example, to the

52. See above Section 2.

53. See as an early reference Georg Erler, “*Die Rechtsentwicklung der internationalen Zusammenarbeit im Atombereich*”, in: *Beiträge zum internationalen Wirtschaftsrecht und Atomenergierecht*, Vol. 1 No. 1, Göttingen 1962. See also Norbert Pelzer, “The Nature and Scope of International Co-operation in Connection with the Peaceful Uses of Nuclear Energy, and its Limits – An Assessment”, in: *Nuclear Law Bulletin* No. 27 (June 1981) p. 34 *et seq.*; Vanda Lamm, “The Utilization of Nuclear Energy and International Law”, Budapest 1984, p. 32 *et seq.*; Pelzer (footnote 27) p. 220 *et seq.*

54. UNAEC Official Records No. 14.

55. See the authors referred to in footnote 53 (with further references).

56. UNGAOR 8th Session, 470th Plenary Meeting, 450.

57. The US Atomic Energy Act of 1946 (so-called McMahon Act) [Public Law 585-79, 60 Stat. 755-775] was replaced by the Atomic Energy Act of 1954 [Public Law 703-83, 68 Stat. 919].

58. See, e.g., Erler (footnote 53); Pelzer, IAEA (footnote 26) p. 647.

ILO,⁵⁹ the OECD,⁶⁰ the EU,⁶¹ and in particular the IAEA. The IAEA, often jointly with other international organisations, published a very large number of technical standards. The most famous of them are perhaps the Basic Safety Standards for Radiation Protection, which were first published in 1962,⁶² and the Regulations for the Safe Transport of Radioactive Material, which were first published in 1961.⁶³ The Radiation Protection Standards and the Transport Regulations enjoy nearly universal acceptance: respective national legislation and respective international agreements and conventions are based on those standards which makes them binding and which creates an almost universal harmonisation of the legal framework.

With regard to civil liability for nuclear damage, the situation is more complex. Among those states that enacted special nuclear liability legislation there is international harmonisation. Those states are either Parties to the nuclear liability conventions and are bound by them, or their legislations, without being Parties to the conventions, nevertheless conform more or less to their principles.⁶⁴ Unfortunately, this applies only to some 60 states; the others do not have special nuclear liability laws. Based on the Non-Proliferation Treaty and its implementing agreements, international harmonisation may also be identified for this field of nuclear law. There is hope that the amended Physical Protection Convention will attract many states, which would also result in worldwide harmonisation of nuclear security.⁶⁵

In summary, it is correct to state that nuclear law in many of its branches is internationalised to a high degree. Internationalisation is either the inevitable effect of national implementation of international obligations, or, if there are no such obligations, is the express and voluntary recognition of the authority of non-binding recommendations such as international codes and standards. In the latter case, international informal peer review, in practice, may often change the “voluntary recognition” to a soft obligation to conform, which cannot easily be evaded. Hence, all of the nuclear law branches described meet the requirements of the international co-operation principle.

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59. ILO Convention 115: Convention concerning the Protection of Workers against Ionising Radiations of 22 June 1960 (UNTS Vol. 431 p. 41).
 60. Decision of the Council on the Adoption of Radiation Protection Norms, 18 December 1962 [C/M(62)24 (Final) Item 264 (a) and (c); OECD Doc. No. C(62)1887 Final, in: OECD Acts of the Organisation 2 (1962) p. 515].
 61. Directive on Basic Safety Standards on the Protection of the Health of Workers and the General Public against the Dangers Arising from Ionizing Radiation of 2 February 1959 [Official Journal of the EC 1959 p. 221]; latest version: Directive 96/29/EURATOM of 13 May 1996 [Official Journal of the EC 1996 No. L 159 p. 1]. See Jean-Michel Courades, “The new 96/29/EURATOM Directive on Basic Safety Standards for the Protection of Workers and the General Public against Ionising Radiation”, in: *Nuclear Law Bulletin* No. 58 (December 1996) p. 49 *et seq.*
 62. IAEA Safety Series No. 9. Latest version: Basic Safety Standards for the Protection against Ionizing Radiation and for the Safety of Radiation Sources, jointly sponsored by FAO, IAEA, ILO, OECD/NEA, PAHO, WHO, 1996 (IAEA Safety Series 115).
 63. IAEA Safety Series No 6. The latest version is the 1996 edition (revised) [IAEA Safety Standards Series No. TS-R-1 (ST-1 Revised)].
 64. The only exception is Austria, which is not a Party to any of the conventions and which enacted legislation that contains principles which are in contradiction to the conventions. See *Atomhaftungsgesetz* 1999 [*Bundesgesetzblatt Österreich* I 1998/170, 2001/98, 2003/33].
 65. On the international and national legal problems of safeguards and physical protection, the *Nuclear Law Bulletin* contains not less than 18 elaborate articles in the period from 1974 (No. 13) to 2005 (No. 76).

4.2. Nuclear Safety – A Matter of National Sensitivity

Does this result also apply to the legal framework of nuclear safety? Before this question can be answered the concept of “nuclear safety” needs to be defined.

At international level, the IAEA in its so-called NUSS-Programme, which was launched in 1974,⁶⁶ offered the following definition of nuclear safety (or simply safety):

“The achievement of proper operating conditions, prevention of accidents or mitigation of accident consequences, resulting in protection of site personnel, the public and the environment from undue radiation hazards.”⁶⁷

This is a comprehensive definition. It is broader than radiation protection, which does not cover the protection of the environment, but it includes radiation protection as part of it.⁶⁸ It covers all elements necessary to prevent damage and to mitigate its consequences, if any.

If we look at the body of binding international law instruments in the field of nuclear energy established prior to the Chernobyl accident, we will quickly recognise that none of them provides for a binding legal regime on nuclear safety as defined above. Unlike the international codes, standards and other recommendations in the field of radiation protection or transportation of radioactive materials which have been incorporated into relevant international instruments and thus have been made binding, nuclear safety related codes and standards did not follow the same avenue. It is true, though, that states used international technical codes and standards in their national licensing and supervision regimes but they did it at their own discretion and without being bound by an international obligation. Even the Euratom Treaty⁶⁹ with its supranational powers does not entrust the Community with an express competence to regulate and govern nuclear safety. Its competence is restricted to health protection (= radiation protection).⁷⁰

66. The “Nuclear Safety Standards (NUSS) Programme” shall give guidance to IAEA Member States on the many aspects of the safety of nuclear power reactors. Already in 1984 the Programme involved about 50 codes and safety guides; see Regulations and Guides for Nuclear Power Plants, a Safety Guide, Vienna 1984 (IAEA Safety Series No. 50-SG-G9).

67. See, e. g., Code on the Safety of Nuclear Power Plants: Operation, Vienna 1988 [IAEA Safety Series No. 50-C-O (rev.1)] p. 4.

68. The concept of safety in Article III A 6 of the IAEA Statute (UNTS Vol. 276 No. 3988; 471 p. 334; 1082 p. 290) is slightly different: “...standards of safety for protection of health and minimization of danger to life and property (including such standards for labour conditions)...”. The protection of the environment is not covered by this concept. On the other hand, it expressly includes the protection of property which in the definition of the NUSS-Programme may only be included if one interprets the protection of the public as meaning protection of persons and their property.

69. UNTS Vol. 298 p. 167 (original 1957 version). The treaty has last been amended by the Treaty of Nice of 27 February 2001 [Official Journal of the EC 2001 No. C 80 p. 1].

70. Articles 30 *et seq.* Euratom Treaty. See on this issue with further references, e. g., Norbert Pelzer, “Grundlagen und Entwicklung der Europäischen Atomgemeinschaft”, in: Hans-Werner Rengeling (ed.), *Handbuch zum europäischen und deutschen Umweltrecht*, Vol. II/1, 2nd edition, Köln etc. 2003, p. 365 *et seq.* (386 *et seq.*); Matthias Schmidt-Preuß, “Europäisches Gemeinschaftsrecht und deutsches Atom- und Strahlenschutzrecht”, in: Rengeling *ibidem* p. 478 *et seq.* (490). The European Commission is still striving for competence in the field of nuclear safety, in particular in connection with the so-called nuclear package; see the contributions by Marc Beyens, Ute Blohm-Hieber, Vanda Lamm, Marc Léger, Antonio Morales Plaza, Maurice Strike, Lenka Budinova in: Norbert Pelzer (ed.), *Die*

Where does this reluctant international approach come from? Pierre Strohl in a thorough investigation talks about “*le dilemme des normes internationales de sûreté nucléaire*”.⁷¹

The attitude of states most probably originates from the importance that states attribute to their national nuclear programmes. Nuclear energy in most cases is an important factor of the national energy supply. Moreover, it is the international proof of a high technical and scientific qualification and capability. Consequently, the licensing and supervision of nuclear facilities is a national matter of major sensibility. Any international influence based on an international obligation might be qualified as interference with national sovereignty. It therefore is not at all surprising that nuclear safety largely evaded internationalisation. 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. To the best knowledge of the author of this article, there was never a serious effort supported by a number of states to make technical standards and codes on nuclear safety internationally mandatory. There was no discussion on possibly establishing a binding international instrument on nuclear safety.⁷²

It took the Chernobyl accident to change this situation. The accident created awareness at political level that nuclear safety could not entirely be left to the respective safety philosophies of individual states. The necessity of at least creating a common skeleton of nuclear safety was recognised. As one of the pillars of effective nuclear safety a sound legal framework was identified. The entire nuclear fuel cycle and especially the entire lifetime of nuclear installations were to be covered by internationally accepted safety measures as appropriate. Time apparently was ripe for tackling the establishment of a “nuclear safety convention”.⁷³

On the other hand, a realistic assessment of what states would accept entailed the understanding that states would not be prepared to adhere to a nuclear safety convention that would subject them to a severe international licensing and control system. Like the 1986 Early Notification and Assistance Conventions and, in an even more distinct way, an instrument of the “incentive convention” type⁷⁴ was required and eventually was the solution. After politically difficult negotiations, in 1994 the Convention on Nuclear Safety⁷⁵ and in 1997 the Joint Convention on the Safety of Spent Fuel

Internationalisierung des Atomrechts, Tagungsbericht der AIDN/INLA Regionaltagung 2004 in Celle, Baden-Baden 2005, p. 133-184.

71. Pierre Strohl, “*Les risques résultant de l’utilisation pacifique de l’énergie nucléaire*”, in : Académie de Droit international de la Haye. 1993 Centre d’Étude et de Recherche de Droit international et de Relations internationales, Dordrecht etc. 1994 p. 19 *et seq.* (76).
72. The IAEA may, however, apply nuclear safety standards to its own operations and make them binding upon states in accordance with Article III A 6 of the IAEA Statute (footnote 68). See on the lack of generally binding international instruments on nuclear safety also: Norbert Pelzer, On Harmonizing Nuclear Energy Law. Introductory Remarks to the General Theme of Nuclear Inter Jura ‘85, in: Norbert Pelzer (ed.), International Harmonization in the Field of Nuclear Energy Law. Proceedings of the Nuclear Inter Jura’85 in Konstanz, Baden-Baden 1986, p. 39 *et seq.* (43-44).
73. The proposal to establish a nuclear safety convention to prevent future accidents of the Chernobyl type was made by the German Federal Minister for the Environment Klaus Töpfer at an IAEA Meeting in 1990 [IAEA Doc. GC(XXXV/RES/970)]. See also Jankowitsch (footnote 50) p. 10 who points out that also in other cases accidents triggered the preparation of binding instruments; she refers to the Torrey Canyon oil tanker accident, the Seveso chemical industry accident and others.
74. See above Section 3.3., especially footnote 50.
75. Footnote 7. The Convention on 31 March 2005 had 56 Contracting Parties (IAEA Registration No. 1676).

Management and on the Safety of Radioactive Waste Management⁷⁶ were adopted. Both conventions broke new ground. For the first time, certain basic principles of nuclear safety were made mandatory within the framework of an especially developed legal technique.

As there is sufficient literature available on both the Nuclear Safety Convention⁷⁷ and the Joint Convention,⁷⁸ this article can be restricted to briefly describing the basic concepts of the conventions.

4.3. The Nuclear Safety Convention

The essential and co-existing components necessary to establish an international nuclear safety regime have been identified as soft law and good practices, a national legal framework and international norms,⁷⁹ or to put it in other words: the regime should put internationally accepted fundamentals of nuclear safety into an “international soft law framework”.

Technical basis and main technical reference of the Nuclear Safety Convention are the so-called Safety Fundamentals, which were published under the title “The Safety of Nuclear Installations”.⁸⁰

76. Footnote 8. The Convention on 28 December 2005 had 36 Contracting Parties (IAEA Registration No. 1729).

77. Handl (footnote 50); M. T. Kaminga, “The IAEA Convention on Nuclear Safety”, in: *International and Comparative Law Quarterly* 44 (1995) p. 872 *et seq.*; Jankowitsch (footnote 50); Odette Jankowitsch, “Convention on Nuclear Safety: Status, Structure, Contents, in: Nuclear Law as a Source of Confidence”, Nuclear Inter Jura’95, Proceedings. Helsinki 1996 p. 687 *et seq.*; Odette Jankowitsch, Wolfram Tonhauser, “The Convention on Nuclear Safety”, in: *Austrian Journal of International and European Law* 2 (1997) p. 319 *et seq.*; Patrick Reyners, “The Convention on Nuclear Safety of 1994”, in: *Review of European Community and International Environmental Law* 5 (1996) p. 231 *et seq.*; Carlton Stoiber, “International Convention on Nuclear Safety: National Reporting as the Key to Effective Implementation”, in: Horbach (footnote 24) p. 97 *et seq.* See also the contributions by Anselm Schäfer, Carlton R. Stoiber, Marc Léger, Christian Lindemann, Santiago Ripol Carulla in: Norbert Pelzer (ed.), *Neues Atomenergierecht – Internationale und nationale Entwicklungen. Tagungsbericht der AIDN/INLA Regionaltagung Landshut* 1994, Baden-Baden 1995, First Working Session: The Nuclear Safety Convention p. 33-104. See also the more general overview by Roland Timmerbaev, Abram Ioirysh, “International Co-operation in Nuclear Safety”, in: *Yearbook of International Co-operation on Environment and Development* 1999/2000 p. 49 *et seq.*

78. Peter Cameron, “Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management”, in: Horbach (footnote 24) p. 117 *et seq.*; Peter Cameron, “The Safety of Radioactive Waste Management: New Steps forward in the Law”, Nuclear Inter Jura 1999 Biennial Congress. Proceedings. Washington D. C. 1999, p. 333 *et seq.*; Amelia de Kageneck, Cyril Pinel, “The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management”, in: *International and Comparative Law Quarterly* 47 (1998) p. 409 *et seq.*; Wolfram Tonhauser, Odette Jankowitsch, “The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management”, in: *Nuclear Law Bulletin* No. 60 (December 1997) p. 9 *et seq.*; Gordon Linsley, “Observations on the First Review Meeting of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management”, in: *Nuclear Law Bulletin* No. 74 (2004/2) p. 81 *et seq.* Furthermore: Gordon Linsley, Wolfram Tonhauser, “An Expanding International Legal Regime. Environmental Protection and Radioactive Waste Management”, in: *IAEA Bulletin* 42 (2000) No. 3 p. 24 *et seq.*; Abel Gonzales, “The Safety of Radioactive Waste Management. Achieving Internationally Acceptable Solutions”, in: *IAEA Bulletin* 42 (2000) No. 3 p. 5 *et seq.*

79. Jankowitsch (footnote 50) p. 10.

80. The Safety of Nuclear Installations, Vienna 1993 (IAEA Safety Series 110).

According to the drafters of the convention this document provided all technical input required.⁸¹ The safety objectives of the Fundamentals⁸² are reflected in Article 1 of the convention. They aim at achieving and maintaining a high level of nuclear safety through the enhancement of national measures and international co-operation, at establishing and maintaining effective defences against potential radiological hazards in order to protect individuals, society and the environment from harmful effects of ionising radiation, and at preventing accidents with radiological consequences and mitigating such consequences should they occur. In the Fundamentals “good practices” are condensed and summarised. This relatively new approach to technical standards became most influential and helpful for treaty-making in the field of nuclear safety.

Chapter 2 of the convention, encompassing Articles 4-19, contains the “obligations”. It also follows more or less the Fundamentals⁸³ and includes, *inter alia*, provisions on implementing measures, legislative and regulatory framework, responsibility of the licence holder, quality assurance, assessment and verification of safety, radiation protection, emergency preparedness, siting, design and construction, operation.

While Chapter 2 of the convention may be qualified as the “classical” or “conventional” part of the instrument, there are others which introduce and implement innovative elements and which make the convention most interesting from the public international law point of view. Those elements establish the base for an “incentive convention”.

In the Preamble, there are three paragraphs which have to be looked at in this context.

According to paragraph iv, the Parties are desiring to promote an effective “nuclear safety culture”. This is a new concept the origins and the contents of which are described in detail by Pierre Strohl.⁸⁴ It may be called the summary of the OECD states nuclear safety policy as compared to the “*laxisme et défaillances dont les pays de l’Est ont fait preuve dans ce domaine*”.⁸⁵ The elaboration and the naming of this concept are not the work of lawyers but of technical circles, namely of the IAEA International Nuclear Safety Advisory Group (INSAG).⁸⁶ It has been defined as follows:⁸⁷

“Safety Culture is that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance.”

The concept of promoting nuclear safety culture does not mean that an additional technical approach to a higher level of safety shall be introduced. It adds to the objective element of promoting safety a subjective element, namely the assurance that safety receives the attention warranted by its significance. It addresses the human element of nuclear safety, which includes individual attitudes as

81. Jankowitsch (footnote 50) p. 12.

82. See Section 2 of the Fundamentals (footnote 80) p. 2-4.

83. See Sections 3-6 of the Fundamentals (footnote 80) p. 4-16.

84. Strohl (footnote 71) p. 68 *et seq.*

85. Strohl (footnote 71) p. 68.

86. Safety culture has first been referred to in the 1986 Summary Report on the Post-Chernobyl Review Meeting – INSAG-1 (footnote 1) p. 76.

87. Safety Culture. A Report by the International Nuclear Safety Advisory Group, Vienna 1991, p. 4 (IAEA Safety Series No.75-INSAG-4).

well as questions of organisation.⁸⁸ Lawyers probably never would have chosen such an approach, they would say: safety shall be promoted, and the Parties undertake to do so; lawyers would establish relevant prerequisites to ensure the achievement of safety. Taking into account what has been said about the reluctance of states to accept a binding international regime on nuclear safety, the safety culture approach is a shrewd one: there is no promotion of a hard obligation, only a positive attitude, intellectual training, refinement and improvement in nuclear safety matters shall be promoted.⁸⁹ Who would object to promoting safety “culture”, a concept, which elegantly gets around the concerns of states with regard to internationalising nuclear safety? Thus, the concept of safety culture is an ideal means to form and to strengthen the incentive character of the convention, which is addressed in paragraph vii of the Preamble.⁹⁰

In this preambular paragraph the Parties affirm the importance of international co-operation for the enhancement of nuclear safety through existing instruments and through “the establishment of this incentive convention”. This language on the one hand confirms that the convention aims at implementing and strengthening the international co-operation principle of nuclear law, and on the other hand, expressly introduces the new concept of an incentive convention. The concept has already been discussed earlier in this article.⁹¹

Finally, paragraph viii of the Preamble shall be listed in this context. The Parties recognise that the convention entails a commitment to the application of fundamental safety principles rather than that of detailed safety standards. They also recognise that there are internationally formulated safety guidelines that are updated from time to time and can so provide guidance on contemporary means of achieving a high level of safety. The paragraph contains two elements: first, it assures technical flexibility with the view to facilitating the consideration of new safety related technical developments. Second, by building on safety fundamentals rather than on detailed safety standards it leaves discretion to Parties to apply those safety requirements they deem fit. This is an additional element of the incentive character of the convention.

In the operative part of the convention, the provisions on reporting form the core of what makes the convention an incentive one. The convention does not contain strong provisions on dispute settlement and on sanctions in case of a violation of treaty provisions.⁹² The means to control

88. See in particular INSAG-1 (footnote 86) *ibidem*. See also Annick Carnino, “Achievements in Assessing Safety Culture”, in: *Nuclear Law Bulletin* No. 52 (December 1993) p. 28 *et seq.*

89. See the definition of “culture”, e.g., in: *The New Shorter Oxford English Dictionary*, Vol. 1, Oxford 1993, p. 568.

90. Today an inflationary use of the word “culture” can be noticed. The term will be added whenever people wish to stress the importance of a matter. Such use of the term is not only exaggerated and incorrect but it could harm a concept which, in certain well defined cases, may render helpful services.

91. See above Section 3.3, especially footnote 50.

92. The short Article 29 with the heading “Resolution of Disagreements” reads: “In the event of a disagreement between one or more Contracting Parties concerning the interpretation or application of this Convention, the Contracting Parties shall consult within the framework of a meeting of the Contracting Parties with a view to resolving the disagreement.” This is an unusually weak dispute settlement provision, which thus underlines and supports the peer review mechanism as the only effective “sanction”.

compliance with treaty obligations is the “peer review” among Parties at a meeting of Contracting Parties.⁹³

In accordance with Article 5 of the convention, each Party shall submit for review, prior to each meeting of the Parties [Article 20], a report on the measures it has taken to implement each of the obligations of the convention. Review Meetings shall take place in intervals not exceeding three years [Article 21 paragraph 3].⁹⁴ Parties “shall attend” the meetings, i. e. there is a treaty obligation to take part [Article 24 paragraph 1]. The mandatory attendance of Parties is an obligation which is rare in international treaty law. It is meant to ensure that Parties do not evade their obligation to report, and it thus strengthens the peer review regime.⁹⁵

4.4. The Joint Convention

The pattern and the general concept of the Joint Convention are most similar to those of the Safety Convention; therefore, it does not need to be further elaborated.⁹⁶ Actually, at the beginning of the negotiations on the Joint Convention, some people felt that the Safety Convention could be seen as a “blueprint” for the new instrument.⁹⁷

The issue, which made the negotiations difficult and highly politically sensitive, stemmed from the approach originally taken by the experts: they wanted to deal with spent nuclear fuel and radioactive waste by one and the same instrument. This approach ignored that there were different views on the valuation of both materials. While a number of states identified spent fuel as an asset which must not be treated as waste – for which no further use is foreseen – but must be reprocessed, others qualified spent fuel as radioactive waste to be disposed of directly. The first group did not agree to deal with spent fuel in a “waste convention”. Because of this dispute the negotiations, during a certain period of time, were on the verge of failure. The breakthrough was gained by agreeing to deal with the materials in different chapters of the convention and to use the convention as a common roof only, which is called “Joint Convention”. It follows that the operative parts of both chapters inevitably are repetitive because both spent fuel and waste, to a certain extent, require identical provisions. This is expressed in paragraph ii of the Preamble as follows: “Recognizing that the same safety objectives apply both to spent fuel and radioactive waste management”. Chapter 2 [Articles 4-10] deals with the “Safety of Spent Fuel Management”, while Chapter 3 [Articles 11-17] regulates the “Safety of

93. See on the issue of the peer review mechanism in particular the articles by Carlton Stoiber referred to in footnote 77. During the negotiations of the convention, Stoiber chaired an informal expert working group to develop draft rules of procedure for the review process.

94. The provisions of the convention on the Review Meetings are complemented by the following instruments:

- Guidelines regarding the Review Process under the Nuclear Safety Convention [IAEA Doc. INFCIRC/571/Rev. 2].
- Guidelines regarding National Reports under the Nuclear Safety Convention [IAEA Doc. INFCIRC/572/Rev.2].
- Convention on Nuclear Safety: Rules of Procedure and Financial Rules [IAEA Doc. INFCIRC/573/Rev.2].

95. Review Meetings took place in April 1999, April 2002 and the to-date last one from 11 to 22 April 2005 (Summary Report: IAEA Doc. CNS-RM-2005/08 FINAL).

96. For literature see the authors referred to in footnote 78.

97. See on the history of the Joint Convention in particular Tonhauser/Jankowitsch (footnote 78) p. 12-14.

Radioactive Waste Management”. Provisions that apply to both materials are contained in Chapter 4 [Articles 18-25] “General Safety Provisions”.

As has already been said, the structure and the leading concepts of the Joint Convention are almost identical to those of the Nuclear Safety Convention. The Parties express in the Preamble their desire “to promote an effective nuclear safety culture worldwide” [paragraph v], and they affirm “the importance of international co-operation in enhancing the safety of spent fuel and radioactive waste management through bilateral and multilateral mechanisms, and through this incentive Convention” [paragraph ix]. These paragraphs clearly identify the Joint Convention as twin of the Nuclear Safety Convention.⁹⁸

There is another substantial paragraph of the Preamble which provides an option for possible future developments. Although the Parties are convinced that radioactive waste should, as far as compatible with safety requirements, be disposed of in the state of generation, they nevertheless recognise that, in certain circumstances, safe and efficient management of spent fuel and radioactive waste might be fostered through agreements among Parties to use facilities in one of them for the benefit of the other Parties, particularly where waste originates from joint projects [paragraph xi]. This preambular paragraph expressly opens the door for international radioactive waste repositories, which in certain political circles still is a taboo concept.⁹⁹

Technical basis and reference of the operative parts of the Joint Convention are good practices as laid down in the Safety Fundamentals “Principles of Radioactive Waste Management”.¹⁰⁰ The provisions deal, *inter alia*, with general safety requirements, existing facilities and past practices, siting, design and construction, assessment of safety, operation, implementing measures, legislative and regulatory framework, regulatory body, quality insurance. Article 27 of the convention establishes a special regime of the transboundary movement of spent fuel and radioactive waste.¹⁰¹ The provision is based on the “Code of Practice on the International Transboundary Movement of Radioactive Waste”.¹⁰² Moreover, it creates a clear delimitation to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal of 22 March 1989, which according to its Article 1 paragraph 3 does not apply to radioactive waste provided it is covered by another international instrument.¹⁰³

The provisions on reporting and on the peer review process follow, in substance, the example of the Nuclear Safety Convention but adjust the provisions to the specific requirements of the scope of

98. On the question of a possible overlap of the two conventions, see Tonhauser/Jankowitsch (footnote 78) p. 15-17.

99. See on this subject Charles McCombie, Christina Boutellier, “Problems of an International Repository for Radioactive Waste: Political and Legal Aspects of International Repositories”, in: Pelzer (ed), *Internationalisierung* (footnote 70) p. 87 *et seq.* See also: “Developing Multinational Radioactive Waste Repositories: Infrastructural Framework and Scenarios of Co-operation”, Vienna 2004 [IAEA-TECDOC-1413]; Glenn E. Schweitzer, A. Chelsea Sharber (eds.), “An International Spent Nuclear Fuel Storage Facility. Exploring a Russian Site as a Prototype”. Proceedings of an International Workshop, Washington, D.C. 2005.

100. Principles of Radioactive Waste Management, Vienna 1995 (IAEA Safety Series No. 111-F).

101. This issue is also addressed in Paragraph xii of the Preamble which recognises the right of every state to ban the import of those materials into its territory.

102. Footnote 17.

103. UNTS Vol. 1673 p. 57. The Basel Convention entered into force on 5 May 1992.

the Joint Convention [Chapter 6, Articles 29-37]. Such adjustments have particularly been adopted regarding the reporting obligations the scope of which has been broadened [Article 32]. There is an obligation to attend the review meetings [Article 33].¹⁰⁴ Review meetings shall take place at intervals not exceeding three years [Article 30 paragraph 2(i)].¹⁰⁵ The provisions of the convention are complemented by a number of rules and guidelines on the performance of the meetings.¹⁰⁶

4.5. *Appraisal of the Safety Conventions*

In trying to assess both the Nuclear Safety Convention and the Joint Convention, the summary reports of the review meetings provide useful information. The reports are self-assessments of the Parties, which may suggest that there is some glossing over the real safety situation, and they are written in a diplomatic language which is of a mitigating and hedging character anyway. That may be true. But on the other hand, self-assessment is a substantial element of an incentive convention. The national reports are self-assessments of the Parties that are discussed at the meetings, and the summary report is a self-assessment of the entirety of the Parties. The content of the debates during the meeting is confidential while the summary report is meant for the public.¹⁰⁷ Consequently, the summary report has to be most carefully drafted in order to avoid a conflict between confidentiality and information of the public. If one has in mind this specific situation, it is very well possible to identify those issues in the reports where the meeting felt that further improvement of the safety situation is necessary.

The Summary Report of the Third Review Meeting of the Nuclear Safety Convention¹⁰⁸ concluded that progress had been made, and it continued: “However, complacency is not an option as this Summary Report identified specific areas for continuous improvement into the future where collective effort is needed to secure further improvement in worldwide nuclear safety”.¹⁰⁹ This language quite obviously discloses that there were open and critical discussions during the meeting, and at the same time it confirms that the concept of an incentive convention implies a permanent and common learning process of the Parties. This has also been stated in the First Review Meeting of the Joint Convention regarding the national reports which were subject to a “learning process” since not all reports provided sufficient information. Nevertheless, the Parties concluded that the review meeting, the peer review process and the convention in general had already contributed significantly to the safety of spent fuel and radioactive waste management and that there is a strong commitment to the objectives of the convention.¹¹⁰

104. Under the Basel Convention (footnote 103) there is also established, in accordance with Article 15, a “Conference of the Parties” which shall exercise “continuous review and evaluation of the effective implementation of the Convention” [Article 15 (5)], but there is no obligation to attend the Conference.

105. The first Review Meeting took place from 3 to 14 November 2003.

106. There are three complementing regulations:

- Rules of Procedure and Financial Rules [IAEA Doc. INFCIRC/602/Rev.1];
- Guidelines regarding the Review Process [IAEA Doc. INFCIRC/603/Rev. 1];
- Guidelines regarding the Form and Structure of National Reports [IAEA Doc. INFCIRC/604].

107. Articles 27 paragraph 3, 25 Nuclear Safety Convention; Articles 36 paragraph 4, 34 Joint Convention.

108. Footnote 95.

109. Paragraph 92 of the Report (footnote 95).

110. Paragraphs 14, 77, 78 Summary Report of the First Review Meeting under the Joint Convention [IAEA Doc. JC/RM.1/06/Final version].

Do the Nuclear Safety Convention and the Joint Convention contribute to improving nuclear law?

A first glance study of the conventions invites the statement that the instruments are too weak. “Nuclear safety caught in the trap of ‘soft law’ and ‘nebulous law’”.¹¹¹ The obligations are based on safety fundamentals rather than on specific safety requirements and as a consequence, the obligations are vague. There is no obligatory dispute settlement mechanism with respective sanctions. There is only “peer review”. Parties do not harm other Parties, birds of a feather flock together. The term “Incentive Convention” is nothing else than a euphemism for a toothless tiger. In short, the conventions do not improve the existing regime of nuclear law.¹¹²

Such a view, however, manifests a total misinterpretation of the extent of the states’ readiness to co-operate in nuclear safety matters as well as a considerable underestimate of the effectiveness of the concepts of peer review and incentive convention.

It is true, though, that Chernobyl caused states to not entirely refuse any longer to agree on an international binding instrument dealing with nuclear safety. But that does not mean that they would agree to an instrument intended to establish a comprehensive and severe international regime. States still hold the view that national nuclear programmes and their control is a matter of national sovereignty. The recent controversial discussions about the nuclear package of the EU confirm this assessment.¹¹³ Member States of the EU do not want to give away their national discretion in the nuclear safety field. They very formally argue that the Euratom Treaty¹¹⁴ originally did not grant competence on nuclear safety to the Community and they still today are not ready to agree to a Euratom competence. If this is the reality within the almost “state-like” European Union and among like-minded states – how could anyone assume that states at worldwide level would ever accept a strong international nuclear safety regime? Insisting on a strong international regime would mean jeopardising the idea of internationalising nuclear safety altogether.

There is another issue which was influential: achieving nuclear safety is a complex task and a strong legal instrument on this subject necessarily would also be rather complex. In particular in the field of international law this could entail major problems. Alec J. Baer, a geologist and chairperson of the expert group to negotiate the Joint Convention, addressed this aspect as follows: “Experience shows that the more complex and the stricter a law is, the greater the probability is that it will only be partly put into force or not observed at all. How restrictive can a nuclear law be and still be fully

111. Katia Boustany, “The Development of Nuclear Law Making or the Art of Legal ‘Evasion’”, in: *Nuclear Law Bulletin* No. 61 (June 1998) p. 39 *et seq.* (40).

112. Instead of listing critical voices reference shall only be made to a working paper published in the internet by the Ukrainian Research Institute, Harvard University (HURI): Sergei Milenin, Sergei Skokow, Elizabeth Supeno, “The Chornobyl (Chernobyl) Accident and the Future of Nuclear Energy: The Path towards Safety and Sustainability”, 1996. Chapters 2 and 3, in particular, deal with relevant legal questions. The authors identify weaknesses of the existing system of nuclear energy use regulations; they refer to the non-binding international instruments of the IAEA. On the other hand, they recognise that the Nuclear Safety Convention is an important step towards more precise formulation of the fundamental principles for a reliable and workable international nuclear safety regime. The authors fear that the requirements of the convention exceed the possibilities of many nuclear countries and enumerate respective problems. See: www.huri.harvard.edu/work1.html .

113. See footnote 70.

114. Footnote 69.

applied? Too strict and it slows development down, too lax and it is of little use.”¹¹⁵ There may be doubts as to whether this statement can entirely be agreed to with respect to national law where the state ensures implementation of legal provisions. But it is certainly true for the field of international law in particular if states are anyway reluctant to accept international restrictions.

The fathers of the conventions therefore took an extremely prudent decision when they adopted an incentive convention rather than a “strict” regime using the “soft” tools of peer review. Peer review is not at all a soft tool really. It is a false perception to assume that peers do not harm each other. For good reasons, the Guidelines regarding the Review Process of both Conventions¹¹⁶ provide for establishing so-called Country Groups. The Groups are composed of countries from different geographical areas and include countries with and without nuclear programmes. The review of the national reports takes place in these Groups. The composition of the Groups shall ensure objective and critical discussion, which certainly will be guaranteed especially if pro- and anti-nuclear countries sit in the same Group.¹¹⁷ Hence, peer group review is an effective instrument to contribute to urging Parties to comply with the obligations of the conventions. Peers do not like to be blamed by other peers, even if the debates are confidential.

The incentive nature of the conventions facilitates compliance with the obligations. The Parties are not forced into an immediate full implementation of the conventions’ obligations. It is a step-by-step approach to achieving a high level nuclear safety. Parties are allowed and invited to learn and get better successively. Parties will not lose face.

In summary, the Nuclear Safety Convention and the Joint Convention are most effective instruments for enhancing nuclear safety worldwide. They fill a major gap in the otherwise elaborate and comprehensive international nuclear law regime, and thus they considerably contribute to improving nuclear law.

5. Nuclear Security

5.1. *The 1980 Physical Protection Convention*

The objective to achieve a high level of nuclear safety world wide has to be twinned with the objective of achieving a high level of nuclear security world wide. Nuclear security will be gained by developing and applying adequate measures of physical protection against the theft or unauthorised diversion of nuclear material and against sabotage of nuclear facilities.¹¹⁸ Physical protection has been a matter of national and international concern for a very long time, and the broad adherence to the

115. Alec J. Baer, “Spent Nuclear Fuel and Radioactive Waste: A Challenge for Technicians, Lawyers and Politicians”, in: Norbert Pelzer (ed.), *Rechtsfragen des Umgangs mit abgebrannten Brennelementen und radioaktiven Abfällen, Tagungsbericht der AIDN/INLA Regionaltagung Potsdam 2000*, Baden-Baden 2002, p. 31 *et seq.* (35).

116. Footnotes 94 and 106.

117. An example of the composition of Country Groups is annexed to the Joint Convention Guidelines regarding the Review Process (footnote 106).

118. On physical protection in general see, e.g., Mary Lynn Garcia, *The Design and Evaluation of Physical Protection Systems*, Burlington 2001; Physical Security Standards for Nuclear Materials outside the United States, Washington D.C. 1988; on physical protection standards inside the United States see: 10 Code of Federal Regulations (CFR) Part 73 Physical Protection of Plants and Material.

1980 Convention on the Physical Protection of Nuclear Material¹¹⁹ gives evidence of the states' willingness to accept international obligations in this field. Although there is an interface with nuclear safety,¹²⁰ as already pointed out in Section 1.1 of this article, Chernobyl did not provide much additional momentum to further enhancing international physical protection. Nuclear security came into focus when, after the decay of the Soviet Union, the number of cases of illicit trafficking in nuclear materials grew.¹²¹ Today international terrorism necessitates establishing and maintaining a strong international nuclear security regime even more. As a cornerstone of such regime, a security culture has to be developed.¹²²

The scope of application of the 1980 Physical Protection Convention is limited to nuclear material¹²³ "while in international transport" [Article 2(1)]. With the exception of Articles 3 and 4, the convention shall also be applied to nuclear material used for peaceful purposes while in domestic use, storage and transport [Article 2(2) and (3)].¹²⁴ In substance, the convention establishes obligations in three fields: parties undertake to physically protect nuclear material in transport according to the categorisation of the material set out in the annexes to the convention [Articles 3, 4]. Parties undertake to co-operate in recovering and protecting stolen material, in sharing relevant information and in returning stolen material if possible [Articles 5, 6]. Parties undertake to make the intentional commission of certain acts punishable and extraditable offences under their national law [Articles 7-13].

5.2. *The Amendment of the Convention*

As of 1999, discussions commenced within the IAEA as to whether there was a need to revise the 1980 Convention.¹²⁵ An open-ended working group in May 2001 concluded in its final report that

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119. Footnote 13. The Convention on 29 November 2005 had 116 Parties (IAEA Doc. Registration No. 1533).
 120. Lamm (footnote 53) p. 127 quite correctly raises the point that there is also a connection between physical protection and the safeguards of nuclear material, which perhaps is even closer than that with nuclear safety.
 121. On illicit trafficking see Anita Nilsson, "International Atomic Energy Agency Programmes against Illicit Trafficking of Nuclear Materials and Radioactive Sources", in: Phil Williams, Dimitri Vlassis (eds.), *Combating Transnational Crime. Concepts, Activities and Responses*, London 2001 p. 315 *et seq.*; Norbert Pelzer, "Legal Problems in Regard to Illicit Trafficking in Nuclear Materials", in: *Nuclear Law as a Source of Confidence*. Proceedings of the Nuclear Inter Jura Conference 1995 in Helsinki, Helsinki 1996 p. 492 *et seq.*
 122. See above Section 4.3. "The Nuclear Safety Convention", in particular the references in footnotes 84-90. See also Stoiber *et al.* (footnote 27) p. 154.
 123. The term "nuclear material" is defined in Article 1 (a) of the convention.
 124. See on the convention, e.g., Ha Vinh Phuong, "The Physical Protection of Nuclear Material", in: *Nuclear Law Bulletin* No. 35 (June 1985) p. 113 *et seq.*; Pelzer (footnote 27) p. 244 *et seq.*; Stoiber *et al.* (footnote 27) p. 145 *et seq.*; see furthermore the contributions by F. Nocera, L.W. Herron, H. Müller, G. Glaize at the 4th Working Session of the Nuclear Inter Jura Conference 1981, Proceedings edited by the International Nuclear Law Association, Madrid 1981 p. 287-323. The most recent publication, including the 2005 Amendment to the Convention, is by Maria de Lourdes Vez Carmona, "The International Regime on the Physical Protection of Nuclear Material and the Amendment to the Convention on Physical Protection of Nuclear Material", in: *Nuclear Law Bulletin* No. 76 (2005/2) p. 29 *et seq.*
 125. See, also regarding the following text, IAEA Doc. GOV/INF/2005/10-GC(49)/INF/6 "Nuclear Security – Measures to Protect against Nuclear Terrorism". Report by the Director General and Attachment "Final Act"; IAEA Doc. GOV/2001/41 Nuclear Verification and Security of Material. Physical Protection

there was a need to further strengthen the international physical protection regime and it recommended that a group of legal and technical experts be entrusted with drafting a “well defined amendment” to the convention. The group in particular suggested extending the convention’s scope to nuclear material in domestic use, transport and storage, and to the protection of nuclear material and facilities from sabotage. On the other hand, the group indicated that reporting obligations, a peer review mechanism, a mandatory application of the IAEA Document INFCIRC/225/Rev.4 (Corrected),¹²⁶ a mandatory international oversight of physical protection measures, and material and facilities used for military purposes should not be covered. In September 2001, the Director General of the IAEA formally convened an Open-ended Group of Legal and Technical Experts to prepare a draft amendment to the convention. The Group finalised its work in June 2003 and presented a draft amendment, which, however, still contained a number of bracketed draft provisions on which agreement could not be achieved. Consultations were held among a number of states on the outstanding issues and resulted in agreement on most of the issues. In June 2004 Austria, on behalf of 25 other states, proposed amendments to the convention to the Director General of the IAEA, who circulated the proposal to all Parties of the convention. After having received requests from a sufficient number of states to convene a conference to consider the amendments, the Director General in February 2005 invited all Parties to participate in such conference. It took place in Vienna from 4 to 8 July 2005. 85 State Parties and the European Atomic Energy Community (Euratom) and 18 States not Party and three intergovernmental organisations as observers attended the conference. On 8 July 2005, the conference adopted by consensus the amendment to the convention.¹²⁷

The amended convention’s new title reads: “Convention on the Physical Protection of Nuclear Material and Nuclear Facilities”. The entirely replaced Preamble contains 15 paragraphs including, *inter alia*, a reference to the interface of security with safety, concern about illicit trafficking, international terrorism and crime, emphasis on further strengthening physical protection measures. According to Article 1A, it is the objective of the convention to achieve and maintain effective physical protection and to prevent and combat offences relating to protected material and facilities. The scope includes nuclear material used for peaceful purposes in use, storage and transport and nuclear facilities used for peaceful purposes [Article 2].

A new “core undertaking”¹²⁸ was established in Article 2A paragraph 1. “Each State Party shall establish, implement and maintain an appropriate physical protection regime applicable to nuclear material and nuclear facilities under its jurisdiction.” The aims of the regime are listed in subparagraphs (a) to (d); they are in substance identical with the so-called “Physical Protection Objectives”.¹²⁹ In implementing these aims, the Parties shall establish and maintain a legislative and regulatory framework to govern physical protection; they shall establish or designate a competent authority responsible for the implementation of the legislative and regulatory framework; and they

Objectives and Fundamental Principles. Background; Vez Carmona (footnote 124) p. 34 *et seq.*; Fabrizio Nocera, “Updating the Physical Protection Convention: A Universal Commitment in a Dramatically Changing Reality”, in: Norbert Pelzer (ed.), *Brennpunkte des Atomenergierechts. Tagungsbericht der AIDN/INLA Regionaltagung Wiesbaden 2002*, Baden-Baden 2003 p. 77 *et seq.*

126. The Physical Protection of Nuclear Material and Nuclear Facilities [IAEA Doc.INFCIRC/225/Rev.4 (Corrected)]. See also Guidance and Considerations for the Implementation of INFCIRC/225/Rev. 4, Vienna 2000 [IAEA-TECDOC-967 /Rev. 1)].

127. On 9 January 2006 the Amendment had two Parties, namely Turkmenistan and Seychelles [IAEA Doc. Registration No. Amend-1533].

128. Vez Carmona (footnote 124) p. 41.

129. Attachment to IAEA Doc. GOV/2001/41 p. 2 No. 201.

shall take other appropriate measures necessary for the physical protection of nuclear material and nuclear facilities [Article 2A paragraph 2].

The drafting of paragraph 3 of Article 2A was among the most disputed issues during the negotiating process. The final provision obliges Parties, in implementing the obligations under paragraphs 1 and 2 of the article, to “apply insofar as reasonable and practicable” the so-called Fundamental Principles of Physical Protection of Nuclear Material and Nuclear Facilities, which are verbatim included into the text of the provision. The Fundamentals obviously are an alien element in a legal text. They are drafted in a non-legal language. While some of the Fundamentals are repeating obligations that are anyway part of the convention (e.g. Legislative and Regulatory Framework, Competent Authority), others are not apt at all to be the substance of a legal provision which shall be implemented (Security Culture, Threat). It is therefore not surprising that there were diverging opinions on how to deal with the Fundamentals.

For a better understanding of the background it seems to be useful to briefly consider the origin of the Fundamentals. As has been said above, the experts had recommended refraining from making IAEA Doc. INFCIRC/225/Rev.4 (Corrected) mandatory “through direct reference and also through ‘due consideration’”.¹³⁰ As a consequence of this recommendation, the convention would lack a harmonised technical basis of the physical protection measures required. The working group therefore recommended that the IAEA Secretariat, with the help of Member States, compile a set of Physical Protection Objectives and Fundamentals from INFCIRC/225. It furthermore recommended that the amendment to the convention “should cover, *inter alia*, the content of the Physical Protection Objectives and Fundamental Principles”.¹³¹ During the negotiations it was agreed that the set of Fundamentals should be kept *en bloc* and that its language should not be changed. While the Physical Protection Objectives could, with some slight drafting changes, easily be inserted into Article 2A paragraph 1, the “unchangeable” set of Fundamentals, from a legal and a political point of view, was difficult to deal with.

The existing text of Article 2A paragraph 3 is the result of long and controversial discussions.¹³² Paragraph 3 now establishes an obligation to “apply” the Fundamentals. A minority had suggested using instead of the verb “apply” verbs like “shall be guided by” or “shall have regard to”, which would have weakened the obligation considerably. As a compromise, the mandatory application of the Fundamentals has been made subject to the qualifying clause “insofar as is reasonable and practicable”. This qualifier softens the obligation to apply the Fundamentals by providing the flexibility necessary, on the one hand, to deal with concepts like security culture, and on the other hand, to apply the principles as appropriate to the situation of the individual Party.

The amendment furthermore strengthened the physical protection regime by improved provisions on the fighting against nuclear crimes. The redrafted Article 5 stipulates an international information and co-operation obligation in case of a credible threat of sabotage¹³³ of nuclear material or a nuclear facility. The scope of the revised Article 7 on criminal offences has been broadened, in particular by including acts of sabotage. The provision, to a certain extent, has also been brought in line with respective provisions of other international conventions fighting terrorism, which contributes

130. IAEA Doc. GOV/2001/41 p. 2 No. 5.

131. IAEA Doc. (footnote 129) p. 3 No. 9. The Objectives and the Fundamentals are reproduced in the attachment to IAEA Doc. *ibidem* p. 2 Nos. 201, 301.

132. Vez Carmona (footnote 124) p. 41-42 gives a brief overview of the discussions.

133. The term “sabotage” is defined in Article 1(e).

to international harmonisation.¹³⁴ Nevertheless an overlap with other conventions cannot be excluded¹³⁵ and probably does not do much harm even if it is unsatisfactory for lawyers.

5.3. *Appraisal of the Amendment*

In summary, the amendment without any doubt can be seen as an enhancement of the international nuclear security regime as compared to the 1980 version of the Convention on Physical Protection. The scope of application has been broadened and now also covers nuclear material in domestic use, storage and transport as well as nuclear facilities. The inclusion of acts of sabotage into criminal offences and the other amendments to Article 7, in connection with the other relevant international anti-terror conventions, form an effective tool to fight nuclear terrorism. Nevertheless, there remains an issue regarding which one may have doubts as to whether it is justified to talk about an improvement.

Such doubts exist with regard to Article 2A paragraph 3, which contains the obligation to apply the Fundamentals insofar as is reasonable and practicable. Unlike the other conventions of the “nuclear safety family”,¹³⁶ the Physical Protection Convention, neither in its unamended nor in its amended version, was ever meant to be an incentive convention. Now the qualifiers to the obligation under Article 2A paragraph 3 introduce elements of soft law into the instrument that alter the amended convention to a convention of a hybrid character. As has been discussed above,¹³⁷ soft law elements do not necessarily weaken the convention provided they are interpreted and implemented in the sense of an incentive convention. The qualified or conditioned application of the Fundamentals may step-by-step promote, and eventually lead to, an enhancement of the physical protection regime. However, in light of the discussions during the negotiating exercise where a number of delegates required national flexibility in physical protection matters, there are still reasons for concern: parties might rather use the soft approach of Article 2A paragraph 3 to evade meeting the obligation to apply the Fundamentals whenever they deem fit than using it to gradually enhance their physical protection regime. Reference to requirements of national security or to social and economic requirements may easily be put forward to warrant such attitude. Soft law is Janus-faced: one face looks at ways and means of how to elude the obligations, the other one looks at ways and means of how to meet the objectives of the convention. At which direction the face will turn will be evidenced by the implementing practice of the Parties. Only then a final answer to the question of the title of this article will be possible.

134. See, e.g., International Convention for the Suppression of Terrorist Bombing of 12 January 1998 [UN Doc. A/RES/52/164]; International Convention for the Suppression of the Financing of Terrorism of 10 January 2000 [UN Doc. A/RES/54/49]; International Convention for the Suppression of Acts of Nuclear Terrorism of 14 September 2005 [UN Doc. A/RES/59/290]. On the international legal problems of terrorism in general see Peter J. Van Krieken, *Terrorism and the International Legal Order*, The Hague 2002.

135. On the relationship with the recent Convention for the Suppression of Nuclear Terrorism (footnote 134) see Odette Jankowitsch-Prevor, “International Convention for the Suppression of Acts of Nuclear Terrorism”, in: *Nuclear Law Bulletin* No. 76 (2005/2) p. 7 *et seq.*

136. See above Section 1.1.

137. Sections 3.3 and 4.5.

6. Nuclear Liability

6.1. *Revising the Nuclear Liability Conventions*

At the time of the Chernobyl accident, the 1963 Vienna Convention had been in force since 1977¹³⁸ and the 1960/1964/1982 Paris Convention since 1968 and 1985 respectively.¹³⁹ Yet the liability regime of neither convention could be used to compensate victims of the accident. The accident state Soviet Union was not a Party to any of the conventions, and it had not enacted national nuclear liability legislation.¹⁴⁰ The first lesson to be learnt from the accident therefore is that establishing a nuclear liability law regime is not sufficient. Additional political efforts are needed to convince states to adopt it. Today it still appears that states have not fully understood this lesson because a global nuclear liability regime has not yet been achieved.¹⁴¹

The accident caused damage not only in the territory of the accident state and in the territories of its direct neighbours but also in countries far away from the place of the accident,¹⁴² and it thus triggered a worldwide discussion on the appropriateness of existing nuclear liability schemes. It quickly turned out that the nuclear liability conventions and national laws could not satisfactorily cope with the consequences of the accident in every regard. Lacunae became evident in particular relating to long distance damage (territorial scope of the conventions) and to the concept of nuclear damage, let alone the amounts of compensation under the existing regime.

In the period from 1988 to 2004, negotiations took place to consider the Chernobyl experience and to enhance the international nuclear liability law, if necessary and as appropriate, correspondingly. The exercises started with the drafting and adoption of the 1988 Joint Protocol in Vienna.¹⁴³ They were continued with the drafting and adoption of a Revision Protocol to the Vienna Convention and of the Convention on Supplementary Compensation from 1989 to 1997 in Vienna,¹⁴⁴ and they were concluded with the drafting and adoption of Revision Protocols to the Paris Convention and the Brussels Supplementary Convention from 1998 to 2004 in Paris.¹⁴⁵

The results of the revision exercises have been presented and discussed in numerous fora and publications. In this article only a few key topics shall briefly be addressed, for an in-depth study

138. See footnote 9 and on the status: IAEA Doc. Registration No. 1277.

139. See footnote 11 and on the status: www.nea.fr/html/law/paris-convention-ratification.html.

140. At the time of the accident the Vienna Convention had 9 and the Paris Convention 14 Parties.

141. Aidan Thomson, "The Regime of Governing Liability for Nuclear Accidents: Outstanding Problems and Future Perspectives", in: *Environmental Liability* 5 (1997) p. 56 *et seq.* (58) states in 1997 that an effective liability regime is "still elusive". See on this issue in greater detail below Section 6.6.

142. On the extent of economic damage suffered in Western Europe see: "The Accident of Chernobyl – Economic Damage and its Compensation in Western Europe", in: *Nuclear Law Bulletin* No. 39 (June 1987) p. 58 *et seq.*

143. See footnote 6.

144. See footnotes 9 and 10.

145. See footnotes 11 and 12.

reference can be made to relevant publications¹⁴⁶ and particularly to the official explanatory texts of the revised conventions.¹⁴⁷

There is, however, one element of the outcome of the revision exercises which has to be expressly emphasised here. The overall review of the existing nuclear liability conventions included a thorough study of the leading principles of the conventions. Those principles are: liability without fault (strict liability),¹⁴⁸ exclusive liability of the operator of a nuclear installation (legal channelling of liability), mandatory financial coverage of the operator's liability, congruence of liability and coverage, limitation of liability in amount and in time, equal treatment of all victims, exclusive jurisdiction. The drafters and the negotiators decided that the Chernobyl accident neither required nor warranted a change of principles. They confirmed them. There is one exception, though. They expressly opened both the Paris and the Vienna Conventions to unlimited liability.¹⁴⁹ As a

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146. See, e.g., Vanda Lamm, "The Protocol Amending the 1963 Vienna Convention", in: *Nuclear Law Bulletin* No. 61 (June 1998) p. 7 *et seq.*; Patrick Reyners, "Modernisation du régime de responsabilité civile pour les dommages nucléaires: Revision de la Convention de Vienne et la nouvelle Convention sur la réparation complémentaires des dommages nucléaires", in: *Revue générale de Droit international public* 105 (1998) p. 747 *et seq.*; Vedran Soljan, "Modernization of the International Regime on Civil Liability for Nuclear Damage", in: *Zeitschrift für ausländisches öffentliches Recht und Völkerrecht* 58 (1998) p. 733 *et seq.*; Julia Schwartz, "The Current Revision of the Paris Convention on Third Party Liability in the Field of Nuclear Energy and the Brussels Convention Supplementary to the Paris Convention, in: Nuclear Law under the Sign of Safety and Confidence". Proceedings of the Nuclear Inter Jura 2001 in Budapest, Budapest 2002, p. 171 *et seq.*; Håkan Rustand, "The Revision of the Paris/Brussels System: Important Improvements of the International Nuclear Liability Regime – Some Remarks", in: Pelzer (ed.), *Brennpunkte* (footnote 125) p. 133 *et seq.*; Monika Hinteregger, Susanne Kissich, "The Paris Convention 2004 – A New Nuclear Liability System for Europe", in: *Environmental Liability* 12 (2004) p. 116 *et seq.*; Roland Dussart Desart, "The Reform of the Paris Convention on Third Party Liability in the Field of Nuclear Energy and of the Brussels Supplementary Convention: An Overview of the Main Features of the Modernisation of the two Conventions", in: *Nuclear Law Bulletin* No. 75 (2005/1) p. 7 *et seq.*; Norbert Pelzer, "Modernizing the International Regime Governing Nuclear Third Party Liability", in: *Zeitschrift für Europäisches Umwelt- und Planungsrecht* 3 (2005) p. 212 *et seq.* See furthermore the compendium: Reform of Civil Nuclear Liability, Proceedings of the Budapest Symposium 1999 organised by the OECD/NEA in co-operation with the IAEA and the EC, Paris 2000, and the comprehensive textbook by Susanne Kissich, *Internationales Atomhaftungsrecht: Anwendungsbereich und Haftungsprinzipien*, Baden-Baden 2004.
147. OECD/NEA Docs. "Revised Exposé des Motifs to the Paris Convention" and the newly drafted "Exposé des Motifs to the Brussels Supplementary Convention" (not yet finalised and officially published); IAEA INLEX Doc. "The 1997 Vienna Convention on Civil Liability for Nuclear Damage and the 1997 Convention on Supplementary Compensation for Nuclear Damage". Explanatory Texts (English version in: IAEA Doc. GOV/INF/2004/9-GC(48)/INF/5); the Explanatory Texts are also available in the other official languages of the IAEA: www.iaea.org/About/Policy/GC/GC48/Documents/gc48inf-5.pdf; hereinafter referred to as "Vienna Expl. Texts".
148. According to the Vienna Convention, this type of liability is not quite correctly called "absolute liability" [Article IV paragraph 1]. Absolute liability is a concept which does not allow any exoneration, but that does not apply to the Vienna Convention [see Article IV paragraph 3].
149. The Vienna Convention, unlike the Paris Convention, never stipulated a limitation of liability in amount: "The liability of the operator may be limited by the Installation State to not less than..." [Article V paragraph 1]. Without an express limitation of the liability by the Installation State the liability under the convention is unlimited. Pierre Strohl, in a contribution to the discussion at the Budapest Symposium (footnote 146) p. 582, concluded that the liability principles including the limitation of liability in amount "sont inséparables". There exist doubts as to whether such conclusion can be justified, it is in particular not in line with the results of the revision exercises which expressly allow unlimited liability. Enhancements of the regime are, of course, possible and cannot be blocked by declaring the set of

consequence of this decision, the congruence principle had to be modified as well because unlimited coverage, for logical reasons, is not available.

6.2. *Transboundary Nuclear Damage*

Accidents with detrimental effects in the territory of states other than the accident state create legal problems for both the claimant and the defendant. The collision of two or more legal systems requests a decision on which law is applicable, which court is competent to hear claims and how judgements can be enforced.¹⁵⁰ Whoever was ever involved in a traffic accident in a foreign country knows about the problems of this situation.¹⁵¹ Nuclear accidents with their potentially widespread consequences involving high numbers of victims multiply the complexity. For those reasons the Paris and the Vienna Conventions already in their original versions contain binding provisions on the competent court, on the applicable law, and on the enforcement of judgements. As a rule, the courts of the Party in whose territory the nuclear accident occurred shall be competent. The law of the court will be applied, and final judgements will be enforced in the territories of all Parties.¹⁵² The jurisdiction under the conventions is exclusive, no other courts are competent. Without any doubt, the provisions of the conventions on the competent court count among those provisions which alone warranted the conclusion of an agreement on compensation for nuclear damage. Only treaty relations among interested states can do away with the uncertainties of the general law of conflict rules.

Treaty provisions, however, only apply to those persons who are covered by the scope of application of the respective treaty. Article 2 of the original Paris Convention stipulated that the convention does not apply to incidents occurring in the territory of non-Contracting States or to damage suffered in such states unless provided otherwise by the Installation State. With regard to the unrevised Vienna Convention an identical territorial limitation applies.¹⁵³ It follows from this territorial restriction that in relation to non-Contracting States the benefits of the convention, including the benefits of an exclusive jurisdiction, do not apply, and victims as well as the operator liable have to face the difficulties under general private international law.

liability principles *inséparable*, which seems to imply the element of invariability; see the reply of the author of this article *ibidem* p. 583.

150. International practice provides manifold solutions which do not contribute to legal certainty but invite attorneys to costly “fora-shopping”. In Europe alone there are various options regarding the applicable law: the most common approach is the *lex loci delicti*, which may be the law of the accident state or the law of the state where the damage is suffered. Other options are the *lex fori* (law of the competent court), the “double actionability rule”, which is a kind of combination of the *lex loci delicti* and the *lex fori*, the “proper law of tort rule”, which considers the specifics of the individual case, and finally the law which the parties agree upon. See on these problems the general textbooks on the law of conflict (private international law).
151. On the practical problems connected with the compensation of transboundary nuclear damage see the INEX (footnote 2) workshops 2000 in Paris and 2005 in Bratislava. On the 2000 workshop see OECD/NEA, *Indemnification of Damage in the Event of a Nuclear Accident. Workshop Proceedings* Paris, France, 26-28 November 2000, Paris 2003; see also the evaluation of the workshop in OECD/NEA Doc. NEA/CRPPH/INEX/2005/10; Julia Schwartz, “Putting Theory into Practice: The INEX 2000 Workshop on the Indemnification of Nuclear Damage”, in: Pelzer (ed.), *Brennpunkte* (footnote 125) p. 147 *et seq.* The proceedings of the Bratislava workshop have not yet been published.
152. Articles 13, 11, 14 Paris Convention, Articles XI, XII, VIII Vienna Convention.
153. See with references Pelzer, “Modernizing the International Regime” (footnote 146) p. 214 and footnote 16 *ibidem*.

Under this rule, Paris Convention States are non-Contracting States in relation to Vienna Convention States and vice versa. There is no link between both conventions. Already at an early stage, namely at the 1968 Monaco Symposium, it was recognised that this situation could entail serious legal and practical problems.¹⁵⁴ However, states only responded to this situation after the Chernobyl accident: in 1988 they adopted the Joint Protocol to build a bridge between both conventions.¹⁵⁵ According to the Joint Protocol, the benefits of either of the two conventions will mutually be extended. If there is an accident in a Vienna State, victims in a Paris State will be treated as if they were Vienna State victims, and the same principle applies to the vice versa situation.¹⁵⁶ Among the Parties of the Joint Protocol, the territorial restriction of the scope of application of the conventions according to Article 2 of the Paris Convention and in accordance with a respective interpretation of the Vienna Convention has been abolished. This solution solves the problems of the relationship between the two conventions in a way, which in principle is satisfactory. It transforms two distinct nuclear liability conventions into a unified nuclear liability regime. The triad Vienna Convention + Joint Protocol + Paris Convention may very well be extended to a global nuclear liability regime.

The Joint Protocol, of course, cannot extend the application of the conventions to States that are not Party to any of the conventions. Such extension requires a formal amendment of the conventions. States tackled that issue when revising the Vienna Convention and the Paris Convention respectively, and as a result, they deleted the territorial restrictions of the scope of the conventions.¹⁵⁷

According to Article IA of the revised Vienna Convention, the convention shall apply to nuclear damage wherever suffered [Paragraph 1]. However, the legislation of the Installation State may exclude from the application of the convention damage suffered in the territory of a non-Contracting State and in any maritime zone of such state provided it has a nuclear installation in its territory or in its maritime zone and provided it does not afford equivalent reciprocal benefits [Paragraphs 2 and 3]. Damage suffered in non-nuclear non-Contracting States must not be excluded from the application of the convention.

154. U. K. Nordenson, "Legal Conflicts arising from the Simultaneous Application of the Paris and Vienna Conventions with regard to Nuclear Incidents in the Course of Carriage of Nuclear Substances", in: OECD/IAEA (eds.), *Third Party Liability and Insurance in the Field of Maritime Carriage of Nuclear Substances*, Monaco Symposium 1968, Paris 1970, p. 427 *et seq.*

155. Footnote 6. The Joint Protocol entered into force on 27 April 1992 and has 24 Parties (IAEA Doc. Registration No. 1623).

156. On the Joint Protocol see in particular Otto von Busekist, "A Bridge between two Conventions on Civil Liability for Nuclear Damage: The Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention", in: *Nuclear Law Bulletin* No. 43 (June 1989) p. 10 *et seq.*; Patrick Reyners, Otto von Busekist, "The Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention – One Step towards the Necessary Modernisation of the International Nuclear Liability Regime", in: AIDN/INLA (ed.), *Nuclear Inter Jura'89 – Nuclear Law for the 1990's – Tokyo 1989*, Proceedings, Tokyo 1989 p. II-63 *et seq.*

157. On the extended scope see Kissich (footnote 146) p. 232 *et seq.*; Norbert Pelzer, "The Geographical Scope of Application of the Revised Paris Convention and of the Revised Brussels Supplementary Convention", in: Colloquium on 'Modernising the Paris Convention and the Brussels Supplementary Convention', jointly organised by the French government, the OECD/NEA and the French Section of INLA on 11 February 2004, Paris 2004, 12; James Hamilton, "Access of Victims to the Compensation Regime of the Vienna Convention on Civil Liability for Nuclear Damage – The Question of 'Geographical Scope'", in: Budapest Symposium (footnote 145) p. 99 *et seq.* See also the other authors referred to in footnote 146 and the explanatory texts referred to in footnote 147.

The revised Paris Convention is structured differently but there is no major difference in substance. The revised Article 2 of that convention does not open the convention to damage wherever suffered but it enumerates the cases to which the convention shall apply. Without any provisos it will apply to Parties, to non-Contracting States that are Party to the Vienna Convention and the Joint protocol if the state of the operator liable is also Party to the Joint Protocol, and to non-Contracting States that have no nuclear installation in their territory or maritime zone. Nuclear non-Contracting States are covered only if they have nuclear legislation in force which provides reciprocity and which is based on principles identical to those of the Paris Convention. In this latter case the Paris Convention establishes a higher threshold for the access of victims to the regime of the convention than that of the Vienna Convention.¹⁵⁸

The exercises performed consequential to the Chernobyl experience with the view to facilitating the bringing of claims against the operator liable by victims from non-Contracting States to the convention resulted in a most considerable enhancement of the position of those victims. The Joint Protocol is designed to ensure equal treatment of victims from Paris and Vienna States. The reform of the territorial scope provisions and practices respectively opened the conventions to victims irrespective of whether their state of origin is a Party to the conventions or not. They may use the benefits of the conventions in the same way as victims of the convention states provided certain prerequisites are met. The difficulties and uncertainties of the general law of conflict do not any longer hamper compensation for nuclear damage.

Yet the position of victims from non-Contracting States is not perfect. While the Joint Protocol creates treaty relations among Vienna and Paris States which make equal treatment of all victims a binding treaty obligation, the new territorial scope provisions are only a unilateral offer by the convention states which is binding only on them. The victims from non-Contracting States may use it or not. They may prefer suing at their domestic court under their domestic law rather than at the court designated by the conventions, and they can do so. In that case, we are again under the often incalculable regime of the general law of conflict. It follows that the revision of the territorial scope concept cannot replace treaty relations.

6.3. *Concept of Damage*

The Paris and the Vienna Conventions in their unrevised versions cover the compensation of loss of life, any personal injury and loss of, or damage to, property, which was caused by radioactive properties.¹⁵⁹ This concept corresponds with the classical concept of damage as covered by the general civil codes. The Chernobyl accident brought additional elements of damage into focus that were already well known in other fields of law: damage to the environment. It was also recognised that economic loss including pure economic loss was a major issue of nuclear damage and could perhaps not in every case be subsumed under property damage: dairies, wholesalers and retailers in fruits and vegetables or tourist industry lost turnover, cattle was prevented from grazing, hunters could not sell

158. The provision could possibly cause problems for Austrian victims. Austria still operates a nuclear research reactor and therefore is a nuclear state. It is not a Party to either the Vienna or the Paris Convention, and it has enacted nuclear liability legislation which is not based on principles identical to those of the Paris Convention (see footnote 64).

159. Article I paragraph 1 (k)(i) of the 1963 Vienna Convention. The 1960 Paris Convention does not contain an express definition of nuclear damage. The compensable damage can be taken from the context of Article 3, and it is identical to that of the Vienna Convention. The Vienna Convention in Article I paragraph 1 (k)(ii) grants the law of the Installation State discretion to cover any other loss or damage. Such a far-reaching catch-all clause cannot be found in the Paris Convention.

game, sand from playgrounds had to be removed. Moreover, the costs of preventive measures could only be reimbursed if they were taken after the nuclear incident had occurred but not if they successfully had prevented its occurrence.¹⁶⁰

The revised concept of nuclear damage aims at capturing the enlarged scope. The result is a compromise, though. This applies particularly to what extent damage to the environment is to be compensated. While on the one hand there is an understandable popular tendency to request the polluter to recover damaged environment to the largest extent, there are on the other hand basic principles of civil liability law which must not be abandoned without changing the character of civil liability. Civil liability law is based on individualised damage, and it requires a well-defined object that is damaged. Who shall be entitled to claim civil law compensation for damage to the environment? How is the term environment to be defined, especially if one takes into account that major parts of the “environment”, such as forests, meadows, fields and inland waters, are the property of private persons or public entities? If impaired environment cannot be reinstated, how can environmental damage be expressed in terms of money?

Finally, with regard to economic loss, there is also the question as to what extent it shall be compensated. Certainly not every remote economic loss is sensibly recoverable. Courts and legal doctrine have been dealing with this issue for ages, and they will find appropriate solutions but the drafters of the Revision Protocols had to keep in mind that the conventions are also designed to promote international harmonisation. That objective requires a restriction of national discretion in determining the extent of compensation.

Notwithstanding its compromise character, the result of the drafting efforts related to the definition of “nuclear damage” is outstanding [Article I paragraph 1(k) Vienna Convention, Article 1 paragraph a (vii) Paris Convention]. It addresses in particular the concept of damage to the environment in a way which limits its vague definition and at the same time provides adequate protection. The same applies to economic damage. The definition adds to the traditional heads of damage “personal injury” and “property damage” a number of new heads of damage, which are enumerated under a chapeau sentence that reads: “...and each of the following to the extent determined by the law of the competent court –...”. That chapeau gives clear guidance to the Parties: Parties are obliged to insert these heads of damage into their national implementing law but they have discretion regarding the extent to which such damage is compensated.

The new concept of damage also encompasses the costs of preventive measures as recoverable head of damage. It includes the costs of measures taken after the nuclear incident had occurred to mitigate its consequences and the costs of those measures taken to prevent the occurrence of a nuclear incident in case of a grave and imminent threat of damage.¹⁶¹

For the purposes of this article, there is no need to elaborate on the damage concept in greater detail. Reference to the relevant legal literature shall be made although to date there are only few but substantial titles available.¹⁶² In particular with regard to the smooth operation of the Joint Protocol, it

160. This is a lesson which already could have been learned after the Three-Mile-Island accident in 1979.

161. There is a difference in the systematic approach between the two conventions, which, however, does not mean a difference in substance. While the Vienna Convention makes the threat also a nuclear incident [Article I paragraph 1 (k vi) (l) (n)], the Paris Convention incorporates the threat into the definition of preventive measures [Article 1 paragraph a (vii 6) (ix) (i)].

162. Vedran Soljan, “The New Definition of Nuclear Damage in the 1997 Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage”, in: Budapest Symposium (footnote 146) p. 59 *et seq.*; Torben Melchior, “The Definition of Nuclear Damage”, in: Colloquium on Modernising (footnote

is decisive that the definitions in both the Vienna and the Paris Conventions are identical with one exception. The Paris Convention lacks the Vienna head of damage "... (vii) any other economic loss, other than any caused by the impairment of the environment, if permitted by the general law on civil liability of the competent court...". The drafters of the Paris revision did not see any necessity to adopt this catch-all clause because this head of damage was already covered by the others listed in the provision. Moreover, the reference to national general law on civil liability broadens the concept of damage in a way which might jeopardise international harmonisation and which would not match the limited compensation amounts available.¹⁶³

6.4. *Liability Amounts*

Already prior to the Chernobyl accident, the general public most critically assessed the liability amounts under the conventions and under national law. The accident confirmed that concern. As a matter of fact, the liability amounts in most states are not exactly impressive and seem to be far from being adequate to the nuclear risk. The amounts range from less than 50 million US dollars (USD) up to USD 10 billion; only four states do not limit the liability of the operator in amount but have limited financial coverage of that liability.¹⁶⁴ Obviously, every limitation in amount is arbitrary. Liability ceilings mostly are linked to, and in accordance with, the respective capacity of the insurance industry to cover liability, which is a consequence of the congruence principle. Such interdependence surely is economically sensible but is not a sound basis for fixing the extent of liability. Liability, in principle, has to be based on the risk involved in the activity. However, if the theoretical nuclear risk, if the size of Chernobyl damage were made the basis for fixing liability or coverage ceilings, who would be prepared to operate a nuclear power plant?

Here we face a common misunderstanding, namely that civil liability has to cover the entire extent of risk involved in the respective activity. From a theoretical point of view, that perception may be correct. But a closer look at the respective risk is necessary. The potential nuclear risk, or more concretely: the consequences of a Chernobyl type accident, describe a national or even international catastrophe. Civil liability law is not designed to cope with catastrophes. Natural and other disasters cannot totally be covered under the terms of civil liability law. In all fields of liability, especially regarding liability for major accidents causing damage to many people, there are peaks of liability that are not covered by insurance or other assets of the person liable. At this borderline civil liability ends: *Ultra vires nemo obligatur*. If there is a flood, a hailstorm or an earthquake, states compensate victims. The same rule has to apply to man-made disasters. The Installation State is responsible for adequate licensing and control procedures to prevent accidents. It shares responsibility for a safe operation with the operator albeit prime responsibility rests with the operator.¹⁶⁵ Should a catastrophic nuclear incident occur it is the Installation State's genuine task and obligation to step in when the means of the polluter are exhausted?¹⁶⁶ Consequently, liability limits, if any, need not to be increased to the level of

157) 7 p.; Fiona Wagstaff, "The Concept of Nuclear Damage in the Revised Paris Convention", in: Pelzer (ed.), *Internationalisierung* (footnote 70) p. 197 *et seq.*; Vienna Expl. Texts (footnote 147) Section II (3). See also the authors referred to in footnote 146.

163. See on this issue Vienna Expl. Texts (footnote 147) Section II (3) (b), especially footnote 113 *ibidem*.

164. Unlimited liability exists in Austria, Germany, Japan and Switzerland. Finland and Sweden plan to introduce unlimited liability when ratifying the 2004 Revision Protocol to the Paris Convention.

165. See Articles 7-9 Nuclear Safety Convention (footnote 7).

166. See in greater detail Norbert Pelzer, "Focus on the Future of Nuclear Liability Law", in: Budapest Symposium (footnote 146) p. 421 *et seq.* (445-448) (also reproduced in: *Energy & Natural Resources Law* 17 (1999) p. 332 *et seq.*); Roman Herzog, Keynote Address to the Symposium on Nuclear Third

catastrophe damage. They have to cover the area below the disaster. When fixing liability or coverage amounts legislators have to balance the risk of the activity with economic, social and other relevant factors which are connected with the activity. If one looks at liability amounts from this angle, the size of the amount is almost irrelevant provided states do not evade their obligation to ensure compensation if damage exceeds the liability or coverage amount of the operator liable.¹⁶⁷

The revised Paris and Vienna Conventions fix binding minimum amounts of liability. The amount under the Paris Convention is 700 million euros (EUR); the respective Vienna amount is 300 million Special Drawing Rights (SDRs) of the International Monetary Fund.¹⁶⁸ The concept of minimum amount suggests increasing the amount, as appropriate, or even establishing unlimited liability. In case of unlimited liability, the financial security shall be established at an amount which is at least equal to the minimum liability amount under the conventions.¹⁶⁹ The new figures form a considerable increase of the level of liability and can be qualified as success of the revision exercises. This holds especially true for the worldwide Vienna Convention where states of different political, economic and social systems agreed to the revision.¹⁷⁰ The higher minimum amount gained under the revised Paris Convention certainly is a consequence of the fact that the negotiations – unlike the Vienna negotiations¹⁷¹ – were not open-ended but were reserved to Contracting Parties only, which were all on an equal political, economic and social level.¹⁷²

Party Liability and Insurance – Status and Prospects, held in Munich from 10-14 September 1984, in: *Nuclear Law Bulletin* No. 34 (December 1984) p. 52 *et seq.* (54-57); also: Pelzer, Modernizing (footnote 146) p. 215.

167. In case of catastrophic damage, the problem of the distribution of the available money has to be solved. National legislations often contain relevant provisions. They either grant general authority to the government to take appropriate measures or they provide for special schemes on dealing with catastrophic damage. Regarding the latter case see Nathalie Horbach, “Catastrophic Nuclear Damage under the Dutch Nuclear Liability Law”, in : Pelzer (ed.), *Internationalisierung* (footnote 70) p. 213 *et seq.* (p. 222-228); for the USA see: Report to the Congress from the Presidential Commission on Catastrophic Nuclear Accidents, 2 Volumes. Washington, D.C. 1990; Canada: Part II (Sections 18-32) Nuclear Liability Act 1970 as amended (RSC 1970 ch. 29, 1985 ch. N-28).
168. Article 7 paragraph a Paris Convention. Article V paragraph 1 (a) Vienna Convention. SDR 300 million correspond to approximately EUR 355 million.
169. Article VII paragraph 1 (a) Vienna Convention, Article 10 paragraph b Paris Convention.
170. The Revision Protocol was adopted at a Diplomatic Conference convened to adopt a protocol to amend the Vienna Convention, which took place from 8 to 12 September 1997 in Vienna, on 12 September 1997 by a vote of 64 states in favour and one state against with two abstentions of the 65 states present and voting [Final Act IAEA Doc. GOV/INF/822-GC(41)/INF/13; IAEA Doc. NL/DC/SR:1-5]; on the drafting history see Vienna Expl. Texts (footnote 147) Section I.6.
171. Among the 65 states present and voting at the Diplomatic Conference there were 21 Parties to the Vienna Convention (see reference in footnote 170).
172. Final Act of the Conference on the Revision of the Paris Convention and on the Brussels Supplementary Convention, Paris, 12 February 2004, including the texts of the Revision Protocols, a Recommendation on the Application of the Reciprocity Principle to Nuclear Damage Compensation Funds, and an Explanatory Report by the representatives of the Contracting Parties on the Revision of the Paris Convention and the Brussels Supplementary Convention. 16 states attended the Conference.

6.5. *Supplementary Compensation*

With a view to increasing the amounts of compensation for nuclear damage, states, parallel to their efforts to improve the basic nuclear liability instruments, tackled the issue of international supplementary compensation by public funds.

The concept of international supplementary compensation is not self-evident. While Installation States are responsible for the safety of nuclear activities carried out under their jurisdiction and hence may be held liable for damage in excess of the operator's liability,¹⁷³ such reasons do not apply to states other than the Installation State. "The basis of intervention: Solidarity not liability", it has been stated.¹⁷⁴ That is correct. The statement obviously is valid for nuclear states. Non-nuclear states and even more anti-nuclear states might object to showing solidarity with nuclear states. However, they are not requested to approve of nuclear programmes. For humanitarian reasons they are requested to show solidarity with the victims of a nuclear incident.¹⁷⁵ Moreover, if victims of a major nuclear accident remain uncompensated, a political destabilisation of the respective country or region may be the consequence, which is in nobody's interest. It appears that there are very valid reasons for establishing an international regime of supplementary funding to compensate nuclear damage.

In complement to the system of the Paris Convention, the Brussels Convention Supplementary to the Paris Convention¹⁷⁶ provides such complementary compensation. The Revision Protocol to the Brussels Supplementary Convention leaves the original structure of the convention untouched. It does not change the three tier system of compensation: operator's funds + public funds of the Installation State + international funds provided by all of the Contracting Parties.¹⁷⁷ While the unrevised convention ensured compensation up to an amount of SDR 300 million,¹⁷⁸ the revised convention increases the total amount to EUR 1 500 million. That amount shall be provided by the following tiers: up to an amount of at least EUR 700 million from operator's funds, between that amount and EUR 1 200 million from Installation State's funds and between EUR 1 200 million and EUR 1 500 million from funds to be provided by all of the Parties.¹⁷⁹

Four additional issues shall be highlighted.

As the first tier, the operator's tier, is a minimum amount, the second tier, the Installation State tier, may be entirely consumed by the operator's money if national legislation establishes the liability of the operator at an amount higher than EUR 700 million or establishes unlimited liability. Such an increase is desirable because it strengthens the polluter-pays principle.

173. See above Section 6.4.

174. Dussart Desart (footnote 146) p. 26.

175. States do not hesitate to support people suffering from a famine even if the famine is caused by a government which states disapprove of.

176. Footnote 12. As a "Semi-official Exposé des Motifs" of the convention see: A. Bette *et al.*, *Compensation of Nuclear Damage in Europe*, Brussels 1965.

177. Article 3 paragraph b Brussels Supplementary Convention.

178. Up to at least SDR 5 million from operator's funds, between that amount and SDR 175 million from funds of the Installation State, between SDR 175 million and SDR 300 million from funds provided by all Parties.

179. The international tier will be calculated in accordance with a formula set out in Article 12 of the convention.

Article 9 paragraph c of the convention stipulates that the international tier of EUR 300 million shall be made available once the amounts of the first and the second tiers (EUR 1 200 million) are reached, irrespective of whether operator's funds remain available or whether the liability of the operator is not limited in amount. Remaining funds of the operator may be distributed, as necessary, after the total amount under the convention is exhausted. This provision replaces the so-called deferment solution which in substance meant penalising those Parties which, to the benefit of victims, established high liability amounts or unlimited liability.¹⁸⁰

The formula for contributions to the third tier was changed [Article 12]. Under the unrevised convention the formula is determined as to 50% based on the gross national product (GNP) and as to 50% based on the thermal power of the reactors in the territory of the Installation State. The new formula changes the ratio between the gross domestic product (GDP) and the thermal power to 35% / 65%, thus attributing to the thermal power, i.e. the risk, higher weight.¹⁸¹

In the unrevised convention the three tiers were closed tiers; a change of Parties had no influence on the third tier. According to the amended Article 3 paragraph b (iii) and a new Article 12bis, the third tier is now open-ended. The third tier will be increased by the adherence of new Parties. There will be no decrease if states terminate membership.

The revised Brussels Convention considerably contributes to enhancing the international regime of compensation for nuclear damage. Although it is open for States Party to the Paris Convention only¹⁸² and cannot be extended to Vienna States, it may nevertheless serve as a successful example for other regions of the world.

There was no instrument on additional compensation supplementary to the Vienna Convention. When preparing and negotiating the revision of the Vienna Convention, state representatives from the very beginning of the talks had in focus establishing a regime corresponding to the Paris/Brussels regime. The negotiations were difficult. For a long time they seemed to be doomed to fail. The US delegation presented the decisive input when it submitted the so-called "umbrella draft".¹⁸³ This draft became the basis of the Convention on Supplementary Compensation for Nuclear Damage.¹⁸⁴

This convention breaks new ground. Unlike the Brussels Supplementary Convention with regard to the Paris Convention, it is not made accessory to the Vienna Convention. It is a "free-standing" instrument which is designed to complement either the Vienna Convention or the Paris Convention or national nuclear liability legislation provided the legislation conforms with the liability principles which are set out in an annex to the convention. The annex principles were extracted from

180. The deferment solution allowed mobilising the third tier only if the entire means of the operator were exhausted. See: OECD Council Recommendation of 26 November 1992 [OECD Doc. C(92)166/Final]. See also OECD/NEA Doc. NEA/NLC/DOC(2005)2.

181. See on this issue Dussart Desart (footnote 146) p. 28.

182. The convention has twelve Parties (see www.nea.fr/html/law/brussels-convention-ratification.html). With the exception of Greece, Portugal and Turkey all Parties to the Paris Convention are Party to the Brussels Supplementary Convention.

183. The drafting history is documented in Vienna Expl. Texts (footnote 147) Section III 2, particularly footnotes 192 and 198.

184. Footnote 10.

the Paris/Vienna Conventions. This innovative approach aims at facilitating the adherence of states to the convention and thus at establishing a global nuclear liability regime.¹⁸⁵

As a consequence, the scope of this convention covers more than only the additional compensation of victims in complement to the compensation provided by the operator liable. The main body of the convention together with the annex establishes a basic liability regime of its own that covers the same scope as the Paris and Vienna Conventions. States not Party to the Paris or Vienna Convention may maintain their domestic nuclear liability regime, if any, provided it is in conformity with the principles set forth in the annex. States that have not yet enacted nuclear liability law do not need to also adhere to the Paris or the Vienna Convention but can issue national legislation based on the annex.

The Convention on Supplementary Compensation provides for two compensation tiers [Article III paragraph 1]: the Installation State shall ensure the availability of not less than SDR 300 million; beyond the amount so established the Parties shall make available public funds according to the formula specified in Article IV. That formula is complicated. It consists of two counts: the first one is based on the installed nuclear capacity of the respective Party¹⁸⁶ and the second one is based on the United Nations rate of assessment.¹⁸⁷ As a consequence of this calculation mode, it is assumed that more than 90% of the second tier will be provided by nuclear states. In order to attract states with major nuclear programmes Article IV paragraph 1(c) provides for a “cap” on the contributions. The second tier is open-ended and its size depends on the number of Parties (with nuclear programmes in the first line). If all nuclear states adopt the convention, the amount of the second tier will be somewhat more than SDR 300 million.¹⁸⁸

With regard to the allocation of the international tier of the compensation fund, Article XI paragraph 1 of the convention provides for a split of the fund: 50% of the international money shall be made available to victims suffering damage in or outside the territory of the Installation State, the other 50% shall exclusively be used for the compensation of damage suffered outside the territory of the Installation State to the extent that such damage is uncompensated under the first 50% of the tier. It has been said that this provision recognises the importance that the international community attaches to the compensation of transboundary damage and that it provides an incentive for non-nuclear states to join the convention and an incentive for Installation States to provide amounts of compensation

185. On the Convention see: Ben McRae, “The Compensation Convention: Path to a Global Regime for Dealing with Legal Liability and Compensation for Nuclear Damage”, in: *Nuclear Law Bulletin* No. 61 (June 1998) p. 25 *et seq.*; Vladimir Boulanenkov, “Main Features of the Convention on Supplementary Compensation for Nuclear Damage – An Overview”, in: Budapest Symposium (footnote 146) p. 161 *et seq.*; Steven McIntosh, “The Need to bring the New Global Regime of Civil Nuclear Liability to Life”, in: Budapest Symposium (footnote 146) p. 185 *et seq.*; Ben McRae, “Overview of the Convention on Supplementary Compensation”, in: Budapest Symposium (footnote 146) p. 171 *et seq.*; David Kremen, “Transboundary Damage – *Carpe Solutionem*”, in: Nuclear Inter Jura 1999 Biennial Congress. Proceedings, Washington, D.C. 1999, p. 273 *et seq.* See also the articles by Reyners and Soljan referred to in footnote 146. Furthermore: Vienna Expl. Texts (footnote 147) Section III.

186. The formula for each nuclear reactor situated in the territory of the respective Party is one unit for each Megawatt thermal power multiplied by SDR 300 [Articles IV paragraph 1 (a) (i), paragraph 2, I (j)].

187. Article IV paragraph 1 (ii). On the UN rate of assessment see Wilfried Koschorreck, Contributions, System of, in: Wolfrum/Philipp (eds.) (footnote 26) p. 356 *et seq.*

188. See in greater detail Vienna Expl. Texts (footnote 147) Section III 6 (b); McRae, The Compensation Convention (footnote 185) p. 30.

larger than the minimum amount of SDR 300 million.¹⁸⁹ This perception has merits. It will be supported by a complementing argument: since the Installation State poses the nuclear risk, it is first and foremost its task to ensure compensation. This holds even truer because, as a matter of fact, victims in the territory of the Installation State will, to the detriment of victims outside the Installation State, consume major parts of the compensation money because they live in the vicinity of the accident installation and suffer higher damage than others. The split of the international money shall ensure that there remains money to compensate transboundary damage.¹⁹⁰ The opponents to this concept argued that it resulted in a scheme of two classes of victims and was discriminatory. A victim is a victim.¹⁹¹

From a legal point of view, Article XI paragraph 1 does not conflict with the requirement of equal treatment of victims. Article III paragraph 2(b) expressly subjects the rule on equal treatment to the territorial scope provision in Article V and to the allocation of funds provision in Article XI paragraph 1(b).¹⁹² But as the concept of international supplementary funding is founded on solidarity for humanitarian reasons one might very well conclude that the allocation of funds implies a discrimination of victims which touches on the fundament of the system, particularly if the concept is used to exercise pressure on Installation States to increase compensation amounts.

Irrespective of those problematic concepts, the Convention on Supplementary Compensation marks major progress in developing a universally harmonised nuclear liability law. Its main advantage is its free-standing character. That is an entirely new approach. An international treaty implementing this approach may replace instruments of the Joint Protocol type the scope of which is focused on certain conventions; it may cover all instruments including qualified national legislation.¹⁹³ It is thus apt to provide the basis for a global regime.

6.6. *Appraisal of the Liability Regime*

Nuclear liability is that field of nuclear law which is perhaps the most elaborate one. The revision exercise added important improving elements to it. In substance, the international nuclear liability law has become more perfect than ever before.¹⁹⁴

189. McRae, Compensation Convention (footnote 185) p. 30-31. According to Article XI paragraph 2 there is no split of the funds if a Party, in accordance with Article III paragraph 1 (a), ensures the availability of at least SDR 600 million under the first tier.

190. There is the same situation in certain transport scenarios. In case of transit, the transit state has to license the transport and assumes responsibility for the safety of the transportation. In the event of a nuclear incident victims in the vicinity will consume major parts of the compensation money. But since the incident occurred outside the Installation State – which has no influence whatsoever on the safety of the transport – victims in the transit state will benefit from Article XI paragraph 1. That seems to be unjustified and it appears that the convention is poorly balanced in this regard.

191. When it comes to the ratification of the convention, it will be difficult for Installation States to “sell” the convention to the parliament when they have to explain that victims in other countries enjoy priority over domestic victims. That applies in particular to countries in densely populated areas where the privileged neighbouring state may be close to the installation, as is the case in Europe. “...a form of discrimination that is difficult to justify to their national parliaments.” [Dussart Desart (footnote 146) p. 31].

192. See on this issue in greater detail Vienna Expl. Texts (footnote 147) Section III 7.

193. See the law of conflict provision in Article XIV of the convention.

194. See the summary of the Paris revision exercise, which, *mutatis mutandis*, also applies to the Vienna revision, by Julia Schwartz, “Liability and Compensation for Nuclear Damage: The Revision of the Paris Convention and the Brussels Supplementary Convention”, in: *NEA News* 19 (2003) No. 1, p. 8-11.

The leading nuclear liability principles have been confirmed, which creates legal certainty. They form the main pillar of a worldwide liability regime. Territorial restrictions of the scope of application of the liability conventions have been abandoned which facilitates the bringing of claims by victims from non-Contracting States.¹⁹⁵ The revised concept of damage covers a broader scope without covering too remote damage. It particularly includes well defined damage to the environment and the costs of preventive measures.¹⁹⁶ The liability amounts have been increased considerably. Unlimited liability is now an expressly admitted form of liability.¹⁹⁷ It most probably in the foreseeable future will replace liability which is limited in amount and which already today is a relic of the beginning of the peaceful use of nuclear energy when nuclear industry needed to be fostered. The existing international regime of supplementary compensation has been revised and now ensures very high compensation amounts.¹⁹⁸ A new innovative convention on supplementary compensation has been adopted.¹⁹⁹ The provisions on the limitation of liability in time²⁰⁰ and, last but not least, the provisions on jurisdiction²⁰¹ have been revised.

The enhancements are incorporated in all of the three nuclear liability conventions: the Paris Convention, the Vienna Convention and the new Convention on Supplementary Compensation with its annex. All of them are on equal level and provide equal benefits. States did their homework after the Chernobyl accident.

Yet there is no reason for complacency.

States achieved a higher level of quality in nuclear liability law but they also achieved a higher quantity of instruments covering the very same scope. Since there is consensus that the specifics of a nuclear incident require a globally unified nuclear liability law based on treaty relations the increased figure of liability instruments is a hurdle on the way to a global regime. The existing conventions compete with each other, and states may have difficulties to decide which of them they should adhere to or, if they are already a Party to one of them, whether they should maintain it or replace it by another convention. What can be done to change this situation?

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195. Paris Convention: Article 2; Vienna Convention: Article IA; Convention on Supplementary Compensation: Article V.
 196. Paris Convention: Article 1 Paragraph a (vii-x); Vienna Convention: Article I paragraph 1 (k-o); Convention on Supplementary Compensation : Article I f-h.
 197. Paris Convention: Articles 7, 10; Vienna Convention: Articles V, VII ; Convention on Supplementary Compensation : Article III paragraph 1 (a) (i), Annex Articles 4, 5.
 198. Brussels Supplementary Convention: Article 3.
 199. Convention on Supplementary Funding: Article III paragraph 1 (a) (ii).
 200. Paris Convention: Article 8; Vienna Convention: Article VI; Convention on Supplementary Compensation: Annex Article 9 (in this provision reference is, however, made to the periods of extinction of the unrevised Paris and Vienna Conventions in order to enable States Party to the unrevised conventions to adhere).
 201. Paris Convention: Article 13; Vienna Convention: Articles XI-XII ; Convention on Supplementary Compensation : Article XIII. Jurisdiction has newly been granted to coastal states in the event of a nuclear incident occurring in their internationally recognised maritime zones. See on this subject: Andrea Gioia, "Maritime Zones and the new Provisions on Jurisdiction in the 1997 Vienna Protocol and in the 1997 Convention on Supplementary Compensation", in: Budapest Symposium (footnote 146) p. 299 *et seq.*; also reproduced in: *Nuclear Law Bulletin* No. 63 (June 1999) p. 25 *et seq.*

Prior to the Vienna Convention revision exercise the possibility of merging the Vienna and the Paris Conventions was discussed but quickly discarded.²⁰² From hindsight, this may have been a wrong step because it led to several conventions covering identical scopes. Since we can exclude the possibility of trying to merge the now existing three basic conventions, we have two options.

The first option has already been mentioned.²⁰³ It is the triad Vienna Convention – Joint Protocol – Paris Convention. This triad provides for a basic liability regime, supplementary funds are only available for those members of the triad that are Party to the Brussels Supplementary Convention. Today there are 33 Vienna states, 15 Paris states but, unfortunately, only 24 Joint Protocol states; the group includes 21 states with nuclear programmes. That is a strong basis for further enlargement. This option has a decisive drawback, though. The United States of America, for internal political and legal reasons, will not be able to join the triad. They can only adopt the Convention on Supplementary Compensation because it allows, due to the so-called grandfather clause,²⁰⁴ the United States to maintain its national nuclear liability legislation unchanged.²⁰⁵ A global regime without the leading nuclear power USA certainly would not be perfect. It follows that only the second option based on the Convention on Supplementary Compensation seems to be an acceptable means to establish a global nuclear liability regime. The innovative free-standing approach taken by this convention may form a worldwide “clamp” to connect all of the existing nuclear liability schemes irrespective of whether they are based on conventions or national law. Unfortunately, in the ninth year after its adoption, the convention is not yet in force, and there are no indications that entry into force and especially wider adherence will happen in the near future.²⁰⁶ What are the reasons for the reluctance of states to accept this convention?

It has, from the standpoint of non-nuclear states, been summarised: “...in spite of everything, the final result will on the whole be disappointing.” Nuclear states “have shown hesitation” because of the preferential treatment of victims outside the borders of the Installation State.²⁰⁷ On the other hand, it has also been said that the convention was tailored to ensure “the availability of meaningful compensation”.²⁰⁸ Shortly after the adoption of the convention at the 1999 Budapest Symposium,²⁰⁹ speakers from countries which are not yet Party to any of the conventions expressed their highest interest in the Convention on Supplementary Compensation but at the same time admitted the Vienna Convention and the Paris Convention could also be options for their countries.²¹⁰

202. See Vienna Expl. Texts (footnote 147) Section I 5.

203. See Section 6.2.

204. Article 2 Annex to the Convention on Supplementary Funding.

205. See McRae, Compensation Convention (footnote 185) p. 35; Vienna Expl. Texts (footnote 147) Section III 3 (a) and (c).

206. According to the latest status dated 14 November 2000, the convention has 13 Signatories and 3 Parties, namely Argentina, Morocco and Romania (IAEA Doc. Registration No. N/A). Since 2000 there was no further ratification of, or accession to, the instrument. The US ratification procedure seems to be in an advanced status but is not yet finalised. Ratification by the US would probably give momentum for the adherence of more states.

207. Dussart Desart (footnote 146) p. 31. See also Pelzer, Focus (footnote 166) p. 436-439.

208. McRae, Overview (footnote 185) p. 174.

209. Footnote 146.

210. McIntosh from Australia (footnote 185) p. 192 declared preference for the Convention on Supplementary Compensation but qualified the Paris Convention “as a second best option”. Peter Brown and David

In analysing the situation, the leading concepts of the Convention on Supplementary Compensation shall be discussed. The innovative “free-standing element” and the “bridge building element” of the convention ought to be most welcome to all states because they facilitate the establishment of a global regime. Does that also apply to the “supplementary funding element”? The supplementary money in accordance with the second tier of compensation has nearly totally to be provided by Parties with a nuclear programme. Those states have in their respective parliaments to justify why domestic tax money shall be paid to victims who perhaps live on the other side of the globe which means that there is no mutual risk exposure. For budget people there may be doubts as to whether the extent of the principle of solidarity is that large. There is another question: Why is the Installation State that is responsible for the safe operation of nuclear installations in its territory not required to also use tax money to supplement the operator’s compensation?²¹¹ Unlike the Brussels Supplementary Convention, this convention does not have an Installation State tier. Why should third states use tax money for compensation if the Installation State does not? The split of the international fund in accordance with Article XI paragraph 1²¹² does not properly balance this gap in the system. Finally, nuclear states that mostly have issued elaborate national nuclear liability legislation, may feel discriminated if they, unlike the United States, cannot make use of a grandfather clause to maintain their national nuclear liability law. This, however, is a reason of minor relevance. A grandfather clause in favour of all Parties is not desirable because it would totally jeopardise the goal of international harmonisation of nuclear liability law.

For these reasons, it is not surprising that in particular nuclear states do not feel attracted to join the convention. Without nuclear states, however, there will be no “meaningful compensation” to be provided under the second tier, and this makes the convention also for non-nuclear states less attractive. It follows that the mandatory combination of the “free-standing element” and the “bridge building element” with the “supplementary funding element” is a weakness in the design of the convention. It is apparently based on the too optimistic conception that worldwide international complementary funding is easily feasible. Accepting international nuclear liability rules is not necessarily twinned with agreeing to mandatory supplementary funding.²¹³ That design weakness appears to be the main reason for the reluctance of states to join the convention.²¹⁴

McCauley, “A New Global Regime of Civil Nuclear Liability: Canadian Membership in the International Conventions”, in: Budapest Symposium (footnote 146) p. 193 *et seq.* expressed interest in the Vienna Convention but also in the new convention, *inter alia*, “to enhance its relationship with the United States on third party liability” should the US ratify this convention (p. 201). Ki-Gab Park, “The Convention on Supplementary Compensation for Nuclear Damage and Asian States: The Advantages and Disadvantages of Korea’s Adherence to the Convention”, in: Budapest Symposium (footnote 146) p. 203 *et seq.* avoided a clear statement.

211. The obligation of the Installation State to ensure the payment of claims by providing the necessary funds to the extent that the yield of financial security of the operator liable is inadequate is another issue [Article 5 paragraph 1 of the Annex to the Convention on Supplementary Compensation].
212. See above Section 6.5.
213. If the content of the Brussels Supplementary Convention were an integral and mandatory part of the Paris Convention states would probably also had hesitated to join that convention. The Paris states Greece, Portugal and Turkey still today stay away from the Brussels regime although they would benefit from it.
214. With regard to Paris/Brussels states there exists a special situation. In principle, they are entirely satisfied with the revised Brussels Supplementary Convention which ensures a total compensation amount of EUR 1 500 million, which is more than the Convention on Supplementary Compensation would provide. Consequently, there is no major financial interest in joining the convention. Nevertheless, Article 14 paragraph d of the revised Brussels Convention opens the door to also adhering to the Convention on

This situation is tricky. It could be overcome by decoupling the supplementary funding provisions, e.g., by making them optional. But this solution needed new negotiations, which, for the time being, is not a realistic prospect. Consequently, nothing can be done but explain the pros and cons of the existing conventions to the states and wait and see what they will do. The situation slightly reminds of the antique Greek tragedy where people aim at the best and achieve the worst: States succeeded in significantly enhancing the existing international nuclear liability law. It now reflects the Chernobyl experience and offers risk adequate solutions. In order to make the renovated regime even more perfect, in particular with the view to preparing and securing the ground for a global regime, states opened too many avenues leading to that regime. That, however, entailed uncertainty, perhaps even confusion, which eventually might only lead to conserving the existing patchwork pattern situation with regard to international nuclear liability rather than establishing a globally harmonised nuclear liability law.

7. Nuclear Law of the Year 2006

The overview of main international nuclear law features presented in this article provides the proof that the international community is capable of reacting in an effective and adequate way to a disaster of the Chernobyl accident type. States and international organisations joined their legal and political forces to tackle the legal aspects connected with the accident. The efforts were focused on two goals: prevention of possible future nuclear accidents and mitigation of the consequences of an accident should it occur. The legal instruments to achieve these objectives are binding international agreements and conventions, non-binding international recommendations, such as technical codes and standards, and, last but not least, national legislative and regulatory measures. Since public international law is an imperfect and sometimes weak legal regime which has to be accepted by states and which in particular needs the national implementation of its obligations, national law, without prejudice to its far reaching “internationalisation”, still plays the crucial role in obtaining a sound legal basis for the use of nuclear energy which appropriately governs both the risks and the benefits of nuclear energy and ionising radiation. This article cannot present a comparative overview of the national legal developments, although, of course, the subject necessitates such a study. One may, however, conclude from relevant publications²¹⁵ that national legal developments since the Chernobyl accident concur with and match the international efforts. There is a synallagmatic interrelationship between national and international nuclear law.

The results of the deliberations presented in this article show a clear picture.

For a long time radiation protection law and the law of the transportation of radioactive materials have been governed by international technical recommendations, which were made binding by international and national instruments. This resulted in a global harmonisation of the respective legal regime. The Chernobyl accident did not initiate major new projects in this special technical field but ongoing efforts to up-date and to enhance existing standards, codes and guidelines enjoyed new momentum and were intensified.

The accident, however, did promote and accelerate the incorporation of technical and scientific findings into legal and quasi-legal instruments. New techniques of transformation have been developed: in order to adapt the normally long and complex technical rules to the requirements of a

Supplementary Compensation and allows Parties to use Brussels money to satisfy obligations under that convention provided all of the Brussels Parties join the Convention on Supplementary Compensation.

215. See above Section 1.3., particularly the references in footnotes 23 and 24.

legal text, so-called Fundamentals have been extracted from the technical rules. Those Fundamentals reflect international good practices. In particular, this new approach made possible and facilitated mutual understanding among legal and technical experts when negotiating conventions. Nuclear safety and nuclear security benefited most from this new approach.²¹⁶

Nuclear safety became the centre of innovation. This subject has already for a long time been on the agenda of technical experts who developed relevant standards, guides and codes. National authorities used them as appropriate and as they deemed fit. After Chernobyl nuclear safety for the first time became a legal issue at international and worldwide level. International conventions were negotiated, drafted and adopted. The conventions used new legal techniques: the incentive convention was born. It combines elements of binding and of soft law, a concept which is the only one that is accepted by states in the field of nuclear safety. In parallel, non-binding codes in the field of the safety of research reactors and of radioactive sources have been developed and adopted. Experience will show if and to what extent both different types of instruments will meet their objectives.

Nuclear security was subject of reconsideration as well. An amendment to the existing convention was adopted. The revision was mainly triggered by the increased threat of worldwide terrorism. The agreed amendment also contains some elements of soft law which, in this special case, could invite Parties to evade the obligations under the convention.

Finalising the revision of the three international instruments on nuclear liability and drafting two new instruments lasted from 1988 to 2004. The outcome of these exercises is excellent: the Chernobyl experience has been incorporated into nuclear liability law. Today, it is undisputed and generally acknowledged that an effective nuclear liability regime needs global acceptance. Unfortunately, exactly this requirement gives reason for major concern. There are three basic nuclear liability conventions each of which is alone, or in combination with one of the others, apt to form the basis of such global system. Currently, it cannot be predicted whether at least a majority²¹⁷ of states will decide in favour of one of the options and reject the others.

Nuclear safeguards have not been dealt with in this article because there is no direct link to the Chernobyl accident. Recent political developments in particular in connection with terrorism and with the situation in two countries, however, request highest attention to this field of nuclear law.

In summary, the lessons taught by the Chernobyl accident entailed a principal reconsideration of existing nuclear law worldwide. They triggered international and national activities which resulted in major and significant amendments to the international body of nuclear law and its national implementing legislations. Hence, the Chernobyl lessons did contribute to the improvement of nuclear law.

This positive assessment, however, ought to not suggest discouraging, and slowing down, efforts to further enhancements. Nothing in the world is perfect, and this includes the nuclear law of the year 2006. Without aiming at presenting an exclusive list, the following topics should be brought into international focus.

The national implementation and practice of the new international instruments should be kept under observation, in particular with regard to the incentive convention concept.

216. See above Sections 4.3., 4.4., 5.2.

217. It is scarcely probable that all states opt for one and the same convention; a majority of states would therefore already be progress.

The legal problems of establishing and operating international nuclear waste repositories should be discussed.²¹⁸

The interrelationship of international nuclear law with general international environmental law should be studied with the view to identifying possible overlap, duplication and conflicts.

Nuclear liability continues being a subject of international endeavours. There are a number of issues which call for attention:

- further preparing the ground for a global regime;
- meeting the concern of coastal states with regard to the risk of transport of nuclear material;²¹⁹
- convincing non-nuclear states to adhere to the international nuclear liability conventions rather than relying on domestic civil liability law;²²⁰
- considering internationally harmonised principles and procedures for the compensation of catastrophic nuclear damage;²²¹
- “normalising” nuclear liability law as appropriate, e.g., mitigating the concept of legal channelling in certain well defined cases, replacing liability limited in amount by unlimited liability with limited coverage.²²²

There are probably more issues of interest and, as the case may be, of a higher priority than those listed above. As nuclear law is accessory to the use of nuclear energy, it is a permanent challenge for states and for the competent international organisations. Both have to meet this challenge.

At the level of intergovernmental organisations, there are two expert groups which according to their mandate are particularly entrusted with considering the further development of international nuclear law. Within the OECD Nuclear Energy Agency, the Nuclear Law Committee (NLC) consisting of expert representatives of member countries is the competent body to deal with nuclear law issues. Within the IAEA, its Director General has convened a group of experts, selected *ad personam*, to discuss, and give advice on, nuclear liability matters, namely the International Expert Group on Nuclear Liability (INLEX).²²³ At the level of non-governmental organisations, the learned

218. See references in footnote 99.

219. See Julian Ludbrook, “Sea Transport of Nuclear Material – a Matter of Concern for Coastal States”, in: Pelzer (ed.), *Internationalisierung* (footnote 70), p. 239 *et seq.*

220. See Paul O’Higgins, Patrick McGrath, “Third Party Liability in the Field of Nuclear Law: An Irish Perspective”, in: *Nuclear Law Bulletin* No. 70 (2002/2) p. 7 *et seq.*; Edmund P. Carrol, “Why does Ireland not Adhere to the International Nuclear Liability Conventions?”, in: Pelzer (ed.), *Internationalisierung* (footnote 70) p. 229 *et seq.*

221. See Footnote 167.

222. See Pelzer, *Focus* (footnote 166) p. 427-429; Heikki Kolehmainen, “The Modernisation of the International Nuclear Third Party Liability Regime – Does Exclusive Liability still Make Sense?”, in: *Budapest Symposium* (footnote 146) p. 453 *et seq.*

223. The restriction of the mandate to nuclear liability should perhaps one day be reconsidered. The IAEA, like the OECD/NEA, should deploy a group covering the entire field of nuclear law and give advice as appropriate and requested.

society *Association internationale du droit nucléaire*/International Nuclear Law Association (AIDN/INLA), Brussels, is called upon to co-operate in further enhancing nuclear law.²²⁴

Within the realm of law, nuclear law has a specific position. Although it covers only a narrow part of human activities it nevertheless *in nuce* mirrors the entire field of law. It is its task to tame the risks and dangers of nuclear energy and ionising radiation without inadequately impeding the use of their benefits. This broad objective involves all branches of law: public law, civil law, criminal law, environmental law and in particular international law. Specialised expertise of lawyers is required. The conservation of existing legal knowledge and its transfer to the younger generation is a main challenge which may also be qualified as a lesson to be learnt from the Chernobyl accident. Nuclear law calls for greater attention of the law faculties of universities. Both teaching nuclear law²²⁵ and research in nuclear law have to be promoted. The foundation of the International School of Nuclear Law in 2001 at the University of Montpellier, France, which is jointly sponsored by the OECD/NEA, the IAEA, the EU and by INLA, therefore is a step in the right direction.²²⁶

However, studying nuclear law and educating nuclear law experts alone are not enough to cope with the Chernobyl lessons. There are additional tasks for lawyers. The use of nuclear energy and ionising radiation in most states is a matter of major concern for the general public. People are sceptical or even strongly opposed to this form of energy. The Chernobyl nuclear accident seemed to confirm the views of the opponents. There is general distrust and there is particular distrust in the capability of the law to contribute to taming nuclear energy and to ensuring the use of its benefits without detrimental effects. In democracies under the rule of law such concern of the public and of individuals has to be duly taken into account even if unjustified. Lawmakers have to build confidence among state authorities, nuclear industry and the general public by involving the public in the lawmaking process.²²⁷ Participation of the public is practised in various forms at national level, particularly by public hearings in the course of licensing procedures. In the light of the transboundary effects of a nuclear incident and in the light of the advanced internationalisation of nuclear law, an enlarged involvement of the public in the international lawmaking process is required.²²⁸

224. www.aidn-inla.be.

225. In a contribution to the discussion at the Budapest Symposium (footnote 146) p. 227, Vanda Lamm, referring to a recent Hungarian case on Chernobyl damage compensation, underlined the complexity of nuclear liability law not only from a legal point of view but also in terms of language which often is difficult to translate into the language of the court. It follows that it is advisable to also teach judges and other practitioners in nuclear law.

226. www.nea.fr/html/law/isnl/.

227. “Nuclear Law as a Source of Confidence” was the general theme of the 1995 Nuclear Inter Jura Conference in Helsinki.

228. Pierre Strohl in his article “Disposal of Radioactive Waste: The Question of the Involvement of the Public under International Law”, in: *Nuclear Law Bulletin* No. 64 (December 1999) p. 29 *et seq.* tackles this issue.