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International Nuclear Law in the Post-Chernobyl Period

A Joint Report

IAEA
International Atomic Energy Agency

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A Joint Report by the OECD Nuclear Energy Agency
and the International Atomic Energy Agency

ISBN 92-64-02293-7

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NEA No. 6146

NUCLEAR ENERGY AGENCY
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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NUCLEAR ENERGY AGENCY

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The mission of the NEA is:

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In these and related tasks, the NEA works in close collaboration with the International Atomic Energy Agency in Vienna, with which it has a Co-operation Agreement, as well as with other international organisations in the nuclear field.

FOREWORD

The accident which took place on 26 April 1986 at the Chernobyl nuclear power plant in Ukraine was to have a decisive influence on the development of international nuclear law over the following two decades.

Within six months of the accident, a convention on early notification of a nuclear accident and a convention on assistance in the event of a nuclear accident or radiological emergency were negotiated and adopted under the auspices of the International Atomic Energy Agency. In 1988, a joint protocol forming a bridge between the two existing international nuclear liability regimes was established. 1994 saw the adoption of a convention establishing international benchmarks for nuclear safety, followed by a convention on the safety of spent fuel and radioactive waste management in 1997. The existing international regimes governing liability for nuclear damage have been significantly reinforced and a new global regime created.

The purpose of this compendium, jointly produced by the OECD Nuclear Energy Agency and the International Atomic Energy Agency, is to provide thoughtful analysis on each of the above instruments, demonstrating the extent to which progress has been made and identifying areas in which further improvement would be desirable. It reproduces a number of articles which have been published in the OECD/NEA *Nuclear Law Bulletin*, accompanied by some previously unpublished works. It also summarises the practical steps taken by the respective international organisations that support the international legal framework.

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by Johan Rautenbach, Wolfram Tonhauser and Anthony Wetherall*

Introduction

The accident on 26 April 1986 in unit 4 of the Chernobyl nuclear power plant in the former Ukrainian Republic of the Union of Soviet Socialist Republics, near the present borders of Belarus, the Russian Federation and Ukraine, was categorised at the time as "the most devastating accident in the history of nuclear power".[1] Two decades on, the assessment of the health, environmental and socio-economic impacts of the accident still continues, with the aim of providing definitive and authoritative answers.[2]

In addition, from a legal perspective the accident underlined some significant deficiencies and gaps in the international legal and regulatory norms that had been established to govern the safe and peaceful uses of nuclear energy. At the same time, it stressed the "need for a collective international focus on [nuclear] safety" and, in its wake, prompted a call for "the creation of an international regime for the safe development of [nuclear energy]" under the auspices of the IAEA.[3]

For all its devastating consequences, the accident was in fact a wake-up call for the "international nuclear community" and led to a new era in international nuclear cooperation, involving states which had so far been removed both geographically and technologically from nuclear power. In

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* Mr. Johan Rautenbach is the Director of the Office of Legal Affairs of the International Atomic Energy Agency (IAEA), Mr. Wolfram Tonhauser is the Head of the Nuclear and Treaty Law Section and Mr. Anthony Wetherall is a Legal Officer in that office. The views expressed in this paper are those of the authors and do not necessarily represent those of the IAEA.

1. See IAEA document "Ten years after Chernobyl: What do we really know?", IAEA/PI/A51E.

2. See, *inter alia*, the Chernobyl Forum which was set up in 2003 by the IAEA in cooperation with FAO, OCHA, UNDP, UNEP, UNSCEAR, WHO and the World Bank, as well as representatives of Belarus, the Russian Federation and Ukraine and which aims at finding authoritative consensus on the effects of the accident. At the IAEA conference "Chernobyl: Looking Back to Go Forwards", organised by the IAEA on behalf of the Chernobyl Forum in Vienna in September 2005, the Forum's findings were presented and subsequently published in digest form together with recommendations for concrete action. A link to the digest Report of the Chernobyl Forum, "Chernobyl's Legacy: Health, Environmental and Socio-economic Impacts and Recommendations to the governments of Belarus, the Russian Federation and Ukraine" (IAEA, September 2005) can be found on www.iaea.org/NewsCenter/Focus/Chernobyl.

3. See the statement of Mr. R. Reagan, President of the United States of America [IAEA document GC(SPL.I)OR.1, para. 82] and Mr. M. S. Gorbachev, General Secretary of the Central Committee of the Communist Party of the USSR, to the Special Session of the General Conference [IAEA document GOV/INF/497, 20 May 1986], on 24 September 1986, respectively. See also IAEA Document GC(SPL.I)/8.

its aftermath, the international nuclear community, in an attempt to allay concerns of the public and political world over the use of the atom as a viable energy source, sought to rebuild confidence in the safety of nuclear energy, primarily through the IAEA, by urgently addressing those main deficiencies in the existing international legal framework that had been exemplified by the accident.

As much has already been written on the substantive provisions and negotiating history of the different international instruments that comprise this legal framework and that were developed under the auspices of the IAEA in the two decades since the Chernobyl accident, this paper only briefly describes their substance and the background leading to their respective development. More importantly, however, this paper highlights some of the practical steps taken since the accident, both by the IAEA and the international community, which underpin this framework. In addition, the paper identifies some of the current challenges and, in a brief outlook, considers some recent multilateral initiatives in the nuclear domain and their possible impact on future developments in nuclear law.

Part I. Overview of the International Legal Framework and Practical Steps

The international community's activities concerning nuclear safety have changed dramatically from those carried out in the early years of the IAEA. In particular, prior to the Chernobyl accident there had been little by way of legally binding international commitments. Nuclear power plant safety had differed in that regard from air safety or safety at sea, where binding international rules had long existed. The difference was not surprising: unlike an airplane or ship, these plants are clearly sedentary, remaining firmly situated in the national jurisdiction of one state.

However, in light of the accident's significant transboundary consequences, the international community no longer considered that the safety of nuclear power plants was strictly of national concern, which in turn led to a strong interest in the maintenance of a high level of safety worldwide and ultimately resulted in the establishment and progressive development of today's "global nuclear safety regime". It is fair to say that the IAEA has been at the forefront of this "revolution" and in fact has set the framework for cooperative efforts to build and strengthen this global regime which, in a nutshell, is based on four principal elements: first, the adoption of and widespread subscription to binding and non-binding international legal instruments which have been adopted since the accident; second, a comprehensive suite of nuclear safety standards that embody good practices as a reference point to the high level of safety required for all nuclear activities;[4] third, a suite of international safety advisory reviews and services, based on these standards; fourth, the establishment of national legal and regulatory infrastructures necessary to implement stringent safety measures, for example, the

4. Under the terms of Article III.A.6 of its Statute, the IAEA is authorised to establish or adopt standards of safety for the protection of health and minimisation of danger to life and property and to provide for the application of these standards to peaceful nuclear activities. To date, the IAEA Safety Standards Series comprises of publications of a regulatory nature covering nuclear safety, radiation safety, transport safety, waste safety, and general safety including the legal and governmental infrastructure for safety, emergency preparedness and response, assessment and verification and management systems. The Safety Standards Series which comprises of approximately 70 standards (with a further number under preparation), superseded the Safety Series, in which over 200 publications were issued. Safety Standards Series publications are categorised into: (1) Safety Fundamentals, stating basic objectives, concepts and principles of safety and protection – they are the "policy" documents of the Series; (2) Safety Requirements, establishing the basic requirements that must be fulfilled to ensure safety for particular activities or applications; and (3) Safety Guides, recommending actions, conditions or procedures for complying with these safety requirements. Safety Guides are issued under the authority of the IAEA Director General and Safety Fundamentals and Safety Requirements require the approval of the IAEA Board of Governors before publication.

establishment of technically competent and independent national nuclear regulatory authorities. Also, a global experts' community of self sustaining safety networks of expert knowledge and experience has been created to facilitate continuous safety improvement and mutual learning.

1. Emergency Preparedness and Response

While work under the auspices of the IAEA in the mid-1960s leading to the adoption of a draft multilateral agreement on emergency assistance was eventually decided as being unattainable,[5] following the 1979 Three Mile Island (TMI) nuclear accident in the United States of America there was, through the IAEA, renewed and increased interest in international cooperation in the event of a nuclear accident.[6] Although the benefits of a binding multilateral agreement in this field was always recognised, it was considered, however, that the negotiation of such an instrument would take time and that advisory norms should therefore be developed first which could possibly be used, at a later stage, for the negotiation of a binding instrument in this field.[7]

However, this "later stage" only occurred some seventeen years after TMI and following the Chernobyl accident in 1986. The first response to the call for an "international regime" was almost instantly answered in the breaking of new ground in the treaty making process, by the unprecedented and prompt successful negotiation in four months of international binding commitments to notify and provide assistance in case of a nuclear accident. The two international IAEA guidelines recommending procedures in the event of a nuclear accident that had been previously developed,[8] were quickly replaced by the Convention on Early Notification of a Nuclear Accident (the Early Notification Convention) and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (the Assistance Convention).[9]

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5. See the record of the IAEA Board of Governor's meeting in IAEA document GOV/OR Meeting 386 (34-71), 24 February, 1967.

6. Prior to the TMI accident, the IAEA's role in coordinating emergency planning and preparedness was minor. However, in June 1979 the Board of Governors approved the IAEA Director General's recommendations to include in the IAEA's nuclear safety programme, activities regarding the exchange of nuclear safety information and mutual emergency assistance for radiation accidents [see IAEA document GOV/DEC/103(XXII), No. 27 and also IAEA document GOV/1948]. The TMI accident also led to the establishment of Operational Safety Review Teams (OSART) in 1982 and to the establishment in April 1983 of an Incident Reporting System (IRS).

7. See IAEA document GOV/2069/Rev.1 and paras. 16-74 of GOV/OR.588 concerning the resolution submitted jointly by the Governments of the Netherlands, Sweden and the United States of America requesting the IAEA Director General, *inter alia*, to convene a "Group of Governmental Representatives […] to prepare an international convention on nuclear safety co-operation and mutual emergency assistance in connection with nuclear accidents […]". See also the Report of the Group of Experts which met from 28 June to 2 July 1982 (IAEA document GOV/2093, 16 August 1982).

8. See Guidelines on Reportable Events, Integrated Planning and Information Exchange In Transboundary Release of Radioactive Materials (IAEA document INFCIRC/321 issued in 1985) and Guidelines for Mutual Emergency Assistance Arrangements in Connection with a Nuclear Accident or Radiological Emergency (IAEA document INFCIRC/310, issued in 1984).

9. The Convention on Early Notification of a Nuclear Accident (IAEA document INFCIRC/335) and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (IAEA document INFCIRC/336/Add.1) were both adopted by the IAEA General Conference at its Special Session, held from 24 to 26 September 1986, and were both opened for signature at Vienna on 26 September 1986 and at New York on 6 October 1986. They entered into force on 27 October 1986 and

The conventions establish in treaty form the duty of states to notify nuclear accidents with actual or possible transboundary effects, and the duty of states to cooperate in arranging for assistance in the case of a nuclear accident or radiological emergency.[10] States' obligations under these two conventions derive from the conventions' objectives, which are to minimise (and to mitigate the consequences of) the radiological consequences of an emergency and to protect life, property and the environment. In addition, the conventions contain obligations related to emergency plans, notification procedures, the nature of information to be provided and general requirements concerning the provision of assistance.

While the Early Notification and Assistance Conventions are the key elements of the international legal framework for international co-operation and co-ordination in the event of a nuclear or radiological emergency, there have also been a number of events that were outside their strict scope of application. In this respect, a number of practical arrangements and mechanisms have been developed over the years which have contributed to the international nuclear emergency preparedness and response system. In particular, this system includes the IAEA Incident and Emergency Center (IEC), which was established within the Secretariat of the IAEA as a 24-hour warning and operational focal point for acting on notifications and/or advisory messages by states and relevant international organisations, for example, of nuclear or radiological emergencies, as well as responding to requests for information or assistance during such emergencies. In fact, while the Conventions provide that the IAEA has a specific operational role in a nuclear or radiological emergency, something which had been envisaged since its inception, the IEC at present actually facilitates the management of a rapid coordinated response to events that may give rise to radiological consequences irrespective of their cause. Further, the IEC is concerned with promoting, facilitating and supporting co-operation among Parties to the conventions and establishing and maintaining liaison with relevant international organisations.[11]

A second element or mechanism in this field is the Emergency Notification and Assistance Technical Operations Manual (EPR-ENATOM 2004) which, since 1989, documents the practical implementation of those Articles of the Early Notification and Assistance Conventions that are operational in nature. It conceptually links the IAEA, its Member States, Parties to the conventions, relevant international organisations and other states and clarifies the expectations of the IAEA

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26 February 1987, respectively. However, it should be noted that there are also a number of bilateral agreements and one regional agreement: the Nordic Mutual Emergency Assistance Agreement in Connection with Radiation Accidents. This agreement was signed on 17 October 1963 by the IAEA Director General and by representatives of the governments of Denmark, Finland, Norway and Sweden. It entered into force on 19 June 1964 with the deposit of an instrument of ratification by the Government of Norway (see IAEA document INFCIRC/49 and Add.1).

10. The conventions elaborate and expand in the scope of nuclear activities and practices, Principles 20 and 21 of the Declaration of the United Nations Conference on the Human Environment, adopted in 1972 and endorsed by the UN General Assembly. It should be noted that the acceptance by the five Nuclear Weapons States (China, France, UK and USA and USSR) of the obligation to notify and to provide detailed information on all accidents, implicitly includes military nuclear facilities.

11. Prior to 1 February 2005, the centre was known as the Emergency Response Centre (ERC). Its functions have been extended to include: incident reporting, coordinating prompt assistance to requesting states in the case of a nuclear security incident, and to providing coordinated technical support to the IAEA's Division of Public Information in the case of an event of safety or security concern to the media.

Secretariat for the arrangements concerning the issue of requesting and providing assistance in the event of a nuclear or radiological emergency.[12]

There is also the Emergency Response Network Manual (EPR-ERNET 2002) which, since 2000, addresses the practical arrangements concerning the provision of assistance. In particular, it provides for a global event response network of national response capabilities (e.g. national experts and equipment etc.) available to respond rapidly to nuclear or radiological emergencies. Its major objectives are to strengthen the IAEA's capability to provide assistance and advice, to co-ordinate the provision of assistance as specified within the framework of the Assistance Convention, and to promote emergency preparedness and response capabilities for nuclear or radiological emergencies/incidents among IAEA Member States.[13]

In addition, good planning in advance of an emergency and clarity with clear lines of responsibility and authority, with regard to the interactions between various international organisations during an emergency, has been recognised as an important feature of the emergency response system. In this regard, pursuant to the obligations placed on it by the conventions, the IAEA regularly convenes the Inter-Agency Committee on Response to Nuclear Accidents (IACRNA), whose purpose is to co-ordinate the arrangements of the relevant international organisations for preparing for and responding to nuclear or radiological emergencies.[14]

Furthermore, although the conventions assign specific response functions and responsibilities to the IAEA and the Parties to the conventions, a number of international organisations have – by virtue of their statutory functions or of related legal instruments – general functions and responsibilities that encompass aspects of emergency preparedness and response. In this context, the latest edition of the Joint Radiation Emergency Management Plan of the International Organisations (EPR-Joint Plan 2004) describes the inter-agency framework for preparedness for and response to an actual, potential or perceived nuclear or radiological emergency. In particular, it sets out the objectives of response, the

12. The Manual was first published on 18 January 1989 and was republished in December 2000 and December 2004. The 2004 edition reflects, *inter alia*, that emergency situations can arise from both accidents and deliberate acts (malicious acts).

13. The present Manual entered into effect on 1 March 2003. It superseded the previous version – EPR-ERNET (2000). The Manual has been revised and the new Manual, the Response Assistance Network [EPR-RANET (2006)], will become effective on 1 May 2006. It reflects, *inter alia*, the concept of "radiological incidents" occurring from malicious acts.

14. The Inter-Agency Committee for the Co-ordinated Planning and Implementation of Response to Accidental Releases of Radioactive Substances (now renamed as IACRNA) was established following a meeting of representatives of FAO, UNEP, ILO, UNSCEAR, WMO, WHO and IAEA at the Special Session of the IAEA General Conference in September 1986. Currently its members are representatives from the European Commission (EC), the European Police Office (EUROPOL), the Food and Agriculture Organization of the United Nations (FAO), the International Atomic Energy Agency (IAEA), International Civil Aviation Organization (ICAO), the International Criminal Police Organization (INTERPOL), the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (OECD/NEA), the Pan American Health Organization (PAHO), the United Nations Environment Programme (UNEP), the United Nations Office for the Co-ordination of Humanitarian Affairs (UN/OCHA), the United Nations Office for Outer Space Affairs (UN/OOSA), the World Health Organization (WHO) and the World Meteorological Organization (WMO).

organisations involved in response, including their roles and responsibilities, it clarifies the interfaces among them and states and identifies operational concepts and preparedness arrangements.[15]

Finally, as well as responding to real events, the IAEA regularly tests its capabilities, *inter alia*, by organising and participating in international emergency response exercises. These exercises and their effective evaluation are an essential tool for improving the international emergency response arrangements. The most recent international exercise was ConvEx-3 (2005) which took place from 11 to 12 May 2005. It tested the international information exchange arrangements and mechanisms for providing public information in the early phase of a postulated serious nuclear emergency at the Cernavoda nuclear power plant, in Romania. The exercise provided an opportunity to, *inter alia*, identify possible shortcomings in national and international information exchange and response systems that might hamper the response aimed at minimising the consequences of a nuclear accident.

In addition to the aforementioned practical steps, Article 7 of the Early Notification Convention and Article 4 of the Assistance Convention, respectively, provide for the designation by States Parties of competent authorities to carry out specific functions with respect to issuing and receiving information relating to nuclear and radiological emergencies. Since 2001, the IAEA Secretariat has convened three biennial meetings of such competent authorities.[16] These meetings have resulted in a number of actions that have been considered by the IAEA Secretariat in developing its future plans for strengthening the system. In addition to improvements in the operation of the IEC, a regionally balanced National Competent Authorities' Co-ordinating Group (NCACG) was established in June 2003 which focuses its priorities on strategies for enhancing international communications and assistance while ensuring harmonisation and co-ordination with the IAEA Secretariat. Proposals have also been agreed for enhancing the existing drill and international emergency response exercise regime, recommending that these exercises address both nuclear accidents and radiological emergencies, including those arising from malicious acts. Of particular interest is the recommendation of the last meeting of competent authorities held in July 2005 that the IAEA Secretariat initiate the development of a "Code of Conduct for the International Emergency Management System" as the basis to support the practical mechanisms of the conventions and EPR-ENATOM.[17]

Complementary to the above, the IAEA Board of Governors approved in June 2004 and the IAEA General Conference endorsed the following September, an International Action Plan for Strengthening the International Preparedness and Response System for Nuclear and Radiological Emergencies. The Action Plan covers two main areas: it includes activities concerning international communication and assistance for nuclear and radiological emergencies and attempts to establish a sustainable infrastructure of preparedness and response in such cases.[18]

Finally, the IAEA's principal role with regard to international arrangements for response to a nuclear or radiological emergency is to establish and provide for the application of the relevant

15. These practical arrangements are reflected in the various organisations' own emergency plans. For example, the IAEA's in-house Nuclear and Radiation Event Assistance Plan (NAREAP) and WHO's Radiation Emergency Medical Preparedness and Assistance Network Manual (REMPAN).

16. The first meeting was held from 8 to 22 June 2001, the second from 2 to 6 June 2003 and the third meeting from 12 to 15 July 2005. All meetings have been held at IAEA Headquarters, Vienna.

17. See the Report of the Third Meeting of representatives of competent authorities identified under the Early Notification and Assistance Conventions, held in Vienna from 12 to 15 July 2005 (FINAL NCAM/REP/2005, TM-27206, 2005-08-08).

18. The plan was approved by the IAEA Board of Governors in June 2004 and the IAEA General Conference in resolution GC(47)/RES/7.A of September 2004.

international safety standards.[19] In providing for the application of these standards, international teams of experts conduct reviews on request of Member States preparedness for nuclear and/or radiological emergencies in Emergency Preparedness Review Teams (EPREV).

2. Safety of Nuclear Power Plants

Despite suggestions voiced since the 1960s that an international convention on the safety of nuclear power would create minimum worldwide standards for an activity that rested at the heart of the civilian uses of nuclear energy, the international community was generally disinclined to go beyond the recommendatory nature of the safety standards for nuclear power plants and to work out such a legally binding international instrument. However, the transboundary consequences of the Chernobyl accident clearly demonstrated that in nuclear matters, states shared similar concerns in spite of the differences that might exist in their socio-economic and political systems. Furthermore, it was recognised that while each state operating a nuclear power plant bears full and unequivocal responsibility for safety, for each state the maintenance of safety was an international responsibility.

Although a new set of safety standards for nuclear power plants was approved in June 1988,[20] it took a further five years after the Chernobyl accident for the earlier call for "the creation of an international regime for the safe development of [nuclear energy]" to be echoed in detail by a request for the establishment of an "International Nuclear Safety Regime", based on safety principles, methods of verification, exchange of information and peer review.[21] As a consequence, policymakers decided that it was time "to consider an integrated international approach to all aspects of nuclear safety, including safety objectives for radioactive wastes, which could be adopted by all governments, and in this connection, [they recognised] the potential value of a step by step approach to a framework convention".[22]

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19. See, in particular the Safety Requirements publication on Preparedness and Response for a Nuclear or Radiological Emergency [see IAEA document, Safety Standards Series No. GS-R-2, IAEA, Vienna (2002)], which constitutes the basis for international cooperation and is intended to minimise the consequences for people, property and the environment of any nuclear or radiological emergency.

20. In 1974, the IAEA launched a new Nuclear Safety Standards Programme (NUSS). This programme was comprised of a comprehensive series of Codes of Practice, supplemented by Safety Guides detailing their implementation that were intended to ensure the safe design, siting and operation of the current generation of nuclear power reactors and enhance the reliability of the Codes for nuclear power plants. At the time of the Chernobyl accident some five Codes and 55 Safety Guides for nuclear power plants had been prepared. In light of the Chernobyl accident, the Codes were updated in 1988 to, *inter alia*, include a set of basic Safety Principles to cover nuclear power plants.

21. In particular, see the opening address of Mr. K. Töpfer, President of the International Conference on the Safety of Nuclear Power; Strategy for the Future (organised by the IAEA and held at IAEA Headquarters in Vienna, from 2 to 6 September 1991), in the Safety of Nuclear Power: Strategy for the Future, Proceedings of a Conference [p. 9, IAEA document STI/PUB/880, (1992)]. See also the Co-Chairman's Summary of Issue I.

22. See the Major Findings of the International Conference, p. 95-96 (footnote 21). See also General Conference resolution GC(XXXV)/RES/533, 20 September 1991, paras. 3-4, inviting the IAEA Director General to prepare "an outline on the possible elements of a nuclear safety convention" for the Board of Governors' consideration. Also see the report by the IAEA Director General on an Outline of the Possible Elements of a Nuclear Safety Convention, to the March 1992 meeting of the Board of Governors (IAEA document GOV/2567, 21 January 1992).

At the outset, there was support for the CNS to be more comprehensive, covering the whole nuclear fuel cycle, including the safe management of all types of nuclear installations and the safe management of radioactive waste. It was agreed, however, after protracted deliberations that its scope of application should apply exclusively to land based civil nuclear power plants, as defined therein.[23] The affirmation, though, of the need to begin promptly the development of an international convention on the safety of radioactive waste management illustrated the importance states gave to further making good the international cooperation that had started in earnest a decade earlier.[24] In the end, after two years of preparatory work, the Convention on Nuclear Safety (CNS) was adopted on 17 June 1994.[25]

The CNS requires states to fulfil a number of obligations relating to the regulation, management and operation of nuclear power plants. There is the fundamental obligation to establish and maintain a legislative and regulatory framework with respect to the safe management and operation of land-based civil nuclear power plants, and to implement a number of measures based on general internationally accepted safety considerations regarding, for example, the availability of financial and human resources, the assessment and verification of safety, quality assurance and emergency preparedness. The CNS also addresses technical aspects of the safety of such nuclear installations, including their siting, design and construction, as well as their operation.

The CNS is referred to as an "incentive convention" and therefore, unlike mechanisms in other legally binding international law instruments, its effectiveness does not derive from specific obligations for non-compliance or reliance on dispute settlement provisions but rather it seeks to rely on a common interest amongst the Parties to achieve high levels of safety. The mechanism for realising this commonality is achieved through the holding of periodic triennial meetings of the Parties, which they are not only obligated to attend but where they are also duty bound to submit "national reports" on the implementation of their obligations for a "peer review" by the other Parties.[26]

These national reports are the tools that enable Parties to focus on the steps and measures already taken and the progress made in implementing the respective conventions' obligations. Not only do they demonstrate compliance with a state's international obligations but they also serve two other important purposes. First, although being a major task, they allow national authorities to review all national activities and to draw conclusions on future measures that may have to be taken. Secondly,

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23. For further analysis of the negotiations of the CNS and its substantive provisions see "The Convention on Nuclear Safety", Odette Jankowitsch, *Nuclear Law Bulletin* No. 54 (1996) and "International Convention on Nuclear Safety: National Reporting as the Key to Effective Implementation", Carlton Stoiber, in Nathalie Horbach, *Contemporary Developments in Nuclear Energy Law: Harmonising Legislation in CEES/NIS* (1999).

24. See preambular paragraph (viii) of the CNS which explicitly provides to "begin promptly the development of an international convention on the safety of radioactive waste management as soon as the ongoing process to develop waste management safety fundamentals has resulted in broad international agreement." See also General Conference resolution GC(XXXVII)/RES/615 which, *inter alia*, requested the IAEA Director General to initiate preparations for a convention on the safety of waste management.

25. See IAEA document INFCIRC/449. The Convention was opened for signature on 20 September 1994 and entered into force on 24 October 1996. Less than ten years later, following India's ratification of the Convention in March 2005, every state with an operating nuclear power plant is now a party to the Convention. The Convention will also enter into force for Estonia on 4 May 2006 which will bring the number of Parties up to 57.

26. It should be noted that the term "incentive convention" is strictly speaking a term without precise meaning or international law precedent. Rather, it was created during the early drafting process of the CNS. See also preambular paragraphs (vii) and (ix) of the CNS and the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, respectively.

they enable an open exchange of information between Parties at a Review Meeting, so that they may assess whether further improvement in their own performance is needed.

Prior to the implementation of the CNS review process, it had been commented that the details which had been agreed upon did not bode well for the effectiveness of the review process. Yet, while the focus tends to be on the triennial national reports and Review Meetings, the CNS is actually an ongoing, gradual and sustained process that seeks to continually promote and improve safety worldwide and, after three review meetings, this pessimism has clearly been proven ill-founded. In fact, developments that have occurred during the application of the review process demonstrate not only significant progress towards safety-related improvements but also a willingness of the Parties to fully contribute to the process.

The first Review Meeting held in 1999 provided a first "snapshot" of the measures that Parties had taken, and were taking, to achieve and maintain a high level of nuclear safety. The second meeting held in 2002, however, provided a more focused review, both by highlighting progress in individual states since the first meeting and by concentrating on some specific issues identified at the first meeting. The level of participation in this meeting – around three times as many delegates as at the first meeting – also demonstrated the growing importance attached to the CNS. In recognising the progress made in nuclear safety and in concluding that all Parties in attendance at the last Review Meeting held in April 2005 were in compliance with the requirements of the CNS, Parties have also identified the challenge of avoiding any complacency in nuclear safety.

In addition, it is noted that associated issues, such as the appropriate balance between confidentiality and transparency in the CNS's review process have been addressed by a move away from confidentiality among states, towards openness, transparency and cooperativeness. For example, while the Review Meeting discussions still remain confidential, many states are now placing their own national reports (as well as the questions received and answers given) fully in the public domain.

Finally, a welcome addition to the process is the decision of the second Review Meeting that the IAEA Secretariat should submit a report presenting generic information, although not identifying any specific country, about the significant issues, developments and trends in enhancing nuclear safety, based on the results of its advisory safety related services and missions and to henceforth use the IAEA's comprehensive suite of safety standards as a tool to assist in the review process. The relation between the Parties to the CNS and the IAEA's Secretariat has therefore developed in a mutually beneficial manner with, on the one hand, Parties to the CNS recognising the important role and value that the IAEA's advisory safety peer review services and missions have in maintaining and improving operational safety, and on the other hand, that the many important findings and conclusions during the Review Meetings may serve as valuable guidance for the IAEA Secretariat in implementing its future safety programmes.

3. Radioactive Waste Management

In the early years of nuclear law, the safe management of radioactive waste and spent fuel – the "back end of the nuclear fuel cycle" – had received little attention in the form of a binding international instrument. Even in the years before Chernobyl, however, it was an issue of strong public concern and by the early 1990s it had become a wider concern for the international nuclear

community. In particular, there were a growing number of waste repositories and urgency to ensure the safe management of such repositories and of radioactive waste in general.[27]

The adoption of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (the Joint Convention) was, therefore, another important step towards a comprehensive international safety regime.[28] As its "sister" convention the CNS, which formed the basis for its structure, the Joint Convention is a binding commitment by states to achieve and maintain a high level of safety worldwide and can also be described as an "incentive convention". It covers spent fuel from nuclear power plants and research reactors, radioactive waste from the nuclear industry, from medicine, research and industrial applications of radioactive materials, including disused sealed sources and radioactive discharges into the environment. The Convention also contains requirements with respect to the transboundary movement of spent fuel and radioactive waste.[29]

Under the Joint Convention, Parties are, *inter alia*, obliged to take the appropriate legislative, regulatory and administrative measures to govern the safety of spent fuel and radioactive waste management and to ensure that individuals, society and the environment are adequately protected against radiological and other hazards. This is carried out, *inter alia*, by the appropriate siting, design and construction of facilities and by making provisions for ensuring the safety of facilities both during their operation and after their closure. In addition, Parties are also obliged to participate in a "peer review" process – similar to that under the CNS. The first Review Meeting concluded, *inter alia*, that the process had already contributed significantly to achieving the Joint Convention's objectives: firstly, as a result of being prompted by the Review Meeting, several states had made improvements to the management of spent fuel or radioactive waste in the period leading up to the meeting; secondly, states had acknowledged that the process of preparing their respective national report had been beneficial since it had identified needs and deficiencies in the national arrangements for the safe management of radioactive waste; and thirdly, states had identified improvements for the future and volunteered to report on progress in their implementation at the second Review Meeting which is scheduled for 15 to 24 May 2006.

In addition, in an effort to maintain continuity in the Joint Convention process since the first Review Meeting held in 2003, two newsletters have been published in April and September 2004 to keep Parties up-to-date. Also, the General Committee of the Review Meeting has continued to function, its purpose being to review draft documents prepared by the Secretariat and "to clarify the guidelines to better reflect the duties of officers, prior to and during a Review Meeting and their necessary qualifications."

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27. For example, the General Conference in September 1990 endorsed the Code of Practice on the International Transboundary Movement of Radioactive Waste (see IAEA document INFCIRC/386).

28. See IAEA document INFCIRC/546. The Joint Convention was adopted on 5 September 1997, opened for signature on 29 September 1997 and entered into force on 18 June 2001. For further analysis see "The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management", Professor Peter D. Cameron, in Horbach (footnote 23); "The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management", Wolfram Tonhauser and Odette Jankowitsch, *Nuclear Law Bulletin* No. 60 (1998); and "An Expanding International Legal Regime: Environmental Protection and Radioactive Waste Management", Gordon Linsley and Wolfram Tonhauser, IAEA Bulletin 42, No. 3 (2000).

29. See Article 27 of the Joint Convention.

Finally, a number of activities are also carried out pursuant to the Action Plan on the Safety of Radioactive Waste Management. The Action Plan which was initially endorsed by the General Conference in September 2001 and was formulated from the conclusions of the International Conference on the Safety of Radioactive Waste Management, held in 2000, in Cordoba, Spain,[30] was more recently updated in light of the deliberations of the International Conference on Issues and Trends in Radioactive Waste Management, held in 2002, in Vienna, Austria.[31] In total there are nine action areas under the Action Plan, which include the development of a structured and systematic programme to ensure adequate application of the IAEA's waste safety standards and to facilitate their application in implementation of the Joint Convention. IAEA activities relating to the safety of radioactive waste management, including safety standards development and their use and application, are currently being reviewed.[32]

4. Safety and Security of Radioactive Sources

In addition to the treaty making process, the international community has taken a second, and new, approach to the normative control of nuclear risks through the adoption of legally non-binding norms governing the safe and peaceful uses of nuclear energy. Two Codes have recently been developed, one concerning the safety and security of radioactive sources and the other on the safety of research reactors. Although they have not been developed as a direct response to the Chernobyl accident, these instruments and the practical steps for their application are an important part of the international legal framework.

In light of the need to prevent both accidents involving radioactive sources[33] and the theft or unauthorised use of radioactive materials – including measures to respond adequately to illicit trafficking of these materials – the Major Findings of the 1998 International Conference on the Safety of Radiation Sources and the Security of Radioactive Material considered it interesting to "[…] investigate further whether international undertakings […] attracting broad adherence could be formulated." The initial proposal to satisfy this need was for an international undertaking – possibly in the form of a convention – "which should provide for a clear commitment by and attract the broad adherence of States". [34]

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30. See the Findings of the Conference in IAEA document GOV/INF/2000/8-GC(44)/INF/5, 31 May 2000.

31. See the Proceedings of the Conference in IAEA document STI/PUB/1175**,** 2003.

32. This review is being undertaken in light of the International Conference on the Safety of Radioactive Waste Disposal, 3-7 October, 2005, Tokyo, Japan (see the Proceedings of the Conference to be published in 2006) and the International Symposium on Disposal of Low Activity Radioactive Waste, 13-17 December 2004, Cordoba, Spain (see the Proceedings of the Symposium in IAEA document STI/PUB/1224, 2005).

33. See the following IAEA publications concerning radiological accidents: The Radiological Accident in Cochabamba (Bolivia), IAEA, Vienna, 2004; The Radiological Accident in Gilan (Iran), IAEA, Vienna, 2002; The Radiological Accident in Samut Prakan (Thailand), IAEA, Vienna, 2002; The Radiological Accident in Istanbul (Turkey), IAEA, Vienna, 2000; The Radiological Accident in Yanango (Peru), IAEA, Vienna, 2000; The Radiological Accident in Tammiku (Estonia), IAEA, Vienna, 1998; The Radiological Accident in Soreq (Israel), IAEA, Vienna, 1993.; The Radiological Accident in San Salvador (El Salvador), IAEA, Vienna, 1990; The Radiological Accident in Goiania (Brazil), IAEA, Vienna, 1988.

34. The Conference which was held in Dijon, France, from 14 to 18 September 1998 was the first IAEA Conference devoted to both the safety of radiation sources and the security of radioactive materials. See

However, it soon became clear that states did not wish to enter into such a binding commitment at the present time and accordingly a non-binding Code of Conduct on the Safety and Security of Radioactive Sources was adopted in September 2000.[35] Some three years later, however, the Code of Conduct was revised, to reflect the change in the international community's perception of threats in light of the events of 11 September 2001 by, *inter alia*, including strengthened provisions relating to security of radioactive sources and additional components concerning national registries of such sources.[36] One of the general objectives of this revised Code is to achieve a high level of safety and security of civilian radioactive sources that may pose a significant risk to individuals, society and the environment. It includes guidance on general basic principles, legislation and the regulatory body. In addition, since the Code of Conduct only includes basic provisions on the import and export of "high level" radioactive sources[37] and in response to the need to explore further guidance on the import and export of radioactive sources, the Supplementary Guidance on the Import and Export of Radioactive Sources, was adopted by the Board of Governors and endorsed by the General Conference in 2004.[38]

As a counterbalance to the legally non-binding nature of the Code of Conduct, the IAEA General Conference urged states "to write to the Director General that [they] fully support and endorse the IAEA's efforts to enhance the safety and security of radioactive sources, [that they are] working toward following the guidance contained in the [Code of Conduct], and encourage[d] other countries to do the same".[39] Similarly, the 2004 General Conference encouraged states with respect to the Supplementary Guidance, "to act in accordance with the Guidance on a harmonised basis and to notify the Director General of their intention to do so as supplementary information to the Code of Conduct.[40] In response, both the Code and its Guidance have received considerable support in a relatively short period. To date, 82 states have expressed their political commitment to the Code and 24 states with respect to the Supplementary Guidance.[41]

In further support of the application of the Code of Conduct and its Supplementary Guidance, a number of related developments should be mentioned. First, at an international conference held last year, states discussed, *inter alia*, 24 national reports voluntarily submitted, covering national

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the Proceedings of the Conference in IAEA Document STI/PUB/1042, 1999 and also IAEA document GOV/1999/16 para 6(d), 25 February 1999.

35. See General Conference resolution GC(44)/RES/11 of 11 September 2000. The Code was published in March 2001 as IAEA/CODEOC/2001.

36. See IAEA document INFCIRC/663. A closely related issue is the categorisation of sources. It was recognised that the need to revise the Code also implied a need to revisit the source categorisation scheme developed to accompany the Code. The wider range of scenarios considered since 11 September 2001 has resulted in a categorisation system that is slightly more complex, but potentially more useful for general use.

37. Defined as Categories 1 and 2 in the Code of Conduct and see also the Categorization of Radioactive Sources, Revision of IAEA-TECDOC-1191, (IAEA TECD-1344, 2003).

38 . See General Conference resolution GC(48)/RES/10.D, 24 September 2004.

39. See operative paragraph 6 of General Conference resolution GC(47)/RES/7.B.

40. See operative paragraph 8 of General Conference resolution GC(48)/RES/10.

41. The Supplementary Guidance also encourages states to nominate a point of contact for the purpose of facilitating the export and/or import of radioactive sources and to provide the IAEA with the details of these points of contact (see Section V). To date 54 states have done this. Also, in order to facilitate the timely review of export requests, states are requested to make available to the IAEA their responses to a (confidential) Self Assessment Questionnaire (see Annex 1). To date 17 states have completed this questionnaire.

implementation of the Code.[42] The call at the conference for consultations on a possible formal review mechanism was echoed some months later in the resolution of the IAEA General Conference which, *inter alia*, requested the IAEA Secretariat to undertake consultations with Member States with a view to establishing a more formalised process for a periodic exchange of information and lessons learned and for the evaluation of progress made by states towards implementing the provisions of the Code of Conduct.[43]

Also, with regard to the Supplementary Guidance, states have already met to share national experiences in its application with a view to applying it in a co-operative and harmonised manner.[44] At this meeting, the multilateral nature of the Supplementary Guidance was noted, as was the importance of states making a political commitment to apply the Guidance in a harmonised manner. States were also encouraged to share information with other states. Also, it was recognised that the need for flexibility is required as states work towards implementing the Supplementary Guidance. Finally, communication between exporting and importing states was considered to be an important issue.

In support of the Code and its practical application, the IAEA continues to implement the revised International Action Plan on the Safety and Security of Radioactive Sources.[45] The Action Plan, in particular, concerns the promotion of greater international co-operation in addressing the security concerns raised by insufficiently controlled radioactive sources, the identification of those sources which pose the greatest risks, and the promotion of strong national action by all states to minimise those risks over the whole life-cycle of radioactive sources.

The Action Plan also includes a list of activities to be taken by the Secretariat to assist states in enhancing the safety and security of radioactive sources. In the context of establishing effective national regulatory infrastructures and national plans, the plan promotes mechanisms to encourage states to commit to the application of the Code of Conduct by an assessment by IAEA advisory missions of the degree of application of the Code; a continuation of dialogue with manufacturers and suppliers of radioactive sources, regulatory bodies and users on the appropriate means of controlling the export, use and return of radioactive sources consistent with the relevant provisions of the Code; and also the provision of assistance to manufacturers and suppliers of radioactive sources in the development of an appropriate Code of Practice that defines their roles and responsibilities during the life cycle of high-risk sources.

Extensive work has also been performed under the umbrella of an initiative between the Department of Energy of the United States of America and the Federal Atomic Energy Agency of the Russian Federation Partnership.[46] The IAEA has since the beginning of 2003 been managing the projects for the dismantling of the highest-risk disused sources and facilities (e.g. teletherapy

42. See the Findings of the President of the International Conference on the Safety and Security of Radioactive Sources: Towards a Global System for the Continuous Control of Sources Throughout their Life Cycle (the Bordeaux Conference), Bordeaux, France, 27 June – 1 July 2005.

43. See General Conference resolution GC(49)RES/9.

44. A technical meeting entitled "The Code of Conduct on the Safety and Security of Radioactive Sources – sharing experiences on implementing the Supplementary Guidance on the Import and Export of Radioactive Sources" was held at IAEA Headquarters from 12 to 14 December 2005.

45. See IAEA document GOV/2003/47-GC(47)/7.

46. The initiative was formerly known as the IAEA/Russian Federation/USA ("Tripartite") Initiative but as a result of a decision of the Initiative's Steering Committee meeting on 18 May 2005, the structure of the Initiative was changed to a regional partnership between the Department of Energy and the Federal Atomic Energy Agency, with the IAEA as a facilitator.

machines, irradiators etc.) and the transport of these type of sources to secure storage. In addition, a number of regional projects have been developed, for example, with the United States of America and Australia for increasing awareness on the security of sources and training regulators and radioactive source users in Southeast Asia. Also, a regional partnership between India, the United States of America and the IAEA will provide a mechanism for the provision of training, instrumentation, technical support and awareness building within India and in other states in the region. A third regional partnership was initiated with South Africa, the United States of America and the IAEA, specifically for recovering and securing disused, high-activity sources and training government institutions.

Finally, in an effort to achieve the safety and security of radioactive sources, the IAEA, established in 2004, the Radiation Safety and Security of Radioactive Sources Infrastructure Appraisal (RaSSIA) which is designed to provide the IAEA and its Member States with a means for assessing national progress in establishing a national regulatory infrastructure for radiation safety and security of radioactive sources, to provide recommendations relating to improvements in areas where shortcomings and deficiencies (against international standards and the Code of Conduct) have been identified, and to submit to the state a national action plan for improving the national regulatory infrastructure in this regard.

5. Safety of Research Reactors

For over 50 years, research reactors have been one of the cornerstones of nuclear science and technology. Throughout this time, most of the facilities have generally maintained a good record of safe operation. At the same time, however, a number of concerns still remained about the safety of some facilities which resulted in a number of initiatives in the late 1980s. More recently in April 2000, the Chairman of the International Nuclear Safety Advisory Group (INSAG)[47] wrote to the IAEA Director General drawing attention to the fact that there were a significant number of research reactors in a state of extended shutdown without definite plans for the future; that there were major issues related to the ageing of research reactors; that many research reactors had large stocks of spent fuel; and that research reactors were not covered by the CNS. In this respect, INSAG suggested the development of a Protocol to the CNS or some similar legal instrument as a way of establishing a better international safety framework for these reactors.[48] In recognising that such an instrument would take time to develop, it was recommended that urgent action be taken in two areas: a proper decommissioning of research reactors that are shut down and not decommissioned, and a thorough review of the safety of older research reactors not under the control of an independent national regulatory authority.

As a result of this initiative, the Code of Conduct on the Safety of Research Reactors was adopted in September 2004.[49] The Code is an important step towards an international nuclear safety regime for research reactors comparable to that already in existence for nuclear power plants under the

47. INSAG, established in 1985, is composed of leading experts from IAEA Member States. It is convened with the objective to provide authoritative advice and guidance to the IAEA Director General on nuclear safety approaches, policies and principles. In particular, INSAG provides recommendations and opinions on current and emerging nuclear safety issues to the IAEA, the nuclear community and the public.

48. See also the subsequent IAEA General Conference resolution GC(44)/RES/14, 22 September 2000.

49. For the text of the Code of Conduct see General Conference document GC(48)7. The General Conference in resolution GC(48)/RES/10/A.8 welcomed the adoption of the Code by the Board of Governors in March 2004

CNS. In substance, the Code provides a clear distinction between the different obligations of states, regulatory bodies and reactor operators. Its objective is to achieve and maintain a high level of safety in civilian research reactors worldwide through the enhancement of national measures and international cooperation including, where appropriate, safety related technical cooperation. This objective is to be achieved by proper operating conditions, the prevention of accidents and, should accidents occur, the mitigation of the radiological consequences, in order to protect workers, members of the public and the environment against radiation hazards.

However, unlike the Code of Conduct on the Safety and Security of Radioactive Sources and its Supplementary Guidance, there is currently no process foreseen by which states can make "political commitments" to apply the guidance in the Code.[50]

There are, however, a number of IAEA activities that are related to the Code's application. For example, the IAEA Research Reactor Safety Enhancement Plan of 2001[51] is focused on three main areas: first, establishing IAEA safety documents as the foundation upon which a global safety framework for research reactors is based; secondly, encouraging and assisting Member States in effective application of these safety documents; and finally, fostering global and regional cooperation in research reactor safety. This plan is in the process of being updated and it is expected that the new plan will be finalised during 2006.

In addition, the IAEA has established a number of safety standards that are fundamental to the enhancement of research reactor safety and has also provided for their application through advisory services, such as the Integrated Safety Assessment of Research Reactors (INSARR) missions to Member States. These missions are the principal mechanism for monitoring and enhancing the safety of research reactors by addressing, in an integrated manner, all aspects of safety, including maintenance and regulatory oversight, with follow-up missions carried out for the purpose of assessing progress in the implementation of INSARR team recommendations. In fact, the results of these missions are fed into an integrated information system that will also receive inputs from the IAEA's Incident Reporting System for Research Reactors (IRSRR) and the IAEA's database relating to research reactors. Efforts are also focused on the development of self-assessment capabilities in Member States, through information exchange and the participation of persons from those Member States as observers in INSARR missions. Also, in addition to organising regular training courses and workshops, the Secretariat has been assisting Member States that have research reactors with the establishment of sustainable programmes of education and training in nuclear safety.

Finally, pursuant to the request of the third Review Meeting of the CNS,[52] an open-ended meeting on effective application of the Code was held from 14 to 16 December 2005. At this meeting which was attended by 31 Member States it was agreed that, while national commitments (similar to those made with respect to the Code of Conduct on the Safety and Security of Radioactive Sources and its Supplementary Guidance) would be valuable, commitment is best displayed through participation in meetings for exchanging information and experience on application of the Code. In this respect, the meeting reached consensus on proposals for periodic meetings to discuss topics related to the application of the Code, to exchange experience and lessons learned, to identify good practices, to discuss future plans, and to discuss difficulties encountered and assistance required to

50. See the September 2004 General Conference resolution GC(48)/RES/10/A.8 which merely encourages states to apply the guidance in the Code to the management of research reactors.

51. See IAEA document GOV/2001/28-GC(45)/11, 2 August 2001.

52. See the Summary Report of the Third Review Meeting of Contracting Parties to the Convention on Nuclear Safety (CNS-RM-2005/08 FINAL).

reach full compliance. The meeting also called for an Internet site on which documents related to the periodic meetings can be posted to facilitate exchange of information. Finally, in recognising the benefits of the Code towards enhancing research reactor safety worldwide, there was also a call for the Code to be integrated into all IAEA safety assistance and review activities and for consideration to be given to updating the IAEA Project and Supply Agreements to reflect the provisions of the Code.[53]

6. Nuclear Security

As for nuclear safety, but probably even more so because of the sensitive matters which it impinges on, nuclear security has for a long time been considered as a national domain and thus almost exclusively a matter governed by national law.[54]

In recent years, however, terrorist attacks have taken on heightened significance: the events of September 2001 propelling a rapid and dramatic re-evaluation of the risks of terrorism in all its forms, including the threat of nuclear and radiological terrorism. In fact, while the Chernobyl accident did not contribute significantly to developments in nuclear security – notwithstanding the "coincidental" entry into force of the CPPNM less than a year after the accident – the "lesson of Chernobyl" in the safety sphere has been applied to nuclear security, in the sense that nuclear security should be urgently strengthened, without waiting for a "watershed" event to provide the impetus for security upgrades and expanded international co-operation. In this respect, it recognised that just as the transboundary consequences of the Chernobyl accident which demonstrated that "an accident anywhere is an accident everywhere", the illicit trafficking of nuclear and radioactive materials and the activities of terrorists are not limited by national boundaries.

A fundamental component of nuclear security is the establishment and application of adequate "physical protection measures". The overall objective of the international regime adopted under the auspices of the IAEA governing the physical protection of nuclear material is to have a strong physical protection regime – one in which security is everywhere and at an acceptable level.

The physical protection regime included the development and establishment, under the auspices of the IAEA, of binding and non-binding international norms. In particular, in 1972, guidelines for the establishment of national physical protection systems were developed as recommendations concerning specifics about physical protection measures for nuclear material and nuclear facilities and what states need to do in this regard.[55]

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53. See the Report of the Chairman, Open-ended meeting on Effective Application of the Code of Conduct on the Safety of Research Reactors.

54. Nuclear Security means "the prevention and detection of and response to, theft, sabotage, unauthorised access, illegal transfer or other malicious acts involving nuclear material, other radioactive substances or their associated facilities." (IAEA Advisory Group on Nuclear Security, January 2002).

55. See The Physical Protection of Nuclear Material and Nuclear Facilities, IAEA document INFCIRC/225/Rev. 4(Corrected). The recommendations originated as "Recommendations for the Physical Protection of Nuclear Material" prepared by a panel of experts convened by the IAEA Director General These recommendations were revised by a Group of Experts in cooperation with the IAEA Secretariat, and the revised version was published in 1975 in the IAEA document INFCIRC series. The document was subsequently revised four times in 1977, 1989, 1993 and lastly by a meeting of national experts that met from 2-5 June 1998 and from 27-29 October 1998. Its recommendations, concepts and terminology form the basis for the Physical Protection Objectives and Fundamental Principles (see footnote 56).

Also included in this regime are a number of physical protection objectives and fundamental principles that were endorsed in 2001 as another "step towards strengthening the physical protection regime".[56] These objectives and fundamental principles are intended for nuclear material in use and storage, and during transport, and for nuclear facilities using or storing such materials. They provide the basic elements that states need to take into account when developing their national regimes for preventing the theft, misuse or sabotage of nuclear material and facilities.

Even though the main responsibility in the area of nuclear security rested with the states concerned and despite the adoption of the aforementioned guidelines and fundamental principles, there was a growing widespread recognition in the early 1970s of the need for cooperation between states to ensure adequate physical protection of potentially hazardous nuclear material and of the necessity for an appropriate international legal instrument regulating such cooperation.

The idea of an international legally binding undertaking for protecting nuclear material was first discussed within the Secretariat in 1974[57] and five years later, on 26 October 1979, the international community adopted the Convention on Physical Protection of Nuclear Material (the CPPNM).[58] The adoption of the CPPNM broke significant new ground, not only demonstrating the value of the IAEA as a forum for negotiations on security matters but also by requiring action by states under their internal criminal legal system, which is a sensitive domestic matter.

The first area covered by the CPPNM refers to states' commitments to protect nuclear material during international transport (and during storage incidental to such transport). States commit themselves not to undertake or authorise the undertaking of such international transport unless assurances are provided that nuclear material will be protected at the levels required by the CPPNM. Nuclear material in transit from one part of a States Parties' territory to another, when passing through international waters or airspace, should also be protected at the prescribed levels. The second area covered by the Convention refers to states' undertakings to make the intentional commission of certain acts (e.g. theft or robbery of nuclear material, threat to use nuclear material to cause death and other ancillary offences such as attempt and participation in such acts) punishable offences under their national law, to establish jurisdiction over such offences and to detain alleged offenders for the purpose of prosecution or extradition. As a third subject area, the CPPNM also promotes international cooperation.

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56. The Board endorsed the "Physical Protection Objectives and Fundamental Principles" for publication as a "Security Fundamentals" document, "it being understood that their adoption would not lead to diminished interest on the part of Member States in becoming Parties to the Convention on the Physical Protection of Nuclear Material and that they were not a substitute for the Convention or for the recommendations in document INFCIRC/225/Rev.4 (Corrected)" [see IAEA document GOV/2001/41 or GC(45)/INF/14, GOV/OR.1033, paras 157-162)]. Also, see General Conference resolution GC(45)/RES/14.B of 21 September 2001 which welcomed the Board's endorsement.

57. For further information, see for example the Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons in May 1975; Resolution GC/XIX/RES/328 of the September 1975 General Conference; IAEA document "The Physical Protection of Nuclear Material" (INFCIRC/225); and the report of the Advisory Group on Physical Protection of Nuclear Material (which met in February 1977).

58. See IAEA document INFCIRC/274/Rev.1.The convention was opened for signature on 3 March 1980 and entered into force nearly seven years later on 8 February 1987. At present the convention has 116 Parties.

Despite the aforementioned arrangements, efforts to strengthen the CPPNM were initiated early on.[59] For a number of years it was recognised that the present convention was not adequate, since it did not cover major aspects of physical protection. Notably, there was no commitment by states to protect nuclear material in domestic use, storage and transport. In addition, there was no commitment regarding the protection of nuclear material and nuclear facilities against sabotage.

Recognising these deficiencies, an Amendment to the CPPNM was adopted on 8 July 2005 which now provides for an expanded regime and strengthens the CPPNM in three main areas. [60] The first area relates to the effective physical protection of nuclear material and of nuclear facilities and contains a new "core" undertaking by states to establish, implement and maintain a physical protection regime applicable to nuclear material and facilities under their jurisdiction, including an appropriate legislative and regulatory framework for physical protection, a competent authority responsible for its implementation, and other administrative measures necessary for the physical protection of such material and facilities. The second area concerns the prevention and combating of offences relating to nuclear material and nuclear facilities worldwide and, *inter alia,* requires states to bring under their jurisdiction and make punishable under their national laws certain offences including theft, robbery, smuggling of nuclear material or sabotage of nuclear facilities, as well as acts related to directing and contributing to the commission of such offences. The third area relates to facilitating co-operation among states and foresees, in particular, new arrangements for co-operation, assistance and coordination amongst states in case of a credible threat of sabotage or sabotage.[61]

In parallel to the aforementioned developments in the legal domain and similar to the review of the IAEA's nuclear safety programme shortly after the Chernobyl accident at the Special and Regular Sessions of the General Conference, held in September and October 1986, a sweeping review of the IAEA´s nuclear security programme was undertaken in 2001.[62] As a consequence, since that time the

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59. The IAEA Director General convened in November 1999, an "Informal Open-Ended Expert Meeting to Discuss Whether there is a Need to Revise the Convention […]". The Expert Meeting concluded in May 2001 that there was "a clear need to strengthen the international physical protection regime". In recommending that a "well-defined amendment" be prepared by a group of legal and technical experts, the Expert Meeting indicated a number of subjects that should be covered. In response, the IAEA Director General on 6 September 2001 convened a Group of Experts to prepare a draft amendment aimed at strengthening the CPPNM. At its sixth and final meeting, held on 14 March 2003, the Group adopted by consensus its Final Report, which set out possible amendments to be made to the CPPNM.

60. The Amendment will enter into force in accordance with paragraph 2 of Article 20 of the CPPNM, on the thirtieth day after the date on which two-thirds of the States Parties deposit their instruments of ratification, acceptance or approval. On 19 and 29 September 2005, the IAEA Board of Governors and General Conference, in welcoming the Amendment to the CPPNM encouraged "all States party to the Convention to ratify the amendment as soon as possible and to deposit instruments of ratification, acceptance or approval with the depositary to enable the early entry into force of the amendment." In addition, "all States party to the Convention [were encouraged] to act in accordance with the object and purpose of the amendment until such time as the amendment enters into force".

61. For further information on the Amendment and the physical protection regime see "The International Regime on the Physical Protection of Nuclear Material and the Amendment to the Convention on the Physical Protection of Nuclear Material", Maria de Lourdes Vez Carmona, in *Nuclear Law Bulletin* (NLB), No. 76, Volume 2005/2, p. 29-46.

62. See IAEA document GOV/2001/50. By better exploiting the synergies between safety and security and promoting further cross-fertilisation of approaches, it was considered that the IAEA could help to build up mutually reinforcing global regimes. Accordingly, the IAEA decided to transfer the work on nuclear security that was previously linked with the safeguards programme to the Department of Nuclear Safety, now the Department of Nuclear Safety and Security.

IAEA has taken a holistic and comprehensive approach to helping to strengthen the nuclear security of its Member States. These activities were initially integrated into a three-year Plan of Activities to Protect against Nuclear Terrorism[63] which was since revised into a Nuclear Security Plan for 2006-2009 that provides a more simplified structure, emphasising efficiency and flexibility.[64]

In summary, these IAEA activities have three main points of focus: first, needs assessment, analysis and coordination; secondly, they relate to prevention; and thirdly, to detection and response. The overall goal of this approach is to assist Member States, upon request, in improving their nuclear security, thereby reducing the risk of a successful act of nuclear terrorism. The IAEA's role in achieving this goal is similar to that for nuclear safety. In particular, it consists of the following broad areas: facilitating the development of, and adherence to, legally binding and non-binding international instruments; developing international guidelines and recommendations acceptable to the international community; providing related assessment services, training, equipment and technical advice; and providing or facilitating the exchange of information and related services.

While these activities, unlike those in nuclear safety, are funded voluntarily by IAEA Member States through the Nuclear Security Fund (NSF), contributions have been significant. As of 31 July 2005, a total of 42.4 million US dollars (USD) had been pledged by 26 Member States and one nongovernmental organisation, and in total USD 36.7 million has been received.[65] As a consequence of this increased funding and pursuant to the aforementioned Nuclear Security Plan, there has been an acceleration of the existing IAEA activities, including the development of an extensive range of new voluntary "upon request" measures to assist states in the prevention, detection and response to malicious acts involving nuclear and other radioactive materials and their associated facilities and transports. For example, relevant advisory services include the International Nuclear Security Advisory Service (INSServ); the International Physical Protection Advisory Service (IPPAS); the International Regulatory Review Team (IRRT); and the International Team of Experts to promote adherence to and implementation of relevant international instruments in the area of nuclear terrorism (ITE). As shall be mentioned later, there are important synergies between nuclear safety and security. Consequently, in implementing the aforementioned activities, the IAEA has used a comprehensive approach – where IAEA activities contribute to both nuclear security and other IAEA objectives such as verification or safety.

7. Liability for Nuclear Damage

The Chernobyl accident with its transboundary consequences not only brought into sharp focus the inadequacies of existing international and national safety measures and standards but necessarily alerted the international community to finally arrive at an understanding of the need to strengthen the international rules mitigating the consequences of a nuclear accident through timely and adequate compensation.

63. See IAEA document GOV/2002/10. The 2002-2005 Plan was adopted by the IAEA Board of Governors in March 2002.

64. The Plan was adopted by the IAEA Board of Governors and endorsed by the IAEA General Conference in September 2005 in resolution GC(49)/RES/10. The Plan not only concerns nuclear material but also other radioactive material such as radioactive sources, their transport, as well as nuclear installations.

65. See IAEA document Nuclear Security – Measures to Protect Against Nuclear Terrorism, Progress Report and Nuclear Security Plan for 2006-2009, p. 9-12, GC(49)17, 23 September 2005.

The liability regime prior to the Chernobyl accident consisted of two conventions based on a number of identical basic principles: the Vienna Convention on Civil Liability for Nuclear Damage (the Vienna Convention), an instrument intended to regulate nuclear liability issues on a world-wide scale adopted in 1963 under the auspices of the IAEA; and the Paris Convention on Third Party Liability in the Field of Nuclear Energy (the Paris Convention), a regional instrument adopted in 1960 under the auspices of the OECD.

The Chernobyl accident also raised two issues, both crucially important for the effectiveness of an international legal regime of nuclear liability: the first was, of course, the wide international acceptance of the regime; but the second was, inevitably, the adequacy of the regime to cope with the transboundary consequences of a major nuclear accident.

With a view to ensuring a wider international acceptance and application of the civil liability regimes established by the Vienna and Paris Conventions, the focus, first of all, was on the need to avoid the duplication created by the existence of two different conventional regimes based on very similar principles: the regional Paris regime, on the one hand, and the Vienna regime, on the other. For many years, the Vienna and Paris Conventions, while based on the same principles, existed in isolation from each other. Their parallel operation raised a potential problem of the conflict of law. Although various possibilities were envisaged to address this problem, it was eventually concluded that the best solution would be the adoption of a new international instrument aiming at linking the two conventions into one system. Work that had been initiated some years before the Chernobyl accident received renewed impetus and resulted in the adoption on 21 September 1988 of a Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention.[66]

This Joint Protocol provides for a mutual extension of the operator's liability under the Paris and Vienna systems: thus, if a nuclear incident occurs for which an operator is liable under both the Vienna Convention and the Joint Protocol, he shall be liable in accordance with the Vienna Convention for nuclear damage suffered not only in the territory of Parties thereto, but also in the territory of Parties to both the Paris Convention and the Joint Protocol; conversely, if an incident occurs for which an operator is liable under both the Paris Convention and the Joint Protocol, there shall be reciprocity. Moreover, the Joint Protocol is meant to eliminate conflicts which might otherwise arise, especially in transport cases, from the simultaneous application of the two Conventions. In order to avoid conflict of jurisdiction, the Joint Protocol establishes a choice of law rule to determine which of the Conventions should apply (to the exclusion of the other) in respect of the same accident.

As for the adequacy of the Vienna civil liability regime, it was recognised that the Vienna Convention did not provide adequate protection, especially in the event of a large scale nuclear accident. Even if the former Union of Soviet Socialist Republics had been Party to the convention, making it possible for affected persons to receive compensation, the amount of compensation available would probably only have been available to a small number of affected persons. In this respect, the revision of the existing Convention was proposed, as was the need to consider the broader question of international liability in inter-state relations, in particular, whether a new multilateral instrument, complementary to the existing civil liability instruments, should be developed to elaborate international claims for nuclear damage against states. It was considered, however, during the following years that the need for an international regime of state liability for nuclear damage could, for example, be obviated by the establishment of a system of global supplementary funding.

66. See IAEA document INFCIRC/402. The Joint Protocol was adopted and opened for signature on 21 September 1988 and entered into force on 27 April 1992.

Following eight years of negotiations, states adopted, in September 1997, the Protocol to Amend the Vienna Convention on Liability For Nuclear Damage (the 1997 Protocol) and the Convention on Supplementary Compensation for Nuclear Damage (the CSC).[67]

Quite simply, the 1997 Protocol extends the coverage of the Vienna Convention to include nuclear damage suffered in non-Contracting States (except for states which have a nuclear installation on their territory or in their maritime zones and do not afford reciprocal benefits). The Protocol also expands the types of damage for which coverage is provided, including costs associated with the reinstatement of significantly impaired environment, loss of income deriving from an economic interest in use or enjoyment of a significantly impaired environment; and costs of preventive measure. In addition, the amount of coverage is raised: the minimum liability limit set in the 1963 Vienna Convention is increased to not less than 300 million SDRs (currently, approximately USD 400 million). States that have difficulty in immediately implementing the increased liability amount may phase in this amount during a fixed period of time. The Protocol also extends to 30 years the period for claiming damages due to loss of life and personal injury, and removes the exoneration for natural disasters. It also enhances the jurisdiction provisions of the Vienna Convention by providing that, in the event of transport incidents within the exclusive economic zone or a similar maritime area, jurisdiction over actions concerning nuclear damage lies with the courts of the coastal state. The Protocol may be signed and adhered to by all states, not just Parties to the Vienna Convention.

The need for enhanced compensation of nuclear damage after the Chernobyl accident was not only addressed by the adoption of the 1997 Protocol but also by the CSC. Different to the 1997 Protocol, however, the CSC is aimed at establishing a worldwide liability regime in which all states, irrespective of whether they are party to the Vienna Convention or Paris Convention, may participate. States party to the CSC are required to bring their national legislation on compensation for nuclear damage into line with the liability rules under the Vienna and Paris Conventions – thus it provides a means for states not in a position to adhere to the Vienna or Paris Conventions with an alternative means for joining the international nuclear liability regimes. The CSC also establishes a mechanism for providing additional funds to supplement the compensation of nuclear damage available under the Vienna or Paris Conventions, or under the national legislation of states not party to the two basic conventions, with supplementary compensation being provided by States Parties in addition to the national compensation amount. A state with a nuclear installation on its territory must be also a Contracting State to the Convention on Nuclear Safety.

Despite the adoption of these new instruments, concerns still remain with regard to a comprehensive liability regime. These concerns were expressed, in particular, in the Summary and Findings of the President of the 2003 International Conference on the Safety of Transport of Radioactive Material which noted, *inter alia*, that "there remains considerable uncertainty and debate related to the implementation of a comprehensive regime to deal with the legal liability resulting from an accident during the transport of radioactive material. There are a number of liability-related conventions, to which many States are Parties but many others are not." Further, "the provisions of the liability conventions, and the relationships between them, are not simple to understand" and concluded that "the preparation of an explanatory text for these instruments would assist in developing a common understanding of what are complex legal issues, and thereby promote adherence to these instruments.

67. Both instruments were opened for signature by all states on 29 September 1997. The Protocol entered into force on 4 October 2003, the CSC is not yet in force. See IAEA documents INFCIRC/566 and INFCIRC/567, respectively.

The IAEA Secretariat should prepare such an explanatory text, with the assistance of an independent group of legal experts appointed by the IAEA Director General."[68]

In light of the aforementioned findings and with a view to fostering a global and effective nuclear liability regime, the IAEA Director General established the same year an advisory Group – the International Expert Group on Nuclear Liability (INLEX).[69] Since its inception INLEX has held a total of five meetings.[70]

Among the tasks INLEX has accomplished so far, and pursuant to the Conference's call, is the finalisation of explanatory texts (including an overview of the revised IAEA nuclear liability regime) on the nuclear liability instruments adopted under IAEA auspices. These texts constitute a comprehensive study of the IAEA's nuclear liability regime in order to aid the understanding and authoritative interpretation of that regime.[71] In addition, INLEX has also discussed and reached conclusions on possible gaps and ambiguities in the scope and coverage of the existing nuclear liability regime, and the disadvantages of not adhering to a global nuclear liability regime, in particular, with regard to the possible difficulties of obtaining compensation outside the regime.

In order to provide a platform for both fostering adherence to the international nuclear liability regime and to provide a forum for open discussions on possible difficulties, concerns or issues states may have with the regime, INLEX has also dealt with a number of outreach activities, including the development of standard training material in the area of nuclear liability and the organisation of regional workshops.[72]

8. The IAEA's Legislative Assistance Programme

The aforementioned international legal framework and its steps for its practical application would not be complete, however, without a program that assists states in the establishment and

68. See Section A.3 of the Summary of Explanatory Topical Session on Liability in the Summary and Findings of the President of the International Conference on the Safety of Transport of Radioactive Material, held from 7 to 11 July 2003, in Vienna (IAEA document STI/PUB/1200, 2004).

69. See the IAEA Director General's Statement to the September 2003 General Conference and also the resolution of the Conference GC(47)/RES/7.C, 19 September 2003 which, *inter alia*, welcomed "the decision of the IAEA Director General to appoint a group of experts to explore and advise on issues related to nuclear liability".

70. The first meeting was held on 16 and 17 October 2003, the second from 22 to 26 March 2004, the third from 13 to 16 July 2004, the fourth from 7 to 11 February 2005 and the fifth from 11 to 14 July 2005. The sixth meeting is scheduled for May 2006.

71. See The 1997 Vienna Convention on Civil Liability for Nuclear Damage and the 1997 Convention on Supplementary Compensation for Nuclear Damage – Explanatory Texts – A comprehensive study of the IAEA's nuclear liability regime by the IAEA International Expert Group on Nuclear Liability (INLEX) to aid the understanding and authoritative interpretation of that regime: www.iaea.org/About/Policy/GC/GC48/Documents/gc48inf-5expltext.pdf.

72. The first Regional Workshop on Liability for Nuclear Damage, in the context of INLEX's outreach activities, was held in Sydney, Australia, from 28 to 30 November 2005. The workshop was attended by 49 participants from 14 IAEA Member States in the Asia region and 12 non-IAEA Member States who are Member States of the Pacific Islands Forum. Two representatives of the Pacific Islands Forum Secretariat also attended the workshop. The second regional workshop under INLEX's outreach activities is scheduled to be held in Lima, Peru in 2006. The workshop is open to representatives from Member States in Latin America.

development of a comprehensive corresponding national legal framework governing the safe and peaceful uses of nuclear energy that, *inter alia*, implements the international legal instruments which they have ratified.

In this regard, the IAEA – independently of the various safety and security, technical missions and advisory services carried out in Member States – has been providing advice on Member States' legislative and regulatory frameworks since its inception but in a more systematic manner since 1997, within the framework of a legislative assistance programme.[73]

This programme has evolved to include three primary elements, first, an interaction with individual states entailing a long-term relationship and an ongoing process; secondly, an interface between legal and technical issues, requiring lawyers and technical experts to interact with each other and to work jointly; and finally, a multi-means approach to transfer knowledge and know-how through the combination of regional and national workshops and seminars, training, bilateral assistance in drafting legislation, and the development of reference material for the assessment and drafting of national nuclear legislation. In this regard, the IAEA published a Handbook on Nuclear Law in 2003 which, *inter alia*, provides a basic understanding of key elements, principles and concepts of nuclear legislation.[74]

To date, assistance to states to improve their nuclear legislative frameworks in the areas of nuclear safety, security, safeguards and liability for nuclear damage, has been provided to more than 100 Member States. The programme, therefore, has been highly successful in strengthening the nuclear legal infrastructure of many countries and its appreciation by Member States is reflected, *inter alia*, in yearly resolutions of the General Conference.[75]

In recent years, however, there has been an increasing number and complexity of international instruments adopted in the areas of safety and security and there has been an increased interest in the field of liability for nuclear damage, as indicated by the work of INLEX. In fact, today more than ever, there is an increasing need for the IAEA to provide advice to states about the contents of existing and new international legal instruments in the nuclear field in a structured and coordinated manner; to clarify the interrelation among these different instruments; and to develop and convey a uniform message to states on how they should develop their national nuclear legislation.

In addition, the interrelationship between safety and security and the effect that a well-developed regulatory safety system in a given state has on ensuring the security of radioactive material can be now found more and more in IAEA documentation.[76] Similarly, a number of IAEA documents

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73. For an overview of the IAEA's legislative assistance activities see **"**Building a Stronger Framework of Nuclear Law: The IAEA's Legislative Assistance Services", Carlton Stoiber, IAEA Bulletin, Volume 45, Number 1 (2003).

74. See the *Handbook on Nuclear Law*, IAEA, STI/PUB/1160, July 2003: www-pub.iaea.org/MTCD/publications/PDF/Pub1160_web.pdf.

75. See for example, omnibus safety resolutions of the General Conference in 2001-2005 e.g. GC(45)/RES/10 of 2001 and GC(46)/RES/9 of 2002.

76. A number of General Conference resolutions (for example GC(49)/RES/10, GC(48)/RES/11 and GC(47)RES/8), and the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources [(BSS) IAEA Safety Series No.115, 1996] recognise the interrelation between safety and security and the effect that a well-developed regulatory safety system in a given country has on ensuring the security of radioactive material. In addition, the Findings of the President of the "International Conference on the Safety and Security of Radioactive Sources", held from 27 June to 1 July, 2005, in Bordeaux, France, "recognised that safety and security are an integral part of effective

recognise the central contribution of IAEA safeguards agreements and additional protocols thereto and also of state systems of accounting for and control of nuclear material (SSACs) to preventing illicit trafficking and to deterring and detecting diversion of nuclear material, thus recognising the dual purpose of SSACs for safeguards and security.[77]

But more needs to be done than simple recognition. These concepts have overlapping jurisdictions and implications, in particular, further consideration has to be given to the impact of safety or security measures on each other. Bringing balance and harmony to these two principles not only requires the development of international guidance but also the application of effectively coordinated mechanisms for national application. This is a big challenge as the interrelationship as well as the areas of overlap and of diversity must be identified, rationalised and given effect in the national legislation.

To explore this further, there has accordingly been a re-orientation and re-structuring of the IAEA's legislative assistance programme. In fact, the IAEA will in the future be pursuing a comprehensive approach to nuclear safety, security and safeguards – the so called "3S" approach – as well as encompassing nuclear liability. This approach not only recognises the complex technical and legal interrelationships, as well as the areas of coexistence and diversity of these branches of nuclear law but also provides for their practical implementation – so that they may be given effect in a national legislative framework. In particular, in addition to the aforementioned primary elements of the programme, the development of further guidance material for Member States on how to draft national legislation in the various fields of nuclear law is foreseen. In this context, for example, a second volume of the aforementioned Handbook on Nuclear Law will be published later in 2006 that, in light of the different legal systems in states, comprises elements and sample modular legislation text plus extracts from the national legislation of various states, with corresponding explanations and annotations. Also, an International Nuclear Law Web site (and underlying database of nuclear information and knowledge), will be created from where information to be used for legislative drafting can be found in one place and from where states can exchange experiences in drafting national legislation. Finally, a pool of nuclear law legal experts is being trained from which the IAEA can draw on, so as to provide the required assistance and training to states.

Part II. Challenges

Despite the numerous legal and practical achievements in the international framework for the safe and peaceful uses of nuclear energy in the two decades since the Chernobyl accident, a number of challenges still remain.

1. Emergency Preparedness and Response

For example, while the Early Notification and Assistance Conventions were drafted with the aim of closing a significant "gap" in the legal framework for mitigating the consequences of nuclear accidents and while they represent important progress in international law and in the field of nuclear safety, they were always considered as being only a first step. While admittedly much has been done since their entry into force and there are now a large number of practical arrangements for notifying

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and comprehensive regulatory infrastructures for ensuring the continuous control of radioactive sources throughout their life cycle."

77. See for example the aforementioned Nuclear Security Plan for 2006-2009.

and responding to nuclear accidents and emergencies, international cooperation in this area cannot stand still.

Also, since the Chernobyl accident, major political and technological developments such as improvements in international cooperation and advances in information technology require the continuous improvement of the international emergency preparedness and response system. In addition, there is a heightened awareness of the need to strengthen arrangements to respond to emergencies that could arise from activities involving the possible malicious use of nuclear or radioactive material and about possible attacks on nuclear installations. It is also recognised that there is a large number of radioactive sources for which the international emergency preparedness and response system is less developed than for nuclear installations.

The development of the International Action Plan for Strengthening the International Preparedness and Response System for Nuclear and Radiological Emergencies, which recognises these issues, is therefore a welcome step. Also, the proposal to initiate the development of a "Code of Conduct for the International Emergency Management System" which is intended to expand and formalise arrangements outlined in the aforementioned EPR-ENATOM 2004 and which applies to emergency situations that can arise from both accidents as well as malicious acts, involving radioactive and other nuclear material, should greatly contribute towards a more uniform and state-of-the-art emergency assistance and response system worldwide.

Ultimately, however, the Early Notification and Assistance Conventions would need to be revised and updated so as to represent legally binding state of the art practice in this field.

2. Safety of Nuclear Power Plants

In the area of nuclear power plant safety, a major challenge facing the international nuclear community was recognised for the 1990s as ensuring that all nuclear installations worldwide are safe.[78] It is without doubt that the adoption of the CNS later in that decade contributed to overcoming this challenge.

Yet despite past efforts, challenges still remain, not only for those countries with extensive operating experience and strong regulatory oversight but also for those without. Quite simply, the safe operation of nuclear power plants can never be considered as being completed, even in those states with a high level of safety. At the same time, the past few years have witnessed a significant change in attitudes towards nuclear power. There is increasing attention to its benefits as an environmentally clean source of electricity and to meet the energy needs in the 21st century. In fact, there are 443 power reactors now operating in 30 countries (with a further 26 under construction), generating electricity for nearly 1 billion people. Nuclear energy presently accounts for about 16% of the world's electricity production, keeping pace with the steady expansion in the global electricity market. It is clear that not only is there a need for the establishment of adequate and comprehensive national legal and regulatory frameworks for the safe and peaceful uses of nuclear energy worldwide, but also a need for their constant maintenance and development.

78. See the 1990 Report by the IAEA Director General to the Board of Governors, in IAEA document GOV/INF/583, 21 May 1990.

3. Radioactive Waste Management

The safe management of radioactive waste is still a point of scepticism in public acceptance of nuclear energy. In this respect, the significance of the Joint Convention as the only binding instrument in the field and thus as an important mechanism to improve worldwide confidence cannot be underestimated.

Although there is recognition of the growing support for the universal application of the safety standards for protecting people and the environment against nuclear accidents, there is still a need to have broader participation in the nuclear safety conventions, in particular, the Joint Convention. Despite a modest increase this past year in the membership of the Convention, it is highlighted that it is relevant to all states in which there is radioactive waste, even to those where the only waste generated comes from the use of radioactive materials in medicine and research. The Joint Convention, however, has at the time of writing, only 36 Parties[79] and in fact, just less than one third of the states that operate nuclear power plants (8 out of 30 worldwide) have yet joined the regime. Promoting adherence to the convention and achieving a worldwide common understanding of the issues underlying the safe management of radioactive waste and spent fuel is certainly one of the more important near term tasks.

4. Safety and Security of Radioactive Sources and Safety of Research Reactors

As concerns the Codes of Conduct that have been mentioned, it would appear at first glance that these Codes are an exception to the call shortly after the Chernobyl accident for "the creation of an international regime for the safe development of [nuclear energy]". At that time, there appeared a need for binding norms: to move away from the recommendatory nature of the safety standards.

In this regard, the codes could be considered, as a step backwards. They are not obligatory and again like the safety standards are non-mandatory, leaving states free to pick and choose whether to apply at will the norms contained therein. However, it should be borne in mind that whatever the legal form of an instrument (i.e. whether it is binding such as a treaty, or not), what is important is its effectiveness. In fact, a binding instrument may itself contain vague or non-obligatory language and even if it does not, it may also do very little to alter the behaviour of its addressees. Also, in cases where a binding instrument is in force, it still may be deficient from a lack of adherence by states. In contrast, a legally non-binding instrument such as a Code of Conduct can be supported by many more states committing themselves to apply the guidance contained therein, than might become party to a legally binding convention.

That said, as with any international legal instrument, but even more so with a Code of Conduct, proper national implementation or application is the key to its success and effectiveness. Application can be encouraged through the incorporation of "peer review" mechanisms such as in the CNS and the Joint Convention, as opposed to specific obligations for non-compliance or reliance on dispute settlement provisions. While at the outset, states did not wish the inclusion of such "peer review" mechanisms during the preparatory work on the two Codes adopted under IAEA auspices, the international community is now considering the effectiveness of their application.

79. With the entry into force of the Joint Convention for Brazil on 18 May 2006; Estonia on 4 May 2006; Iceland on 27 April 2006; Italy on 9 May 2006; and the Russian Federation on 19 April 2006, there will be 41 Parties to the convention.

In this regard, it will be interesting to see whether states wish to take steps leading to the adoption of a formalised process for discussing the application of the Code of Conduct on the Safety and Security of Radioactive Sources. Should states choose to do so, it will illustrate a new and interesting development of nuclear normative rule making at the IAEA: a mechanism for "hardening" or "strengthening" what can in fact be considered as "soft law".

5. Nuclear Security

The challenge of increasing the nuclear security of states has taken on heightened significance in recent years. Accordingly, the practical response has been swift and also on multiple fronts.[80] Indeed, few areas of activity in the nuclear field have undergone such fundamental changes in so short a period. These efforts have been focused, by necessity, on helping states identify and address vulnerabilities, upgrading the physical protection of nuclear facilities, improving national detection and response capabilities, securing high priority radioactive sources and developing standards and guidance. The overall objective is to achieve the improved worldwide security of such material in use, storage and transport, and of associated facilities, by supporting Member States in their efforts to establish, maintain and sustain effective national nuclear security regimes, *inter alia*, through the implementation of relevant international legal instruments.

As in the other branches of nuclear law, there is an increasing number and complexity of binding and non-binding international instruments in this area which require application and implementation by Member States.[81] In particular, following the UN General Assembly's adoption in April 2005, after seven years of negotiation, of the International Convention for the Suppression of Acts of Nuclear Terrorism (the Nuclear Terrorism Convention) there are now 13 universal conventions

80. For example, there are a number of international and regional initiatives that are directly relevant to the IAEA's Nuclear Security Programme. Mention will be given two of them. First, the 2004 Global Threat Reduction Initiative (GTRI), announced by the USA Secretary of Energy Spencer Abraham on 26 May 2004. The mission of the GTRI is to remove and-or secure high-risk nuclear and radiological materials and equipment around the world that pose a threat to the United States and to the international community. The GTRI has been working in collaboration with the IAEA to systematically address threats, posed by high-risk nuclear and other radioactive material. Second, there is the 2003 EU Strategy against the Proliferation of Weapons of Mass Destruction. In May 2004, the European Council adopted in the implementation of this Strategy, a Joint Action on support for IAEA activities under the IAEA's Nuclear Security Programme. In July 2005, the Council also adopted, in this framework, a new Joint Action on support for IAEA activities not only in the area of nuclear security, but also in the area of verification. The purpose of one of the projects in the latter Joint Action is to strengthen national legislative frameworks for the implementation of states' obligations under IAEA safeguards agreements and additional protocols. This is to be achieved by the provision of IAEA legislative assistance to target countries in the drafting and/or revision of national legislation. Further mention of this type of assistance and the synergies between security and safeguards is provided later in this paper.

81. The importance of some of these instruments is recognised in UN Security Council Resolution 1540, adopted in April 2004. Many governments have already responded to this resolution which, *inter alia*, calls on all states to develop and maintain effective border controls and law enforcement efforts to detect and combat illicit trafficking, and to refrain from providing any form of support to non-state actors that attempt to develop, acquire, use or transfer nuclear, chemical or biological weapons or their delivery systems.

and protocols against terrorism, including the CPPNM, which have been developed under the auspices of the UN and its specialised agencies.[82]

One of the main challenges in building a global nuclear security regime, therefore, is clearly to analyse all the relevant international instruments that have been adopted in various fora and to explore their interrelation and synergies but also any conflicting or overlapping obligations and to assist states in updating their national legislation.

6. Liability for Nuclear Damage

Turning to liability for nuclear damage, it is highlighted that despite the adoption of the aforementioned new norms, providing for a broader geographical scope of application of the liability regime, an increased amount of liability of the operator of a nuclear installation, enhanced means for securing adequate and equitable compensation, and a means for supplementary compensation, there still remain concerns. For example, the lack of adherence to the various nuclear liability instruments by the main states engaged in these activities is clearly a disincentive for other states to join these instruments.

In addition, although INLEX has identified some gaps and ambiguities, it is clear that further steps still need to be taken towards actually filling these gaps and ambiguities, with the aim of eventually leading towards the universal application of a global regime of nuclear liability. In this respect, the entry into force of the CSC which could serve as an "umbrella" over the present somewhat fragmented situation would certainly be a step in the right direction. To facilitate this ongoing process, the IAEA Director General decided in 2005 that INLEX should carry on its work and extended its term for an indefinite period. It is expected that INLEX will continue to play its role not only as a forum of expertise for providing authoritative advice on the nuclear liability instruments adopted under IAEA auspices but also for developing further a global nuclear liability regime.

Part III. Outlook

Having considered the international legal framework on the safe and peaceful uses of nuclear energy and the most relevant practical aspects underpinning these instruments, it is fair to say that in the two decades since Chernobyl, significant achievements and important steps have been taken by the international community to establish a harmonised, efficient, effective and transparent infrastructure and that as forums for international cooperation among states, international organisations such as the IAEA have been indispensable for fulfilling this purpose.

At the same time, however, it appears that concerns are now driven by new realities. On the one hand the "renaissance" of nuclear energy production and technology. On the other hand the rise in terrorism and the declared ambition of terrorists to acquire and use weapons of mass destruction; the discovery of clandestine nuclear programmes and supply networks; and the emergence of an extensive black market in nuclear material and equipment. To name but a few.

82. For the text of the Nuclear Terrorism Convention see the Annex to UN General Assembly resolution A/RES/59/290 of 13 April 2005. It should also be noted that the Ad Hoc Committee established by UN General Assembly resolution 51/210 is currently negotiating a draft "comprehensive convention on international terrorism".

In this respect, for nuclear energy to play a fundamental role in the future and to be a viable option for more countries – in particular developing countries – and so as to address these concerns, the international community will need innovation in terms of policy, infrastructure development and the present level of international cooperation.

Although much has been achieved and the IAEA's work is making a difference – recognised by the award of the 2005 Nobel Peace Prize[83] – it is still acknowledged that much still remains to be done. In this context, the international legal framework and the practical activities that are carried out thereunder should always be viewed as a "work in progress". In fact, one of the lessons of Chernobyl should certainly be that progress in nuclear law should not be a reaction to crisis. Instead there should be a "gradual evolution or progressive development" of both international and national rules of law which not only addresses potential or perceived problems and events but also follows developments and initiatives. Examples which require such a gradual evolution can at this stage be found in initiatives that are at present being developed.

These initiatives, in short, concern regional approaches to energy needs;[84] the use of an advanced generation of nuclear power plants;[85] and consistent with regional approaches – multinational arrangements for enrichment, fuel production, waste disposal and reprocessing which could feasibly facilitate safety, security and proliferation resistance in the future utilisation of nuclear energy.[86] Such multilateral approaches are not new but they would require, for example, a legal framework for multilateral management and control of both the "front end" (fuel reprocessing and waste disposal) and "back end" (i.e. spent fuel and radioactive waste) of the fuel cycle. Also, there would have to be assurances of supply of reactor technology and fuel, either through the IAEA, under Article IX of its Statute, where it is authorised to serve as guarantor of the supply of fissile material for fuel and the reprocessing of spent fuel, or under a separate multilateral/regional or bilateral arrangement.

In any event, while greater internationalisation of the existing nuclear safety and security regimes would be in line with the envisaged world-wide nature of such multilateral approaches, there would obviously be a need to consider thoroughly whether the existing instruments are effective or even any longer adequate in their present form. Furthermore, most of the practical arrangements that

83. The Nobel Peace Prize for 2005 was awarded by the Norwegian Nobel Committee to the IAEA and its IAEA Director General, Dr. Mohamed ElBaradei for "their efforts to prevent nuclear energy from being used for military purposes and to ensure that nuclear energy for peaceful purposes is used in the safest possible way." See the Press Release concerning the award of the 2005 Nobel Peace Price, http://nobelprize.org/peace/laureates/2005/press.html.

84. An example of such an approach is the joint communiqué signed on 27 February 2006 by the Prime Ministers of the three Baltic states, Estonia, Latvia and Lithuania in which they agreed to prepare, during 2006, a common Baltic Energy Strategy which includes cooperation in building a new nuclear plant.

85. See the Generation IV International Forum for the development of a technology "road map" to help guide future nuclear power plant development and evaluations and the IAEA's International Project on Nuclear Reactors and Fuel Cycles (INPRO) are helping to promote evaluation of and cooperative research on innovative nuclear energy designs.

86. See the IAEA Director General's Expert Group on Multilateral Approaches to Nuclear Fuel Cycle. The Group was to explore options and develop proposals for improved controls, including possible multilateral oversight arrangements, for the front- and back-ends of the nuclear fuel cycle. The Group's report, finalised in February 2005, identifies a number of approaches with the objective of increasing non-proliferation assurances associated with the civilian nuclear fuel cycle while preserving assurances of supply and services. (see IAEA document INFCIRC/640, 22 February 2005 or IAEA document MNA/2005, April 2005).

support the legal framework, such as the international safety standards and associated peer reviews and advisory services, would no doubt need to be updated to ensure that advanced reactor types and fuel cycle facilities are adequately addressed. Transport of nuclear and radioactive material safety and security, as well as the liability of the operator or supplier of nuclear fuel will also be important issues that will need to be addressed and could be major considerations in the development of the future international legal framework governing the safe and peaceful uses of nuclear energy.

All of these multilateral initiatives will impose significant tasks on international normative regulation not at least because internationalisation of what was for many years considered a strictly national domain will be required. In as much as it has been time, 20 years after Chernobyl, to look back and to take stock, challenges still remain.

International Nuclear Third Party Liability Law: The Response to Chernobyl

by Julia A. Schwartz*

I. Introduction

Twenty years ago a nuclear accident occurred at the Chernobyl Nuclear Power Plant in Ukraine that would have a profound impact on the evolution of international nuclear liability law. The accident had serious detrimental effects upon human health, property and the natural environment and damage was suffered not only in Ukraine itself, but in several neighbouring countries and in some cases, far beyond.[1]

The accident resulted in a prolonged release to the atmosphere of large quantities of radioactive substances with widespread distribution of radioactivity throughout the northern hemisphere. The most serious radiological, health, and socio-economic consequences were experienced by the populations of Belarus, Ukraine and Russia and they still suffer from many of those consequences to this day. Approximately five million people still live in areas in these three countries that are contaminated with radionuclides from the Chernobyl disaster.

Acute health effects were experienced first by the fire fighters and other emergency clean-up workers who intervened immediately following the explosions. A total of 31 people died as a consequence of the accident, and about 140 people suffered various degrees of radiation sickness and radiation-related health impairment. Longer term health effects are evidenced by a significant increase of carcinomas of the thyroid amongst infants and children exposed at the time of the accident in the contaminated regions of the former Soviet Union.

The town of Pripyat, located 4 kilometres from the plant, was evacuated within hours of the accident, and the town remains uninhabited to this day. More than 100 000 people were evacuated from their homes, mostly from the 30-km radius area around the accident site, during the first few weeks following the accident.

The impact of the accident on the environment, particularly on agricultural production, was and continues to be widespread. Tens of thousands of square kilometres of agricultural land were contaminated with radiation and large quantities of food products, particularly dairy products, had to be destroyed. Bans or restrictions were placed on the production and sale of certain other agricultural products and even today there are several thousand square kilometres of land on which agricultural activities are prohibited.

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* Head of Legal Affairs, OECD Nuclear Energy Agency. The facts contained and ideas expressed in this paper are the responsibility of the author alone.

1. There are numerous publications describing the radiological, health and socio-economic consequences of the Chernobyl accident. The information contained in the following paragraphs has been largely taken from, "Chernobyl: Assessment of Radiological and Health Impacts, 2002 Update of Chernobyl: Ten Years On", OECD Nuclear Energy Agency, 2002.

The activity transported by the multiple plumes from Chernobyl was not only measured across Europe, but as well in Canada, Japan and the United States, although the radiological impact of the accident in these others countries was generally very low or even insignificant. What *was* significant, however, was the sobering realisation of the extent to which a major nuclear accident could have trans-boundary implications, affecting countries that were a considerable distance from the accident site.

Equally sobering was the realisation of the costs of the damage incurred, both on individual and societal levels – costs which resulted from loss of life, personal injury and illness including the effects of psychological stress and other mental health problems, property damage, economic loss, damage to the environment and other socio-economic disruptions. The range of damage suffered seems almost limitless. No precise figures are available, but the costs of the accident over the last two decades are estimated to have risen to the level of hundreds of billions of dollars.

While much has been written about the extent of the damage caused by Chernobyl, relatively little attention has been focused, by comparison, on the ability of individuals who did suffer damage to obtain compensation for it, wherever they were or are geographically situated. This is not actually surprising, given the magnitude of the accident's consequences, which would have been beyond the financial capacity of any legal entity or entities that may eventually have been held liable for the resulting damage.

One also has to take into account the fact that in 1986 there was no special legislation in place in the former Soviet Union which would have entitled victims in the most severely affected successor countries of Ukraine, Belarus and Russia to claim compensation for nuclear damage suffered. Nor was there any international liability and compensation regime to which the former Soviet Union was Party and under which victims in neighbouring countries would have had a right to claim compensation in respect of nuclear damage incurred as a result of the accident. The absence of both made it very difficult for victims, both within and outside of the Soviet Union, to be compensated for the damage they suffered. Victims within the Soviet Union were obliged to trust in the political will of their government to provide compensation, in one form or another, for the damages they suffered, whilst victims outside the Soviet Union fell back on either common or civil law principles if applicable, or the political will of their own governments to compensate their losses.[2]

The 20th anniversary of the Chernobyl accident stirs painful memories of this tragic event, but it is also a time to reflect on the ways in which the international nuclear community has responded, since that accident, to the need to protect victims of nuclear damage through a viable and effective international liability and compensation regime. To assess the extent and value of that response, we need to go back and look at what protections were available to victims on an international level *before* Chernobyl.

II. The Evolution of the Fundamental Principles

In the early days of the development of the nuclear industry, the governments of many industrialised countries viewed nuclear power as a possibly limitless source of indigenously produced energy that would enable their economies to grow and prosper rapidly. There were, however, a number of important barriers to this development.

2 . A good example of this is found in Dr. Werner Eich, "The Compensation of Damage in Germany Following the Chernobyl Accident" together with the Documentation of the German Federal Office of Administration, "Compensation for Damage Following the Accident at the Chernobyl Nuclear Power Plant", in Workshop Proceedings of Indemnification of Damage in the Event of a Nuclear Accident, OECD 2003, p. 89-92 and p. 99-116.

First, it was recognised that the public needed to be assured of sufficient protection against the potential magnitude and peculiarity of risks arising from nuclear energy production. These risks are not only associated with the operation of nuclear reactors, but with the production, carriage, storage and disposal of nuclear fuel capable of spontaneous criticality. They could lead to far greater damage than that normally associated with conventional industries and in addition, that damage might not manifest itself until many years after the incident which caused it. While governments at the time may not have envisaged a "Chernobyl" type accident, they were very much aware that in the case of a nuclear catastrophe involving a large scale emission of ionising radiation, hundreds or even thousands of people could suffer radiation related illness, incur damage to their property and suffer various other forms of economic loss.

Secondly, it was recognised that the public was not the only entity in need of protection. Fear of financially debilitating liability claims that might be instituted by innocent victims following a nuclear accident was inhibiting investment in the construction of new power plants by potential owners, builders, and suppliers of equipment, services and technology. All were concerned that such claims, if successful, could place them in bankruptcy. With no protection against a liability that was potentially unlimited both in time and amount, nuclear plant owners/operators, builders and suppliers were understandably hesitant to commit to the development of the industry.

Governments realised that a solution to these conflicting interests was essential; the need to protect the public from the exceptional risks posed by the production of nuclear energy, the economic benefits of a developed nuclear power industry, and the need to protect investors and suppliers from ruinous claims for damages all had to be reconciled. It quickly became obvious that the answer lay in removing the legal and financial impediments to industrial development while at the same time ensuring adequate compensation for any damage that might be suffered by innocent third parties.

Accomplishing these objectives meant setting aside the application of the rules of ordinary tort law to nuclear accidents. Those rules, while appropriate for conventional industrial risks, were not deemed compatible with nuclear ones. They were seen to inhibit, rather than facilitate victims from demonstrating which of the many potential parties involved in a nuclear incident was legally liable therefor, particularly given the overwhelming technical complexities of such a task. They were also seen to expose nuclear owners/operators, builders and suppliers to unlimited liability amounts, and for unlimited periods of time, in respect of which they would never have been able to obtain adequate insurance coverage in the normal course of business.

States promoting the peaceful uses of nuclear energy thus developed a number of basic principles to replace the rules of ordinary tort law, principles which form the basis of nuclear liability law in most industrialised countries of the world today. Those basic principles include:

Strict Liability: The operator of a nuclear installation is strictly liable for damage to third parties[3] resulting from a nuclear incident occurring at its installation or during the course of transport of nuclear substances to or from that installation. Due to the unusual risks associated with the operation of nuclear installations or the transport of nuclear substances, it was clear that those who carried out those activities should be fully responsible for any injurious consequences

3. A third party is anyone other than the nuclear operator itself and other than a supplier of goods, services or technology for use in connection with a nuclear installation. A third party may be inside or outside of the nuclear installation and as such the term includes employees of the operator of the nuclear installation at which an accident occurs. In most countries, employees of the nuclear operator will also have a right to claim compensation under a system of public health insurance, social security, workers or occupational disease compensation.

resulting therefrom. Strict liability relieves a claimant of the burden of proving fault or negligence, and imposes liability, together with the obligation to compensate the damage suffered, merely on proof of a causal link between the damage and the nuclear accident in issue.[4] Since it would be virtually impossible for a claimant to have the necessary knowledge of what had taken place in a nuclear installation or in the course of carriage when the accident occurred, strict liability provides a large measure of equity that would not otherwise be available to victims of a nuclear accident.

Exclusive Liability: The operator of a nuclear installation is exclusively liable for damage to third parties resulting from a nuclear incident occurring at its installation or during the course of transport of nuclear substances to or from that installation. The operator is legally liable regardless of whose acts or omissions were the actual cause of the accident. For the victim, this principle obviates the need to identify and pursue those who actually caused the accident, a task which, due to the difficulty of obtaining the necessary evidence after an accident has occurred, would be virtually impossible. In addition, suppliers of nuclear goods, services and technology are spared the considerable expense of defending complicated liability actions instituted by those suffering damage. They are also relieved of the need to purchase costly third party liability insurance, an expense which would need to be incurred by each and every entity supplying goods, services or technology to the nuclear installation or for the transport of nuclear substances. The advantages enjoyed by suppliers are extended to carriers who are not responsible for the packaging of the nuclear substances being transported, who do not necessarily have the specialised knowledge of how to handle them and who would otherwise also be required to purchase costly third party liability insurance to cover their liability exposure.

Liability is Limited in Amount: Governments' desire to encourage the development of the nuclear industry by relieving nuclear operators of the burden of potentially ruinous liability claims in the event of a nuclear accident, led them to adopt a principle which limits the amount of compensation payable to victims by a nuclear operator in the event of an accident for which it is liable. Without it, nuclear operators would be exposed to unlimited liability, meaning that once their available insurance coverage for this risk is exhausted, they would have to resort to their own assets to pay nuclear damage compensation which could, in turn, lead them into bankruptcy.[5] This principle is, so to speak, the *quid pro quo* for the benefits to victims of the imposition of strict and exclusive liability upon a nuclear operator. Thus, even if the amount of damage suffered as a result of a nuclear accident exceeds the specified amount of liability imposed upon an operator, that operator will not be required to provide any further compensation.[6]

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4. This is contrary to the rules of ordinary tort law which require a claimant to prove the fault or negligence of the entity from whom it is seeking compensation. There are usually a few exceptions to this rule however; a nuclear operator is generally exonerated from liability, for example, where the damage results from a nuclear accident caused directly by an act of war or other similar hostilities which are deemed to be the responsibility of the state. In cases where the operator is exonerated from liability, it is expected that the state itself will assume responsibility for compensating any nuclear damage incurred.

5. Even if a nuclear operator were required to liquidate its assets to pay compensation claims over and above its available insurance, there is no guarantee that victims would necessarily benefit, especially where the nuclear accident destroys the operator's major asset, the nuclear installation itself.

6. Most governments recognise that in the case of a major accident the nuclear operator's liability insurance may not be sufficient to compensate all damage suffered, and they are usually prepared therefore to provide some form of additional or supplementary compensation. State intervention is based on the

Liability must be Financially Secured: Nuclear operators are obliged to obtain and maintain financial security in respect of their liability to third parties in an amount corresponding to their imposed liability amount. Compulsory financial security ensures that, if and when the time ever comes, funds will actually be available to pay compensation to claimants. Insurance provided by the private sector is the most frequent type of security obtained by nuclear operators but other forms are possible as well, such as a state or bank provided guarantee, operator pooling system or even self-insurance.[7] The nuclear insurance market capacity has always been limited and it remains so to this day, even though it has increased significantly from what it was in the early days of the industry. It is this capacity which largely determines the amount of liability imposed on nuclear operators, as well as the ability of nuclear operators to pay not unreasonably priced premiums for that insurance.

Liability is Limited in Time: The providers of required financial security, primarily private insurers, have made it clear that the coverage which they provide must be limited in time, usually to not more than ten years from the date of the nuclear accident for both personal injury and property damage claims. Neither insurance companies nor nuclear operators can accept the prospect of remaining liable to pay compensation for nuclear damage for an indefinite or even an extended period of time after a nuclear accident. In addition, in most jurisdictions there is a "discovery rule" which, in addition to the time limit for instituting claims, requires claims to be filed within two or three years of the date upon which the victims discovered the damage for which compensation is claimed. In some cases, the state will assume the responsibility of paying compensation for damage suffered where claims are instituted beyond the specified limitation period.

These principles form the basis of many national legislative regimes adopted to address liability and compensation for damage suffered by a third party. They also form the basis of the existing international regimes established to address third party nuclear liability and compensation issues as will be seen below.

III. The International Nuclear Liability Regimes before Chernobyl

Even before the Chernobyl accident took place, states promoting the peaceful uses of nuclear energy also recognised that the repercussions of a nuclear accident would not stop at political or geographical borders, and that it would be highly desirable to establish an international regime to provide for a harmonised liability system for all neighbouring countries – this was especially true for Western Europe. It was decided to establish such a regime by means of an international agreement which would set out rules for instituting cross-border legal actions where victims in one state wished to claim compensation for damage against a nuclear operator in another state, for addressing liability for damage arising out of the transport of nuclear substances from one country to another, and for resolving the often complicated questions of which state's courts should have jurisdiction to hear victims' claims for compensation and which state's laws should apply to the adjudication of such claims.

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recognition of state responsibility for the protection and welfare of its citizens and the principle of national solidarity.

7. Self-insurance is usually only permitted in respect of nuclear installations that are owned or operated by a state.

It was recognised that such a harmonised liability system would contribute to legal certainty, eliminate the possibility of discrimination and ensure that claimants in states party to the convention would have their actions adjudged by similar laws, regardless of where the accident took place and where the damage was suffered.

Furthermore, governments realised that the potential magnitude of a nuclear incident would require international collaboration between national insurers. Only by marshalling the resources of the international insurance market by coinsurance and reinsurance could sufficient financial security be made available to meet possible compensation claims.[8] Such collaboration could only be achieved if there were a uniform third party liability regime at the international level.

That international regime was initially founded in 1960, under the auspices of the Organisation for European Economic Co-operation (now the Organisation for Economic Co-operation and Development – OECD), with the adoption by its Western European member countries of a regional convention known as the Paris Convention on Third Party Liability in the Field of Nuclear Energy (Paris Convention).[9] The principles described above form the basis of that Convention, thus allowing its Contracting Parties to achieve their desired objectives at both national and international levels.

But it was not only the states of Western Europe who foresaw the need for an international regime establishing liability and compensation for nuclear damage. The year 1963 also witnessed the adoption, by a number of IAEA[10] member states from Central and South America, Africa, Asia Pacific and Eastern Europe, of a second international nuclear liability convention, incorporating the same fundamental principles as those set out in the Paris Convention, but intended to have a wider geographic scope of application, the 1963 Vienna Convention on Civil Liability for Nuclear Damage (Vienna Convention).[11]

The provisions of the two conventions are very similar, if not, in fact, identical but there are some differences, particularly in respect of the liability amounts imposed on nuclear operators, the level of financial security required, states' obligations where that security fails, and the types of damage for which compensation may be awarded, none of which should be overlooked. Nevertheless, this is not the place to compare these two instruments, given that each of them has recently undergone a major amendment[12] and so a very brief description will have to suffice.

A look at their most important features confirms that under each convention, a nuclear operator is both strictly and exclusively liable for damage resulting from a nuclear incident occurring at its installation, or in the course of carriage of nuclear substances to or from its installation. The operator is liable, generally speaking, only for personal injury (including death) and loss of, or damage to

8 . "Coinsurance" means that a number of insurers collectively insure a certain risk with the sum of their individual shares totalling 100%. "Reinsurance" is where an insurer or co-insurer cedes part of the risk it has assumed to another insurer for which it pays a premium, essentially insuring the risk it has insured.

9. The full title of this instrument is: Convention on Third Party Liability in the Field of Nuclear Energy of 29th July 1960, as amended by the Additional Protocol of 28th January 1964 and by the Protocol of 16th November 1982. A further Protocol to amend the Paris Convention was adopted on 12 February 2004 but it has not yet come into force. A list of the 15 Contracting Parties to the Paris Convention is set out in Annex 1.

10. International Atomic Energy Agency.

11. A list of the 33 Contracting Parties to the Vienna Convention is set out in Annex 2.

12. See the 1997 Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage and the 2004 Protocol to Amend the Paris Convention on Third Party Liability in the Field of Nuclear Energy.

property, other than property on the site of the installation. The conventions do not apply to nuclear incidents occurring in the territory of non-contracting states or to damage suffered in such territory.

The operator's liability is limited both in time and amount. Under both conventions, claims for compensation of damage must be instituted within ten years from the date of the accident. Contracting Parties may establish a "discovery rule" under which claims must be made within at least two years from the time the victim discovered the damage and the identity of the operator, and most if not all have done so. Under the Paris Convention, the *maximum* liability of the operator is set at 15 million SDRs,[13] and the minimum is fixed at 5 million SDRs[14] while under the Vienna Convention, only a minimum amount of 5 million US dollars (USD)[15] is established. The nature, form and extent of compensation are matters to be governed by national law. The operator must obtain and maintain financial security to cover the amount of its liability.

In addition, the two conventions contain provisions based upon two important additional principles, both designed to address the complexities raised by the transboundary scope of nuclear damage and the institution of cross-border compensation claims: first, jurisdiction over nuclear damage compensation claims lies only with the Contracting Party in whose territory the accident occurred, or, where it occurs in the territory of a non-Contracting State, with the courts of the Contracting Party where the liable operator's nuclear installation is situated;[16] secondly, those courts are to apply the convention, and their own national law for all matters not covered by the convention, without discrimination based on nationality, domicile or residence. Judgements are to be enforceable in any Contracting Party.

At about the time of the adoption of the Vienna Convention, the Paris Convention states recognised that the liability amount fixed under their own convention would not be adequate to cover the damage suffered in the event of a serious nuclear accident. To remedy that deficiency, most of the Paris Convention states adopted a third international instrument, the 1963 Brussels Convention Supplementary to the Paris Convention (Brussels Supplementary Convention),[17] created to provide *additional* compensation to victims through the establishment of a 3-tier system of supplementary

13. The Special Drawing Right is a unit of account defined by the International Monetary Fund (IMF) based upon the US dollar, the Euro, the Japanese Yen and the Pound Sterling. The IMF Treasury Department exchange rate between the SDR and the EUR on 31 March 2006 was SDR 1= EUR 1.19 and between the SDR and the USD on that same date was SDR 1=USD 1.44. All SDR-EUR/USD conversions in this paper are based on these exchange rates. 15 million SDRs is approximately EUR 17.8 million or USD 21.6 million.

14. Approximately EUR 5.9 million or USD 7.2 million.

15. This amount is defined by reference to its value in gold on 29 April 1963. That value is USD 35 per one troy ounce of fine gold. The liability amount is generally considered to have a value of approximately USD 50 million today.

16. In the absence of a "unity of jurisdiction" principle, it would be almost impossible to respect a limitation upon the operator's liability. A court hearing nuclear damage claims or granting compensation awards in one jurisdiction, for example, would have no knowledge of or control over a court in another jurisdiction performing the same functions.

17. The full title of this instrument is: Convention of 31st January 1963 Supplementary to the Paris Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy amended by the Additional Protocol of 28 January 1964 and by the Protocol of 16 November 1982. A further Protocol to amend the Brussels Supplementary Convention was adopted 12 February 2004 but it has not yet come into force. A list of the 12 Contracting Parties to the Brussels Supplementary Convention is set out in Annex 3.

compensation.[18] The convention applies only to incidents occurring within one of its states and only to damage for which a Paris Convention state operator is liable. The system in effect at the time of the Chernobyl accident, and still in effect today, calls for the distribution of operator funds in the amount set under the Paris Convention, followed by the distribution of Installation State[19] funds up to 175 million SDRs[20] and finally, by the distribution of funds provided by the combined contributions of all Contracting Parties, up to 300 million SDRs.[21]

IV. The First Response to Chernobyl: The 1988 Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention

The international nuclear liability regimes established by the Paris and Vienna Conventions retained most of their original features until the late 1980s. Victims in States Party to the Paris Convention would receive the benefits available under its provisions if a nuclear incident occurred in a Paris Convention state, supplemented by the additional compensation provided for under the Brussels Supplementary Convention if the victim's state and that of the liable operator were Parties to that convention as well. Likewise, victims in States Party to the Vienna Convention were entitled to the benefits available under that convention in the event a nuclear incident occurred in one of its Contracting Parties.

Neither the Paris nor Vienna Convention applied to nuclear damage suffered in the territory of a Party to the other. Even the idea that Parties to one convention could adhere to the other never received much support, as this would have led to conflicting obligations under the two conventions. Nevertheless during the 1970s and early 1980s several attempts were made to find a means of connecting the two conventions,[22] particularly in light of the continuing growth of international trade in nuclear materials, which, in turn, led to continuing concerns with both improving protection for victims and serving the interests of nuclear operators and their suppliers.

It was, however, the 1986 accident at Chernobyl which proved to be the final impetus motivating both Paris and Vienna Convention states to establish a formal relationship between the two instruments. That incident propelled the entire international nuclear community into taking a very close look at whether the existing liability and compensation regimes were effectively protecting victims of a nuclear incident, particularly in light of the detrimental effects which a nuclear incident in one country could have upon the people, property and natural resources in a neighbouring country. Legislators became painfully aware of the need to expand the geographical coverage of the liability

18. A comprehensive commentary on the system created by the Brussels Convention Supplementary to the Paris Convention is to be found in, Bette, Didier, Fornasier and Stein, "Compensation of Nuclear Damage in Europe", Brussels, 1965.

19. The Installation State is the state in which the nuclear installation of the liable operator is situated.

20. Approximately EUR 295 million or USD 252 million.

21. Approximately EUR 357 million or USD 432 million.

22. The idea of a "joint protocol" open to both Paris and Vienna Convention States was first promoted in 1974 by the OECD Nuclear Energy Agency's (NEA) Group of Governmental Experts on Third Party Liability in the Field of Nuclear Energy, now called the Nuclear Law Committee. The aim of this mechanism was to remove conflicts resulting from the simultaneous application of both Conventions while promoting broader adherence to the basic principles underlying those Conventions. The idea received only limited acceptance at the time, but it was revived in 1984, at the suggestion of the IAEA's Standing Committee on Civil Liability for Nuclear Damage (SCNL) which was concerned with a potential increase in the number of 1963 Vienna Convention adherents and a real increase in the number of bilateral nuclear trade arrangements.

conventions as much as possible. Many believed that creating a link between the Paris and Vienna Conventions would induce a number of countries, especially those of Central and Eastern Europe, to join the latter, thereby extending the application of the existing international nuclear liability conventions throughout all or most of Europe.

In September 1986, less than six months after the tragedy at Chernobyl, experts from both the OECD/NEA and the IAEA concluded that a joint protocol uniting the Paris and Vienna Conventions would be the most practical and effective solution, and in October 1987, a joint Working Group of Governmental Experts from both organisations was established to pursue that solution. The result was the adoption, in September 1988, of the Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention (Joint Protocol).

The Joint Protocol generally extends to states adhering to it the coverage that is provided under the convention (either Paris or Vienna) to which it is not already a Contracting Party.[23] It thus creates a "bridge" between the two conventions. In doing so, it ensures that only one of the two conventions will be exclusively applicable to a nuclear incident.[24] The Joint Protocol entered into force in April 1992.

As noted above, at the time it was believed that such a link would induce a greater number of Central and Eastern European countries to join the Vienna Convention, particular those which had formed part of the former Soviet Union. To some extent this has proved to be true. Some 18 countries from those parts of Europe have ratified or acceded to that convention, more than half the total number of Contracting Parties thereto. Yet only 11 of those 18 countries have ratified or acceded to the Joint Protocol, the instrument which would link them to the regime established by the Paris Convention, a disappointing development for those who had hoped to link all of Europe with one single nuclear liability and compensation regime.

The international community soon recognised, however, that the Joint Protocol was not enough to redress the liability and compensation problems brought to harsh light by the Chernobyl accident. To attract broad adherence to the international nuclear liability conventions and to make them really effective, reform had to be more far reaching. In short, it had to ensure that in the case of a nuclear accident, much greater financial compensation would be made available to a much larger number of victims in respect of a much broader scope of nuclear damage than ever before. The Joint Protocol could only target the second of these goals, enabling compensation to be made available to a larger number of victims, and it could only do so to the extent that Paris and Vienna Convention states were prepared to adhere to it.[25]

23. For example, where a nuclear incident occurs for which an operator in a Paris Convention/Joint Protocol state is liable and damage is suffered by victims in a Vienna Convention/Joint Protocol state, those victims will be able to claim compensation for damage suffered against the liable operator as if they were victims in a Paris Convention state.

24. The exclusive application to a nuclear incident of only one of the two conventions is accomplished by means of the conflict rule contained in Article III of the Joint Protocol.

25. A list of the Contracting Parties to the Joint Protocol is set out in Annex 4.

V. The Second Response to Chernobyl: The 1997 Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage (VC Protocol)

During the 1988 Diplomatic Conference to adopt the Joint Protocol, the complementary nature of the civil nuclear liability regime established by the Paris and Vienna Conventions and a system of state liability for nuclear incidents was strongly emphasised. Not long afterwards, the IAEA adopted a resolution stating that "further strengthening of the liability regime for nuclear damage is essential to the development and use of nuclear energy for peaceful purposes".[26] In February 1990 an IAEA open-ended Standing Committee on Nuclear Liability (SCNL) was established with a mandate to study those very issues.[27]

It was clear that if the IAEA Resolution were to be implemented, then one or both of the two founding nuclear liability conventions would have to be modernised. As Professor Vanda Lamm has succinctly pointed out,[28] the Vienna Convention was selected first, simply because the Paris Convention had already been amended twice (in 1964 and in 1982), its liability amount had already been raised, its compensation provisions were already supplemented by those of the Brussels Supplementary Convention and most Western European States were already Party to it. By contrast, a number of Vienna Convention provisions were already considered outdated by the time that convention came into force in 1977, it had never been amended, and by the end of the 1980s it could only count 11 States Party.

Perhaps more importantly, as Professor Lamm has remarked, "…after the Chernobyl accident, the then Soviet Union refused to pay compensation to any foreign victims (and) some people believed that if the Soviet Union had been a party to the Vienna Convention, foreign victims would at least have had a chance to receive some compensation".[29] Revising the Vienna Convention was viewed as a means of attracting new members, thereby extending the convention's benefits to victims of any future accident with transboundary consequences such as those of Chernobyl.

The Chernobyl accident caused damage which went much further than anyone could have imagined up to that point. As noted earlier in this paper, apart from the tragic incidents of personal injury and death, the accident resulted in extensive environmental damage. Thousands of square kilometres of agricultural land were contaminated with radiation and a wide range of food products could no longer be sold because of a contaminated food chain. Towns had to be evacuated and some are still uninhabited today. The tourist industry collapsed. The Chernobyl accident encouraged the negotiators who were undertaking the revision of the Vienna Convention to institute significant reform in this area, both to better protect victims and to attract broader adherence to an international nuclear liability regime.

During the SCNL negotiations, there was general agreement that the minimum level of a nuclear operator's liability under the Vienna Convention needed to be significantly increased. On the other hand, it was also acknowledged that the capacity of the nuclear risk insurance market available

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26. See Resolution GC(XXXII)/RES/491 entitled "Liability for nuclear damage".

27. The SCNL's principle mandate was to: (i) consider international liability for nuclear damage, including international civil liability, international state liability, and the relationship between the two, and (ii) keep under review problems relating to the Vienna Convention on Civil Liability and advise States Party to that Convention on any such problems.

28. Lamm, V., "The Protocol amending the 1963 Vienna Convention" in *Nuclear Law Bulletin*, No. 61, June 1998, p. 7-8.

29. Lamm, V., *op. cit.*, p. 8.

to such operators was itself limited. This fact, amongst others, led to considerable debate on the need to adopt a regime of state liability to either replace or supplement the civil liability regime established by the convention, with supporting states taking the position that in the case of a "Chernobyl" type accident, only the financial resources of the state would be sufficient to compensate victims. As will be seen later, it was eventually decided to retain a civil liability regime, albeit with provisions allowing for nuclear damage compensation with public funds.

It was also agreed that a mechanism for mobilising supplementary funds to compensate nuclear damage, over and above those to be provided by nuclear operators through insurance or other form of financial security, should be established. The mechanism eventually selected is set out in an entirely separate instrument, the Convention on Supplementary Compensation for Nuclear Damage, an instrument which is described further on in this paper.

The SCNL negotiations resulted in the adoption of the Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage (VC Protocol), an instrument clearly designed to ensure that more money will be available to compensate more people for a broader range of nuclear damage suffered than ever before, and equally clearly designed to attract broad adherence from both nuclear and non-nuclear power generating states. The following are its major features:

More Money Available to Compensate Victims: Nuclear operator liability amounts are increased from a USD 5 million minimum to a 300 million SDRs[30] minimum. The operator may provide as little as 150 million SDRs,[31] but in that case the Installation State is obliged to make available an additional, equal amount. Contracting Parties may fix a liability amount as low as 5 million SDRs where the nature of the nuclear installation or nuclear substances involved so justifies,[32] but should the nuclear damage incurred exceed that lower amount, the Installation State must ensure that public funds are available to make up the difference to 300 million SDRs. States are free to impose unlimited liability on their nuclear operators if they wish. Financial security limits must match liability amounts and where unlimited liability is imposed, the financial security requirement for operators is fixed at 300 million SDRs.[33] During a 15-year transitional period following the Protocol's entry into force, Contracting Parties may fix their operators' minimum liability amount at only 100 million SDRs, or an even lower amount, if the State makes up the difference to 100 million SDRs.

More People Entitled to Compensation: The Vienna Convention is generally viewed as only applying to damage suffered within the territory of a Contracting Party and on or over the high seas. The VC Protocol significantly extends that geographic scope so that the revised convention will apply to nuclear damage wherever suffered,[34] subject to a permitted exclusion for a non-Contracting State which has a nuclear installation on its territory and does not provide equivalent reciprocal benefits. In addition, claims for personal injury or death may now be brought within 30 years from the date of the nuclear incident rather than the 10-year period provided for under the Vienna Convention. Where the funds are likely to be insufficient to

30. See Article 7 of the VC Protocol.

31. Approximately EUR 179 million or USD 216 million.

32. Generally this applies to lower risk activities, such as nuclear substance transport and research installations.

33. Approximately EUR 357 million or USD 432 million.

34. See Article 3 of the VC Protocol. Technically, this means damage suffered anywhere in the world, including in non-Contracting States.

compensate all damage suffered, priority must be given to such claims as long as they are brought within 10 years of the date of the incident.

More Damage to be Compensated: The Vienna Convention covers personal injury (including death), loss of or damage to property, and other damage compensable under the "law of the competent court.[35] Under the VC Protocol, and largely in response to what occurred following the Chernobyl accident, several additional heads of damage will now be covered although to what extent will depend on the law of the competent court: damage to the environment, economic losses resulting from that damage and the cost of environmental re-instatement, other economic losses consequent upon personal injury or property damage, the cost of preventive measures taken to minimise damage and any losses suffered as a result thereof, as well as other types of loss or damage recoverable under a Contracting Party's civil liability law.[36] Furthermore, a "nuclear incident" will now include the concept of an occurrence which creates a grave and imminent threat of causing nuclear damage,[37] an amendment permitting compensation to be paid for costs incurred in taking preventive measures.

The adoption of the VC Protocol was one of the most significant developments to have taken place in nuclear liability law for several decades.[38] It was hoped that this new instrument would attract broad adherence by both nuclear power generating states and non-nuclear power generating states, whether Party to the Vienna Convention or not.

Yet despite the many years of difficult negotiations required to reach agreement on this instrument, the keen interest it elicited from a broad range of interested states, and the many provisions it contains to encourage and facilitate adherence to it, the VC Protocol has not drawn the wide support originally hoped for or expected. Some 80 states participated in its negotiation and in the Diplomatic Conference which culminated in its adoption. Yet only 15 countries have actually signed the Protocol, and 14 of those did so within one year of its adoption, when motivation and impetus were both still strong. The Protocol entered into force on 4 October 2003, some six years after it had been adopted, having been ratified by the number of states required for that purpose.[39]

While its entry into force is to be applauded, one might wonder whether this Protocol will have any real effect, given both the number and nature of countries that have agreed to be bound by it. Of the 33 Contracting Parties to the Vienna Convention, only 13 of them have signed the VC Protocol and of those, only five have ratified the instrument: Argentina, Belarus, Latvia, Morocco and Romania. Looking at the statistics a little more closely, one cannot help but notice that none of these

35. The "law of the competent court" is defined in Article I.1(e) of the convention to mean the law of the court which has jurisdiction under that convention, including any rules of such law relating to conflict of laws.

36. See Articles 2.2 and 2.4 of the VC Protocol for the new definition of "nuclear damage".

37. During the negotiations to adopt the VC Protocol, the delegation from Ukraine expressed particular concern with the inclusion of this new concept, fearing that the existence of the Chernobyl "sarcophagus" would be regarded by neighbouring countries as constituting a continual "grave and imminent threat of causing nuclear damage".

38. For a comprehensive study of the VC Protocol, see "The 1997 Vienna Convention on Civil Liability for Nuclear Damage and the 1997 Convention on Supplementary Compensation for Nuclear Damage, Explanatory Texts", International Atomic Energy Agency, July 2004.

39. Pursuant to Article 21, the Protocol is to enter into force three months after the date of deposit of the fifth instrument of ratification, acceptance or approval. See Annex 5 for a list of Signatories and Parties thereto.

five states have significant nuclear generating capacity; in fact only two have any nuclear generating capacity at all, these being Argentina and Romania and their levels of generation are quite low.[40]

Furthermore, of the Protocol's remaining ten Signatories, only four can be categorised as nuclear power generating states, the Czech Republic, Hungary, Lithuania and Ukraine. Apart from Ukraine, which has significant nuclear power generating capacity, each of these countries is a relatively low generator of nuclear power compared to other major nuclear power generating countries in the world today.[41]

Other countries with significant nuclear power programmes, such as the Russian Federation, have not yet taken any steps towards acceding to the VC Protocol, a development which would provide considerably increased protection to victims of an accident occurring in its territory. For many of these countries, the minimum liability requirement is seen as too steep notwithstanding the benefits of the phasing-in provisions. Others may find that the expanded geographical scope provisions or the extended definition of nuclear damage are so broad as to be politically unacceptable.

Even more remarkable, perhaps, is the fact that none of the important "non-convention" nuclear power generating countries have joined the VC Protocol notwithstanding that it is easily open to them to do so, countries such as Canada, China, India, Japan, Korea and the United States. The position of these "non-convention" countries will be addressed fully later on in this paper.

VI. The Third Response to Chernobyl: The 1997 Convention on Supplementary Compensation for Nuclear Damage (Supplementary Compensation Convention)

As noted previously, in the early stages of the SCNL's deliberations, negotiating states decided to establish a mechanism for mobilising supplementary funds to compensate nuclear damage, in addition to the funds to be provided by the operator under the Paris and Vienna Conventions. One of the two favoured approaches to this idea was to establish a system of supplementary state funding on both national and international levels in respect of which the Brussels Supplementary Convention proved to be a very useful model.

In searching for the most effective type of supplementary fund, the SCNL delegates considered whether it should be part of the VC Protocol or be provided for in a separate instrument, whether the system of contributions should be voluntary or mandatory, and whether the fund should apply only to transboundary damage, or to both transboundary damage as well as that suffered within the Installation State. The system eventually selected reflected the choice of the second alternative for each of these considerations, and the result was the adoption, in September 1997, of the Convention on Supplementary Compensation for Nuclear Damage (Supplementary Compensation Convention), a development which "open(ed) a new chapter in international nuclear liability law (by providing) the world community with the opportunity to deal with legal liability and compensation for nuclear

40. According to the IAEA's Power Reactor Information System (PRIS) data, as of 10 March 2006 the net nuclear power generating capacity of Argentina is 935 MWe and that of Romania is 655 MWe.

41. According to PRIS data, as of 10 March 2006 the net nuclear power generating capacity of the Czech Republic is 3 368 MWe while that of Hungary is 1 755 MWe, that of Lithuania is 1 185 MWe and that of Ukraine is 13 107 MWe.

damage through a global regime that includes all countries that operate nuclear power plants…and most countries that do not…".[42]

The Supplementary Compensation Convention maintains the essential principles established under the Paris and Vienna Conventions, while at the same time creating an instrument by which states can ensure that more money will be made available to compensate more victims for a broader range of damage than ever before. What follows is a brief description of how the Convention sets out to accomplish just that.[43]

More Money Available to Compensate Victims

The new convention envisages a first tier of compensation consisting of at least 300 million SDRs,[44] the new minimum amount required under the VC Protocol, to be provided by the liable nuclear operator, by the Installation State or by a combination of the two. It is to be distributed on a non-discriminatory basis to victims both inside and outside of the Installation State. A second tier of compensation consists of an international fund to which all Contracting Parties will contribute when it appears that the damage to be compensated exceeds the first tier amount, and whose size will be determined by the number and type of states adhering to the convention.[45] Half of the fund is to be allocated to victims both inside and outside of the Installation State, and the other half to trans-boundary victims only. This 50-50 division is an important innovation in nuclear liability law; the only exception to it is where a Contracting Party makes available at least 600 million SDRs under the first tier, in which case the entire fund is to be distributed on a non-discriminatory basis.

More People Entitled to Compensation

In order to attract as many nuclear power generating states as possible to participate in this new regime, the Supplementary Compensation Convention is specially designed as a free-standing convention, open to any state, with no requirement for previous adherence to either the Paris or Vienna Convention.[46] States which are not party to either of those conventions, however, must have national legislation in place that reflects the principles of those conventions.[47] Special provisions are included in the convention to permit the United States, with its legal system of "economic" rather than "legal" channelling of liability, to participate in the regime; given its extremely important nuclear power generating capacity, the convention would likely have little impact if the United States were not a

42. McRae, B., "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.

43. For a comprehensive study of the Supplementary Compensation Convention, see "The 1997 Vienna Convention on Civil Liability for Nuclear Damage and the 1997 Convention on Supplementary Compensation for Nuclear Damage, Explanatory Texts", International Atomic Energy Agency, July 2004.

44. Approximately EUR 357 million or USD 432 million.

45. The fund is expected to reach 300 million SDRs if all major nuclear power generating states join the Convention.

46. Many of the world's largest nuclear power generating states were not party to either the Paris or Vienna Conventions in 1997, nor are they today. As B. McRae points out in his article cited above, at page 26 "…those nuclear power generating countries that do not belong to the Paris Convention or the Vienna Convention account for more than half of worldwide installed capacity".

47. The relevant requirements are set out in the Annex to the convention.

Party to it.[48] The scope of application of the convention is determined by reference to the two different compensation tiers. As to the 1st tier, the law of the Installation State determines to what extent nuclear damage suffered in non-Contracting States will be covered; as to the 2nd tier, the convention prohibits its distribution to compensate nuclear damage suffered in non-Contracting States, a restriction which is also found in the Brussels Supplementary Convention and is in keeping with the philosophy that a fund comprising "public" money should be distributed only to victims in states which contribute to that fund.

More Damage to be Compensated

Both "nuclear damage" and a "nuclear incident" are defined in the same broad fashion as they are under the VC Protocol (see the discussion under Part V of this paper). These expanded definitions are important in terms of attracting states who have historically viewed the Paris and Vienna Conventions as too narrowly restricting the types of damage for which compensation will be given.

The Supplementary Compensation Convention was adopted at the same time as the VC Protocol and only time will tell to what degree it will be supported by the international community. The intent of this free-standing convention was, and still is, to attract as many countries as possible to participate in a global liability and compensation regime. Yet it is likely that widespread adherence, or even its entry into force, will be a challenge.

Almost ten years following its adoption, the Supplementary Compensation Convention has not yet shown itself to be a central focus for many governments. To date, only 13 states are Signatories to the convention and all of them signed within nine months of the convention's adoption in September 1997; only three states have ratified it, the last ratification having taken place in the year 2000.[49] Of those three states, only two, Argentina and Romania, have any nuclear power generating capacity and as has already been seen, neither of their generating capacity levels is significant.

The statistics are not much more encouraging when it comes to those nuclear power generating countries which *do* have significant capacity. No country with more than two operating nuclear reactors has yet joined the convention; in fact none of the world's countries with the highest nuclear power generating capacities has joined the Convention – neither Canada, France, Germany, Japan, Korea, the Russian Federation, Spain, Sweden, Ukraine, the United Kingdom nor the United States.[50]

While past performance is not necessarily an indicator of future trends, the entry into force requirements of this convention are rather strict compared to those of other international nuclear liability instruments and this, in itself, could delay or even prevent the convention's eventual coming into effect. The convention must be ratified, accepted or approved by least five states with a combined

48. Legal channelling means that all liability is channelled to the nuclear operator; no other entity may be held liable for nuclear damage. Economic channelling means that any entity may be held legally liable, but the economic consequences of that liability are channelled to the liable nuclear operator. Thus, any person who is held legally liable will be indemnified in respect of that liability.

49. See Annex 6 for a list of Signatories and Parties to the Supplementary Compensation Convention.

50. According to PRIS data, as of 10 March 2006 the net nuclear power generating capacity of these countries is as follows: Canada (12 599 MWe); France (63 363 MWe); Germany (20 339 MWe); Japan (47 839 MWe); Korea (16 810 MWe); the Russian Federation (21 743 MWe); Spain (7 588 MWe); Sweden (8 910 MWe); Ukraine (13107 MWe); the United Kingdom (11 852 MWe) and the United States (99 210 MWe).

minimum of 400 000 units of installed nuclear capacity[51] before it may enter into force. The reason for this requirement is clearly to encourage the participation of "major nuclear power generating states" whose adherence was thought necessary to ensure the global character of the convention.[52]

One of those "major nuclear power generating states" is the United States,[53] and it appears that a number of potential parties to the convention are unlikely to join until after the United States has become a Party to it.[54] Other major nuclear power generating states, such as those referred to in the previous paragraphs do not yet seem to have taken any steps towards signing or ratifying the CSC, a matter which would help immeasurably in meeting that convention's entry into force requirements.

One reason for the hesitation shown by certain nuclear power generating countries is the preferential treatment given to victims who suffer damage and who are outside of the Installation State's borders, a treatment that is seen by those countries as discriminatory and thus difficult to justify.

Another reason is simply that "most of the Parties to the (Brussels Supplementary Convention have) claimed…it hard to envisage signing two complementary conventions with different mechanisms, allocation rules and beneficiaries"[55] even though they do not want to exclude that possibility. The supplementary regime established under the Brussels Supplementary Convention is designed to benefit its Contracting Parties alone and allowing its third (international) tier to be allocated in satisfaction of an obligation under another supplementary funding regime would only be workable, in practice, if all of the Contracting Parties were to agree. Under the newly revised Brussels Supplementary Convention, a provision is included which would require all of its Contracting Parties to simultaneously ratify any other such regime, a provision which applies equally to the Supplementary Compensation Convention. Joining that new convention at a time when there are no, or very few major nuclear power generating states Party to it would result in the Brussels Supplementary Convention states being called upon to make major contributions to its second tier fund without having the benefit of substantial contributions made by other second tier fund contributors available should a nuclear incident occur in a Brussels Supplementary Convention state.

VII. The Fourth Response to Chernobyl: The 2004 Protocols to Amend the Paris Convention and the Brussels Supplementary Convention (PC Protocol and BSC Protocol)

The Paris Convention states began their revision negotiations in April 1998, less than a year after the adoption of the VC Protocol and the Supplementary Compensation Convention. This was not

51. See Article XX.1 concerning entry into force. The term "installed nuclear capacity", defined in Article 1(j) of the Convention, is the total number of megawatts of thermal power authorised by the competent national authority.

52. "The 1997 Vienna Convention on Civil Liability for Nuclear Damage and the 1997 Convention on Supplementary Compensation for Nuclear Damage, Explanatory Texts", *op.cit*., p. 86.

53. See footnote 51 for the nuclear power generating capacity of the United States.

54. As of the writing of this paper, it was expected that the U.S. Senate Foreign Relations Committee would provide its consent to the ratification and pass the matter to the full Senate within a few months. Assuming a positive vote in the Senate, the ratification process will essentially be complete and the formalities for depositing the U.S. instrument of ratification with the Convention's depositary can then be instituted.

55. Dussart Desart, R., "The Reform of the Paris Convention on Third Party Liability in the Field of Nuclear Energy and of the Brussels Supplementary Convention", *Nuclear Law Bulletin* No. 75 (2005) p. 24.

surprising – in view of the Joint Protocol, the significant amendments made to the Vienna Convention would invariably have an impact upon the Paris Convention.

Approximately two years after the start of those negotiations, the Contracting Parties to the Brussels Supplementary Convention undertook to revise that convention as well. They fully recognised that such a revision was necessary to ensure that convention's compatibility with the revised Paris Convention and to increase the amount of "supplementary" funds to be made available thereunder.

Unlike the procedure which had been used for previous revisions of the Paris and Brussels Supplementary Conventions,[56] the representatives of the Contracting Parties to both conventions decided that it would be more efficient to carry out the revision work as an "ad hoc" group of Contracting Parties within the NEA. They agreed, however, to keep the NEA's Nuclear Law Committee regularly informed of the progress of the negotiations in order to give the Committee's members an opportunity to express their views on the orientation of the revision work, and to provide periodic progress reports to the NEA Steering Committee.

As with the VC Protocol and the Supplementary Compensation Convention, the Protocol to amend the Paris Convention (PC Protocol) and its companion Protocol to amend the Brussels Supplementary Convention (BSC Protocol) both aim to make more money available to compensate more victims for a broader range of nuclear damage than ever before. They will accomplish these goals when the two Protocols, containing the important provisions described below, come into effect. At the same time the Paris and Brussels Supplementary Convention states conducted their revision work so as to ensure their revised conventions would be aligned and compatible with the new Supplementary Compensation Convention.

The Protocol to Amend the Paris Convention

More Money Available to Compensate Victims

The Protocol will effect an important increase in the nuclear operator's liability amount, raising its current *maximum* level of 15 million SDRs[57] to a new *minimum* amount of EUR 700 million.[58] This is very significant, even if one takes into account the 1990 NEA Steering Committee Recommendation[59] pursuant to which Contracting Parties were encouraged to raise their operator liability amount to not less than 150 million SDRs.[60] While reduced liability amounts for low risk installations and transport will still be permitted, the revised convention imposes minimum amounts of EUR 70 million[61] for low risk installations and EUR 80 million[62] for transport activities. In fixing the

56. The negotiations for the 1964 and 1982 revisions were carried out within the NEA's Group of Governmental Experts on Third Party Liability in the Field of Nuclear Energy (now the Nuclear Law Committee).

57. Approximately EUR 17.8 million or USD 21.6 million.

58. Revised Article 7 of the Paris Convention. The new amount is approximately USD 845.5 million or 586.9 million SDRs and it betters by 65% the 300 million SDRs liability amount called for under the VC Protocol.

59. Recommendation of the NEA Steering Committee of 20 April 1990 [NE/M(90)1].

60. Approximately EUR 178.5 million or USD 216 million.

61. Approximately USD 100.8 million or 58.7 million SDRs.

liability amount as a minimum, states which impose either limited or unlimited liability upon their nuclear operators are welcome to participate in the regime.[63] Operators will still be required to provide financial security in the amount for which they are liable, but for those which are subject to unlimited liability, their financial security obligations will be limited to either the full minimum or one of the reduced minimum liability amounts, whichever is applicable. Paris Convention states will also be required to ensure the payment of nuclear damage claims where the operator's financial security is unavailable or insufficient to satisfy such claims, up to the amount specified in the convention.

More People Entitled to Compensation

Under the existing convention, a nuclear incident must occur in the territory of a Contracting Party and damage must be suffered there before the convention will apply.[64] The PC Protocol relaxes that rule considerably. The revised convention will not only apply to nuclear damage suffered in the territory of a Contracting Party or in any of its maritime zones or on board a ship or aircraft registered in that Contracting Party. It will, as well, apply to any nuclear damage suffered in a non-Contracting State (both territories and maritime zones) if that state is a Party to the Vienna Convention and the Joint Protocol, or it has no nuclear installations, or it has a nuclear installation and its nuclear liability legislation provides for equivalent reciprocal benefits and is based on Paris Convention principles. In addition, prescription and extinction periods for nuclear damage claims will be extended to 30 years for actions respecting loss of life and personal injury. Unlike the VC Protocol however, no "priority" rule will be included in the revised Paris Convention for such claims. Where the compensation is, or is likely to be insufficient to cover all of the damage suffered, the competent court will determine whether, and to what degree priority will be given to claims for loss of life and personal injury.

More Damage to be Compensated

For the first time ever, the Paris Convention will contain a definition of "nuclear damage", and it will permit compensation for a broader range of damage than is the case under the existing convention.[65] The new definition is almost identical to that found in the VC Protocol and the Supplementary Compensation Convention, with specific references to economic loss, the cost of measures of reinstatement of a significantly impaired environment, loss of income resulting from that impaired environment and the cost of preventive measures. Measures of reinstatement and preventive measures are defined as in those other two instruments. The only major difference is that the PC Protocol does not include a reference to other economic loss permitted by the civil liability law of the

62. Approximately USD 115.2 million or 67.1 million SDRs.

63. Germany adopted a regime of unlimited liability in the mid-1980s despite the Paris Convention's fundamental principle that a nuclear operator's liability is limited in amount. While its participation in the Paris Convention has never been refuted on that ground, some rather creative thinking had to be done in order to interpret the convention in a manner compatible with Germany's new regime.

64. See Article 2 of the Paris Convention. The effect of this provision was softened by two NEA Steering Committee Recommendations made in 1968 and 1971 respectively, the first recommending that the convention cover nuclear incidents occurring or nuclear damage suffered on the high seas, and the second recommending that the convention apply (by national legislation) to damage suffered in a Contracting State (or on the high seas on board a ship registered in the territory of a Contracting State) even if the nuclear incident occurs in a non-Contracting State.

65. See revised Article 1(a) of the Paris Convention.

competent court, a head of damage whose specific meaning was never very clear or which was thought to be covered under other specified categories of damage.[66]

The Protocol to Amend the Brussels Supplementary Convention

More Money Available to Compensate Victims

The BSC Protocol maintains the existing three-tier compensation system found in the original convention but the amounts of those tiers are increased significantly: the first tier of compensation continues to come from the nuclear operator's financial security and will continue to be distributed in accordance with the revised Paris Convention, but the amount of that tier rises from a minimum of 5 million SDRs to not less than EUR 700 million; the second tier will continue to be provided by the Installation State but will increase from 175 million SDRs[67] to EUR 500 million;[68] and the third tier will continue to come from public funds made available by all of the Contracting Parties, increasing from 125 million SDRs[69] to EUR 300 million.[70] The total amount of compensation available to victims of a nuclear incident under the revised Paris-Brussels regime therefore rises from the current 300 million SDRs to EUR 1.5 billion.[71] Following the example of the Supplementary Compensation Convention which imposes greater responsibility upon nuclear power generating states to provide compensation, the formula for calculating contributions to the international tier under the BSC Protocol moves from one based equally on gross national product and installed nuclear capacity to one based 35% on gross domestic product and 65% on installed nuclear capacity. This new formula, which takes into account, at least partially, the "polluter pays" principle, is deemed to be much more acceptable from both the political and public standpoints.

More People Entitled to Compensation

The revised Brussels Supplementary Convention will not reflect the new geographic scope provisions of the revised Paris Convention which permits compensation to be paid to victims in certain non-Contracting States. Compensation will continue to be made available only to victims in the territory of Brussels Supplementary Convention states, although that territory has been extended to include a Contracting Party's exclusive economic zone and its continental shelf with respect to exploration or exploitation of natural resources within those areas. The rationale behind this distinction is simply that since the supplementary compensation established by the 2nd and 3rd tiers is essentially "public" money, it should only be used to compensate victims in states who have agreed to participate in that supplementary regime. The rationale appears logical to some, unjust to others, but that's what it is.

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66. Excluding this head of damage from the PC Protocol means, in relation to the operation of the Joint Protocol, that no liable Paris Convention state operator is obliged to compensate victims for such damage, regardless of whether those victims are in a Paris Convention state or in a revised Vienna Convention/Joint Protocol state. Similarly, no liable Paris Convention state operator would be obliged to compensate such damage under the Supplementary Compensation Convention as the latter would only apply to damage for which the operator is liable under the Paris Convention.

67. Approximately EUR 208.2 million or USD 252 million.

68. Approximately USD 605.8 million or 420.6 million SDRs.

69. Approximately EUR 148.7 million or USD 180 million.

70. Approximately USD 363.7 million or 252.4 million SDRs.

71. Approximately USD 1.8 billion or 1.3 billion SDRs.

More Damage to be Compensated

The BSC Protocol is a mechanism by which supplementary funding is distributed in accordance with the provisions of the Paris Convention. It contains no definition of nuclear damage itself, but the funding to be made available under this Protocol will be allocated to the broader range of compensable damage called for under the PC Protocol.

The PC Protocol has been signed by 16 states and the BSC Protocol has been signed by 13 of those same states. In both cases all Signatories are members of the OECD except for Slovenia.[72] Each Protocol may count one additional Signatory to the number of existing Contracting Parties to its corresponding Convention, this being Switzerland. In order for the PC Protocol to enter into force, it must be ratified, accepted or approved by two-thirds of the Contracting Parties.[73] In the case of the BSC Protocol, it shall come into force only when all Contracting Parties have ratified, accepted or approved it.[74] There have been no ratifications, as yet, of the PC Protocol, but Spain deposited its instrument of ratification of the BSC Protocol on 12 January 2006.

Although neither Protocol has yet entered into force, it is reasonably safe to predict that they will both do so in the relatively near future. Historically, the Paris and Brussels Supplementary Convention states have always negotiated their conventions and their various amending Protocols on the understanding and with the intent that all states that sign the convention or an amending Protocol will also ratify it, and will do so as expediently as possible.[75] And no country can accede to either convention unless it joins the Protocol amending that convention at the same time.[76] Such a goal is always much easier to achieve when the number of Signatories involved is relatively small as is the case with both these conventions.

Contrary to the VC Protocol which is open to every state, the PC Protocol is only open to OECD member countries by automatic right, although OECD non-member countries having previously obtained the unanimous consent of all Paris Convention states may accede to it, as Slovenia did in 2001. The BSC Protocol is only open to states which are already Party to the Paris Convention.

The Signatories to both the PC Protocol and BSC Protocol are progressing rapidly towards ratification, acceptance or approval of those instruments and their implementation into national law. In Finland for example, the Nuclear Liability Bill implementing the provisions of both the Protocols was enacted in 2005 and will enter into force on a date to be determined by government decree. France submitted its proposed legislation implementing the both Protocols to the National Assembly in late March of this year.

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72. See Annex 7 for a list of the Signatories to both the PC Protocol and the BSC Protocol. Greece, Portugal and Turkey are the only Paris Convention states which are not Contracting Parties to the Brussels Supplementary Convention and did not sign the BSC Protocol.

73. See Part II, paragraph e) of the PC Protocol and Article 20 of the Paris Convention.

74. See Part II, paragraph e) of the BSC Protocol and Article 21 of the Brussels Supplementary Convention.

75. Paragraph c) of Part II of the PC Protocol and of the BSC Protocol each reads as follows: "The Signatories of this Protocol who have already ratified or acceded to the Convention express their intention to ratify, accept or approve this Protocol as soon as possible. The other Signatories of this Protocol undertake to ratify, accept or approve it at the same time as they ratify the Convention."

76. See Part II, paragraph d) of the PC Protocol and Part II, paragraph d) of the BSC Protocol.

The Council of the European Union has urged those of its Member States that are Parties to the Paris Convention[77] to deposit simultaneously their instruments of ratification of, or accession to, the PC Protocol within a reasonable time, and if possible, before 31 December 2006.[78] Although it is not likely that this deadline will be met by all of those states, one can safely say that most of the Signatories to the Paris and BSC Protocols are well on their way of ratification, acceptance or approval of those instruments and their implementation into national law.

VIII. The Position of "Non-Convention" States

But what of the many countries which are not yet party to any international nuclear liability convention? So many of the world's important nuclear power generating nations have not yet joined any of these instruments, and perhaps more significantly, the majority of nuclear power plants in operation in the world today are not covered by the liability and compensation regimes which those conventions establish.

According to IAEA figures, as of 10 March 2006 there were 443 nuclear power plants in operation in 30 countries around the world and another 26 units under construction in those same countries.[79] Construction of a first nuclear power plant has also begun in the Islamic Republic of Iran. Of those 443 operating plants, 231 units or 52% of the total, are located in countries that are not currently party to any international nuclear liability convention – Canada, China, India, Japan, Korea, Switzerland and the United States – to name those which are most important in terms of their nuclear generating capacity. In addition, 14 of the 26 units under construction (54%) are being built in those same non-convention countries.[80]

What is particularly striking is that the majority of these same non-convention countries are amongst the most populated in the world. The statistics are quite revealing. Looking at the 10 most populous countries in the world in 2005, one finds China at the top of the list with 1.31 billion people, India next with 1.08 billion people and the United States as the third most populous country with 295 million people. These are followed by Pakistan in sixth place with 162 million people, the Russian Federation in 8th place with 143 million people and Japan in tenth place with 127 million people.[81] The

77. EU Member States Party to the Paris Convention are: Belgium, Denmark, Finland, France, Germany, Greece, Italy, the Netherlands, Portugal, Slovenia, Spain, Sweden and the United Kingdom.

78. Council Decision 2004/294/EC of 8 March 2004 authorizing the Member States which are Contracting Parties to the Paris Convention to ratify the Protocol amending that convention, or to accede to it. Article 2 of that Decision reads as follows:

"1. Member States which are Contracting Parties to the Paris Convention shall take the necessary steps to deposit simultaneously their instruments of ratification of the Protocol, or accession to it, with the Secretary-General of the Organisation for Economic Cooperation and Development within a reasonable time and, if possible, before 31 December 2006.

2. Member States which are Contracting Parties to the Paris Convention shall exchange information with the Commission within the Council before 1 July 2006 on the date on which they expect their parliamentary procedures required for ratification or accession to be completed. The date and arrangements for simultaneous deposit shall be determined on that basis."

79. See Annex 8 for a list of the 30 countries, and the number of nuclear power plants, both operating and under construction, in each.

80. See Annex 9 for a list of the world's nuclear power generating countries which are Party to an international nuclear liability convention.

81. Data from the U.S. Census Bureau, online at: www.census.gov/ipc/www/idbnew.html.

total population of these 6 non-convention countries alone constitutes almost half the world's total population, approximately 6.4 billion people as of August 2005.[82] Clearly, there is still much work to do before the international nuclear liability regimes will cover the majority of the global population.

Looking at the statistics from an OECD perspective, we see that 351 of the world's 443 operating nuclear power plants are concentrated in 17 member countries of the OECD, the organisation under whose auspices the Paris Convention was adopted and whose member countries may accede to that convention simply by giving notice to the OECD Secretary-General. Of those 351 plants, 203 of them are located in OECD member countries *not party* to any international nuclear liability convention.

When it comes to IAEA member countries, the statistics are not dissimilar. 231 of the world's 443 operating nuclear power plants are located in nine IAEA member states, the organisation under whose auspices the Vienna Convention, the VC Protocol and the Supplementary Compensation Convention were all adopted, and *none* are party to any international nuclear liability convention.

Nevertheless, it is encouraging to note that an important number of these non-convention countries have already incorporated at least some, if not many, of the fundamental principles contained in these conventions into their national law, thereby making legislative implementation that much easier if and when the times comes for them to join one or more of these instruments. Canada, Korea, Switzerland, Japan and the United States all fall into this category to one degree or another.

On the other hand, there are still nuclear power generating countries which have not adopted any specific nuclear liability and compensation legislation – or which have only adopted half-measures to deal with this issue: India, Pakistan and the Islamic Republic of Iran are all examples of such countries. As for China, most of the international convention principles are to be found in the only instrument which does exist, the (1986) Reply of the Council to the Ministry of Nuclear Industry, the National Nuclear Safety Bureau and the State Council Atomic Energy Board in respect of Resolving Third Parties' Nuclear Liability.[83]

In the event of a nuclear incident occurring at or in connection with a nuclear installation in any one of these countries, victims who suffer injury, whether inside or outside of that country's borders, are likely to find themselves in a precarious position when it comes to claiming damages resulting from that incident – the same sort of precarious position in which Chernobyl victims found themselves. Do they have a right to sue? Who should they sue? Which courts will have jurisdiction to hear their claims? What is the burden of proof? How much money will be available to satisfy their claims? How quickly must they institute those claims? Where will the money come from to satisfy their judgments assuming they are successful? Answering these questions involves a myriad of complicated legal, political and practical problems, many of which are, of course, resolved by the international nuclear liability conventions themselves.

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82. The World Factbook, 2004, online at: www.cia.gov/cia/publications/factbook/index.html

83. The "Reply" is not a national law passed by the National People's Congress, the body possessing general legislative power under the Constitution of the People's Republic of China. However, since the State Council has wide subordinate legislative authority under that constitution, the Reply could be seen as an administrative statute enacted pursuant to the State Council's administrative powers. Yet the effect of the Reply is still open to legal interpretation, particularly because certain of its provisions may be in conflict with provisions of China's Civil Code, and in the case of conflict, it would seem that the provisions of the Code would prevail.

One of the reasons explaining the reluctance of certain countries to join an international nuclear liability regime is that up until recently, "limited liability" has been a foundation block of the existing regimes. These countries see no reason why victims should have their compensation rights so restricted now that the nuclear industry has matured. In fact, it is obvious to those who follow what might be deemed "trends" in nuclear liability law that this basic principle is being more and more often rejected. Such was the case in 1985 for the Federal Republic of Germany, a Contracting Party to both the Paris Convention and the Brussels Supplementary Convention, which saw that principle as contrary to the best interests of victims.

The rejection of the "limited liability" principle has already been embraced by three non-convention countries, namely Austria, Japan and Switzerland, and it is being seriously considered by Sweden, a State Party to both the Paris and Brussels Supplementary Conventions. As noted earlier, the concept of *unlimited liability* will now be incorporated into the revised Paris Convention once the PC Protocol has come into force.

The notion of "limiting the liability" of a nuclear operator is obviously losing favour. It is only logical that, following a rejection of this principle, the obligation imposed upon nuclear operators to "maintain financial security in the amount of their liability" will eventually disappear given that it is impossible to financially secure an unlimited liability. The disappearance has already occurred in Austria, Germany, Japan and Switzerland.

Equally logical would be the disappearance of the principle of "unity of jurisdiction" by which one single court is competent to rule on all nuclear damage claims, serving as it does to ensure that the "maximum" amount of liability will not be exceeded through judgments, awards and settlements which are issued or reached in several jurisdictions.

Still other states hold the view that suppliers of nuclear goods, services and technology no longer need the protection which, in the early stages of the development of the nuclear industry, was considered essential for the survival and expansion of that industry. Adherents of this view believe that the industry is now mature enough and sufficiently strong economically to assume its normal share of nuclear risks and that thus the concept of the nuclear operator's "exclusive liability" should also fall by the wayside.

Austria's recently adopted legislation,[84] for example, clearly reflects a rejection of many of the fundamental principles forming the basis of the international nuclear liability regimes. Under that legislation, liability may be imposed upon the operator of a nuclear plant, the carrier of nuclear substances and the holder of a radioisotope licence. The concept of "channelling" liability to the operator of a nuclear installation simply does not exist. In fact, victims may even assert a claim against an operator or a carrier pursuant to other liability legislation in force, such as product liability legislation. Nor are victims precluded from asserting a claim against another defendant altogether.

The liability imposed upon operators of nuclear installations, carriers of nuclear materials and upon holders of radioisotope licences is, in all cases, unlimited. In addition, there is no limitation upon the time within which compensation claims may be brought. Prescription periods are determined by the general law of civil procedure in Austria.

84. *Federal Law on Civil Liability for Damages Caused by Radioactivity. Bundesgesetz über die zivilrechtliche Haftung für Schäden durch Radioaktivität* (Atomhaftungsgesetz 1999), BGB1 I, No. 170/1998. For a complete analysis of this legislation, see M. Hinterregger, "The New Austrian Act on Third Party Liability for Nuclear Damage", *Nuclear Law Bulletin* No. 62, p. 27.

Since there is no limit upon the amount of liability that may be imposed, there is little need for the concept of unity of jurisdiction, and it has thus been rejected. If radiation from a foreign territory causes nuclear damage in Austria, then Austrian courts have jurisdiction to determine claims and Austrian law is applicable, regardless of where the incident causing the damage took place, subject to certain exceptions where nuclear damage occurs in that foreign territory as well.

It remains to be seen to what extent the Austrian example will be followed.

IX. An Imperfect System

The response of the international community in the post-Chernobyl period to protecting victims of a nuclear accident is not a perfect one by any means and the implementation of the VC Protocol, the Supplementary Compensation Convention, the PC Protocol and the BSC Protocol will not always be easy. A number of problems remain "unsolved" despite the best of intentions of the international community, some of which are outlined below.

During the negotiations to amend or adopt those conventions, representatives of the nuclear insurance market made it clear that some of the proposed provisions would be, to say the least, problematical.[85] They noted, in particular, that there may not be sufficient market capacity to insure nuclear operators against the increased liability amounts provided for under the new or revised conventions, at least not in all countries, given that insurance capacity will vary from one country to another as a reflection both of national insurance markets and the available amount of reinsurance.

They also warned that coverage would not likely apply for the full 30-year duration of the extended prescription/extinction periods under the revised conventions in respect of personal injury actions. The basic reason for this refusal to provide coverage is simply that many cancers resulting from exposures consequent upon a nuclear accident are likely to manifest themselves only decades after exposure to ionising radiation. This is exactly what has happened in Belarus, Russia and Ukraine as a result of Chernobyl. In addition, these same cancers will be indistinguishable from those suffered naturally by the population. While it may be possible to establish causality in a small number of cases, for the vast majority of cancer victims, it will be impossible.

Insurers have also made it clear that coverage might not be available to secure all of the additional heads of damage for which operators would be liable under the revised conventions. In particular, they are concerned with the lack of a precise definition for "impairment of the environment" which is not defined either in terms of minimum levels of radioactivity or the effects of radioactive contamination. Cover for environmental damage might not be universally available. Even where insurers are prepared to provide that coverage, policies would exclude damage arising from releases of radioactive materials within authorised limits as part of the day-to-day operations.[86]

In addition, insurers have taken the position that preventive measures would not necessarily be considered an insurable risk in many countries, even if the measures had been retroactively approved by the competent authorities. The requirement that preventive measures be reasonable under the law of the competent court involves, once again, a measure of uncertainty and leaves open the possibility of

85. See S.M. Reitsma, "Paris and Vienna Nuclear Liability Conventions: Challenges for Insurers", presented to the 5th International Conference on Nuclear Option in Countries with Small and Medium Electricity Grids, Dubrovnik, Croatia, 16-20 May 2004.

86. Insurers have repeatedly expressed reservations about providing coverage for liability for damage incurred as a result of a gradual build-up of contamination over a period of years.

speculative claims from people who might take any manner of "preventive" action that they viewed as reasonable, the costs of which could well be quite high.

Finally, the terrorist attacks of 11 September 2001 led the insurance industry to look much more critically at the risks to which it exposes its capital and to the extent to which it is willing to do so. As a result, insurers are now generally unwilling to provide full third party liability coverage for risks of that magnitude. They are currently exploring ways of solving the coverage problem which would enable them to maintain their responsibilities to nuclear operators while ensuring the protection of their own industry. Solutions must take into account the fact that nuclear operators are obliged by law to maintain a specific amount of financial security, whether under international nuclear liability conventions or national legislation.

The extent to which terrorism coverage will be available to an operator in the amount required by its national law depends on several factors: (i) the insurers' perception of the risk of terrorism in the country concerned (the United States and the United Kingdom are seen as more likely targets of terrorism than are many other countries); (ii) the strength/capacity of the national insurance market in the country concerned; (iii) the willingness of the national insurance market in the country concerned to assume terrorist risks altogether; and (iv) the legally imposed amount of operator liability in the country concerned.[87]

It is true that in many countries today, terrorism risks are fully included in the insured limit under nuclear liability policies, but this is largely due to the fact that the operator's liability amount is relatively modest. It can be expected that following increases in operator liability amounts pursuant to recent amendments to the international nuclear liability conventions, more insurance pools will be faced with a shortage of terrorism insurance capacity. The shortage is a matter that must be resolved by operators, insurers and governments together.

In short, insurers have pointed out that nuclear operators might simply not be able to fully comply with their financial security obligations under the revised conventions by means of private insurance coverage.

There remains, in addition, a potential problem with damage to property that is on the site of the installation and to be used in connection therewith. There is no right to compensation under the international conventions for damage to the nuclear installation itself or to any property on that same site which is used or to be used in connection with any such installation. The purpose of this exclusion is to avoid the financial security maintained by the operator from being used to compensate damage to such property to the detriment of third parties. Owners of nuclear installations are obliged to assume the risks of loss of or damage to their own property and they are able to include the cost of this risk in the cost of the installation. Similarly, contractors whose property is on the site of a nuclear installation are obliged to assume the risks of loss or damage thereto, and they too are able to include the cost of this risk in the price of their supply contracts.

The conventions, however, are unclear on the question of how to deal with damage to the nuclear installation itself and property on the site of the installation ("on-site property") caused by a nuclear incident. The provisions which channel liability for nuclear damage to the operator provide that the operator shall be liable for all nuclear damage except damage to on-site property, but are silent on the issue of on-site property damage itself. It is thus not clear whether an operator has a right of action against a negligent supplier of goods, services or technology for damage incurred at its

87. The higher the amount of liability imposed upon operators, the less likely it is that available insurance will cover that entire amount.

installation. In this regard, there are two opposing points of view: first, since the overriding principle of the conventions is to channel liability to the operator, on-site property damage should not be recoverable from any other person; and secondly, since the overriding purpose of the conventions is to compensate damage suffered by third parties and since damage to on-site property is not third party damage, it should fall outside the conventions' scope and be recoverable under ordinary civil law principles.

The most effective way of solving this problem is by amending the text of the conventions to make it clear that operators either do, or do not, have any such right, or at least to require Contracting Parties to include a specific provision, one way or the other, in their national legislation. During the negotiations to adopt the PC Protocol, the Paris Convention states were asked by representatives of the nuclear industry to adopt the first point of view, the latter claiming that this would lead to legal clarity and certainty, but the Paris Convention states declined to do so for a variety of reasons. The problem thus remains.

X. The Way Ahead

In terms of liability and compensation issues, the response of the international community to the accident at Chernobyl has been comprehensive, aimed at modernising two outdated international regimes, linking them together and adopting a brand, new global one – all this in the hope of bettering the situation of victims of a nuclear accident, wherever they may be found. That improvement will be brought about in a number of ways once all of the relevant international instruments have entered into force.

Much more money will be available to compensate victims of a nuclear accident and that money will be more readily and easily accessible. More victims will be entitled to compensation, both in terms of the type of damage that they have suffered and where those victims were physically located at the time they suffered it; in some cases, such as under the Supplementary Compensation Convention, victims in states other than that of the liable operator will be in a privileged position as regards a portion of the available compensation. In addition, the period in which claims for compensation can be made in respect of personal injury and loss of life has been extended, in recognition of the fact that some such injuries may not manifest themselves for many years after the accident has occurred.

Yet despite the lessons learned from Chernobyl, despite the attempts to make these new or amended instruments as attractive as possible to encourage the broadest possible adherence, their acceptance by individual states has not been overwhelming. This is particularly true in the case of the VC Protocol and the CSC where the required liability amounts and financial security limits were intentionally established at levels deemed to be acceptable to the vast majority of potential parties. It is equally discouraging to see that Ukraine has not ratified either the VC Protocol or the CSC, even though it signed both shortly after their adoption in 1997. Similarly, the Russian Federation has not yet given any indication of its intent to accede to the VC Protocol or sign the CSC. And one can only hope that the United States, after repeated assurances of its intention to join the CSC, will soon become one of the first major nuclear states to ratify it.

Some countries, both nuclear generating and non-nuclear generating alike, have indicated (unofficially) that they are unlikely to make a decision on joining one or more of the conventions until they have adopted, or in some cases revised, their existing domestic legislation in this field, a position which justifies a "wait and see" attitude.

On the other hand, there will always be countries which are not tempted to adhere to any of these conventions for a variety of political and legal reasons. Some governments may simply take the view that the conventions are too regional in scope, or that their countries are geographically too remote for them to be of real value. It is understandable that these states might prefer to explore the idea of concluding bilateral or multilateral regional arrangements with their neighbouring countries, be they nuclear power generating or otherwise.

It must be understood, however, that the international community's response to Chernobyl has been a compromise. All of the nuclear liability and compensation instruments adopted since that accident are the result of just that – a compromise between states which utilise nuclear energy for peaceful purposes and those which do not, states which are already Party to one of the existing international nuclear liability conventions and those which are not, states which implement the principle of legal channelling of liability and those which do not, states which have hundreds of thousands of units of installed nuclear capacity and those which have relatively few units, states which are primarily concerned with a nuclear accident occurring the during transport of nuclear substances through their coastal waters and states which are major transporters of those substances, and finally, states which hold differing opinions as to the manner in which nuclear damage is to be determined – in short, like the international community's response, they are all, ultimately, a compromise.

Whatever the final outcome, it is clear that it is not sufficient to simply establish an international liability regime or to improve it – ongoing efforts are needed to attract as many states as possible to adhere to it. It is also important to accompany countries in their passage from Protocol adoption to implementation at the national legislative level. This can best be achieved through international cooperation with strong and committed support from both the OECD Nuclear Energy Agency and the International Atomic Energy Agency. Both agencies are there to encourage and to help. Let us hope that the remembrance of the Chernobyl tragedy will constitute the motivation necessary to accomplish that goal.

ANNEX 1

PARIS CONVENTION ON THIRD PARTY LIABILITY IN THE FIELD OF NUCLEAR ENERGY STATUS OF RATIFICATIONS AND ACCESSIONS

Adoption of the Convention: 29 July 1960
Entry into force of the Convention and the 1964 Additional Protocol: 01 April 1968
Entry into force of the 1982 Protocol: 07 October 1988
Adoption of the 2004 Protocol: 12 February 2004

Signatories	Convention	1964 Additional Protocol	1982 Protocol
Austria	…	…	…
Belgium	03 August 1966	03 August 1966	19 September 1985
Denmark	04 September 1974	04 September 1974	16 May 1989
Finland	16 June 1972	16 June 1972	22 December 1989
France	09 March 1966	09 March 1966	06 July 1990
Germany	30 September 1975	30 September 1975	25 September 1985
Greece	12 May 1970	12 May 1970	30 May 1988
Italy	17 September 1975	17 September 1975	28 June 1985
Luxembourg	…	…	…
Netherlands	28 December 1979	28 December 1979	01 August 1991
Norway	02 July 1973	02 July 1973	03 June 1986
Portugal	29 September 1977	29 September 1977	28 May 1984
Slovenia	16 October 2002	16 October 2002	16 October 2002
Spain	31 October 1961	30 April 1965	7 October 1988
Sweden	01 April 1968	01 April 1968	08 March 1983
Switzerland	…	…	…
Turkey	10 October 1961	05 April 1968	21 January 1986
United Kingdom	23 February 1966	23 February 1966	19 August 1985

Note: All of the above states, with the exception of Austria and Luxembourg, are Signatories to the 2004 Protocol to Amend the Paris Convention.

ANNEX 2

1963 VIENNA CONVENTION ON CIVIL LIABILITY FOR NUCLEAR DAMAGE ***STATUS OF RATIFICATIONS, ACCESSIONS, SUCCESSIONS*** **Date of Adoption: 21 May 1963; Entry into Force: 12 November 1977**	
Signatories	**Ratification, Accession, Succession**
Argentina	25 April 1967
Armenia	24 August 1993
Belarus	09 February 1998
Bolivia	10 April 1968
Bosnia and Herzegovina	30 June 1998
Brazil	26 March 1993
Bulgaria	24 August 1994
Cameroon	06 March 1964
Chile	23 November 1989
Colombia	…
Croatia	29 Sept. 1992 (notif.); Oct. 1991 (effect)
Cuba	25 October 1965
Czech Republic	24 March 1994
Egypt	05 November 1965
Estonia	09 May 1994
Hungary	28 July 1989
Israel	...
Latvia	15 March 1995
Lebanon	17 April 1997
Lithuania	15 September 1992
Mexico	25 April 1989
Morocco	...
Niger	24 July 1979
Peru	26 August 1980
Philippines	15 November 1965
Poland	23 January 1990
Republic of Moldova	07 May 1998
Romania	29 December 1992
Russian Federation	...
Saint Vincent & the Grenadines	18 September 2001
Slovak Republic	07 March 1995
Slovenia	07 July 1992 (notif.); June 1991 (effect)
Spain	...
The former Yugoslav Republic of Macedonia	8 April 1994 (notif.); Sept. 1991 (effect)
Trinidad and Tobago	31 January 1966
Ukraine	20 September 1996
United Kingdom	...
Uruguay	13 April 1999
Yugoslavia	12 August 1977

ANNEX 3

BRUSSELS CONVENTION SUPPLEMENTARY TO THE PARIS CONVENTION

Adoption of the Convention: 31 January 1963
Entry into Force of Convention and 1964 Additional Protocol: 04 December 1974
Entry into Force of 1982 Protocol: 01 August 1991
Adoption of 2004 Protocol: 12 February 2004

Dates of Ratification or Accession		
Signatories	**Convention and 1964 Additional Protocol**	**1982 Protocol**
Austria	…	…
Belgium	20 August 1985	20 August 1985
Denmark	04 September 1974	10 May 1989
Finland (accession)	14 January 1977	15 January 1990
France	30 March 1966	11 July 1990
Germany	01 October 1975	25 September 1985
Italy	03 February 1976	14 June 1985
Luxembourg	…	…
Netherlands	28 September 1979	01 August 1991
Norway	07 July 1973	13 May 1986
Slovenia (accession)	05 June 2003	05 June 2003
Spain	27 July 1966	29 September 1988
Sweden	03 April 1968	22 March 1983
Switzerland	…	…
United Kingdom	24 March 1966	08 August 1985

Note: All of the above states, with the exception of Austria and Luxembourg, are Signatories to the 2004 Protocol to Amend the Brussels Supplementary Convention.

ANNEX 4

JOINT PROTOCOL RELATING TO THE APPLICATION OF THE 1963 VIENNA CONVENTION AND THE PARIS CONVENTION

STATUS OF RATIFICATIONS, ACCESSIONS, APPROVALS

Date of Adoption: 21 September 1988;Date of Entry into Force: 27 April 1992

PC: Paris Convention; VC: Vienna Convention; *Not Party to either Convention

Signatories	**Ratification, Accession, Approval**
Argentina (VC)	…
Belgium (PC)	…
Bulgaria (VC)	24 August 1994
Cameroon (VC)	28 October 1991
Chile (VC)	23 November 1989
Croatia (VC)	10 May 1994
Czech Republic (VC)	24 March 1994
Denmark (PC)	26 May 1989
Egypt (VC)	10 August 1989
Estonia (VC)	9 May 1994
Finland (PC)	3 October 1994
France (PC)	…
Germany (PC)	13 June 2001
Greece (PC)	16 May 2001
Hungary (VC)	26 March 1990
Italy (PC)	31 July 1991
Latvia (VC)	15 March 1995
Lithuania (VC)	20 September 1993
Morocco*	…
Netherlands (PC)	1 August 1991
Norway (PC)	11 March 1991
Philippines (VC)	…
Poland (VC)	23 January 1990
Portugal (PC)	…
Romania (VC)	29 December 1992
Saint Vincent & the Grenadines (VC)	18 September 2001
Slovakia (VC)	7 March 1995
Slovenia (VC)	27 January 1995
Spain (PC)	…
Sweden (PC)	27 January 1992
Switzerland (PC)	…
Turkey (PC)	…
Ukraine (VC)	24 March 2000
United Kingdom (PC)	…

ANNEX 5

PROTOCOL TO AMEND THE VIENNA CONVENTION ON CIVIL LIABILITY FOR NUCLEAR DAMAGE

STATUS OF RATIFICATIONS OR ACCESSIONS (March 2006)

Date of Adoption: 12 September 1997
Date of Entry into Force: 4 October 2003

Country	Signature	Instrument	Date of deposit	Entry into force
Argentina	19 Dec 1997	Ratification	14 Nov 2000	04 Oct 2003
Belarus	14 Sep 1998	Ratification	04 Jul 2003	04 Oct 2003
Czech Republic	18 Jun 1998			
Hungary	29 Sep 1997			
Indonesia	06 Oct 1997			
Italy	26 Jan 1998			
Latvia	07 Mar 2001	Ratification	05 Dec 2001	04 Oct 2003
Lebanon	30 Sep 1997			
Lithuania	30 Sep 1997			
Morocco	29 Sep 1997	Ratification	06 Jul 1999	04 Oct 2003
Peru	04 Jun 1998			
Philippines	10 Mar 1998			
Poland	03 Oct 1997			
Romania	30 Sep 1997	Ratification	29 Dec 1998	04 Oct 2003
Ukraine	29 Sept 1997			

ANNEX 6

CONVENTION ON SUPPLEMENTARY COMPENSATION FOR NUCLEAR DAMAGE

STATUS OF RATIFICATIONS OR ACCESSIONS (March 2006)

Date of Adoption: 12 September 1997
Not yet in Force

Country	Signature	Instrument	Date of deposit
Argentina	19 Dec 1997	Ratification	14 Nov 2000
Australia	01 Oct 1997		
Czech Republic	18 Jun 1998		
Indonesia	06 Oct 1997		
Italy	26 Jan 1998		
Lebanon	30 Sep 1997		
Lithuania	30 Sep 1997		
Morocco	29 Sep 1997	Ratification	06 Jul 1999
Peru	04 Jun 1998		
Philippines	10 Mar 1998		
Romania	30 Sep 1997	Ratification	02 Mar 1999
Ukraine	29 Sept 1997		
United States of America	29 Sept 1997		

ANNEX 7

2004 PROTOCOL TO AMEND THE PARIS CONVENTION (March 2006)	
OECD countries	**Signature**
Australia	
Austria	
Belgium	12 Feb 2004
Canada	
Czech Republic	
Denmark	12 Feb 2004
Finland	12 Feb 2004
France	12 Feb 2004
Germany	12 Feb 2004
Greece	12 Feb 2004
Hungary	
Iceland	
Ireland	
Italy	12 Feb 2004
Japan	
Korea (Rep. of)	
Luxembourg	
Mexico	
Netherlands	12 Feb 2004
New Zealand	
Norway	12 Feb 2004
Poland	
Portugal	12 Feb 2004
Slovak Republic	
Spain	12 Feb 2004
Sweden	12 Feb 2004
Switzerland	12 Feb 2004
Turkey	12 Feb 2004
United Kingdom	12 Feb 2004
United States	
Non-OECD	
Slovenia	12 Feb 2004

2004 PROTOCOL TO AMEND THE BRUSSELS SUPPLEMENTARYCONVENTION (March 2006)	
OECD countries	**Signature**
Australia	
Austria	
Belgium	12 Feb 2004
Canada	
Czech Republic	
Denmark	12 Feb 2004
Finland	12 Feb 2004
France	12 Feb 2004
Germany	12 Feb 2004
Greece	
Hungary	
Iceland	
Ireland	
Italy	12 Feb 2004
Japan	
Korea (Rep. of)	
Luxembourg	
Mexico	
Netherlands	12 Feb 2004
New Zealand	
Norway	12 Feb 2004
Poland	
Portugal	
Slovak Republic	
Spain*	12 Feb 2004
Sweden	12 Feb 2004
Switzerland	12 Feb 2004
Turkey	
United Kingdom	12 Feb 2004
United States	
Non-OECD	
Slovenia	12 Feb 2004

* Spain deposited its instrument of ratification of the Protocol to Amend the Brussels Supplementary Convention on 12 January 2006. That Protocol will come into force when all Signatories have deposited their instruments of ratification, acceptance or approval.

ANNEX 8

Nuclear Power Plants Worldwide: Operating and Under Construction

Data taken from IAEA Power Reactor Information System. The total figures include 6 operating NPPs and 2 NPPs under construction in Taiwan, China.

Country	Operating	UC
Argentina	2	1
Armenia	1	0
Belgium	7	0
Brazil	2	0
Bulgaria	4	1
Canada	18	0
China	9	3
Czech Republic	6	0
Finalnd	4	1
France	59	0
Germany	17	0
Hungary	4	0
India	15	8
Iran	0	1
Japan	56	1
Korea	20	0
Lithuania	1	0
Mexico	2	0
Netherlands	1	0
Pakistan	2	1
Romania	1	1
Russian Federation	31	4
Slovak Republic	6	0
Slovenia	1	0
South Africa	2	0
Spain	9	0
Sweden	10	0
Switzerland	5	0
Ukraine	15	2
United Kingdom	23	0
United States	104	0
Total:	**443**	**26**

ANNEX 9

World's Nuclear Power Generating Countries that are Contracting Parties/States to:

- Paris Convention on Nuclear Third Party Liability, amended 1964 and 1982 (PC)
- Brussels Supplementary Convention, amended 1964 and 1982 (BSC)
- 1963 Vienna Convention on Civil Liability for Nuclear Damage (VC)
- Protocol to Amend the 1963 Vienna Convention (VCP)
- Convention on Supplementary Compensation for Nuclear Damage (CSC) (not in force)

Note: The 2004 Protocol to Amend the Paris Convention has been signed by 16 countries but has not yet been ratified, approved or accepted by any of the Signatories. The 2004 Protocol to Amend the Brussels Supplementary Convention has been signed by 13 countries and has been ratified by one country (Spain).

Argentina:	VC; VCP; CSC	Mexico	VC
Armenia:	VC	Netherlands	PC; BSC
Belgium:	PC; BSC	Pakistan	
Brazil:	VC	Romania	VC; VCP; CSC
Bulgaria	VC	Russian Federation	VC
Canada		Slovak Republic	VC
China		Slovenia	PC; BSC
Czech Republic	VC	South Africa	
Finland	PC; BSC	Spain	PC; BSC
France	PC; BSC	Sweden	PC; BSC
Germany	PC; BSC	Switzerland	
Hungary	VC	Taiwan	
India		Ukraine	VC
Japan		United Kingdom	PC; BSC
Korea		United States	
Lithuania	VC		

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

by Norbert Pelzer*

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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* Dr. iur., Consultant in Nuclear Law; Retired Academic, University of Göttingen, Germany; Honorary Lecturer, University of Dundee, Scotland; Board Member of, and Lecturer at the International School for Nuclear Law at the University of Montpellier, France; Honorary President of the International Nuclear Law Association (INLA). Facts given and ideas expressed in this article are the responsibility of the author alone.

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 multilateral 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.

- 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]

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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

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 code[17] 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] Germany[21] 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

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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 Rauschning, 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 Assistance[29] 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 states[31] 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 principle[34] 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.

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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 Götz, 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

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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 states[47] 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.

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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 Assembly[56] 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 legislation[57] 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 Treaty[69] 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]

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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" type[74] was required and eventually was the solution. After politically difficult negotiations, in 1994 the Convention on Nuclear Safety[75] and in 1997 the Joint Convention on the Safety of Spent Fuel

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

71. Pierre Strohl, "*Les risques resultant 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 Management[76] 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 Convention[77] 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]

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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 Fundamentals[82] 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 Fundamentals[83] 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 Convention[108] 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]

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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 Treaty[114] 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 Conventions[116] 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 System*s, 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 Material[119] 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 material[123] "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

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

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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 sabotage[133] 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 excluded[135] 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.

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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 1977[138] 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 publications[146] 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

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 regime de responsabilité civile pour les dommages nucléaires: Revision de la Convention de Vienne et la nouvelle Convention sur la reparation 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.

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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.

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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

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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 negotiations[171] – 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 Convention[176] 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.

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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 only[182] 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 Party[186] 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]

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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 time[200] and, last but not least, the provisions on jurisdiction[201] 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]

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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 1[212] 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 publications[215] 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

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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 majority[217] 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.

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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 law[225] 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.

The IAEA Conventions on Early Notification of a Nuclear Accident and on Assistance in the Case of a Nuclear Accident or Radiological Emergency

by Hon. Prof. em. Rechtsanwalt DDr. Berthold Moser*

Abstract

This article provides a comprehensive analysis of the provisions of both conventions. Special attention is paid to the rules of the Convention on Early Notification which identify the event subject to notification and the content and addressees of the information provided with regard to a nuclear accident, as well as to the provisions of the Convention on Assistance concerning the request and grant of international assistance with regard to a nuclear accident and the duties attributed in this field to the IAEA. The author also considers the liability questions raised by that convention.

I. General

In the wake of the Chernobyl reactor accident on 26 April 1986, discussions were initiated in the International Atomic Energy Agency (IAEA) with the object of strengthening international co-operation in the development and use of nuclear energy. To that end, the intention, among other things, was that IAEA Member States (and the IAEA itself) should be under an obligation, in the event of an accident in their own country, to notify any other states for which there was a danger of harmful radiological effects as quickly as possible. It was also the intention that Member States and the IAEA should agree on an undertaking to provide assistance in the case of a nuclear accident or a radiological emergency. The Chernobyl accident in the Ukraine had radiological consequences on an unprecedented scale on the territory of other states not limited to those bordering the USSR. The disaster was in no way attributable solely to reactor staff; a major factor was the extremely risky design of this type of reactor in which the drawbacks are so serious that the construction of this type of power plant has hardly ever been authorised in any other country.[1] For this reason, it is not possible to

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* This article was initially published in *Nuclear Law Bulletin* No. 44 (1989). The author alone is responsible for the facts mentioned and opinions expressed in this article.

1. The moderator used in the Chernobyl 1 000 megawatt reactor (a type known as RBMK 1000) is a graphite block of slightly oval shape, average diameter 11.8 metres and 7 metres high. The graphite is carbon. The moderator is needed in order to slow down the fast neutrons released by nuclear fission to a lower energy level by collision with the atoms of the moderator material, since only a few fast neutrons are sufficient to cause further nuclear fission. The radioactive fissile material is contained in the approximately 7m long metal alloy (zircalloy) rods which are cooled by water circulating in cooling channels in the graphite block. It is clear that the cooling system failed, causing the fuel in the rods to overheat. This burst open the jackets which were oxidised by the vaporised water and the direct contact with the fissile material caused the graphite to burn. The gases generated by the fire exploded upward throwing radioactive material from the fuel rods as high as some 1 500 metres in the air.

   In contrast, with graphite-moderated reactors, the moderator used in other countries is water – light water or heavy water. The United Kingdom (together with a few other countries) is an exception to the rule, having long built mainly graphite-moderated reactors. Their design, however, is not the same as that of

compare the potential danger of such an installation with that of other nuclear plants and yet it was vitally important to take the fullest possible precautions for the future.[2]

Both conventions, drawn up in a very short space of time, had their precursors in the form of bilateral agreements between various neighbouring European states. In their scope, however, they go far beyond these agreements, to the extent that they are not confined to relations between neighbouring countries – indeed the geographical situation of countries affected by a radiation accident is immaterial.

II. The substantive provisions of the two conventions

A. The Convention on Early Notification

1. The essential substantive content of this convention [Article 2] consists of the obligation to notify and inform those states affected or likely to be affected by a nuclear accident. To notify means to advise that the accident has occurred and to inform means to provide further information. Accident means essentially an effect occurring suddenly or within a very short space of time. An accumulation of minor damage within a short time may also constitute an accident. Personal injury or damage to property must have been brought about by the incident. Whether the accident was foreseeable or not is irrelevant. A further point is that the territory of a state being physically affected is also covered regardless of whether the affected part of the country is subject to use or not. In addition, the traditional definition of an accident requiring that there has to be actual damage is extended insofar as the probability of damage or harm is sufficient to cause the convention to come into effect. The authentic English and French wordings of the convention read "…accident… from which a release of radioactive material occurs or is likely to occur" and "…*accident… qui entraîne ou entraînera probablement un rejet de matières radioactives*…". Where there is no certainty, therefore, there has to be the probability of a release of radioactive materials.

Thus the convention needs two conditions to come into operation:

- the actual or probable release of radioactive materials; and
- the actual or possible crossing of frontiers by the materials actually or probably released.

The accident is a nuclear accident if it is caused by radioactive material released by a specific plant or because of specific activities in such a way that radiological consequences occur or may occur in the territory of another state. Who the owner or operator of the plant happens to be or who performs

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the Chernobyl units and the power rating much lower. In the other types of reactors, water is used as both coolant and moderator. Water cannot burn.

However, there was another major determinant in the course taken by the Chernobyl disaster. Unlike other types of reactors, RBMK 1 000 reactors have no steel and concrete protective shield (containment) which is why the burning gases were released into the open air without the slightest hindrance. In the nuclear reactors operated in the Federal Republic of Germany, France and Switzerland, for example, the provision of a protective shield of this type goes without saying.

Cf. Wenger, Sicherheitsaspekte in "*Kernkraftwerken*", in *Der Kernkraftwekunfall von Tschernobyl, Forum Wissenschaft und Energie*, Zurich 1986, p. 13 et seq, and Sonneck, *Aufbau und Funktionsweise des Reaktors von Tschernobyl – Unfallhergang mit Freisetzung von Radionuklide*, Seibersdorf 1986.

2. Some 17-18 reactors of this dangerous design are still in service in the USSR. See *SVA Bulletin*, Bern 1989, Vol. 11, p. 21.

the activity is irrelevant. Whether it is the government itself or natural persons, corporations or companies with a legal personality under its jurisdiction or control is also irrelevant. In every case the duty to notify and inform lies with the state in which the plant is located or the activity performed.

2. The plants and activities concerned are listed by types in Article 1, paragraph 2. They are as follows: nuclear reactors; nuclear fuel cycle and radioactive waste storage facilities; the storage of nuclear fuels or radioactive wastes; the manufacture, use, storage, disposal and transport of radioisotopes[3] for agricultural, industrial, medical and related scientific and research purposes; and lastly, the use of radioisotopes for power generation in space objects. Whether the use of nuclear energy is for civil or military purposes is, as far as the application of the convention is concerned, immaterial. This list by types applies unless a State Party to the convention extends the list unilaterally or by agreement between two or more States Parties. Under Article 3, States Parties are at liberty to notify other states of other nuclear accidents caused by radioactive materials. This applies in particular to accidents caused by nuclear weapons or during tests of nuclear weapons.

The purpose served by the nuclear reactor is of no importance. It may be for the production of electrical power or heat, for research, experimental or instructional purposes, for the recovery of certain radioactive materials or for any other purpose. The location of the nuclear reactor and whether it is stationary or mobile is of no importance. Radioactive waste treatment plants may similarly differ in their type, the main ones being reprocessing plants and plants for the conditioning of waste for the purpose of safe disposal.

The convention also refers, under the different types of plant and activities, to the transport and storage of nuclear fuels or radioactive wastes. Transport embraces all types of transport by road, rail, sea, waterway or air. For transport by ship or by aircraft, responsibility for notification under the convention lies with the state to which the means of transport "belongs". This, in the case of state-owned ships and aircrafts, is the owning state and, in the case of privately-owned ships and aircrafts, the state where the ship or aircraft is registered since that is the state that exercises jurisdiction. The storage of nuclear fuels means both intermediate and final storage.

The convention also applies to accidents caused by radioactive materials that are neither fuel nor fuel wastes since it refers to radioisotopes for agricultural, industrial, medical and related scientific and research purposes and to the production and use of such radioactive materials as well as their storage, disposal and transport. In many cases the plants handling nuclear fuel and fuel wastes may also be used for the intermediate or final storage or reprocessing of radioisotopes.

One type of use of radioisotopes is specifically listed in the convention, namely their use for power generation in space objects. Here, the obligation to notify and inform after the occurrence of an accident lies with the launching country. This is the country that launches the space object or causes it to be launched or from whose territory or installations a space object is launched, the reason being that this is the state having jurisdiction or control over the event.

3. The plants and activities listed in Article 1, paragraph 2, do not, as already pointed out, include all possible sources of damage with transboundary radiological consequences. In particular, there is no mention of plants and activities connected with nuclear weapons and the testing of such weapons. Article 3 allows for such cases but in an incomplete fashion. It says that States Parties may notify in

3. The term "radioisotopes" means the same thing as radioactive material. Although nuclear fuels are also no different from radioactive materials, for brevity's sake in legal language the term radioisotope or radionuclide is used for radioactive materials that are neither nuclear fuel nor wastes from nuclear fuel and are therefore not or no longer used in the operation of nuclear power plants.

the event of nuclear accidents other than those specified in Article 1. This supplementary field of application of the convention is therefore purely optional. It is a regrettable omission but can be explained by the fact that states in possession of nuclear weapons are not prepared for their military sector to be subject to international regulations in respect of nuclear or any type of weapon.[4] Whether and to what extent notification and information are given following an accident in connection with nuclear weapons or nuclear weapon testing is left to the discretion of the state where the accident has taken place. Furthermore, Article 3 refers only to notification. Since, in any case, the initiative for notification in such cases is a matter for the discretion of the states, the provision of further information is not ruled out.

4. The content of the notification and information to be supplied is specified in Article 2(a) and paragraphs 1 and 2 of Article 5. Article 2(a) relates to the basic obligation to provide information whereas Article 5 sets out what this information should contain. Apart from the fact of its occurrence, the notification of a nuclear accident has to specify its nature, time of occurrence and, if possible, exact location. Where the state concerned is in a position to do so, the information given has to include the following further details: the facility or activity involved in the accident; the assumed or established cause of the nuclear accident; its foreseeable development relevant to the transboundary release of the radioactive materials and its predicted behaviour over time; the general characteristics of the radioactive release including the nature, probable physical and chemical form and the quantity, composition and effective altitude of the radioactive release; the metrological and hydrological conditions necessary for forecasting the transboundary release; and lastly, the offsite protective measures taken or planned. Since the purpose of all this information is to keep the radiological consequences in other states to a minimum, Article 6 of the convention provides that affected States Parties may request further information or consultations from the state providing the information. This right to request further information only applies to a State Party affected by the accident but not to a state that is not affected or to a state that is affected – even if a member of the IAEA – that is not a Party to the convention.

Under paragraph 3 of Article 5, there is in principle no restriction on the use of any of this information. The only exception concerns information provided in confidence.

5. Article 8 of the convention makes provisions for assistance to countries which do not have nuclear activities themselves but border on a state having an active nuclear programme but which is not Party to the convention. For such states, the feasibility and establishment of an appropriate radiation monitoring system is to be facilitated; the responsibility for providing this assistance lies with the IAEA.

B. The Convention on Assistance

1. Like the Convention on Early Notification of a Nuclear Accident, the Convention on Assistance is also not limited to accidents originating in nuclear installations but also applies to accidents caused by other kinds of radioactive materials. Similarly, it is applicable not only to neighbouring states but generally and without reference to the location of the state exposed to radiation. However, its scope exceeds that of the Convention on Early Notification in that it applies not only to accidents but also to radiological emergencies. The definition of these terms is not easy since several circumstances have to be borne in mind. First and foremost is the fact that this convention and the Convention on Early Notification of a Nuclear Accident were drawn up in the IAEA prompted by the same event – the

4. The representative of India specifically complained of this omission on the occasion of the signing of the convention. IAEA, INFCIRC/355/Add 2 of 20 May 1988.

Chernobyl accident on 26 April 1986 – and have a considerable similarity in their content. The term nuclear accident therefore has to be understood in the same way as in the Convention on Early Notification.

Though the meaning of nuclear accident is thus established, extreme difficulties arise in defining the term "radiological emergency". A first point is that a radiological emergency can be understood as being less than a nuclear accident because radiological emergency also covers a process that has certainly or probably caused no injury or damage but may possibly give rise thereto. Assistance is then requested to prevent or at least minimise the occurrence of injury or damage in all cases.

What is more, in the absence of closer definition, radiological emergency could also apply to those cases where damage or injury or the threat of damage or injury originates in installations or activities connected with nuclear weapons or the testing of nuclear weapons. If so, a situation calling for assistance would arise if the territory or population of a state at war suffered damage as a result of belligerent activity in which atomic weapons were used or if damage was caused to a state not involved in the hostilities. Would the Convention on Assistance apply in such cases or not? Of itself, the expression radiological emergency would have to be understood in its unlimited sense and would therefore include damage or the threat of damage due to the testing and use of atomic weapons. On the other hand, however, the role of the IAEA is to concern itself with the peaceful uses of nuclear energy so that measures connected with the use of atomic weapons for military purposes are excluded from its field of responsibility – and this would apply to regulations drawn within the IAEA framework. Against this, however, there is the fact that Article 3 of the Convention on Early Notification leaves it to the States Parties to decide whether to notify in cases other than the accidents listed in Article 1 as set out above, and these include the military sector. Because of this confusion it would seem important to clarify the situation by making the necessary additions to the wording of the Convention on Assistance. This could be done by an amendment as provided under Article 16.

2. From the substantive viewpoint, the Convention on Assistance contains various provisions that can be divided into three groups. The first group, which may well be described as the fundamental provisions because they govern the preconditions for and the content and scope of the measures of assistance, includes Articles 1, 3 and 5. The second group relates to questions of reimbursement of costs and compensation, the relevant provisions here being contained in Articles 7, 10, 11. The third group is to do with special provisions for assistance personnel and the state providing the assistance, the relevant provisions here being Articles 8 and 9. In detail the situation is as follows:

a) As regards the assistance arrangements, Article 1 lays down the principle that the States Parties should co-operate between themselves to minimise the consequences of a nuclear accident or radiological emergency and thus to protect life, property and the environment. Agreement on bilateral and multilateral arrangements or a combination of these is recommended as the most effective way of achieving this object. The IAEA should also be asked to lend its aid in arriving at this co-operation. In actual fact there are already a fair number of such bilateral arrangements.

   Nothing further is said in the convention about the detailed nature of such assistance arrangements; they will depend on the requirements of each individual case. For this reason only general indications are given as set out in Article 2. First, the article makes it clear that whether the nuclear accident or radiological emergency has its origin in the state requesting the assistance or has started elsewhere is irrelevant, its effects having come into that state across its borders. The state requesting assistance has to specify the scope and type of assistance. If it is impracticable to give this information immediately,

the two states shall decide upon the scope and type of assistance by joint consultation. The state requested to provide assistance must promptly notify the requesting state, either directly or via the IAEA, whether and to what extent it is able to provide such assistance. The assistance will, in any case, include medical treatment and the temporary relocation of people into the territory of the state affording assistance. [5]

The request for assistance does not have to be directed to other states alone. It may also be addressed to the IAEA so that experts and articles of equipment and other material may be made available or assistance requested of other states by the IAEA itself. The IAEA also has the responsibility of co-ordinating assistance at the international level. Where such co-ordination is not ensured by the IAEA and if no other arrangement is made, then the direction, control, co-ordination and supervision of the assistance within its territory shall, under Article 3 of the convention, be the responsibility of the requesting state. The requesting state is also responsible for protecting personnel, equipment and materials brought into its territory and ensuring their safe return. In addition to the general indications given in Article 3, the IAEA's field of responsibility in the provision of assistance is set out in Article 5 as follows: in addition to the supply of experts, equipment and materials and the transmission of requests for assistance to other states, the IAEA also has to supply the requesting state with information on methodologies, techniques and results of research relating to response to emergencies. Even in the absence of any actual emergency situation the IAEA is required to respond to requests from individual states – even if they are not IAEA Member States – for assistance in precautions against possible future emergency situations with advice of the most varied kind. This includes preparing emergency plans, recommending appropriate legislation, developing training programmes for emergency personnel, developing warning systems, establishing and maintaining liaison with relevant international organisations for the purpose of exchanging information and data, etc.[6]

The termination of the assistance may be requested both by the state requesting the assistance and by the state providing it. Provision for this is made in Article 11. Once such a request is made the two states have to consult together. The request to terminate assistance has to be made in writing. Where assistance has been provided by the IAEA, the same provisions, *mutatis mutandis*, apply.

b) Since assistance understandably entails cost, Article 7 makes the necessary provisions. The basic principle is that the assisting state provides its help without claiming back the

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5. In the technical annex on emergency assistance in his book "The IAEA Notification and Assistance Convention in case of a Nuclear Accident", London 1987, Graham and Trotman, p. 199 et seq., Adede, former head of the IAEA legal department summarises the staff and material (technological and medical) requirements for effective assistance in the case of a nuclear accident or radiological emergency. Adede sees three phases of assistance: the initial phase when the most urgent measures have to be taken and which may last anything from a few hours to two days, an intermediate phase ranging from a number of days to several weeks and a final phase which may last months or even years.

   As regards the very many individual measures, see also IAEA publication *Mutual Emergency Assistance for Radiation Accident*, IAEA-TECDOC-237, IAEA, Vienna, 1980, together with Supplement IAEA-TECDOC-284, Vienna, 1983.

6. The IAEA sent out a detailed questionnaire to all Member States on preparations for assistance applicable to any kind of radiological accident. Each country had to state those kinds of assistance it could provide and those it could not. The results of the survey are published in IAEA Safety Series No. 50-SG-06, Vienna, 1982, p. 55 et seq.

cost. Departures from this principle are, however, possible by mutual agreement, this having to relate to whether the assistance is wholly or partly reimbursed. In the decision as to whether the assistance should be provided without cost or wholly or partly on a reimbursement basis, various factors are to be taken into account including: the nature of the emergency, the place of origin of the accident and needs of developing countries and of countries without nuclear facilities. However, even in cases where reimbursement has been agreed, the state providing the assistance is at all times free to waive part or all of the reimbursement of its costs. Reimbursement is to be provided promptly and be freely transferable. Since Article 7 refers to "assisting parties" in general, the above principles are also applicable to assistance provided by the IAEA.

c) It is also understandable that various kinds of injury and damage could be sustained on the territories of both the requesting and the assisting state in the course of providing assistance. This may include personal injury, damage to or loss of property and damage to the environment. Unless otherwise agreed, the provisions of Article 10 apply. The rule is that the state requesting assistance has no claim for compensation against the state providing it. This has several implications. First, the requesting state is not allowed to bring any legal proceedings against the assisting party or persons or other legal entities acting on its behalf. Next, the requesting state must assume responsibility for claims of this nature brought by third parties. In such cases the state that has received assistance must either come to an arrangement with the persons claiming compensation or hold the state against which the claim is made and persons acting on its behalf harmless and blameless. This does not apply in cases where those persons acting in the name or on behalf of the assisting state have caused damage intentionally. The requesting state is free to decide whether to make these provisions binding in whole or in part on its own nationals or permanent residents.

d) In order that assistance personnel may reach the target location as quickly as possible and, once there, perform their duties unhindered, various exceptions have to be made on their behalf to the provisions of the generally applicable local legislation. To that end, the requesting state has to grant a number of immunities and privileges to persons sent by the assisting state or acting on its behalf. This is conditional on such personnel having been duly declared to and accepted by the requesting state. Assistance personnel may not be arrested or detained in respect of acts or omissions in connection with the assistance they are rendering. They are also immune from legal process including criminal, civil and administrative jurisdiction and exempt from all taxation, duties or other charges, the only exception being those normally incorporated in the price of goods and services, e.g. value-added tax. In addition, they must have freedom of entry into and departure from the territory of the requesting state. The requesting state is free to decide whether or not to provide its own nationals and permanent residents with the same privileges and immunities as non-national assistance personnel. Conversely, all beneficiaries of such privileges and immunities have a duty to respect laws and regulations of the requesting state and not to interfere in the domestic affairs of that state.

The assisting state itself is also exempt from taxes and other charges on the equipment and other materials that it causes to be brought in for assistance purposes nor may such articles be seized or searched. In addition, the requesting state is required to facilitate the importation and exportation of items of equipment and other materials. Should such articles become radioactive during the provisions of assistance, the state that has been assisted is responsible for their decontamination.

Should it be necessary for assistance personnel or equipment to be routed through another state, then under Article 8, that state is required, at the request of the state requesting or providing assistance, to facilitate transit across its territory. However, such personnel, equipment and other property must be duly notified for this purpose to the country of transit.

III. Procedural provisions of the two conventions

A. The Convention on Early Notification

1. The essential provisions are contained in Article 2 which governs notification and the provision of information in the event of a nuclear accident. Two possibilities are provided for. In the first, both the state which may be affected by radiation and the IAEA are immediately and directly notified. In the second, there is no direct notification and information of the states that may be affected, notification of and provision of information to the IAEA alone being sufficient. The choice is left to the judgement of the state responsible. In either case, the IAEA becomes a centre for the receipt and distribution of notifications and information. Since the purpose of this provision of information is to minimise radiological consequences, it would be advisable, in order to save time in particularly urgent cases, to notify directly any states that may be affected as well as the IAEA.

Under Article 4 of the convention, the IAEA must immediately convey every notification of a nuclear accident, together with the information it contains, to those states that are or may be affected and to the relevant international organisations.[7] This duty of notification also applies with regard to states that are neither party to the convention nor even IAEA Member States.

Under Article 7, the issue and receipt of the notifications and information referred to in Article 2 has to be via points of contact. These have to be decided by the States Parties and made known to the IAEA and, either directly or via the IAEA, to the other States Parties. Within the Agency, a similar focal point has to be set up for the receipt and issue of these reports. The States Parties are also required to indicate the authority responsible for the ongoing performance of the duties set out in the convention. Other international organisations concerned with protection against nuclear accidents may also set up points of contact. The points of contact both of the States Parties and the IAEA must be continuously available. The IAEA is to be promptly informed of any changes in the responsible authorities or points of contact.

The convention does not specify the way in which notifications and information are to be conveyed. Each State Party is therefore free to choose the method of transmission unless some particular mode is agreed with the IAEA and other states.

2. A further procedural provision concerns the settlement of disputes between states that are Party to the convention or between one or more States Parties and the IAEA on the interpretation or application of the convention. Article 11 provides, on the pattern of other international agreements, that consultations should be held in such a case with a view to settling the dispute by negotiation or other peaceful means. If a dispute cannot be settled in this way, it has to be submitted to arbitration or to the International Court of Justice at the request of one of the Parties. If no agreement can be reached on an arbitrator, the president of the International Court of Justice or the secretary-general of the United Nations may be asked to appoint one or more arbitrators.

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7. Including the Organisation for Economic Co-operation and Development (OECD) and its Nuclear Energy Agency (NEA), the International Labour Organization (ILO) and the World Health Organization (WHO).

Ever State Party is entitled to declare that is does not consider itself bound by this dispute settlement procedure. Declarations to that effect may, however, be withdrawn at any time.[8]

B. The Convention on Assistance

1. In the same way as in the Convention on Early Notification of a Nuclear Accident, states that are party to the Convention on Assistance are required under Article 4 to make known to both the IAEA and other States Parties the responsible authorities and the points of contact authorised to make and receive requests for and to accept offers of assistance. The more detailed provisions on this point are the same as those in the Convention on Notification. These provisions, however, are supplemented by a special article on the confidentiality of requests for assistance.

This is Article 6 which says that if any information is given by the requesting state to any other state or the IAEA in confidence, that confidentiality must be respected and the information may only be used for the purpose of the assistance. Where possible, the assisting state or the IAEA must obtain the agreement of the requesting state before releasing information to the public.

2. Like the Convention on Early Notification, the Convention on Assistance also contains provisions for the settlement of disputes. These are set out in Article 13. Since the wording of the two conventions is identical on this point, reference is directed to III.A.2 above.

IV. Relationship with other international agreements

1. Article 10 of the Convention on Early Notification leaves the States Parties free to conclude bilateral or multilateral agreements relating to matters covered by the convention and in accordance with the object and purpose of the convention. Such agreements are unaffected by the convention. Article 9 even suggests that such additional agreements should be considered by the States Parties. Existing international agreements relating to the subject matter of the convention are also unaffected. As regards future agreements, the rule is clear: they have to be in accordance with the object and purpose of the convention. If not, then the convention takes precedence in every case. However, the provision is less clear regarding international agreements that already exist, in that these could possibly be in conflict with the convention. If so, do the provisions of the convention apply or do those of the earlier agreement? In such a case the preferred interpretation must presumably be that the provisions of the convention take precedence as being later in date.

2. Article 12 of the Convention on Assistance also says that international agreements which relate to the matters covered by the convention are not affected. States Parties are also free to conclude bilateral or multilateral agreements on the subject in the future. As already pointed out in the commentary on Article 1, such agreements or combinations of such agreements should be concluded to facilitate co-operation between them.

V. Adoption, entry into force and denunciation of the conventions

Both conventions were adopted by the General Conference of the IAEA at a special session in Vienna on 26 September 1986 and were open for signature by all states as of 26 September 1986 at the

8. It should be noted that when signing each convention, a number of States Parties entered reservations about Article 11 and rejected the compulsory method for the settlement of disputes by an arbitrator or the International Court of Justice. IAEA INFCIRC/335add.1 and INFCIRC/336Add.2 of May 1987 and INFCIRC/335add.2 and INFCIRC/336add.3 of 20 May 1988.

IAEA headquarters and as of 6 October 1986 at UN headquarters. Each convention entered into force thirty days after three states had expressed their consent to be bound by its provisions. For the Convention on Notification this was 27 October 1986 and for the Convention on Assistance it was 26 February 1987.[9]

For each state the convention entered into force thirty days after it declared itself bound by the convention but each signatory state was free to declare that it would apply the convention provisionally even though the convention had not yet entered into force in this respect.

Articles 15 and 17 respectively provide for possible denunciation of the conventions. Notification must be in writing and takes effect one year following receipt by the IAEA.

Like all documents to be sent to the IAEA, late accessions and denunciations have to be addressed to the Director General who, under Articles 16 and 18 respectively, is the depositary of both conventions. This applies in particular to the declaration regarding provisional application of the convention and the reservations in respect of certain provisions. The Director General of the IAEA is required to inform other States Parties immediately on receipt of such declarations.

VI. Amendments to the conventions

Under Articles 14 and 16 respectively, every State Party is entitled to propose amendments to the Director General of the IAEA as depositary of the conventions. As provided for any other declarations, the latter has to inform all the other States Parties thereof immediately. At the request of a majority of Member States a conference then has to be called to discuss the proposed amendments. If the amendment is carried by a two-thirds majority, it is laid down in a protocol which will be open for signature by all Member States in Vienna and New York and enter into force after three states have expressed consent to be bound.

VII. Authentic text

The original of the conventions deposited with the Director General of the IAEA in accordance with Articles 17 and 19 is in six languages – Arabic, Chinese, English, French, Russian and Spanish – all six texts being equally authentic.

VIII. Concluding remarks

The two IAEA conventions represent a considerable advance on the previous legal situation since early notification of a nuclear accident and assistance in the event of a nuclear accident or radiological emergency considerably reduce the risk to other countries and often make it easier to repair the damage. After the Chernobyl accident, the consent of the states affected was forthcoming only after great hesitation so that it was relatively late before the necessary protective measures could be taken. Nor did any prior arrangements exist for assistance from other countries, so that help from outside was the exception. Let us hope that the two IAEA conventions rarely have to be applied and that, should a nuclear accident or radiological emergency occur, it will be on a far smaller scale than the Chernobyl disaster.

9. IAEA INFCIRC/335 of 18 November 1986 and INFCIRC/336/Add.1 of 10 March 1987.

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

by Otto von Busekist*

1. The adoption of the Joint Protocol and its signature on 21 September 1988,[1] at the closure of the diplomatic conference jointly convened in Vienna by the IAEA and the NEA, was hailed as a landmark in efforts towards the establishment of a comprehensive civil nuclear liability regime. The importance of liability and compensation for transfrontier damage caused by a nuclear incident is indeed one of the lessons learned from the Chernobyl accident. The present article attempts to describe the history of the Joint Protocol during the many years it took to develop this link between the two conventions, to provide comment on its objectives and content, and to discuss some important questions related to its application.

The long road to the bridge

Retrospect

2. When the International Conference on Civil Liability for Nuclear Damage met in Vienna from 29 April to 19 May 1963, the Paris Convention and the Brussels Supplementary Convention had been signed (on 29 July 1960 and 31 January 1963 respectively) but had not yet come into force. The issue of the relationship between the Paris Convention and the Vienna Convention was obviously raised during the Conference,[2] which agreed to include two articles in the Vienna Convention dealing with this subject. Article XVI of the Vienna Convention provides that "no person shall be entitled to recover compensation under this convention to the extent that he has recovered compensation in respect of the same nuclear damage under another international convention on civil liability in the field of nuclear energy." According to Article XVII, the Vienna Convention "shall not, as between the Parties to them, affect the application of any international agreements or international conventions on civil liability in the field of nuclear energy in force, or open to signature, ratification or accession at

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* This article was initially published in *Nuclear Law Bulletin* No. 43 (1989). At the time of publication, the author was Legal Adviser at Eurochemic. The author alone is responsible for the facts mentioned and opinions expressed in this article.

1. The English and French texts of the Joint Protocol are reproduced in *Nuclear Law Bulletin* No. 42 (December 1988). The IAEA and NEA will shortly issue a joint publication containing all authentic texts as well as a short explanatory note. The signatory countries to date are: Argentina, Belgium, Cameroon, Chile, Denmark, Egypt, Germany, Finland, Greece, Italy, Morocco, Netherlands, Norway, Philippines, Portugal, Spain, Sweden, Switzerland, Turkey and United Kingdom.

2. Official Records of the Conference (Legal Series No. 2), IAEA, Vienna, 1964, p. 381 and 383 (Report of the Sub-Committee on Relations with Other International Agreements), p. 199-208, 332-334 (deliberations of the Committee of the Whole), 147 (vote of the plenary).

the date on which this convention is opened to signature." The only international conventions to which these provisions apply are the Paris Convention and the Brussels Supplementary Convention which were amended by Additional Protocols signed on 28 January 1964 in order to harmonise their provisions with those of the Vienna Convention. The Preamble of the Additional Protocol to the Paris Convention refers to Article XVII of the Vienna Convention and states the desire of the signatories "of ensuring that as far as possible there are no conflicts between the two conventions, thus enabling them to become parties to both conventions if they so decide."

3. However, no Contracting Party to the Paris Convention has so far ratified the Vienna Convention; the signatures of Spain (6 September 1963) and the United Kingdom (11 November 1964) were not followed by ratifications. This lack of interest in becoming party to the Vienna Convention with a worldwide vocation is probably due to the following reasons. The minimum liability amount of 5 million units of account fixed by Article V of the Vienna Convention is considered unacceptably low by many countries. It is true that Article 7 of the Paris Convention, while fixing a general maximum amount of liability of 15 million Special Drawing Rights (SDRs) of the International Monetary Fund (IMF) which may be exceeded, permits also the establishment of a liability amount of not less than SDR 5 million. It is to be noted in this respect that the OECD Council recommended on 16 November 1982 that Paris Convention Parties taking advantage of the possibility under Article 7(b)(ii) of fixing a lower liability amount than for operators of nuclear installations in general should make public funds available up to the general liability amount in the event of damage exceeding the lower amount. In particular, the liability amounts established by the Paris Convention must be seen in light of the Brussels Supplementary Convention which, through its system of state intervention, actually covers damage up to SDR 120 million and will cover SDR 300 million as soon as the 1982 Protocol has entered into force.[3] The Vienna Convention has not been followed by any supplementary agreement, although the International Conference on Civil Liability for Nuclear Damage, in its Resolution of 19 May 1963 on the Establishment of a Standing Committee, charged that committee "to study the desirability and feasibility of setting up an international compensation fund for nuclear damage and the manner in which such a fund would work to enable operators of the Contracting Parties to meet the liability under Article V of the convention, including ways of covering nuclear damage exceeding the amount therein provided".[4] Another reason, related to the first one, is probably the absence of a provision in the Vienna Convention similar to Article 7(e) of the Paris Convention which allows Contracting Parties to make the transit of nuclear substances through their territories subject to the condition that the maximum liability of the (sending or receiving) foreign nuclear operator be increased up to the maximum amount applicable to operators within those territories. A proposal to insert such a provision was rejected by the Vienna Nuclear Liability Conference.[5] The slow progress of ratifications of the Vienna Convention (it took 14 years for its entry into force although only five ratifications were required) did not enhance the interest of the parties to the Paris Convention which have little, if any, geographical or commercial relationship with the present parties to the Vienna Convention. Finally, the parties to the Paris Convention were made aware of the fact that their ratification of the Vienna Convention might lead to a number of conflicts

3. The "Protocol to amend the Convention of 31 January 1963 Supplementary to the Paris Convention of 29 July 1960 on Third Part Liability in the Field of Nuclear Energy, as amended by the Additional Protocol of 28 January 1964" was adopted in Paris on 16 November 1982 and has so far been ratified by eight Contracting Parties to the Brussels Supplementary Convention. It will enter into force on the date when all Contracting Parties, i.e. eleven at present, have ratified it [Article 21].

4. Official Records of the Conference, p. 515.

5. Official Records of the Conference, p. 134, 452 [draft Article IV, paragraph 2].

which were evoked during the 1968 IAEA/NEA Monaco Symposium on Third Party Liability and Insurance in the Field of Maritime Carriage of Nuclear Substances.[6]

4. Despite the extensive harmonisation of the two conventions by means of the 1964 Additional Protocol to the Paris Convention, a number of differences remained and further ones were added after the entry into force of the 1982 Protocol amending the Paris Convention.[7] These differences concern the membership (the Vienna Convention with a worldwide vocation, the Paris Convention with a *de facto* "regional" character, concluded within the framework of the OECD), the fact that only the Paris Convention contains provisions on its territorial scope of application [Article 2] and the transit of nuclear material [Article 7(e) already mentioned above], the liability amounts, the rules on subrogation and conflicts of jurisdiction, as well as on the settlement of disputes. In particular, the 1982 Protocol has replaced the unit of account of the European Monetary Agreement based on the gold standard by the Special Drawing Rights (SDR) of the IMF, while the unit of account according to Article V.3 of the Vienna Convention is still the gold value of the US dollar on 29 April 1963, which may give rise to different interpretations and does not correspond to the general tendency to replace gold-based units of account by the SDR in international agreements.

5. However, none of these differences touches upon the common principles of both conventions which are well known: the operator of a nuclear installation is absolutely and exclusively liable for nuclear damage; the operator's liability is limited in amount and in time; the operator must cover his/her liability by insurance or other financial security; the courts of a single Contracting Party are competent for claims against the operator; and the conventions are applied without any discrimination based upon nationality, domicile or residence. Another common feature of both conventions is that they are comprehensive in the sense that they apply to nuclear incidents occurring not only in nuclear installations but also during transport of nuclear material sent thereto or therefrom.

A blueprint is shelved

6. After the hope of the parties to the Paris Convention ratifying the Vienna Convention had virtually been abandoned, the problem of the relationship between the two conventions was taken up again in 1972 by the NEA Group of Governmental Experts on Third Party Liability in the Field of Nuclear Energy. This initiative stemmed from the wish to unify the principles on which civil liability for nuclear damage were based, in light of the continuing growth of the nuclear industry and international trade in nuclear materials, equipment and installations, and at the same time to both improve protection for victims and serve the interests of operators of nuclear installations, carriers and insurers. At this time the Paris Convention had already entered into force (1 April 1968), but neither the Vienna Convention nor the Brussels Supplementary Convention were as yet operative. In collaboration with the IAEA Secretariat, a series of possible solutions were examined which were to achieve two interrelated objectives: first, the removal of difficulties resulting from the simultaneous application of both conventions and, second, the wider acceptance of the basic system underlying both conventions. The solutions discussed with the NEA and IAEA can be summarised as follows:

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6. 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 Third Party Liability and Insurance in the Field of Maritime Carriage of Nuclear Substances (Monaco Symposium), OECD Paris, 1969, p. 427 et seq.

7. The "Protocol to Amend the Convention on Third Party Liability n the Field of Nuclear Energy of 29 July 1960, as amended by the Additional Protocol of 28 January 1964" was signed on 16 November 1982 and entered into force on 7 October 1988, according to Article 20 of the Paris Convention.

I. A single convention:

a) termination of the Paris Convention and continuation of the Vienna Convention;

b) termination of the Vienna Convention and continuation of the Paris Convention;

c) a new convention.

II. Continuation of both conventions:

a) ratification of the Vienna Convention by the Contracting Parties of the Paris Convention;

b) extension of the territorial scope of both conventions;

c) a "bridge" between the two conventions in the form of a joint protocol or two identical protocols.

During this work, all solutions barring the latter were discarded for various legal, practical or political reasons.[8] The solution of a joint protocol open to both the Contracting Parties of the Paris Convention and the Vienna Convention was selected as being most satisfactory.

7. This joint protocol was first considered by the Restricted Working Group of the IAEA Standing Committee on Civil Liability for Nuclear Damage, convened in Vienna in May 1974. It was subsequently studied in June 1974 by the NEA Group of Governmental Experts and again in March 1975 when the Group of Experts concluded that a joint protocol was generally the most satisfactory solution from a legal point of view, though certain minor reservations were expressed regarding transit of nuclear material and the question of the application of the Brussels Supplementary Convention. At the same time, however, the national representatives had not decided definitely on the advisability of implementing this solution (the Vienna Convention was not yet in force) and agreed to submit the draft protocol to the IAEA Standing Committee for a formal opinion. However, the latter did not place this item on the agenda of its following meeting, thus putting a (provisional) end to the exercise. The operative provisions of the 1974 Draft Joint Protocol (hereinafter referred to as the 1974 Draft) read as follows:

Article I

(a) For purposes of application of the Vienna Convention, the Parties to this Protocol which are Parties to the Paris Convention shall be considered as if they were Parties to the Vienna Convention, with the exception of Articles XVI, XVII, XXII, XXIII, XXIV, XXV, and XXVI of the latter convention.

(b) For purposes of application of the Paris Convention, the Parties to this Protocol which are Parties to the Vienna Convention shall be considered as if they were Parties to the Paris Convention, with the exception of Articles 6(e), 7(e), 17, 18, 19, 20, 21 and 22 of the latter convention.

8. These solutions are analysed by O. von Busekist, "*Haftungsprobleme im Verhältnis zwischen Vertragsstaaten des Pariser und des Wiener Atomhaftungsübereinkommens*", in Pelzer (ed.), *Friedliche Kernergienutzung und Staatsgrenzen in Mitteleuropa*, Baden-Baden 1987, p. 271 et seq.

Article II

For the purposes of this Protocol and taking into account the provisions of Article I above, either the Paris Convention or the Vienna Convention shall apply to a nuclear incident, to the exclusion of the other. The Convention applicable shall be that to which the Installation State of the operator liable, by virtue of either Convention, is a Party.

Construction

8. It took more than nine years to revive consideration of this problem. In May 1984, the IAEA Standing Committee raised anew the desirability of establishing some formal relationship between the conventions. It was felt that the time had come to reactivate consideration of this matter as further states were considering adhesion to the Vienna Convention (which had come into force on 12 November 1977) and north-south bilateral nuclear co-operation and supply arrangements were increasing. The NEA Group of Governmental Experts endorsed the IAEA proposal for a joint study of the relationship between the Paris Convention and the Vienna Convention, and an informal meeting of experts was therefore convened by both Secretariats in Vienna in September 1986. After having reviewed the problems and solutions already discussed between 1972 and 1975 (see paragraph 6 above), the experts favoured a joint protocol as the most practical and effective solution, but emphasised the need to consider a number of issues related to the effect and content of the portocol. The NEA Group of Governmental Experts equally considered a joint protocol as the best solution to the problem of the relationship between the two conventions, provided that the applicability of the Brussels Supplementary Convention among its Parties was preserved. The Group underlined that adhesion to the Vienna Convention by a greater number of states was a prerequisite for the success of a joint protocol. The IAEA Standing Committee, at its meeting in March 1987, discussed and endorsed the same solution and agreed in principle on a draft preamble as well as two draft articles. In June 1987, the NEA Group of Governmental Experts reviewed the results of the IAEA Standing Committee's work and discussed various draft articles elaborated by the NEA Secretariat.

9. Upon the Standing Committee's recommendation, the IAEA Board of Governors and the OECD Steering Committee for Nuclear Energy agreed to establish a Joint IAEA/NEA Working Group to continue work on the drafting of a joint protocol. Accordingly, the "Joint IAEA/NEA Working Group of Governmental Experts on the Relationship between the Paris and Vienna Convention" met at the IAEA headquarters in Vienna from 27 to 30 October 1987. Relying on the extensive preparatory work described above, the Group succeeded in agreeing on all issues in a remarkable spirit of co-operation. The text of the "Joint Protocol relating to the application of the Vienna Convention and the Paris Convention" was thus adopted by consensus on 30 October 1987 at the end of that meeting (see *Nuclear Law Bulletin* No. 40).

10. At its session in February 1988, the IAEA Board of Governors endorsed the Joint Protocol and agreed to the convening of a one-day conference to be organised jointly by the IAEA and the OECD/NEA in conjunction with the 32nd regular session of the IAEA General Conference in September 1988 for the purpose of adopting the Joint Protocol and opening it for signature. The OECD Steering Committee for Nuclear Energy, at its meeting in April 1988, endorsed the protocol and recommended the convening of the conference; these decisions were approved by the OECD Council in June 1988 (see *Nuclear Law Bulletin* No. 41). Some concern had been voiced that one day might be too short a duration should issues of substance be raised. But this proved not to be the case, due to the solid groundwork laid by the Joint IAEA/NEA Working Group in October 1987, the Diplomatic Conference of 21 September 1988 crowned the work of 16 years.

Basic ideas of the Joint Protocol

11. The preparatory work of the Joint Protocol started with a thorough analysis of the relationship between the two conventions. As both conventions apply to nuclear incidents occurring in nuclear installations and during transport of nuclear materials, possible positive or negative conflicts between them are best illustrated by two groups of cases. The first one concerns nuclear incidents occurring in land-based nuclear installations situated in the territory of Contracting Parties to either the Paris Convention or the Vienna Convention. The second group deals with transport of nuclear material between operators of nuclear installations situated in those territories, such transport may be direct between neighbouring countries or require the transit through the territory of Contracting Parties to either the Paris Convention or the Vienna Convention. Each of these groups and sub-groups has a series of variants depending on where the nuclear incident and damage occurs, which are set out diagrammatically in Annex I. In examining these cases it was assumed that no Contracting State to the Paris Convention has extended the convention to cover nuclear incidents or damage in non-Contracting States and that the Vienna Convention also excludes nuclear incidents and damage occurring in non-Contracting States.[9] Although this assumption does not always correspond to the actual state of law, particularly in the case of the Paris Convention,[10] it enabled the problem to be presented in a clearer way.

12. This analysis revealed that, despite their common basic principles, there exists no relationship between the Paris Convention and the Vienna Convention. Contracting Parties to the Paris Convention are non-Contracting States within the meaning of the Vienna Convention and vice-versa. This

9. The Standing Committee on Civil Liability for Nuclear Damage took view in April 1964 "having regard *inter alia* to the transport cases referred to in Article II(1), that in the case of a nuclear incident involving the liability of an operator within the meaning of the convention, nuclear damage suffered within the territory of Contracting States and on or over the high seas would be nuclear damage covered by the convention even if the nuclear incident causing such damage occurred on or over the high seas or within the territory of a non-Contracting State. On the other hand, the nuclear damage suffered within the territory of a non-Contracting State would not be nuclear damage covered by the convention even if the nuclear incident causing such damage occurred within the territory of a Contracting Party or on or over the high seas." This view is in particular disputed by Nordenson, *op cit*., p. 431, who considers that the Vienna Convention "must be deemed to have left the question whether the Convention shall apply to nuclear incidents occurring outside the territory of the Contracting States or to nuclear damage suffered outside such territory to be governed by national law, i.e. the law of the Contracting Party whose courts are or would be competent under the convention and to be determined in accordance with the rules of private international law of the *lex fori*.

10. The Steering Committee for Nuclear Energy recommended on 22 April 1971 that the scope of application of the Paris Convention should be extended to damage suffered in a Contracting State, or on the high seas on board a ship registered in the territory of a Contracting State, even if the nuclear incident causing the damage has occurred in a non-Contracting State. This recommendation, which applies in practice only to damage caused by nuclear incidents in the course of carriage, was followed by Belgium, Denmark and Norway. The latter two countries as well as the Netherlands and Sweden have adopted legislation covering nuclear damage suffered in non-Contracting States provided that the nuclear incident occurred in those countries and liability lies with an operator of a nuclear installation situated therein. The Nordic countries provide further that compensation for such damage may be made subject to reciprocity. Germany applies the Paris Convention without territorial restriction and considers the Brussels Supplementary Convention as a self-executing treaty; compensation exceeding SDR 15 million for damage suffered in non-Contracting Parties to the Paris Convention, and SDR 120 or SDR 300 million for damage suffered in Contracting Parties to the Brussels Supplementary Convention, according to whether or not they have ratified the 1982 Protocol, is subject to reciprocity. No territorial extension is foreseen in the implanting legislation of France, Greece, Italy, Portugal, Turkey and the United Kingdom.

situation has the following consequences (neglecting, under the above assumption, the provisions in certain national laws concerning the extension of territorial scope):

a) either convention applies to nuclear damage suffered in the territory of a Contracting Party to the other convention; this is of particular relevance in cases where the damage originates in land-based installations (Annex I, cases A1 to 4, column 4);

b) neither convention applies to nuclear incidents occurring in the territory of a Contracting Party to the other convention which is especially relevant in transport cases (Annex I, cases B and C, column 4);

c) both conventions are applicable to nuclear incidents occurring and nuclear damage suffered on or above the high seas which may result in their simultaneous application (Annex I, cases B1 and 2, column 4).

13. It followed further from analysis that the distinction of the conventions between "Contracting Parties" or "Installation State" [the latter term is used in the Vienna Convention only but is defined with reference to "Contracting Party" in Article I 1(d)] and non-Contracting States is of particular significance with respect to:

a) their geographical scope [Article 2 Paris Convention];

b) the transport of nuclear material [Articles 4(a)(iv) and (b)(iv) Paris Convention, II.1(b)(iv) and (c)(iv) Vienna Convention];

c) the right of subrogation [Articles 6(d) and (e) Paris Convention, IX.2 Vienna Convention];

d) the free transfer of compensation and funds provided by insurance or other financial security [Articles 12 Paris Convention and XV Vienna Convention];

e) the jurisdictional provisions [Articles 13(a) to (c) Paris Convention, XI Vienna Convention];

f) the enforcement of judgements [Articles 13(d) Paris Convention, XII Vienna Convention] and jurisdictional immunities [Articles 13(e) Paris Convention, XIV Vienna Convention];

g) the principle of non-discrimination [Articles 14 Paris Convention, XIII Vienna Convention].

The first principle underlying the Joint Protocol is therefore to create a link between the Paris Convention and the Vienna Convention by abolishing this distinction between their respective Contracting Parties as regards the operative provisions of either convention. Consequently, Contracting Parties to the Paris Convention are no longer treated as non-Contracting States within the meaning of the Vienna Convention and vice versa. On the contrary, they are mutually regarded as Contracting Parties whenever the operative provisions of either convention are applicable, notably those referred to above.

14. The second basic principle of the Joint Protocol is the elimination of conflicts between the two conventions by making either the Paris Convention or the Vienna Convention exclusively applicable to a nuclear incident. The choice of the applicable convention can be made in light of the connecting factors established by the first principle.

15. The consequences of this approach are the following:

a) The territorial scope of the two conventions is extended: operator of nuclear installations situated in the territories of Contracting Parties to either convention are liable for nuclear

damage suffered in such territories and on or over the high seas and resulting from nuclear incidents occurring in those territories on or over the high seas (Annex I, column 6).

b) In case of transport of nuclear material, the respective provisions of the conventions concerning Contracting Parties [Vienna Convention, Article II.1(b)(i) and (ii), (c)(i) and (ii), Paris Convention, Article 4(a)(i) and (ii), (b)(i) and (ii)] are applicable. Consequently, the transfer of liability between V- and P-operators is determined by the terms of a contract in writing or, in the absence thereof, by taking charge of the nuclear material (Annex I, cases B, column 6).

c) The jurisdictional provisions [Vienna Convention, Article XI; Paris Convention, Article 13] apply as between Contracting Parties.

d) The maximum amount of the operator's liability as fixed by the Installation State's legislation pursuant to the convention to which the latter is a Party, covers nuclear damage suffered in V- as well as P-states without discrimination.

If, for example, the operator of a nuclear installation in P, which has ratified the protocol, sends nuclear material to the operator of a nuclear installation in V, which has also ratified the protocol, and a nuclear incident occurs in V (Annex I, case B4, column 6), the operator liable will be determined according to the identical provisions applicable to Contracting States, i.e. in accordance with actual or contractual taking over of the material [Articles 4(a)(i) or (ii) Paris Convention, II.1(b)(i) or (ii) Vienna Convention]. The courts in V have jurisdiction under both conventions [Articles 13(a) Paris Convention, XI.1 Vienna Convention]. The laws of Vienna, the state in which the installation of the operator liable is situated, will determine the amount of liability.

Analysis of the Joint Protocol

Title

16. As indicated by its title, the protocol "joins" the two conventions by means of a single instrument. This solution, already contained in the 1974 Draft, was favoured by both the IAEA Standing Committee and the NEA Group of Governmental Experts as it stresses the reciprocity of the mutual undertakings accepted by the Parties to either convention ratifying the protocol. In addition, this solution had practical advantages: the adoption of the Joint Protocol required only one diplomatic conference, thus avoiding the possible risk of diverging texts between separate protocols to each convention, it was also easier to formulate the entry-into-force clause [Article VII.1], since with two protocols the entry into force of the one would have to be made dependent on the entry of force of the other.

Preamble

17. The reference to the Paris Convention includes the Protocol of 16 November 1982 which at the time of the diplomatic conference had not yet entered into force; it did so on 7 October 1988. On the other hand, no mention is made of the Brussels Supplementary Convention which would have been advisable, had the Joint Protocol contained an article dealing with that convention. The insertion of such a provision was however discarded for the reasons explained below.

18. The preamble evokes further the points mentioned above: the similarity in substance of both conventions, the difficulties resulting from their simultaneous application and the dual purpose of the Joint Protocol.

Article I

19. This article, which did not appear in the 1974 Draft, was inserted by the Joint IAEA/NEA Working Group of Governmental Experts in October 1987 in order to cover future amendments to either convention and avoiding the need to having to amend the Joint Protocol as a consequence thereof. Each Contracting Party to both the protocol and the Vienna Convention or the Paris Convention is therefore bound with respect to the other Parties to the protocol, to apply either convention in the same form as it does in relation to the other Parties to its own convention. Thus the Parties having ratified the 1982 Protocol amending the Paris Convention will have to apply the amended version, while those Parties which have not yet done so will continue to apply the Paris Convention as mended by the 1964 Additional Protocol only. Similarly, should the Vienna Convention be revised, the revised version will be applied to those Parties for which it is in force.

Article II

20. Compared to the 1974 Draft, this article reflects a fundamental change in the drafting philosophy of the Joint Protocol. While the operative provisions of the former were confined to the minimum (they covered only the substance of the present Articles III and IV) and may be called legalistic and even esoteric, the final version spells out directly the extension of the liability and compensation system of either convention to the Parties of the other convention. As pointed out above, the Chernobyl accident has triggered public concern about international civil liability regimes for nuclear damage and has made lawmakers aware of the need not only to enlarge the system but also to state the objectives of such enlargement as clearly as possible.

21. When drafting this basic rule, reflecting the desire expressed in the preamble of mutually extending the benefits under either convention to the Parties of the other convention, the Experts considered two alternatives. Under the first one, the rule would provide for the extension of the scope of application of either convention to cover nuclear damage suffered in the territory of one or more Contacting Parties to the other convention. According to the second alternative, it would be stipulated that nuclear operators shall be liable for such damage, according to the convention to which their installation state is a Party. The first alternative stresses the territorial scope of application of the conventions while the second one emphasises the operator's liability. Both draft alternatives contained the provisio that the nuclear incident causing the damage must have occurred in the territory of a Contracting Party to either convention in order to specify that the Joint Protocol as such does not cover nuclear damage caused in the territories of its Contracting Parties by incidents occurring in non-Contracting States (i.e. in those states which are not Party to either convention nor to the Protocol).

22. It was eventually decided to adopt the second alternative as it was considered to be more in line with the two conventions which also place the emphasis on the operator's liability. It was also felt that the wording of the first alternative ("the scope of application of the Vienna Convention/Paris Convention shall be extended to cover nuclear damage suffered in the territory of a Contracting Party to the Paris Convention/Vienna Convention") might be somewhat vague from the legal point of view. The Experts also agreed to leave out any reference to the place of the nuclear incident which caused the nuclear damage, as they judged this to be a matter of national legislation. If the nuclear incident

occurs in the territory of a Contracting Party to the Joint Protocol, it goes without saying that Article II is applicable. Should nuclear material be carries to, from or through a non-Contracting State and a nuclear incident in its territory cause damage in the territory of a Contracting Party to either Convention and to the Protocol, the operator's liability for such damage is determined by the legislation of its Installation State. This is made clear by the wording that "the operator shall be liable in accordance with that Convention…" which includes national legislation implementing that convention. If, for example, a Contracting Party to the Paris Convention has followed the recommendation of the Steering Committee of 22 April 1971 and extended the scope of the application of that convention to damage suffered in a Contracting State to the Paris Convention, even if the nuclear incident causing the damage has occurred in a non-Contracting State, the Paris Convention-operator will also be liable in such a case for nuclear damage suffered in the territory of a Contracting Party to the Vienna Convention which is also a Party to the Joint Protocol.

23. Neither the Vienna Convention nor the Paris Convention mentions the case of nuclear incidents occurring and nuclear damage suffered on or above the high seas. It was therefore decided not to refer explicitly thereto in Article II of the Joint Protocol. There is, however, general agreement that both conventions apply to such cases. The Steering Committee for Nuclear Energy adopted a recommendation to that effect on 25 April 1968, and the Standing Committee on Civil Liability for Nuclear Damage took the same view in April 1964.

Article III

24. This article implements the second principle referred to in the preamble by clearly determining the applicable convention. The 1974 Draft [Article II, second sentence] contained only a very short rule: "The convention applicable shall be that to which the Installation State of the operator liable, by virtue of either convention, is a Party." The present wording, as that of Article II, results equally from the wish to indicate clearly the purport of the conflict rule by mentioning the two principal cases involving the nuclear operator's liability. Article III.1 establishes the guiding principle that a simultaneous application of both conventions should be avoided and that only one convention should apply to a nuclear incident to the exclusion of the other convention. This principle is implemented by two conflict rules, the first dealing with nuclear incidents occurring in a nuclear installation [Article III.2] and the second one concerning nuclear incidents involving nuclear material in the course of carriage [Article III.3].

25. As regards these conflict rules in general, there was a unanimous agreement that the applicable convention should be the one to which the Installation State of the operator liable is a Party. The operator would thus be liable under the convention which corresponds to his/her own national law. In transport cases, if the incident occurs in the territory other than that of the liable operator's Installation State, the court having jurisdiction [Article 13(a) Paris Convention, Article XI.1 Vienna Convention] will have to apply a national law different from the *lex fori*, but that is not unusual in conflict of law cases. Moreover, the application of the foreign law will in most cases be limited to the amount of compensation available under the foreign operator's national law, while the nature, form and extent of the compensation as well as the equitable distribution thereof will be governed by the national law of the competent court [Article 11 Paris convention, Article VIII Vienna Convention]. Applying the convention to which state whose courts have jurisdiction is a Party could have resulted in the operator being liable under a convention to which his Installation State is not a Party. This result would have created difficulties: for example, as the provisions of the Paris Convention on the rights of subrogation and recourse are wider than those of the Vienna Convention, Parties to the latter would have had to amend their national laws to provide for the case that an action is brought before a court of a Party to

the Paris Convention against a Vienna Convention-operator under Article 6(d) or (e) of the Paris Convention; such legislation would not be in conformity with the Vienna Convention.

26. The conflict rule in the case of nuclear incidents occurring in nuclear installations [Article III.2] relies on the principle of territoriality: the place of the incident determines the applicable convention.

27. The conflict rule in transport cases [Article III.3] was perhaps the most disputed one during the negotiations, not so much because of its substance but because of its wording. It was argued that conflict rules are drafted in such a way that the choice of law is made on the basis of facts or status (for example, domicile, nationality or, as in Article III.2, place of the incident) and not by reference to legal provisions. The supporters of this argument presented a number of drafting proposals which tried to combine the identical transport provisions of both conventions [Article 4(a) and (b) Paris Convention, Article II.1 Vienna Convention]. While these proposals had the advantage of spelling out the rules determining the liable sending or receiving operator and thus the applicable convention, as well as of avoiding the need to resort to other legal instruments (which might be amended), they had the disadvantage of making the text rather heavy and of carrying the risk of being inconsistent with the transport provisions of either convention. It was finally agreed to make an exception to the usual practice of drafting choice of law rules. This exception was considered to be justified by the fact that the provisions referred to in Article III.3 describe facts, namely the assumption of liability assumed to the express terms of a contract in writing, the taking charge of nuclear material, and the loading on or unloading from a means of transport. It is true that the specific reference to the articles of the Vienna Convention and the Paris Conventions has the inconvenience that Article III.3 has to be amended if these provisions are modified or renumbered. It is, however, unlikely that the substance of these articles or their numbering will be changed; a revision of the Paris Convention is not expected for some time to come, and a possible revision of the Vienna Convention will probably not alter the substance or the numbering of Article II 1(b) and (c).

28. The conflict rule in transport cases is based on the fact that the cited provisions of the Vienna Convention and the Paris Convention are identical in substance and are to be applied “in the same manner as between Contracting Parties” to one and the same convention [see Article IV of the Joint Protocol]. This comprehensive rule allows determining the applicable convention in all transport cases as shown by the following examples:

a) As pointed out in paragraph 15 above, these provisions apply whenever nuclear material is carried between operators of nuclear installations situated in the territories of Contracting Parties to the Joint Protocol. If a nuclear incident occurs in the course of carriage, the sending P- or V-operator remains liable until the receiving operator has assumed the liability or has taken charge of the nuclear material [Article 4(a)(i) and (ii) Paris Convention, Article II.1(b)(i) and (ii) Vienna Convention]. The liability of the receiving P- or V-operator is determined by the mirror-like provisions of Article 4(b)(i) and (ii) Paris Convention and Article II.1(c)(i) and (ii) Vienna Convention.

b) When nuclear material is sent to or from a person within the territory of a non-Contracting State (NC) the sending or receiving P- or V-operator is liable according to Article 4(a)(iv) or (b)(iv) of the Paris Convention or Article II.1(b)(iv) and (c)(iv) of the Vienna Convention, respectively. This is obvious when the non-Contracting State is a Party to neither the Paris Convention nor to the Vienna Convention (and consequently not Party to the Joint Protocol, see Article VI.1). The notion of non-Contracting State within the meaning of the abovementioned provisions comes also into play where nuclear material is carried between nuclear operators situated in the territory of Contracting Parties to the Paris Convention and to the Vienna Convention respectively, and neither (P or V) or only one of these Contracting Parties (PP or VP) has ratified the Joint Protocol:

Article IV of the latter does not operate as it is only applicable between its Contracting Parties. The provisions relating to non-Contracting States are therefore applicable in the following cases involving carriage of nuclear material between V and P, V and PP, VP and P, P and NC, and V and NC.

c) There is one (rather theoretical) case where the Joint Protocol does not automatically avoid the simultaneous application of both conventions, as shown by the following example:[11] on the same means of transport (e.g. a ship) nuclear material is carried from or to a P-operator's and from or to a V-operator; in the course of carriage a nuclear incident occurs. Which convention applies is not a problem, where one of the operators has taken charge of the material or has accepted liability in writing. Under the rules described above, the convention will apply whose Contracting Party is the Installation State of the liable operator. Where there is no actual taking of charge or no written acceptance of the liability by one of the operators, the convention applicable is only clear when the nuclear incident is caused exclusively by one of the nuclear consignments. Where it is caused by both consignments or – what is more likely, it is uncertain which one was responsible – both operators will be liable [Article 5(d) Paris Convention, Article II.3(a) Vienna Convention]. Both conventions are applicable, and the Protocol does not point to the exclusive application of one convention. This legal position is however in no way the result of the Protocol and would not be any different without it. The advantage of the Joint Protocol is precisely that it permits agreements between P- and V-operators which excludes the simultaneous application of both conventions.

29. Article 4(a) and (b) of the Paris Convention and Article II.1 of the Vienna Convention are not entirely identical in substance, as the latter provision (*in fine*) covers the case of a nuclear incident occurring in a nuclear installation and involving nuclear material stored therein incidentally to the carriage of such material, whereas the corresponding provision of the Paris Convention is to be found in Article 5(b). The latter article is however applied by virtue of Article IV of the Joint Protocol. The same is true for the case of the operator being substituted by a carrier [Article 5(d) Paris Convention, Article II.2 Vienna Convention] or by a person handling radioactive waste [Article II.2 Vienna Convention].

Article IV

30. As pointed out above, the first principle underlying the Joint Protocol is to create a link between the two conventions by abolishing the distinction between Contracting Parties and non-Contracting States between the Contracting Parties of the Protocol. This mutual recognition as Contracting Parties should however not give the full status of a Contracting Party to the other convention, a result which could only be achieved by ratification and was discarded as pointed out above. A solution had therefore to be found which conveyed the idea of limited recognition in an appropriate manner. The proper wording of such an article caused some drafting problems. There was general agreement that the mutual recognition should cover the operative articles of either convention but should not extend to their "procedural" provisions such as those dealing with signatures, ratifications, accessions, amendments [Articles 17 to 22 Paris Convention, Articles XXI to XXVI Vienna Convention].

11. J. Deprimoz, "*Effets de la Convention de Bruxelles du 17 décembre 1971 sur l'assurance de l'exploitant nucléaire pour les dommages à la cargaison en cours de transport* ", Proceedings of the IAEA/NEA Stockholm Symposium on the Maritime Carriage of Nuclear Materials, IAEA, Vienna, 1973, p. 241 *et seq*., 246 *et seq*.

31. The 1974 Draft [Article 1] tried to express this idea by enumerating the inapplicable articles of either convention. This choice was mainly determined by the wish not to mention those articles of the conventions which are not directly relevant to the concept of non-Contracting States and to exclude expressly not only the procedural articles but also those articles of either convention which have no counterpart in the other [Article 7(e) and 17 Paris Convention, Article XVI Vienna Convention] or are different in substance [Article 6(e) Paris Convention]. The Joint IAEA/NEA Working Group of Governmental Experts, following proposals by the IAEA Standing Committee and the NEA Group of Governmental Experts, preferred the enumeration of the applicable articles of either convention as this positive formula expressed the positive objective of the Joint Protocol better than a negative formula stating exceptions.

32. In this context, it is to be noted that, contrary to the 1974 Draft, Articles 6(e) and 7(e) of the Paris Convention are not excluded. As a matter of fact, Article 6(e) is confined to compensation in respect of damage caused by a nuclear incident occurring in the territory of a non-Contracting State, or in respect of damage caused in such territory. This rule remains unaffected if the operator is liable under the Paris Convention but does not apply to incidents occurring and damage suffered in Contracting Parties to the Vienna Convention as they are not considered as non-Contracting States under the terms of Article IV of the Joint Protocol. As regards Article 7(e), it remains applicable among the Contracting Parties to the Paris Convention. As the Joint Protocol establishes the principle of equal treatment and non-discrimination between Contracting Parties to the Joint Protocol, this article applies equally between those Parties. Consequently, if nuclear material is carried between operators whose Installation States are Parties to the Joint Protocol (VP and PP) through the territory of a Contracting Party to the Paris Convention (P) (whether Party to the Joint Protocol or not), the latter may require that the liable operator's amount of liability be increased up to the amount applicable to operators in P. If P is also Party to the Joint Protocol and the VP-operator has assumed liability or taken charge of the nuclear material before the transit, this follows from Article IV of the Joint Protocol. Had the PP operator assumed liability or taken charge of the nuclear material, Article 7(e) of the Paris Convention would be applicable according to Article III.3 and IV of the Joint Protocol. In case P is not Party to the Joint Protocol, VP is a non-Contracting State in relation to P so that the sending or receiving PP-operator is liable until the nuclear material has been unloaded from the means of transport arriving in VP or after it has been loaded on such means destined for PP [cf. paragraph 28(b) above]; Article 7(e) is thus applicable as between Contracting Parties to the Paris Convention.

33. During the final round of negotiations, the question was raised whether Article 15(b) of the Paris Convention should be included in the list of applicable articles. It was finally decided not to do so as this article is not relevant in the context of the Joint Protocol.

34. The wording "… shall be applied (…) in the same manner as between Contracting Parties to the Vienna Convention/Paris Convention" aims at establishing equal treatment as regards the operative articles of either convention without affording the status of a full Contracting Party. This language, proposed by the NEA Group of Governmental Experts, is intended to meet the concern that the wording used in Article I of the 1974 Draft ("… the Parties to this Protocol… shall be considered as if they were Parties to the Vienna Convention/Paris Convention…") might be too far-reaching in light of international treaty practice. The IAEA Standing Committee, at its meeting in March 1987, had proposed the following version: "For the purpose of application of the Vienna Convention/Paris Convention, articles of that convention shall apply (be made applicable) with respect to the Parties to this Protocol which are Parties to the Paris Convention/Vienna Convention." It was considered that this language did not sufficiently convey the idea of mutual treatment as Contracting Parties with respect to the operative articles of either convention.

35. The application of the operative provisions "in the same manner as between Parties" leads to equal treatment as regards the amount of compensation available under the legislation of Contracting Parties to either convention. Consequently, Parties to one convention are not allowed to limit, as far as the Parties to the other convention are concerned, the amount of compensation available under their legislation to the amount available under the legislation of the Parties to the other convention, as long as no public funds are involved [see Articles 7(d) and 15 of the Paris Convention]. Such limitation would also be contrary to the non-discrimination articles of both conventions [Article 14(a) Paris Convention, Article XIII Vienna Convention] made applicable by Article IV of the Joint Protocol.

36. The Joint Protocol could lead to enlarging the number of victims entitled to compensation, to the detriment of victims suffering damage in the territories of Contracting Parties to either convention which are not Parties to the Protocol. For example, if a nuclear incident occurring in P, which has not extended the territorial scope of the Paris Convention, causes damage both in P and V, then the entire amount of compensation under the Paris Convention will be available for victims in P. In the event that the Joint Protocol is in force for both P and V, the P-operator's amount of liability serves to compensate damage in P and V which could affect the distribution of available funds. However, the Paris Convention (and also the Vienna Convention, according to some authors) may be extended by Contracting Parties to nuclear damage suffered in non-Contracting States without the other Contracting Parties having to consent thereto, and the Joint Protocol does not change this situation (that such consent is required by the Contracting Parties to the Brussels Supplementary Convention as regards the making available of their public funds is a matter to be settled outside the Protocol and is dealt with below). Moreover, it should be borne in mind that protection of victims in the opposite case (a nuclear incident in V, damage in V and P) is also covered by virtue of the Joint Protocol.

Final clauses

37. The final clauses contained in Articles V and XI follow the usual practice. It is to be noted that they do not comprise an amendment clause as it was felt that any required amendments could be dealt with in accordance with the procedures foreseen in Articles 39 and 41 of the Vienna Convention on the Law of Treaties. It was pointed out in this context that Article I of the Joint Protocol covered future amendments to both conventions so that it would not have to be amended in such a case. A proposal was made to insert a clause, similar to Article 16 Brussels Supplementary Convention, providing for consultations between the Parties to the Joint Protocol "on all questions of common interest raised by the application of this Protocol, in particular in case of an amendment to either the Vienna Convention or the Paris Convention". This provision was also considered to be unnecessary as consultations could always be organised through the normal diplomatic channels.

38. The final clauses do not refer to the Brussels Supplementary Convention, although the Joint Protocol can have certain effects on that convention (see below). The NEA Group of Governmental Experts considered that any problems related to the application of the Brussels Supplementary Convention should be settled outside the Joint Protocol as the latter deals only with the relationship between the Paris Convention and the Vienna Convention. It would have been inappropriate to insert in the Joint Protocol a provision similar to Article XVII of the Vienna Convention stating that the Protocol shall not affect the application of the Brussels Supplementary Convention as between the Parties thereto, as it is necessary to preserve the application of the Paris Convention as a condition for the application of the Brussels Supplementary Convention. The NEA Group of Governmental Experts proposed therefore the insertion of a declaratory article having the following wording: "Nothing in this protocol shall prevent a Party which is Party to the Paris Convention from making provisions preserving the application of the Brussels Supplementary Convention". At the Joint IAEA/NEA meeting of Governmental Experts in October 1987, this proposal was enlarged by a number of

delegations to cover other agreements, leading eventually to the following draft article: "Nothing in this protocol shall affect the rights and obligations of States Parties under other agreements provided that these rights and obligations are not in conflict with the present protocol." The Experts finally decided not to adopt such an article as the subject of conflicting treaty obligations was sufficiently covered by other sources of international law [see for example Article 30, paragraph 5 of the Vienna Convention on the Law of Treaties].

Articles V and VI

39. It follows from the nature of the Joint Protocol as a "bridge" between the two conventions that it may be signed only by the states which are at least signatories of either convention [Article V] and that only Parties to the latter are entitled to become Parties to the Protocol [Article VI.1]. In Article VI.2 the Director General of the International Atomic Energy Agency is designated as the depositary of this protocol, as he has the same function with respect to the Vienna Convention which has a universal character.

Article VII

40. The entry-into-force conditions constitute a compromise between the interest of allowing the instrument to become effective within a reasonable period of time on the one hand and that of ensuring its practical application by a sufficient number of adhesions on the other hand. These conditions were discussed to some extent during the preparatory work. Two extreme solutions were rapidly discarded: the first one required the ratification by only one Party to either convention while the second made the entry into force of the Joint Protocol contingent on its ratification by all Parties to either convention. The "minimum" solution would have been incompatible with the goal of establishing a unified system of civil liability for nuclear damage and would have led to the prolonged existence of a "third class" of countries namely the Parties to the Joint Protocol. The "maximum" solution carried the risk of considerably delaying the entry into force of the protocol. To cover future adhesions to the conventions, it would have been necessary to make them conditional on adhesion to the Joint Protocol, a condition implying an amendment to both conventions.

41. In search of a compromise two proposals were considered. The first one relied on the 1974 Draft which had proposed that ratification by five Parties to either convention should bring the protocol into force which corresponds to the number of ratifications necessary for the entry into force of either convention [Article 19(b) Paris Convention, Article XXIII Vienna Convention]. The second proposal suggested ratification by two-thirds of the respective Contracting Parties, using Article 20 of the Paris Convention as a guideline which requires this number for the entry into force of amendments and underlining the change of circumstance since 1974: the entry into force of the Vienna Convention having meanwhile ten Parties and the increase from ten to 14 of the Contracting Parties to the Paris Convention. The first proposal was eventually adopted as the wish to bring the Joint Protocol into force as quickly as possible prevailed over the concern that the number of ratifications required (one-half of the Contracting Parties to the Vienna Convention and about one-third of those to the Paris Convention) might be too small a foundation for the bridge between the conventions.

Articles VIII and IX

42. The period required for a denunciation of the Joint Protocol to become effective [Article VIII.2] is the same as that fixed by both conventions [Article 22(a) Paris Convention, Article XXV.1 Vienna

Convention] and is intended to allow the other Contracting Parties to take account of that situation sufficiently in advance. For the same reason, Article IX.1 requires a Contracting Party to notify the depositary of the termination of the application to it of either the Vienna Convention or the Paris Convention and to state the effective date of such termination. Article IX.2 stipulates the obvious consequences of such termination.

Articles X and XI

43. Article X provides for the usual functions of the depositary of an international agreement. The Secretary-General of the OECD is mentioned in Articles X and XI as he is the depositary of the Paris Convention and therefore interested in all matters related to the Joint Protocol.

Effects of the Joint Protocol on the Brussels Supplementary Convention

System of the Brussels Supplementary Convention

44. This convention constitutes a collective implementation of Article 15 Paris Convention which authorises Contracting Parties to take measures providing for an increase in the amount of compensation specified in the Paris Convention and to apply them under conditions derogating from the Paris Convention insofar as such compensation involves public funds and exceeds SDR 5 million. The system of compensation established by Article 3 of the Brussels Supplementary Convention consists of three tiers (stages). The first tier if provided by financial security held by the operator, usually according to the maximum amount of liability established by national legislation; the second tier covers damage exceeding this amount to an upper limit of SDR 70/175 (1982 Protocol) million and is provided by the government of the country where the installation of the responsible operator is located; the third tier covers damage beyond 70/175 to an upper limit of SDR 120/300 million and is provided jointly by the Contracting Parties to the convention in accordance with a formula based on the gross national product and the thermal power of the rectors installed in the territory of each Contracting Party. This system is supplementary to that of the Paris Convention as indicated by the titles of the Brussels Supplementary Convention and expressly stated in its Article 1 which provides further that it “shall be subject to the provisions of the Paris Convention”. The Brussels Supplementary Convention is thus a dependant treaty and can operate only on condition that the “mother treaty”, the Paris Convention, is applicable.

45. The application of the Brussels Supplementary Convention depends on several conditions which must be satisfied concurrently [Article 2]:

a) the operator of a nuclear installation must be liable under the Paris Convention;

b) this nuclear installation must be:

   i) situated in the territory of a Contracting Party to the Brussels Supplementary Convention,

   ii) used for peaceful purposes,

   iii) appear on the list according to Article 13 of the Brussels Supplementary Convention.

c) the courts of a Contracting Party to the Brussels Supplementary Convention must have jurisdiction pursuant to the Paris Convention [Article 13];

d) the nuclear incident must have occurred at least partly in the territory of a Contracting Party to the Brussels Supplementary Convention or on or over the high seas;

e) the nuclear damage must be suffered in the territory of Contracting Parties, or on or above the high seas by their nationals; in the latter case, nationals of non-Contracting States are entitled to compensation only if the damage was suffered on board a ship or aircraft registered in the territory of a Contracting Party.

46. The Joint Protocol does not in any way change the scope of application of the Brussels Supplementary Convention as it deals only with the relationship between the Paris Convention and the Vienna Convention (see also paragraph 38 above). The public funds to be made available by the Contracting Parties to the Brussels Supplementary Convention will be used exclusively for compensation of nuclear damage if the criteria of Article 2 descried above are met. These criteria exclude nuclear damage suffered in non-Contracting Sates (e.g. Parties to the Vienna Convention whether Parties to the Joint Protocol or not) even if the nuclear incident causing the damage occurred in the territory of a Contracting Party to the Brussels Supplementary Convention (see Annex I, cases A1, B6, C8); they equally exclude nuclear damage suffered in such territories of the nuclear incident occurred entirely in a non-Contracting State (e.g. in the course of transport of nuclear material to an operator of a nuclear installation situated in the territory of a Contracting Party to the Brussels Supplementary Convention, see Annex I, cases B5, B8, C11, C12).

47. The geographical scope of the Brussels Supplementary Convention is thus narrower than that of the Paris Convention which allows Contracting Parties to extend by legislation its scope to nuclear incidents occurring and nuclear damage suffered in non-Contracting States [Article 2]. As such an extension may affect the system of joint intervention by public funds established by the Brussels Supplementary Convention, its Article 14(b) stipulates that "any provisions made by Contracting Parties pursuant to Article 2 of the Paris Convention as a result of which the public funds referred to in Article 3(b)(ii) and (iii) are required to be made available may not be invoked against any other Contracting Party unless it has consented thereto". It is to be noted that none of the Contracting Parties to the Brussels Supplementary Convention which have extended the territorial scope of the Paris Convention[12] has so far asked for such consent.

Effects on the system of compensation

48. According to Article II(b) of the Joint Protocol, the operator of a nuclear installation situated in the territory of a Party to the Paris Convention and to the Joint Protocol (PP) shall be liable in accordance with the Paris Convention for nuclear damage suffered in the territory of a Party to both the Vienna Convention and the Joint Protocol (VP). The territorial scope of the Paris Convention is thus extended by means of the Joint Protocol. Without the Protocol in force, damage suffered in a Contracting Party to the Vienna Convention (V) would only be covered if the Installation State Party to the Paris Convention (P) had extended its scope to such damage. Thus, if a nuclear incident occurs in PP and causes damage in PP and in VP, the amount of compensation available under the Paris Convention will have to be distributed between victims in PP and in VP. It could happen that the insurance or other financial security to cover the PP-operator's liability is insufficient to fully compensate victims in both PP and VP, whereas victims in P would have obtained full compensation had the Joint Protocol not been in force. The drafters of the Joint Protocol were aware of this consequence (see paragraph 36 above) which does not change the actual situation as each Contracting Party to the Paris Convention is free to extend its scope to nuclear damage suffered in non-Contracting States.

12. See note 9 for the Contracting Parties to the Paris Convention having made use of this possibility.

49. However, the exhaustion of the PP-operator's financial security assumed in the above example has certain consequences for the system of compensation established by the Brussels Supplementary Convention, in other words, if PP is also a Contracting Party to that convention. The effects of the Joint Protocol on this system are illustrated by the following examples assuming that the Joint Protocol is not in force (a) or is in force (b) between the countries concerned:

a) A nuclear incident occurs in a nuclear installation situated in the territory of a Contracting Party to the Brussels Supplementary Convention (B) and causes damage amounting to SDR 200 million each in B and in a Contracting Party to the Vienna Convention (V). B has limited the operator's liability to SDR 100 million and has not extended the territorial scope of the Paris Convention. The Paris Convention and the Brussels Supplementary Convention are inapplicable to the damage in V, a non-Contracting State.

b) The situation is different if, in the example under (a), B and V are Parties to the Joint Protocol (BP and VP). The Paris Convention is applicable by virtue of Articles II(b), III.2 and IV.2 of the Joint Protocol to the damage suffered in VP. The Brussels Supplementary Convention, however, is applicable only to damage in BP. If the damage in BP cannot be fully compensated by the operator's financial security because half of it has to be used for the compensation of victims in VP, the Contracting Parties to the Brussels Supplementary Convention are obliged to intervene collectively with their public funds under the third tier if they have all consented to the extension of the territorial scope of the Paris Convention by virtue of the Joint Protocol. In the absence of such consent, they can limit their contribution to the amount which they would have to make available without this extension.

50. The compensation scheme in the above examples is illustrated by the following Table:

Source of funds	**Distribution of compensation (million SDRs)**					
	Without Joint Protocol		With Joint Protocol			
			With consent		Without consent	
	B	V	BP	VP	BP	VP
1	2	3	4	5	6	7
B(P)-operator's financial security	100	–	50	50	50	50
Public funds of B(P)	75	–	75	–	75	–
Public funds of all Parties to BSC	25	–	75	–	25	–
TOTALS	200	–	200	50	150	50

A comparison between the two examples shows that in case of collective consent (columns 4 and 5), the additional public funds to be made available by all Contracting Parties to the Brussels Supplementary Convention, namely SDR 75 million instead of 25 million, correspond to the damage suffered in V. In other words, although these funds are used exclusively to compensate damage suffered in the territory of a Contracting Party to the Brussels Supplementary Convention, they serve indirectly to cover damage falling outside the scope of that convention. In case of collective refusal of such consent (columns 6 and 7), the result would be that the damage suffered in BP amounting to

SDR 200 million would not be fully compensated under the system of the Brussels Supplementary Convention, unless additional public funds were made available by the Installation State BP.

51. The NEA Group of Governmental Experts examined this problem and agreed that the solidarity among the Contracting Parties to the Brussels Supplementary Convention should be maintained by requesting them to give their collective consent to such extension according to Article 14(b) of the Brussels Supplementary Convention. This consent should be given by all Contracting Parties regardless of whether or not they have ratified the Joint Protocol. To request such consent only from the Parties to the Protocol would create two classes of Contracting Parties to the Brussels Supplementary Convention and run counter to the principle of collective intervention and thus against the interest of the largest possible adherence to the Joint Protocol by those Parties.

52. Article 14(b) of the Brussels Supplementary Convention does not prescribe any particular form which the required consent should take, nor does its specify the point in time at which this consent should be given (for example adoption of the relevant legislation, date of the nuclear incident, date of the request to the other Contracting Parties to make available their public funds). The NEA Group of Governmental Experts reported this effect of the Joint Protocol on the Brussels Supplementary Convention to the Steering Committee for Nuclear Energy and recommended that the latter report in turn to the OECD Council which would be invited to "take note of the declared intention of the governments of all Contracting Parties to the Brussels Supplementary Convention to undertake the necessary steps to give their consent, according to Article 14(b) of that convention, to the extension of the scope of application of the Paris Convention resulting from the Joint Protocol". Although not expressly stated, there is an understanding that the consent should actually be given no later than the entry into force of the Protocol. In order to ensure that this situation will be maintained in the future, the Group of Governmental Experts recommended further that states which are currently signatories of the Brussels Supplementary Convention but have not yet ratified it declare the intention to give this consent when ratifying the convention. Finally, in the same spirit, the Contracting Parties and Signatories of the Brussels Supplementary Convention should declare that they will require, as a condition for their assent to accessions to the convention according to its Article 22(b), that any government requesting accession to the convention will have given such consent. At its meeting of 28 April 1989, the Steering Committee for Nuclear Energy supported these recommendations. The OECD Council is expected to take note of the declarations in the near future.

Effects of the Joint Protocol on the Brussels Supplementary Convention in certain transport cases

53. In case of nuclear incidents occurring in nuclear installations, the operation of the Brussels Supplementary Convention will not be affected by the Joint Protocol: the applicable convention will always be that to which the state is a party within whose territory the installation concerned is situated [Article III.2 of the Joint Protocol]. If this state is a Party to the Paris Convention and to the Brussels Supplementary Convention, the latter will apply only to damage suffered in the territories of its Contracting Parties, although public funds may have to be made available at an earlier stage as pointed out above.

54. In certain cases involving the transport of nuclear material, on the other hand, the operation of the Joint Protocol may result in the inapplicability of the Brussels Supplementary Convention. As explained in paragraphs 15 and 28 above, the transport provisions of either convention relating to Contracting Parties are made applicable by means of Articles III and IV of the Joint Protocol, so that those concerning non-Contracting states are no longer relevant between Parties to the Joint Protocol.

The consequences of this principle are illustrated by the following examples dealing with situations without the Joint Protocol in force (a) and with the Joint Protocol in force (b) respectively:

a) The operator of a nuclear installation situated in B sends nuclear material to a nuclear operator in V. Before the substances are unloaded from the means of transport, a nuclear incident occurs in B and causes damage in B. The B-operator is liable for the damage suffered in B according to Article 4(a)(iv) of the Paris Convention and compensation for that damage is to be paid under the Brussels Supplementary Convention as the conditions of its Article 2(a) are met (see Annex I, case B3, column 5).

b) On the other hand, if in the above example the nuclear material is sent from a BP-operator to a VP-operator (both installation states are thus party to the Joint Protocol which is in force), the unloading from the means of transport is irrelevant. Which of the two operators is liable is determined by the express terms of a contract in writing (the normal case) or by the taking charge of the nuclear material. If the VP-operator has assumed liability in writing or taken charge of the material before the incident in B occurred, he is liable according to Article II.1(c)(i) or (ii) of the Vienna Convention in conjunction with Article III of the Joint Protocol. Consequently, the Brussels Supplementary Convention is inapplicable, as there is no operator liable under the Paris Convention, a condition for the application of the Brussels Supplementary Convention according to its Article 2 (see Annex I, case B3, column 8).

The Joint Protocol will thus make it possible to render the Brussels Supplementary Convention inapplicable in certain transport cases (including incidents occurring and damage suffered on or above the high seas) when it would be applicable without the Protocol being in force.

55. The example given in paragraph 54(b) above may appear rather theoretical if one looks at the present parties to either convention and the extent of trade in nuclear material, if any, between them. However, it will gain practical importance if the Joint Protocol fulfills the hope of attracting more adhesions to the Vienna Convention, particularly in Europe. In this case, the Contracting Parties to the Brussels Supplementary Convention would be ill-advised if they did not take measures to preserve its application in the interest of their nationals. The public in those countries will hardly understand that the ratification of the Joint Protocol as a means to enhance the enlargement of the international nuclear liability regime might be counterproductive in depriving potential victims of a nuclear incident of additional compensation.

56. In order to resolve this problem, the Contracting Parties to the Brussels Supplementary Convention could agree to make public funds available in case the convention were applicable according to its Article 2 but for the fact that an operator of a nuclear installation is liable according to the Vienna Convention in conjunction with Article III of the Joint Protocol and the VP-operator's financial security (and possibly public funds made available by the operator's Installation State) proves to be insufficient to cover the nuclear damage in BP. However, this solution would deviate from the principle that the Brussels Supplementary Convention is supplementary to, or dependent on, the applicability of the Paris Convention and always presupposes a liable P-operator. For this reason alone, this solution may require an amendment to the Brussels Supplementary Convention. In addition, serious problems would arise as regards the system of intervention of public funds established by the Brussels Supplementary Convention. Articles 10 and 11 of the latter convention set up a well-balanced framework in this respect which works between its Contracting Parties only and would have to be amended if the Installation State of the operator liable is an outsider of that system.

57. The NEA Group of Governmental Experts concentrated therefore on another solution which, without requiring amendments to the Brussels Supplementary Convention, would preserve its application in the example given in paragraph 54(b) above. The consequences for the Brussels Supplementary Convention illustrated by that example could have been avoided if BP had obliged the sending operator under its jurisdiction to assume liability by contract for any nuclear damage which may be caused by a nuclear incident occurring during carriage of nuclear material between his installation and installations of a VP-operator and for which the Brussels Supplementary Convention would be applicable. This solution would fit into the concept of Article III of the Joint Protocol. By making the BP-operator liable, the Paris Convention and consequently the Brussels Supplementary Convention would be rendered applicable. In practice, this would mean that the BP-operator must assume liability as long as nuclear material sent to or from his installation remains on the territory of Contracting Parties to the Brussels Supplementary Convention (the latter being inapplicable to incidents occurring in non-Contracting states). In addition, the BP-operator must assume liability in case of transport on or over the high seas in order to preserve the applicability of Article 2(a)(ii)(2) and (3) of the Brussels Supplementary Convention. The proposal was therefore made that the Contracting Parties to the Brussels Supplementary Convention which ratify the Joint Protocol should take appropriate measures to ensure that the operators of nuclear installations, or carriers under their jurisdiction, assume liability in all cases involving transport of nuclear substances between such installations and those of operators situated in the territory of Contracting Parties to the Vienna Convention and to the Joint Protocol, to the extent that nuclear incidents occurring during the transport would, were it not for the operation of the Joint Protocol, lead to the application of the Brussels Supplementary Convention according to its Article 2.

58. It is true that imposing the assumption of liability on the P-operator limits the freedom of contractual arrangements between P- and V-operators made possible by Article III.3 and IV of the Joint Protocol. The proposed solution returns in practice to the situation existing before the entry into force of the Joint Protocol where the sending or receiving P-operator is liable according to the provisions on carriage to or from non-Contracting States [see the example in paragraph 54(a) above]. The return to the situation *ex ante* would, however, be limited as the P-operator would not be obliged to assume liability during the entire carriage but only until, or from the moment where, the conditions related to the place of the nuclear incident and the damage suffered specified in Article 2 of the Brussels Supplementary Convention would be met. The infringement on the freedom of contract following from the proposal would not appear to be contrary to the letter and spirit of the Paris Convention as paragraph 32 of the Exposé des Motifs allows such measures to be taken by the Contracting States.[13]

59. As regards the legal form of the solution, the NEA Group of Governmental Experts preferred that consisting of a recommendation of the OECD Council. This proposal was submitted to the Steering Committee for Nuclear Energy which approved it at its meeting of 28 April 1989 and invited the OECD Council to adopt the recommendation. The Council is expected to do so in the near future.

60. As soon as the Joint Protocol has entered into force and its practical application comes into play, it is important that all Contracting Parties to the Brussels Supplementary Convention which are also Parties to the Joint Protocol have taken the proposed measures. If one or more of them were not to

13. Paragraph 32 of the Exposé des Motifs (which remained unchanged when the 1982 Protocol was adopted) reads as follows:"For transport of nuclear substances to or from installations situated in its territory, a Contracting Party may require the operators of the installations for whom the substances are carried from abroad to take the substances in charge the moment the substances reach its territory or even earlier. Similarly, in the case of nuclear substances sent by operators of nuclear installations in its territory to a foreign destination, a Contracting Party may require that the nuclear substances shall remain in the charge of such operators until they have left its territory or even longer".

follow the recommendation, the uniformity of the application of the Brussels Supplementary Convention and the solidarity between Contracting Parties might be jeopardised. There might indeed be cases leading to different treatment of victims and creating two classes of Parties to the Brussels Supplementary Convention, as shown by the following example: The Joint Protocol has entered into force. An operator of a nuclear installation situated in a Contracting Party to the Brussels Supplementary Convention and to the Joint Protocol (BP) receives nuclear material from an operator of a nuclear installation situated in a Contracting Party to the Vienna Convention and to the Joint Protocol (VP). The VP-operator has assumed liability during the entire transport. A nuclear incident occurs on the territory of BP and causes damage in BP as well as in another Contracting Party to the Brussels Supplementary Convention which has not ratified the Joint Protocol (B). As regards the relationship between BP and VP, the Vienna Convention is applicable by virtue of Article III.3 of the Joint Protocol. The Brussels Supplementary Convention is inapplicable as there is no operator liable under the Paris Convention [Article 2(a)(i) Brussels Supplementary Convention]. The total amount of compensation is determined by the VP-operator's national legislation. If the operator's financial security is exhausted, the legislation of BP could provide for additional compensation, but the other Contracting Parties to the Brussels Supplementary Convention are not obliged to intervene with their public funds according to Article 3(b)(iii) Brussels Supplementary Convention. The legal situation is different as regards the relationship between BP and B. As B has not ratified the Joint Protocol, the assumption of liability by the VP-operator does not come into play; for B the nuclear substances have been sent from a person within the territory of a non-Contracting State so that the BP-operator is liable according to Article 4(b)(iv) of the Paris Convention. Consequently, the Brussels Supplementary Convention is applicable so that the victims in B can claim the full benefits of the Brussels Supplementary Convention which might put them in a much better position than the victims in BP. This example shows that there are two operators liable for damage resulting from one and the same nuclear incident – the VP-operator for damage in BP and the BP-operator for damage in B. This result runs clearly counter to the intention of the Joint Protocol to avoid the simultaneous application of the Vienna Convention and of the Paris Convention and could have been avoided if BP had taken measures recommended.

Conclusions and outlooks

61. It took 25 years from 1963 to 1988 to settle the relationship between the two conventions, but after consideration of this problem had been resumed in 1986 a result achieved in the remarkably short period of two years. The task was facilitated by the solid groundwork already laid between 1972 and 1975. The Chernobyl accident occurred after the new initiatives taken by the IAEA in 1984 and 1985 but demonstrated the importance of the problem and helped to accelerate the work with the continuous support of the governing bodies of the IAEA and OECD/NEA.

62. At first sight, the present number of 20 signatures apposed to the Joint Protocol looks impressive; it represents about two-thirds of the 31 states entitled to sign according to Article V. A closer look reveals however that the signatories are unevenly divided between those of the respective conventions. As regards the Paris Convention, the Joint Protocol was signed by 13 Contracting Parties (this includes all Contracting Parties to the Brussels Supplementary Convention, except France) and one signatory (Switzerland) i.e. 14 out of 17 or 82% of possible candidates. On the other hand, only six signatories of the Vienna Convention (60%) were in a position to sign so far. None of the Eastern European countries with centrally planned economy took the opportunity to sign the Vienna Convention on 21 September 1988 which would have qualified them for signature of the Joint Protocol.

63. Adhesion to the Vienna Convention by those countries is indeed a *conditio sine qua non* for the success of the Joint Protocol. Representatives of the Contracting Parties to the Paris Convention have made it abundantly clear that they would consider ratification of the Joint Protocol only if that condition is met. Annex II shows the difference between nuclear power plants covered by the Paris Convention on the one hand and by the Vienna Convention on the other. The geographically almost closed group of Parties to the Paris Convention/ Brussels Supplementary Convention contrasts with the dispersed Parties to the Vienna Convention, most of which are far from each other and use nuclear energy for peaceful purposes to a far less extent than the first group of countries. This difference is particularly striking in densely populated Europe where the "white patches on the map" indicate a clear borderline between East and West. This situation, which was presumably one of the reasons that prevented Parties to the Paris Convention from ratifying the Vienna Convention, still exists, with the exception of Yugoslavia which ratified the Vienna Convention in 1977. Paragraph 3 of the Exposé des Motifs to the Paris Convention states: "The effects and repercussions of a nuclear incident will not stop at political or geographical frontiers and it is highly desirable that persons on one side of the frontier should be no less protected than persons on the other side." The Chernobyl incident has confirmed this forecast along with the urgent need for general acceptance of an international civil liability regime. As a first step in this direction, ratification of the Vienna Convention by a large number of countries, in particular in Eastern Europe, is highly desirable. The General Conference of the IAEA expressed the hope on 28 September 1984 that more Member States would consider becoming parties to the convention.[14] This hope has so far been deceived.

64. There are some other problems to be resolved. The Vienna Convention has to be modernised; above all, the present gold-based unit of account needs to be replaced by the SDR of the IMF in order to bring the Vienna Convention in line with the 1982 Protocol amending the Paris Convention and this to provide common "currency" within the framework of the Joint Protocol. According to Article XXVI of the Vienna Convention, the convocation of a revision conference requires the request from one-third of the Contracting Parties, i.e. actually four. Some Parties have shown an interest in such a conference, but no official steps have been taken thus far. Second, the Contracting Parties to the Brussels Supplementary Convention will have to take the recommended measures; it is hardly conceivable that their parliaments will consider ratification of the Joint Protocol if there is a risk that it will render the Brussels Supplementary Convention inapplicable and thus lead to depriving potential victims of their benefits.

65. The adoption of the Joint Protocol is indeed a remarkable achievement, but this bridge between the two conventions will be opened only after is entry into force, and a lot of water may still have to flow under it before this will happen. The many years it took for the entry into force of the Paris Convention (eight years), the Brussels Supplementary Convention (11 years), the Vienna Convention (14 years) and the 1982 Protocol amending the Paris Convention (six years) is not particularly encouraging in this respect, let alone the obstacles mentioned above. Some cautious optimism will be in place if the Joint Protocol fulfills the hope of attracting more adhesions to the Vienna Convention. Even after the Protocol has entered into force, the bridge will be rather small as in the beginning it will only link five Contracting Parties to either convention, and complications could arise through outsiders, i.e. those Contracting Parties to the Paris Convention/Brussels Supplementary Convention or Vienna Convention which have not ratified the Joint Protocol. The bridge will pass its full load test only if it is accepted as a means of creating a unified civil liability regime at least in Europe.

14. IAEA document GC(XXVIII)/RES/431, reproduced in *Nuclear Law Bulletin* No. 34, p. 51.

ANNEX I

Cases		Place of Incident[15]	Place of Damage	Applicable Conventions				
				Without Protocol		With Protocol		
							BSC applicable?	
				PC/VC without Territorial extension	BSC	PC/VC	P-operator liable	V-operator liable
1		2	3	4	5	6	7	8
A Fixed Instal-lations	(1)	P	V	None	No	PC	No	-
	(2)	V	P	None	No	VC	-	No
	(3)	P	P + V	PC to damage in P	To damage in P	PC	To damage in P	-
	(4)	V	V + P	VC to damage in V	No	VC	-	No
B Direct Trans-port P->V V->P	(1)	High seas	High seas	Both	Yes	PC or VC	Yes	No
	(2)	High seas	High seas P and/or V	PC + VC to damage on high seas PC to damage in P, VC to damage in V	To damage on high seas and in P	PC or VC	To damage on high seas and in P	No
	(3)	P	P	PC	Yes	PC or VC	Yes	No
	(4)	V	V	VC	No	PC or VC	No	No
	(5)	V	P	None	No	PC or VC	No	No
	(6)	P	V	None	No	PC or VC	No	No
	(7)	P	P + V	PC to damage in P	To damage in P	PC or VC	To damage in P	No
	(8)	V	P + V	VC to damage in V	No	PC or VC	No	No
	(9)	P or V	P + V	PC to damage in P VC to damage in V	To damage in P	PC or VC	To damage in P	No
C Transit V->P->V	(1)	V	V	VC	No	VC	-	No
	(2)	V	P	Non	No	VC	-	No
	(3)	V	V + P	VC to damage in V	No	VC	-	No
	(4)	P	P	None	No	VC	-	No
	(5)	P	V	None	No	VC	-	No
	(6)	P	V + P	None	No	VC	-	No
P->V->P	(7)	P	P	PC	Yes	PC	Yes	-
	(8)	P	V	None	No	PC	No	-
	(9)	P	P + V	PC to damage in P	To damage in P	PC	To damage in P	-
	(10)	V	V	None	No	PC	No	-
	(11)	V	P	None	No	PC	No	-
	(12)	V	P + V	None	No	PC	No	-

15. In transport cases it is assumed for the result referred to in column 4 that the nuclear incident occurred before the nuclear substances had been loaded onto or unloaded from the means of transport. [See Articles 4(a)(iv) and (b)(iv) PC, Article II.1(b)(iv) and (c)(iv) VC].

ANNEX II

Nuclear Liability Conventions and Nuclear Power Plants

Situation in January 1989
Source: Atomwirschaft March 1989

	Power plants		Capacity	
	Number	**%**	**MWe (gross)**	**%**
A Worldwide				
Total	414	100.00	331 094	100.00
Covered by VC	3	0.72	1 652	0.50
Covered by PC/BSC	139	33.58	118 467	35.78
Not covered by Conventions[16]	272	65.70	210 975	63.72
B Europe (incl. USSR)				
Total	223	100.00	170 026	100.00
Covered by VC	1	0.45	664	0.39
Covered by PC/BSC	139	62.33	118 467	69.68
Not covered by conventions[17]	83	37.22	50 895	29.93

16. Brazil (1 plant/657 MWe), Canada (18/12381), India (6/1330), Japan (38/29445), Korea, Rep of (8/6758), Pakistan (1/137), South Africa (2/1930), Taiwan (6/5144), USA (109/102298), Europe, see below (83/50895).

17. Bulgaria (5/2760), CSSR (8/3520), German Democratic Republic (5/1830), Hungary (4/1760), Switzerland (5/3034), USSR (56/37991).

The Convention on Nuclear Safety

by Odette Jankowitsch-Prevor*

Foreword

1. The Convention on Nuclear Safety was opened for signature on 20 September 1994 in conjunction with the 38th regular session of the General Conference of the IAEA. 50 states signed the Convention.[1] On 17 June 1994, it had been adopted without a vote by the representatives of 84 countries at the Diplomatic Conference convened in Vienna by the IAEA from 14-l7 June 1994. The Convention will enter into force on the 90th day after the deposit with the Director General of the IAEA of the 22nd instrument of ratification, including the instruments of 17 states "each having at least one nuclear installation which has achieved criticality in a reactor core."[2]

2. The large number of countries involved in this treaty making process reflects the intense international interest for all matters regarding nuclear safety and the willingness of countries both with and without nuclear power programmes to actively contribute to the safety of nuclear power plants wherever they are located.

3. At the present juncture, it is, however, not easy to foresee how soon the Convention will enter into effect. The number of states required for its entry into force (22) is huge compared to the IAEA's Convention on Early Notification of a Nuclear Accident[3] that entered into force 30 days after consent to be bound had been expressed by three states only; the requirement is similar to the Convention on the Physical Protection of Nuclear Material (21 states), but modest in comparison with the 40 "other" states in addition to the three depositaries required by the Treaty on the Non-Proliferation of Nuclear

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* This article was initially published in *Nuclear Law Bulletin* No. 54 (1994). The author served as Secretary to the Group of Experts on a Convention on Nuclear Safety. The views expressed are those of the author and do not represent those of the IAEA. The author expresses her appreciation for the constructive criticism formulated by Patrick Reyners and acknowledges with thanks the efforts made by Judy Goodman in the painstaking preparation of the manuscript.

1. Algeria, Armenia, Argentina, Australia, Austria, Belgium, Brazil, Bulgaria, Canada, Chile, China, Cuba, Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Rep. of Korea, Luxembourg, Netherlands, Nicaragua, Nigeria, Norway, Pakistan, Peru, Philippines, Poland, Portugal, Romania, Russian Federation, Slovak Republic, Slovenia, South Africa, Sudan, Sweden, Syria, Tunisia, Turkey, Ukraine, United Kingdom, United States.

2. The Diplomatic Conference was attended by 84 states. Four international organisations attended as observers. The Final Act was signed by 71 states. Convention on Nuclear Safety, IAEA, INFCIRC/449, Article 31.

3. Article 14, in INFCIRC/335. The same applies to the Convention on Assistance in Case of a Nuclear Accident or Radiological Emergency, Article 14, para. 3, INFCIRC/336.

Weapons.[4] Coupled with the requirement that 17 states must be included in this sum of 22 that have at least one operating nuclear plant, the entry into force provision reveals the intention of the drafters: in order to be an effective and meaningful instrument, about half of the world's 32 states with nuclear power plants in operation must have expressed their agreement to be bound before the convention can become operational.

I. Introduction and background

4. International law making is rarely attributable to a single factor but, frequently enough, the decision to prepare a binding instrument is triggered off by major events, often a catastrophe – perceived *ex post* as having been potentially avoidable by the enactment and enforcement of proper legal norms. Such was the case of the Torrey Canyon oil tanker accident which led to the adoption of several instruments regarding liability and compensation for oil pollution damages; the chemical industry accident at Seveso which brought about intensified efforts to develop an instrument on the International Movement of Hazardous Wastes as well as EC Directives on this subject,[5] and more recently, the International Civil Aviation Association (ICAO) Convention on Monitoring Plastic Explosives (1991) resulted from "the need for a legal regime" to preclude the recurrence of terrorist acts such as those which took place in 1988 and 1989.[6]

As to the nuclear field, it is recalled that in May 1986 the Board of Governors of the IAEA having "considered the recent reactor accident at the Chernobyl Nuclear Power Station and other accidents in the past" and noting "the evident need for greater co-operation in nuclear safety…"[7] decided on the setting up of groups of government experts "to draft on an urgent basis international agreements" regarding early notification and information about nuclear accidents as well as the co-ordination of emergency response and assistance in the event of a nuclear accident. The Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency were thereafter prepared, adopted and signed within a few months only.

5. As regards the Convention on Nuclear Safety, however, it appears to have its political origins and motivation in the intention to prevent rather than cure. In 1990, at a meeting of the policymaking organ of the IAEA, the Member States of the European Community proposed the convening by the IAEA of an international conference in 1991 on the "Safety of Nuclear Power: Strategy for the Future".[8] It was the intention of the promoters of this initiative that the conference and its results should be a contribution by the IAEA to the United Nations Conference on Environment and Development (1992, Rio de Janeiro).

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4. NPT, Article IX.2, in INFCIRC/140. Note: The Basel Convention Article (X) also required 20 ratifications. The Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction, Article XXI, required 65 ratifications.

5. EC Council Directive 84/631 of 6 December 1984.

6. See "Contemporary Practice of the United States relating to International Law" in *American Journal of International Law*, January 1994, Vol. 88, No. 1, p. 89-93.

7. Decision adopted on 21 May 1986, GOV/OR.649.

8. Note: At the Conference the proposal to establish a Nuclear Safety Convention was made by the Minister for Environment, Nature Conservation and Nuclear Safety of Germany, Mr. Toepfer. See Proceedings GC(XXXV)/970.

6. The Safety Conference, in its "Major Findings", declared that there was "a need to consider an integrated international approach to all aspects of nuclear safety, including safety objectives for radioactive wastes … which would be adopted by all governments"; "the governing bodies of the IAEA" were requested to organise "the preparation of a proposal on the necessary elements of such a formalised international approach, examining the merits of various options and taking into account the activities and roles of relevant international and intergovernmental bodies and using the guidance and mechanisms already established in the IAEA." The Conference in its final declaration, however, also recalled that "safety should be primarily enforced at national levels by conscientious application of existing safety principles, standards and good practices at each plant, and within each regulatory body, making best use of national legal frameworks and working practices."[9]

7. Soft law and good practices, a national legal framework and international norms were thereby well described as being the essential – co-existing – components of an international nuclear safety "regime".

8. The 35th regular session of the IAEA General Conference[10] in September 1991 gave its support to this idea and, "noting in particular that the International Safety Conference recognised the potential value of a step-by-step approach to a framework convention for the promotion of an international nuclear safety regime", invited the Director General "to prepare, for the Board's consideration in February 1992, an outline of the possible elements of a nuclear safety convention taking into account the activities and roles of relevant international and intergovernmental bodies and drawing on the advice of standing groups like INSAG, NUSSAG and INWAC, and also on expertise made available by Member States and competent international organisations."[11]

9. With this consensus endorsement, the stage was set to start preparatory work on the Convention on Nuclear Safety.

II. Drafting by lawyers and technicians: the Group of Experts on a Nuclear Safety Convention

10. The resolution of the General Conference did not specify the form or the type of instrument to be established nor did it provide clear indications as to its possible scope and contents. It referred rather to technical bodies, to standing groups of the IAEA and to international organisations that would be competent to give advice, thereby indicating the procedure to be followed and expressing the need to consult all available sources. The mandate of the technical standing groups of the IAEA[12] together with those of the international organisations[13] having competence in matters of nuclear safety encompasses however all facets of nuclear safety: the areas covered range indeed from protection of workers from ionising radiation (International Labour Organization) and health (World Health Organization) to the transport of nuclear material, and radioactive waste. The first task of the Director

9. Ibid.

10. IAEA GC(XXXV)/RES/553 preambular paragraph (e).

11. Ibid, paragraph 4. INSAG: International Safety Advisory Group; NUSSAG: Nuclear Safety Standards Advisory Group; INWAC: International Nuclear Waste Advisory Committee.

12. SAGSTRAM was added to the listing above (Standing Advisory Group on the Safe Transport of Radioactive Material).

13. The following international organisations were invited: ILO, WHO, the NEA/OECD as observers and the Commission of the EC initially as a participant.

General of the Agency, pursuant to the mandate received from the General Conference, was therefore to find ways and means of defining options and delimiting the possible substance and form of a future Convention. Both legal and technical expertise were required.

11. To fulfil this first task, the Director General convened, from 9 to 13 December 1991, an initial group of 36 experts from Member States and competent international organisations (the Commission of the European Communities was invited as a participant, the ILO and the OECD Nuclear Energy Agency as observers) and also included the chairpersons of NUSSAG, INWAC and SAGSTRAM to advise on the structure and contents of possible elements of an international nuclear safety convention. The Group of Experts elected as its chairperson E.A. Ryder, (UK) chairperson of NUSSAG. It based its discussions on a working paper prepared by the Secretariat as well as on two recent draft Agency documents namely "Safety Fundamentals: The Safety of Nuclear Installations", of 1991[14] and "Draft Safety Fundamentals: The Principles of Radioactive Waste Management, a publication within the RADWASS Programme", also of 1991.

12. The first document, the so-called "Safety Fundamentals", was later accepted by the experts as the main technical reference text for the convention, in view of the fact that it presented an international consensus on basic concepts for the regulation, management of safety and operation of nuclear installations. It determined the scope and the contents of the convention. The document on waste management was not used.

The concepts enounced in the "Safety Fundamentals" document, drafted from a national regulatory perspective, proved however to not be automatically translatable into international treaty language, notably as regards the relation between the responsibility of the operator of a plant and that of the State Party to the convention. (An informal working group of lawyers and technicians was set up to translate the Safety Fundamentals into draft convention language).

13. In the report to the Director General, the chairperson of the Group of Experts stated that there was a need for an international instrument on nuclear safety and urged that preparatory work for the establishment of such an instrument begin as soon as possible; a decision on the structure of a convention should be taken after agreement had been reached on its scope and contents. The experts considered that the convention should give emphasis to general principles and procedures rather than to technical details regarding nuclear safety.

14. By a decision taken by the Board of Governors in February 1992 in the light of a report submitted by the Director General on the Group's work, a new "open-ended" (i.e. open to all IAEA Member States) group of legal and technical experts was established and entrusted with the task of carrying out the necessary substantive preparations for a Convention on Nuclear Safety.[15] The Group, composed of about 100 experts from 45 countries, the CEC, NEA/OECD and ILO, elected as its chairman Mr. Z. Domaratzki of the Atomic Energy Control Board of Canada. It took the Group of Experts two years and seven meetings to reach agreement on the substance and form of the draft convention.

15. From the outset, the experts addressed both the possible form and contents of such an instrument. As to form, the experts "recognised that several types of international instruments could be

14. The document was later published in the Safety Series, No. 50 "The Safety of Nuclear Installations", 5 December 1993.

15. GOV/2567, February 1992.

envisaged."[16] The Agency's Secretariat had initially considered and proposed a framework type convention:[17] a main general agreement supported by annexes or protocols – covering the different types of nuclear activities – which could be developed either simultaneously or over time. The structure that prevailed and was preferred by most experts, notably from countries with large nuclear power programmes, however, was a single document, without protocols, possibly with an annex only, to be adopted at the same time

16. As regards the desirable contents, the experts agreed that the "Safety Fundamentals" document would provide all technical input required. The "elements for inclusion in a convention" were thus to be drawn essentially from the principles and basic requirements contained therein: a legislative and regulatory framework, the "management" of safety, the technical aspects of safety, and verification of safety. The objectives to be achieved by the convention would also be based on the same source:

i) a general nuclear safety objective: "To protect individuals, society and the environment from harm by establishing and maintaining in nuclear installations effective defences against radiological hazards";

ii) a radiation protection objective: "To ensure that in all operational states radiation exposure within the installation or due to any planned release of radioactive material from the installation is kept below prescribed limits and as low as reasonably achievable, and to ensure mitigation of the radiological consequences of any accidents"; and as a main goal;

iii) the technical safety objective: "To take all reasonable practicable measures to prevent accidents in nuclear installations and to mitigate their consequences should they occur; to ensure with a high level of confidence that, for all possible accidents taken into account in the design of the installation, including those of very low probability, any radiological consequences would be minor and below prescribed limits; and to ensure that the likelihood of accidents with serious radiological consequences is extremely low."[18]

17. The obligations of Parties to the convention would be derived from these "fundamental" principles: i.e. to establish a legislative and regulatory framework, which should define the discrete responsibilities of the government, the regulatory body and the operators; to take necessary measures for the education and training of the workforce; and for the safety of the nuclear facilities (including matters of siting, design, construction, commissioning, decommissioning), to require the continued surveillance of the safety of the facilities; to secure the safe operation and maintenance of the facilities; and to take necessary measures for the safe management and disposal of radioactive waste should such wastes be included in the scope of the convention.

18. It was clear however that a listing of general obligations defined only in terms of principles for the safe operation of nuclear installations would not suffice. If the convention was to contribute to promoting "the highest level of nuclear safety worldwide", it required a mechanism commensurate with the objectives set out.

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16. Report of the "Expert Group on an Outline of the Possible Elements for an International Convention on Nuclear Safety", dated 13 December 1991. Unpublished document made available to members of the Board of Governors at the February 1992 Session [GOV/2567].

17. The Director General in his first report to the Board of Governors on the findings of the Group argued in support of a framework convention allowing for a more comprehensive approach from the outset. GOV/2567; implementation of resolution GC(XXXV)/RES/553.

18. Safety Fundamentals, see note 14.

The difficulty encountered in devising for the convention a mode of verifying compliance with the convention's obligations without introducing at the same time exceptions to the principle that the safety of nuclear power plants was primarily a question of national responsibility was resolved with the help of the convincing argument that enlightened self-interest of states in matters of nuclear safety would be stronger than any form of outside control devised under international law: this self-interest would be developed and promoted among the Contracting Parties with nuclear installations, that is the "peer group"; peer group "pressure" or "persuasion" would be effective in compelling the Parties to meet their obligations under the convention, and as a result, improve nuclear safety in all power plants. A "meeting" of all Contracting Parties would be the appropriate method of focusing these "peer group" effects.

The experts also agreed in the context of this approach and, in the same spirit, that their objective was to establish a convention with an "incentive character" to which a large number of states could adhere. The term "incentive", though not defined, was inserted in the Preamble of the convention; it is not to be understood in a material sense, but rather as synonymous with "encouragement" or "emulation".

19. As to the issue of the scope of the instrument and, accordingly, the elements that would need to be included in addition to reactor safety, it remained open until the last phase of the negotiation process reflecting two main schools of thought – two possible approaches.[19]

According to one approach, the convention would cover all nuclear facilities and activities of the civil nuclear fuel cycle and include the safety of research reactors and the safe management and disposal of radioactive waste; the instrument would be drafted as a framework agreement with annexes or protocols added over time and containing detailed standards. A second view, which was to be the determinant one, gave preference to a unified document, restricted to operating nuclear power plants and based on broad principles.

The first school grouped the countries (mainly European) with few or no nuclear power plants; it also argued in favour of a more detailed, prescriptive form of convention, some countries expressing the wish for some form of mandatory international safety controls implemented by the IAEA.

20. The second, represented by regulators, nuclear technicians and heads of national authorities of countries with large nuclear power programmes, expressed a preference for a single text without technical annexes, for an incentive-oriented convention that would encourage all countries, including the developing countries and the countries of central and eastern Europe, to strengthen safety programmes and safety culture, and for the peer group mechanism described above.

After four meetings of the Expert Group, major disagreements were resolved and compromises accepted. The last three meetings of the Expert Group were therefore able to be devoted to drafting after a compromise text had been established by the Group's chairman.

III. The Convention: its structure and contents

21. The Convention on Nuclear Safety consists of a preamble and 35 articles; there are no annexes and no protocols to the convention.[20] In a style similar to many recent instruments,[21] the convention

19. See *supra* para. 15.

20. The Diplomatic Conference that adopted the convention also decided to adopt an attachment to the Final Act entitled "Some Clarification with respect to Procedural and Financial Arrangements, National

opens with a long preamble containing elements from the "Safety Fundamentals", notably the reference to the environment, as well as language based on resolutions adopted by General Conferences [GC(XXXV)/RES/553, GC(XXXIV)/RES/529]. It also refers to the other conventions relating to nuclear safety adopted under IAEA auspices.[22] Preambular paragraphs of an early draft (June 1992) of the Nuclear Protocol to the draft European Energy Charter are also included.

22. The most relevant elements of the preamble are its last two paragraphs: paragraph (ix) affirms "… the need to begin promptly the development of an international convention on the safety of radioactive waste management…" and paragraph (x) refers to the "safety of other parts of the nuclear fuel cycle" which "in time" would also be covered by international instruments. These two paragraphs reflect the political compromise reached after protracted negotiations, which also included the IAEA Board of Governors, to limit the scope of the convention to land-based civil nuclear power plants, but to express, at the same time, a commitment to developing an instrument on the safety of waste management as soon as the technical document to serve as substantive backbone of such instrument has been agreed upon. Other parts of the fuel cycle, and e.g. research reactors, raising different safety problems which, to some extent are of a more limited national dimension would, in the intention of the negotiators, also be covered by international instruments to be developed at a later stage.

Paragraph (viii) deserves special mention as it also results from a compromise on whether or not to include reference to the Agency's Nuclear Safety Standards (NUSS); the phrase "internationally formulated safety guidelines which are updated from time to time" is in fact a description of the NUS[S] standards.

Although not in a strict legal sense, the content of these preambular paragraphs recalls the original concept of an international nuclear safety framework built on several successive instruments of a similar nature.

23. In addition to the general premises enumerated in the preamble, the convention defines three sets of "Objectives" in Article 1 which, as explained above, are based on the "Safety Objectives" of the "Safety Fundamentals" document:[23] (i) General Nuclear Safety Objective, (ii) Radiation Protection Objective and (iii) Technical Safety Objective.[24] In the convention, the first objective set by the drafters is the achievement and maintenance of "a high level of nuclear safety worldwide" adding that this should be carried out by way of enhancement of measures taken at a national level, and by "international co-operation including, where appropriate, safety related technical co-operation." This requirement was particularly stressed by China and some technologically advanced developing countries.

Reports and the Conduct of Review Meetings, envisaged in the Convention on Nuclear Safety" in Final Act of the Diplomatic Conference, 17 June 1994 [INFCIRC/449/Add.1].

21. See for instance Vienna Convention for the Protection of the Ozone Layer, 1985; Convention on the Transboundary Effects of Industrial Accidents, Helsinki, 1992; the UN Framework Convention on Climate Change, New York, 1992; Base1 Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989.

22. Convention on the Physical Protection of Nuclear Material, 1980; Convention on Early Notification of a Nuclear Accident, 1986; Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, 1986.

23. Ibid. p. 2-3.

24. See *supra* para. 15.

24. In fact, much political negotiation lies behind the language finally adopted in Article 1(i) and in preambular paragraph (viii). Whilst it was generally agreed that international co-operation on nuclear safety should be promoted and that, *ipso facto*, the convention would serve this purpose, two different views were held as to the need for a specific provision on the transfer of technology through technical co-operation. In the opinion of major OECD countries, such provision would create for Contracting Parties an obligation to provide assistance; the additional concern being that international co-operation in nuclear safety could be de-linked from adherence to binding non-proliferation commitments – notably the Non-Proliferation Treaty. In the opinion of most developing countries and China, assistance in upgrading nuclear safety through technical co-operation was an essential component of the convention. The formulation of the objective of the convention takes this view into consideration without, however, creating a separate obligation for bilateral or multilateral assistance.

25. The convention applies to "the safety of nuclear installations" [Article 3, Scope of Application]. "Nuclear installation" is defined in Article 2 to mean "for each Contracting Party any land-based civil nuclear power plant under its jurisdiction"; an addition is made as to waste: i.e. "storage, handling and treatment facilities for radioactive materials as are on the same site and are directly related to the operation of the nuclear power plant." The definition also clarifies that "a plant ceases to be a nuclear installation when all nuclear fuel elements have been removed permanently from the reactor core and have been stored safely in accordance with approved procedures and a decommissioning programme has been agreed to by the regulatory body." The concept of "jurisdiction" was given preference over the term "location".[25] Preambular paragraph (iii) reaffirms "that responsibility for nuclear safety rests with the state having jurisdiction over a nuclear installation." The location of a plant may, in practice, not always be sufficient for defining responsibility, notably in connection with the granting of licence by a regulatory body having the legal authority to do so.

26. The question of delineating the responsibility of the operator[26] (the "licence holder" as provided in Article 9 of the convention) within an international instrument where, by definition, obligations spelled out are entered into by the States Parties to the convention is addressed in several provisions of the convention: the preamble refers to the responsibility for nuclear safety of the state having jurisdiction over an installation; Article 9 provides for the "prime responsibility" of the licence holder[27] for the safety of a nuclear installation. The "overall responsibility"[28] of the state is distinct from the "prime"[29] responsibility of the operator as the first establishes the responsibility to take the legislative measures required to ensure that the licence holder meets its responsibility.

27. The obligations[30] to be undertaken by the Contracting Parties pursuant to the convention are contained in Chapter 2. Principally these obligations are of two different types: (i) the first is a general

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25. The Vienna Convention on the Law of Treaties, 1980, provides in Article 29, Territorial Scope of Treaties: "unless a different intention appears from the treaty or is otherwise established, a treaty is binding upon each party in respect of its entire territory.

26. Vienna Convention on Civil Liability for Nuclear Damage; Convention on Third Party Liability in the Field of Nuclear Energy (Paris Convention).

27. The concept of "licence holder" has broader international acceptance than the term "operator" or "operating organisation" used in the "Safety Fundamentals" document and in the draft Nuclear Protocol of the European Energy Charter; the term "operator" is understood in a narrow sense as individual actor in some countries.

28. Nuclear Protocol (Text Nu8) preambular paragraph (v).

29. lbid para. (vi).

30. The obligations also include in Article 6 a provision entitled "Existing Nuclear Installations". Although in legal terms all nuclear installations to which the definition of Article 2(i) applies are covered by the

obligation *de moyens*,[31] namely the requirement to take legislative, regulatory and administrative measures in order to implement its obligations under the convention; these obligations are categorised as follows:

(a) Legislation and regulation

"Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of nuclear installations", [Article 7, para. 1] including the establishment of applicable national nuclear safety requirements and regulations; a system of licensing, and the prohibition of operating an installation without a licence; a system of regulatory inspection, and the enforcement of the applicable regulations coupled with sanctions which include "suspension, modification or revocation" [para. 2]. As to the regulatory body, which has to hold the "authority, competence, financial and human resources" to fulfil its responsibilities [Article 8], the convention provides that its functions should be effectively separated from those of organisations concerned with the "promotion or utilisation of nuclear energy".

(b) General safety considerations

Under this title, the convention groups a number of different obligations: the obligation regarding "priority to safety" binding Contracting Parties to establish safety policies; the undertaking that adequate financial resources as well as "sufficient numbers of qualified staff with appropriate education, training and retraining" are available "throughout the life" of a nuclear installation to support the safety of each installation; Contracting Parties are also held to "ensure that the capabilities and limitations of human performance are taken into account" – most certainly a modern and unusual

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convention *ipso facto*, this provision addresses the need to "review as soon as possible" the "safety of nuclear installations existing at the time the convention entered into force." The undertaking of the Contracting Parties in this context is "to ensure" "where necessary" that all reasonably practicable improvements are made as a matter of urgency to upgrade the safety of the nuclear installations. The obligation goes further: "If such upgrading cannot be achieved, plans should be implemented to shut down the nuclear installation as soon as practically possible. The timing of the shut down may take into account the whole energy context and possible alternatives as well as the social, environmental and economic impact." Worded in a non-discriminatory manner, this obligation is however clearly directed at the concern for power plants built to and operated under standards that are not in line with the safety requirements of the convention and are located in central Europe and in the countries of the former Soviet Union.

31. For general obligations, see: Convention on the Physical Protection of Nuclear Material, Article 3: "Each State Party shall take appropriate steps within the framework of its national laws and consistent with international law to ensure as far as practicable that, during international nuclear transport, nuclear material within its territory, or on board a ship or aircraft under its jurisdiction insofar as such ship or aircraft is engaged in the transport to or from that state, is protected at the levels described in Annex 1." International Convention for the Safety of Life at Sea, Article 1: "The Contracting governments undertake to promulgate all laws, decrees, orders, and regulations and to take all other steps which may be necessary to give the present convention full and complete effect, so as to ensure that from the point of view of safety of life, a ship is fit for the service for which it is intended." ICAO Convention on International Civil Aviation, Article 37, paragraph 1: "Each Contracting State undertakes to collaborate in securing the highest practicable degree of uniformity in regulations, standards, procedures, and organisation in relation to aircraft, personnel, airways and auxiliary services in all matters in which such uniformity will facilitate and improve air navigation."

treaty provision. Of a more common technical nature are the obligations regarding "quality assurance" and "assessment and verification of safety" – to be carried out throughout the life of an installation.

Contracting Parties also commit themselves to an obligation regarding radiation protection. Article 15 provides that "in all operational states the radiation exposure to the workers and the public caused by a nuclear installation shall be kept as low as reasonably achievable and that no individual shall be exposed to radiation doses which exceed prescribed national dose limits".

Among the few safety-related provisions which are *expressis verbis* addressed to countries with and without nuclear installations on their territory, Article 16 provides for a system of emergency preparedness to be organised and tested by each Contracting Party. The concept of "vicinity" of the nuclear installation with the connotation of proximity or closeness is included here. The same concept is used in the context of the provision regarding the siting of installations [Article 17] where the convention contains an obligation to consult "Contracting Parties in the vicinity of a proposed nuclear installation, insofar as they are likely to be affected by that installation".

(c) Safety of installation

This chapter is entirely based on the Safety Fundamentals document ("Technical Aspects of Safety") and covers the obligations of Contracting Parties regarding the nuclear installation itself, rather than the general issues concerning overall nuclear safety matters. In particular, these obligations relate to:

i) the siting of new installations: Article 17 provides for evaluation of "all relevant site-related factors likely to affect the safety of a nuclear installation…", "the likely safety impact of a proposed nuclear installation on individuals, society and the environment"; the need to ensure "the continued safety acceptability", and the obligation to consult Contracting Parties in the vicinity of a proposed installation";

ii) design and construction [Article 18] which includes the concepts of "defence in depth", i.e. several levels of protection against the release of radioactive materials into the environment and a "specific consideration of human factors and the man-machine interface"; and

iii) the operation of a nuclear installation [Article 19] covering all of its stages.

The second obligation binding upon the States Parties to the convention is of a different nature from the first set of obligations discussed above: Article 5 (Reporting) creates a reporting requirement linked to an implementation mechanism *sui generis*; states undertake to establish national reports on the measures taken "to implement each of the obligations of [this] convention" and to submit such reports for "review" to meetings of the Contracting Parties.

28. These "review meetings" referred to by the negotiators as "peer" review by analogy to a practice set up a number of years ago by nuclear regulators and other nuclear authorities and technical bodies, notably in the context of the WANO (World Association of Nuclear Operators) and the IAEA, are to be the main innovative and dynamic element of the convention.

IV. The Peer Review Mechanism

29. The convention provides for "Meetings of the Contracting Parties" in Chapter 3, Articles 20 to 28. These meetings called "Review Meetings" are to be held at intervals not exceeding three years. A

preparatory meeting shall be convened no later than six months after entry into force of the convention, the first review meeting not later than 30 months after entry into force. Rules of Procedure and Financial Rules for the review meetings shall be drawn up at the preparatory meeting.

30. Although the drafters of the convention appeared to leave much flexibility to the Contracting Parties to determine the general conditions and *modus operandi* of their meetings and avoided the setting up of rigid structures or institutional mechanisms, they provided nonetheless a few clear markings and points of reference specifying their intentions. In fact, the provisions on the review meetings [Chapter 3] contain the most carefully worded language of the convention. Since the fourth meeting of the Expert Group (May 1993), which reached agreement on the main elements of the convention, several proposals[32] were made as to the basic concepts of a review mechanism and illustrative examples of its possible operation. The need to further determine the modalities of the review process remained a major concern of the negotiators and led to the adoption of a document attached to the Final Act (see note 18).

This document, which is intentionally attached to the Final Act of the Diplomatic Conference and not to the convention itself, should provide some guidance on questions where the text of the convention is silent or not sufficiently explicit. The usefulness of such a document was felt in the last round of negotiations and it became the common denominator for different concerns regarding the national reports, the conduct of review meetings and financial implications for the Contracting Parties and for the Secretariat in implementing the convention. The main concepts expressed in the "clarification" are added emphasis on the "national responsibility for nuclear safety", the need for detailed and comprehensive reports to be submitted to and discussed by technical experts, consensus rule for all major decisions and confidentiality. Furthermore, costs to Contracting Parties and to the Secretariat should be limited.

(a) Pattern of a meeting

As described above, Article 21 provides that a preparatory meeting of the Contracting Parties shall be held no later than six months after the date of entry into force of the convention. The first review meeting is to take place no later than 30 months after entry into force. Although the Parties shall be free to determine the date of the second review meeting, and any meeting thereafter – the convention provides that intervals between review meetings shall not exceed three years. Article 23 provides that extraordinary meetings may also be convened.

(b) Subject matter of the meetings

In accordance with Article 5, the requirement is to submit in advance of a meeting and for its review, a report established by the Contracting Party "on the measures it has taken to implement each of the obligations of [this] convention", it being understood, *mutatis mutandis*, that certain obligations can only be met by Parties with nuclear installations under their jurisdiction. The preparation, submission and presentation of the national report are the responsibility of the Contracting Party: in preparing the report, or any part thereof, the Contracting Party is however free to request and involve outside expertise be it from other countries ("peer review" in a narrower sense) or from international organisations, notably the IAEA.

32. GOV/INF/723. INSAG prepared a report dated 9 July 1993 on the proposed Nuclear Safety Convention entitled "Basic Concepts and Review Mechanisms".

At the preparatory meeting, the Contracting Parties are to establish the Rules of Procedure and the Financial Rules[33] for the regular review meetings. In this context, they will notably address both form and structure – including contents – of the national reports.

After the fifth meeting of the Group of Experts (October 1993) the chairperson of the Group established a small informal group of experts chaired by C. Stoiber (USA) which developed a "conference room" paper containing Draft Rules of Procedure for the review process, elements of a budget for the meeting of Contracting Parties and a scenario on the mechanism of the review process. This paper, which was not further discussed by the Group, will presumably serve as a first input for the preparatory process after entry into force. A few months earlier, upon request by the Director General, INSAG prepared a report on "Basic Concepts and Review Mechanisms"[34] of the convention. The report describes the reporting obligation of Contracting Parties as the "commitment to a process"; stressing the national responsibility for preparing the report, INSAG outlines the possible steps leading from a "peer review mechanism on the national level" to the "national report" and the "meeting of the Contracting Parties". This report will probably also be consulted in the preparatory process after entry into force of the convention.

(c) Modus operandi: the "review" process

At review meetings, sub-groups may be established for the purpose of reviewing specific subjects contained in the reports: it is expected that such groups would be set up to discuss matters concerning e.g. the safety of installations [part (d) of Chapter 2], individual questions relating to emergency preparedness for instance [Article 16] or, possibly, an issue regarding a particular existing installation [Article 6]. Reporting and discussion of reports would be protected by the strict confidentiality rules of Article 27, but allow for clarification to be sought and obtained pursuant to the provisions of Article 20, paragraph 3.

(d) Secretariat

The convention establishes [Article 28] that the IAEA shall provide the secretariat for the meetings of the Contracting Parties. Other services which Contracting Parties may also require in "support" of the review meetings shall equally be provided by the IAEA – either in the frame of its regular programme and budget or as separately funded activities.

The Director General of the IAEA shall be the depositary of the convention [Article 34].

V. Provisions of the convention regarding disputes, final clauses

31. The convention provides only for a simple consultation mechanism to resolve possible disputes – referred to as "disagreement[s]" among Contracting Parties concerning the interpretation or application of the convention: Article 29 provides that Parties "shall consult within the framework of a meeting of the Contracting Parties with a view to resolving the disagreement." The nature of this

33. Following the 5th meeting of the Group of Experts, an informal group (chaired by the expert from the US Mr. Stoiber) developed Draft Rules of Procedure for meetings of the Contracting Parties.

34. Report of INSAG dated 9 July 1993, not published.

provision is in keeping with the pragmatic "peer group" approach devised by the negotiators.[35] Disputes should be settled in an amicable manner within the existing structure, i.e. the meeting of Parties and not be brought to any court.

32. No provision is included in the convention as to reservations.[36]

33. The convention is subject to ratification, acceptance or approval by the signatory states; after entry into force, it is open for accession by all states. As many other recent instruments, the convention also provides for signature or accession by "regional organisations of an integration or other nature, provided that any such organisation is constituted by sovereign states and has competence in respect of the negotiation, conclusion and application of international agreements in matters covered by this convention." Such organisations shall, however, not hold any vote additional to the vote of its Member States.

Amendments

34. Changes to the convention can only be made through a stringent formal amendment process laid out in Article 32; proposals for changes are to be considered either at regular review meetings, or at extraordinary meetings to be held if so agreed by a majority of the Contracting Parties, or, at the written request of one Party if such request is supported by a majority of the Contracting Parties. The text of any proposed amendment and the reasons for it shall be communicated through the depositary to the Contracting Parties. Amendments require consensus. In the absence of consensus, a two-thirds majority of the Contracting Parties can decide to submit a proposed amendment to a diplomatic conference where, in the absence of consensus, amendments shall be adopted with a two-thirds majority of the Contracting Parties. Amendments as adopted require ratification, acceptance, approval or confirmation by the Contracting Parties.

Denunciation

35 The convention is of unlimited duration. However, each Contracting Party has the right to withdraw from the convention without providing reasons, by way of written notification to the depositary. Denunciation takes effect one year – or later if so specified – following the date of receipt of the notification by the Depositary.

35. The provision of Article 29, "Resolution of Disagreements" is unusual. Bilateral agreements sometimes refer to "diplomatic channels" as a means of settlement by negotiations only. Most conventions provide for reference to a permanent political or administrative body, a court – the ICJ – or an arbitral tribunal. See *The Treaty Maker's Handbook*, *op.cit* Sec. 10, p. 117-129.

36. The Vienna Convention on the Law of Treaties provides in Article 19: "A State may, when signing, ratifying, accepting, approving or acceding to a treaty, formulate a reservation unless: (a) the reservation is prohibited by the treaty; (b) the treaty provides that only specified reservations, which do not include the reservation in question, may be made; or (c) in cases not falling under sub-paragraphs (a) and (b), the reservation is incompatible with the object and purpose of the treaty.

VI. Internal application[37]

36. The convention provides under Article 4 "Implementing Measures" that "Each Contracting Party shall take, within the framework of its national law, the legislative, regulatory and administrative measures and other steps necessary for implementing its obligations under this convention."

The convention does not provide for any specific authority, focal point or other national institution to be created for the purpose of its implementation;[38] nor does it prescribe any specific national law to be adopted.[39]

Outlook

Despite the apparent technical character of the convention, the negotiators and drafters have achieved the establishment of an instrument that can be implemented by countries with very different industrial, regulatory and legal systems, at different stages of development, and even with widely differing approaches to nuclear power. The first international binding instrument directly addressing the safety of civil nuclear power plants, hopefully, will soon enter into force.

37. For variations on internal application clauses, see *The Treaty Maker's Handbook*, Hans Blix and J.H. Emerson, Dag Hammarskfold Foundation, 1973, Sec. 13, p. 168-172.

38. This is the case e.g. for the London Dumping Convention [Article VI]; Basel Convention [Article 5].

39. As e.g. Convention on the Physical Protection of Nuclear Material, Article 7 acts "to be made punishable offences under national law."

The Protocol Amending the 1963 Vienna Convention

by Vanda Lamm*

The Chernobyl disaster of 1986 caused the Vienna Convention on Civil Liability for Nuclear Damage (hereafter called the Vienna Convention), adopted in 1963 under the aegis of the International Atomic Energy Agency, to awaken from its sleep of Briar Rose. For over two decades there had been little, if any, public concern over this instrument apart from that shown by a select segment of nuclear liability professionals.[1] The reasons were several.

The Vienna Convention was adopted three years after the 1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy, (hereinafter called the Paris Convention) and it governs civil liability for nuclear damage on the same conceptual basis as does the Paris Convention.[2] The main difference between the two conventions, other than those arising from their respective provisions, is that the Paris Convention was signed by a group of states, all members of the Organisation for European Economic Co-operation, whereas the Vienna Convention was intended to regulate nuclear liability issues on a world-wide scale. In this connection, the greatest problem was no doubt presented by the fact that by the time the Vienna Convention was concluded, the Paris Convention already existed among the states most affected by this complex of issues, notably the highly industrialised Western European states.[3]

From the mid 1960s onwards, the two conventions followed rather different paths. During the 1960s and the 1970s, the Paris Convention kept "developing", growing into a living system, with more and more states acceding to it and with the limit of liability being raised on several occasions. In 1963, the Brussels Convention Supplementary to the Paris Convention was adopted to provide additional compensation from public funds to supplement that payable under the Paris Convention.[4] By contrast, the Vienna Convention did not even come into force for nearly 15 years, although it required

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* This article was initially published in *Nuclear Law Bulletin* No. 61 (1998). Vanda Lamm is Professor, Institute for Legal and Administrative Studies, Hungarian Academy of Sciences. Facts given and opinions expressed are the responsibility of the author alone.

1. The revision of international nuclear liability conventions was on the agenda of the 1984 Symposium of Munich and the Nuclear InterJura '85. Cf. Nuclear Third Party Liability and Insurance – Status and Prospects, Proceedings of the Symposium of Munich, 1984; International Harmonization in the Field of Nuclear Energy (Norbert Pelzer, ed.) Nomos Verlagsgesellschaft, Baden-Baden, 1986.

2. On the basic principles of nuclear civil liability conventions see, J.P.H. Trevor: Principles of civil liability for nuclear damage. in: Nuclear Law for a Developing World, IAEA, Vienna, 1968, p.109-115, and Pierre Strohl: *La Convention de 1971 relative à la responsabilité civile dans le domaine du transport martime de matières nucléaires,* AFDI, 1972, p. 755-760.

3. Both the Paris Convention and its Additional Protocol signed in Paris on 28 January 1964 entered into force on 1 April 1968.

4. On the Brussels Supplementary Convention see, M. Lagorce: "The Brussels Supplementary Convention and its Joint Intergovernmental Security Fund" in: *Nuclear Law for a Developing World*. *op.cit*., p. 143-148.

ratification by as few as five states.[5] When, after so many years, the Vienna Convention finally did come into force, certain of its provisions already called for revision. Its dormant state is amply evidenced by the fact that only 11 states were parties to the convention by the end of the 1980s.[6]

However, the Chernobyl disaster had clearly shown that a nuclear accident could cause enormous damage not only in the Installation State, but also thousands of kilometres away; and after that accident it became obvious that the dormant Vienna Convention might be an appropriate tool for settling the claims of foreign victims in similar cases. Everyone soon came to realise the absolute necessity of adjusting the provisions of the Vienna Convention to respond to technological developments over the past 25 years. It is known that after the Chernobyl accident, the then-Soviet Union refused to pay compensation to any foreign victims; some people believed that if the Soviet Union had been a party to the Vienna Convention, foreign victims would have had at least a chance to receive some compensation. It is a separate issue, of course, whether the amount of compensation eventually payable under the Vienna Convention would have been enough to satisfy anything but a minor, almost ridiculous fraction, of the claims by comparison with the extent of the accident.

Following the signature in 1988 of the Joint Protocol establishing a bridge between the Vienna and the Paris Conventions,[7] several fora within the International Atomic Energy Agency addressed the question of revising the Vienna Convention. The necessity of doing so was stated in Resolution GC (XXXII)/RES/491 of the Agency's General Conference on 23 September 1988, which emphasised that the existing civil liability regime "does not cover all liability issues that might arise in the event of a nuclear accident." The next year, the IAEA Board of Governors, by decision adopted 23 February 1989, established an open-ended Working Group "to study all aspects of liability for nuclear damage" and to "consider ways and means of complementing and strengthening the existing civil liability regime and consider also the question of international liability."[8] In another Decision of 21 February 1990, the Board of Governors dissolved the above mentioned Working Group and at the same time established a new, open-ended Standing Committee on Liability for Nuclear Damage with a wide mandate to "consider international liability for nuclear damage, including international civil liability, international state liability, and the relationship between international civil and state liability."[9]

After more than eight years of negotiations within the framework of the Standing Committee,[10] which covered 17 sessions and several intersessional working group meetings, a Diplomatic Conference to revise the 1963 Vienna Convention took place at Vienna from 8-12 September 1997. The delegates adopted two treaties, the Protocol to Amend the Vienna Convention on Civil Liability

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5. The Vienna Convention entered into force on 12 November 1977.

6. On the signatures, ratifications, etc. of the Vienna Convention see Document NL/DC/INF.4. prepared by the IAEA to the Diplomatic Conference of 8-12 September 1997.

7. On the Joint Protocol see, O. 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.

8. IAEA document GOV/OR.707. p.13.

9. This decision of the Board was based on the second report of the Working Group which recommended that the Board revise the mandate of the Standing Committee and include the questions of international liability and the relationship between international and State liability. See IAEA NL/2/3.

10. In the work of the Standing Committee, experts from more than 55 states took part, and the representatives of several international organisations were present as observers. The high quality work of the IAEA Secretariat and the NEA expertise on liability issues largely contributed to the success of the negotiations.

for Nuclear Damage (hereafter called the protocol)[11] and the Convention on Supplementary Compensation for Nuclear Damage.

In the first stage of the revision process, the only goal was to amend certain provisions of the Vienna Convention. Later, in what might be called the second stage, the question was seriously raised of establishing a new supplementary convention by which additional funds were to be provided by the international community of states. Most experts felt that the nuclear liability regime of the Vienna Convention, as amended, would really serve the interests of potential victims of nuclear incidents only if it were supported by an international supplementary fund providing additional compensation for nuclear damage to that provided by the operator. Thus, the Standing Committee started to consider the establishment, under the Vienna Convention, of a mechanism for mobilising additional funds for compensation of nuclear damage. During the negotiations it was deemed necessary to establish a separate treaty for such a supplementary fund, and indeed, efforts were undertaken to draw up such an instrument concurrently with the revision of the Vienna Convention.

The outcome of the revision process of the Vienna Convention is a protocol containing 24 articles, some being completely new provisions, with others revising existing articles. Before describing and analysing the outcome of this process, the following preliminary remarks should be made:

- The provisions of the protocol can be divided into three main groups. Some of the new and revised articles deal with matters of substance, and, we may add, with matters of great importance indeed. Other amendments contain rules of a basically procedural nature, which facilitate victims in enforcing their claims for compensation. The third category of amendments raises no new issues, either substantive or procedural, and essentially serves to refine existing provisions of the convention or to bring other provisions of the convention into line with the newly incorporated substantive and procedural changes.

- As regards the articles dealing with matters of substance, it should be stressed that the revision does not affect the basic concept of the Vienna Convention, although attempts in that direction were made during the negotiations in the Standing Committee, particularly in the early stage. I refer to efforts to have the basic civil liability regime of the Vienna Convention replaced by a State liability regime.

- There is no doubt that the revision clarified numerous provisions of the Vienna Convention. An effective liability regime can only work if a considerable number of nuclear liability issues are uniformly regulated by the national legislation of the Contracting Parties. Nevertheless, the revised Vienna Convention continues to leave certain matters to be determined by national law and, despite significant efforts at unification of laws as reflected in the Convention, many questions relating to compensation for damage remain subject to the domestic law of the Installation State or the law of the competent court.

11. See Consolidated Text of the Vienna Convention on Civil Liability for Nuclear Damage of 21 May 1968 as Amended by the Protocol of 12 September 1997 established by the IAEA Secretariat. GC(41)INF/13/Add.1.

I. Civil liability or state liability?

The nuclear liability conventions currently in force govern liability in respect of third party damage on the basis of civil law, conceptually based on the analogy of liability for activities involving increased danger, under the national laws of states.

In the first stage of the negotiations in the Standing Committee, the debate about the need to devise a regime of state liability to replace the civil liability regime of the convention was crucial.

The experts raised a number of theoretical and practical arguments both for and against the introduction of a state liability regime. An in-depth analysis of these arguments would go far beyond the scope of this paper, but generally those arguing in favour of state liability referred to the Chernobyl disaster, claiming that only the financial resources available to the state would be sufficient to compensate victims of an accident of such a scale. Some authors in the pertinent literature and several experts at the Vienna negotiations referred to state liability in respect of space activities as an example similar to that of liability for nuclear damage, and noted that the related international treaties provide for state liability.[12] The final outcome of the discussions was a decision to retain the conceptual basis of the Vienna Convention and uphold its civil liability regime. However, and this is one of the major improvements to the Vienna Convention, the protocol expressly provides for compensation from public funds (see section VI. below).

II. Geographical scope of the Vienna Convention

The 1963 Vienna Convention is silent on its geographical scope, and pursuant to the general rules of international law which are clearly laid down in Article 29 of the 1969 Vienna Convention on the Law of Treaties,[13] the convention applies to damage occurring in the territory of a State Party to the instrument, on board aircraft registered in that state and on ships flying its flag.

The protocol adds a new article on the convention's geographical scope [Article IA, of the revised Vienna Convention] which, on the one hand, determines the rules relative to the convention's geographical scope and, on the other, extends its geographical application. Article 3 of the protocol states as a general rule that "this Convention shall apply to nuclear damage wherever suffered" [paragraph 1]. This essentially means that the convention may, at least in principle, be applied to nuclear damage suffered anywhere in the world, even to damage occurring in the territory or territorial waters (internal waters, territorial sea, exclusive economic zone, continental shelf) of a non-Contracting State. Nevertheless, the protocol allows certain exceptions from the said general rule, permitting the Installation State to exclude, by legislation and under specific circumstances, the application of the convention to the territory of a non-Contracting State or in respect of damage occurring in a maritime zone established by such State in accordance with the international law of the sea [paragraph 2]. Any exclusion may apply only to a non-Contracting State which has a nuclear installation on its territory or in any maritime zone and does not afford equivalent reciprocal benefits

12. Cf. Louise de La Fayette: "Towards a New regime of State Responsibility for Nuclear Activities", in: *Nuclear Law Bulletin*, No. 50 and Jan Lopuski: "Liability for Nuclear Damage", National Atomic Energy Agency, Warsaw, 1993.

13. Article 29 of the 1969 Vienna Convention on the Law of Treaties that "Unless a different intention appears from the treaty or is otherwise established, a treaty is binding upon each party in respect of its entire territory."

[paragraph 3]. The protocol here refers to the principle of reciprocity,[14] and as a consequence, the application of the Vienna Convention may in no way be excluded in respect of non-nuclear states, – in case of a nuclear incident, a non-contracting non-nuclear state or its nationals or legal persons under its jurisdiction are entitled to compensation on an equal footing with nationals of Contracting States.

It should be noted that the application of the aforesaid provision on exclusion in respect of a nuclear state on the basis of lack of reciprocity may, in practice, give rise to problems. The existence of reciprocity can always be established on the basis of some practice between states, and, given the fortunate rarity of nuclear incidents, cases in which a nuclear state is likely to apply this provision in respect of another nuclear state are, in fact, infrequent. In theory, such a situation might occur when damage is suffered in a successor state to the former Soviet Union, and a State Party to the revised Vienna Convention tries to evade compensating damage suffered in the territory of the former Soviet Union by invoking the former Soviet Union's refusal to pay compensation for damage suffered by foreign victims after the Chernobyl disaster.

III. Concept of nuclear damage

One of most significant changes effected by the Protocol to amend the Vienna Convention is, perhaps, to the concept of nuclear damage.

Well before the Chernobyl disaster, professionals in the field had been fully aware that the definition of nuclear damage under the 1963 Vienna Convention was too narrow or incomplete, notably because the convention did not refer to certain forms of damage (e.g. environmental damage or costs of preventive measures). The 1963 Vienna Convention makes compensation for any nuclear damage other than loss of life, personal injury, and loss of or damage to property subject exclusively to the law of the court having jurisdiction. In other words, victims could not expect compensation for any other head of damage except when such compensation was allowed by the law of the State of the competent court.

During the revision of the Vienna Convention, it became completely clear that the definition of nuclear damage had to be addressed carefully, since domestic laws show significant differences in the interpretation of, for example, loss of profit or economic loss. If, on the other hand, there were such significant differences between the domestic laws of states, such differences could, in practice, operate to produce situations in which compensation to victims of nuclear damage would tend to depend, in no small measure, on the location of the occurrence of damage or on the interpretation of nuclear damage by the law of the competent court. This, in turn, would but ultimately increase the not insignificant differences already existing between victims of different nuclear incidents.

The definition of nuclear damage is a key provision of the Vienna Convention. The entire nuclear liability regime rests on limited liability amounts, that is, on the principle that regardless of the number of victims and the extent of damage, the amount of compensation payable by the operator or from public funds is a specified sum, after all. (Indeed, such is the case even in states under whose national law the operator's liability is unlimited, as is otherwise suggested by Article 9.2 of the protocol, discussed at a later stage.) Therefore, the inclusion of certain forms of environmental damage or indirect damage in the concept of nuclear damage is bound to enlarge the number of victims, direct or indirect, of a given nuclear incident. In the event of a large nuclear incident causing enormous

14. On the principle of reciprocity see, Emmanuel Decaux: "*La réciprocité en droit international*". *Librairie Générale de Droit et de Jurisprudence*, Paris, 1980, p. 129-159.

damage, this in turn will necessarily put individual victims in a more unfavourable position, since the larger the number of the victims, the less is their chance of receiving full compensation.

Almost from the beginning of the discussions to revise the Vienna Convention, the Standing Committee agreed on the need to broaden the concept of nuclear damage, and to include certain forms of environmental damage, the costs of preventive measures and consequential losses in the definition of that term.[15]

The revision produced a rather detailed definition of nuclear damage in Article 2.2. of the protocol.[16] It gives an almost exhaustive listing of the possible types of damage[17] and, what is particularly important, it renders subject to the law of the competent court only the extent of damage, other than loss of life, personal injury, and loss of or damage to property. By so doing, the protocol has considerably restricted, but not fully eliminated, the significance of the law of the competent court; for, if the legislation of the competent court fails to recognise certain economic loss, victims of a nuclear incident can hardly expect compensation for such damage in a given case.

In addition to loss of life, personal injury, and loss of or damage to property, all of which are already covered by the 1963 Vienna Convention, the protocol clearly includes in the definition of nuclear damage such other loss as is incurred as a result of a significant impairment of the environment, and the costs of certain preventive measures or measures taken to minimise damage under specific circumstances. Accordingly, "nuclear damage" also means:

- further "economic loss" incurred above loss of life, personal injury, loss of or damage to property, provided that the loss is incurred by a victim who can claim in respect of such loss or damage;

- the cost of measures of reinstatement of significantly impaired environment, if such measures are actually taken or to be taken, and insofar as not included in the category of "economic loss";

- loss of income, also related to the environment, deriving from an economic interest in any use or enjoyment of the significantly impaired environment, insofar as not covered by the preceding paragraph (such use of the environment should be taken to mean use for business purposes in the first place);

- cost of preventive measures and consequential losses caused by such measures. It should be noted on this point that, owing to the widened scope of the definition of "nuclear incident" introduced in Article I.1.(l) of the Vienna Convention,[18] nuclear damage may

15. Cf. H. Rustand: "Updating the concept of damage, particularly as regards environmental damage and preventive measures, in the context of the ongoing negotiations on the revision of the Vienna Convention", in: *Nuclear Accidents, Liabilities and Guarantees.* op.cit., p. 218-238.

16 Article I.(k) of the revised Vienna Convention.

17. This notion of "damage" is much more detailed than the notions of damage included in recent conventions on liability for environmental damage. Cf. Article I.(6),(7) of the 1992 London Convention on Civil Liability for Oil Pollution Damage, and Article 2 (7),(8),(9) of 1993 Lugano Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment.

18. Article 2.3 of the Protocol provides that "Nuclear incident means any occurrence or series of occurrences having the same origin which causes nuclear damage or, but only with respect to preventive measures, creates a grave and imminent threat of causing such damage."

also be deemed to be caused by the costs of preventive measures taken before the occurrence of an incident, if taken to remove a grave and imminent threat of causing damage, and according to an additional sentence added at the Diplomatic Conference, provided they were found under the law of the competent court to be appropriate and proportionate having regard to all the circumstances;

- any other economic loss, other than any caused by the impairment of the environment, if permitted by the general civil liability law of the competent court. This element of damage is likewise mentioned by the Protocol in a general clause.

The redefinition by the protocol of nuclear damage is clearly reflective of an intention to ensure as full compensation as possible to victims of nuclear damage. As it virtually covers the broadest range of damage, the protocol has essentially taken civil liability for nuclear damage in the direction of the fullest measure of compensation in an attempt to break with the implied principle that victims of a nuclear incident cannot expect to receive full compensation.

Furthermore, Article 2.4 of the protocol gives very precise definitions of "measures of reinstatement", "preventive measures" and "reasonable measures", which must (i) be reasonable; (ii) be approved by the competent authorities of the state where the measures were taken (the national law of the state where the damage is suffered must determine who is entitled to take such measures); and (iii) aim to reinstate or restore damaged or destroyed components of the environment or to introduce, where reasonable, the equivalents of these components into the environment. "Preventive measures" are likewise subject to previous approval by the competent authorities of the state. As for "reasonable measures", a further criterion for their constituting nuclear damage is that they must be found under the law of the competent court to be appropriate and proportionate having regard to all the circumstances.[19]

It can be said, therefore, that the protocol has considerably broadened the definition of nuclear damage and has definitely taken an important step towards unification of the legislation of States Parties. There is no doubt that the protocol would have created a more clear-cut situation by giving a uniform, all-embracing definition of nuclear damage to all States Parties to the amended Vienna

19. Article 2.4 of the Protocol adds among others these new paragraphs to Article I of the Vienna Convention:

"m) "Measures of reinstatement" means any reasonable measures which have been approved by the competent authorities of the State where the measures were taken, and which aim to reinstate or restore damaged or destroyed components of the environment, or to introduce, where reasonable, the equivalent of these components into the environment. The law of the State where the damage is suffered shall determine who is entitled to take such measures.

(n) "Preventive measures" means any reasonable measures taken by any person after a nuclear incident has occurred to prevent or minimise damage referred to in sub-paragraph (k)(i) to (v) or (vii), subject to any approval of the competent authorities required by the law of the State where measures were taken.

(o) "Reasonable measures" means measures which are found under the law of the competent court to be appropriate and proportionate having regard to all the circumstances, for example

(i) the nature and extent of the damage incurred or, in the case of preventive measures, the nature and extent of the risk of such damage;

(ii) the extent to which, at the time they are taken, such measures are likely to be effective; and

(iii) relevant scientific and technical expertise."

Convention. However, considering the differences existing between the national laws of states in this field, one must appreciate that the protocol has kept touch with reality in upholding the principle that the extent of damage should ultimately be determined by the law of the competent court. At any rate, this rather precise enumeration of the types of damage can be seen as a significant improvement in the Vienna Convention since, in effect, it clearly calls the attention of both legislators and practising lawyers to the need to take into account the various types of nuclear damage listed in the protocol when they occur. Essentially, it constitutes a model or pattern to be followed by states not having legislation containing similar provisions.

IV. Nuclear installations covered by the Convention

The 1963 Vienna Convention is silent on the question of whether it covers all nuclear installations or only those used for certain peaceful purposes. It is only possible on the basis of an interpretation *a contrario* to state that the convention is not applicable to nuclear damage resulting from military installations.[20] The Standing Committee wanted to clarify the situation, and, at its first meeting, acting upon proposals from several delegates, the Committee tried to reach consensus upon an amendment that would have the Vienna Convention cover military installations as well. This proved to be a rather delicate issue. It also brought to light several political and legal problems concerning the extension of the application of the convention to nuclear installations used for non-peaceful purposes, especially the problem of damage arising in connection with those nuclear installations which are not under the control of the territorial state. For a while, a compromise solution was sought which would have allowed individual states to declare that military installations on their territory are not covered, under special circumstances. Until the 16th Session of the Standing Committee, the draft protocol contained a provision stating that the "Convention shall apply to all nuclear installations, whether used for peaceful purposes or not."[21] Later, in the final stages of the negotiations, however, the Standing Committee rejected the extension of the application of the Vienna Convention to nuclear installations used for non-peaceful purposes. The protocol finally succeeded in clarifying the situation by adding a new Article IB expressly stating that "This Convention shall not apply to nuclear installations used for non-peaceful purposes."

V. Exoneration

Article 6.1 of the protocol amends the provisions of the Vienna Convention on exoneration from liability by formulating stricter criteria. On the one hand, the protocol repeals "a grave natural disaster of an exceptional character" as a ground for exoneration, which, even under Article IV.3. of the 1963 Vienna Convention, had operated as such only insofar as the law of the Installation State contained no contrary provisions in this respect. It means that, if a grave natural disaster was not a ground for exoneration under the domestic law of the Installation State, it could not serve as one under the Vienna Convention either. On the other hand, the criteria were tightened for other events (act of armed conflict, hostilities, civil war or insurrection) so that such events do not exonerate the operator from liability except upon proof that the nuclear damage is directly due to such events. The 1963 Vienna Convention does not require such proof by the operator.

20. According to the Preamble of Vienna Convention "The Contracting Parties, having recognised the desirability of establishing some minimum standards to provide financial protection against resulting from certain peaceful uses of nuclear energy."

21. Cf. SCNL/16/INF.3.

Other amendments of the same Article IV increase the liability amount for damage to the means of transport upon which the nuclear material involved was at the time of the nuclear incident, and clearly exclude damages to other nuclear installations operating on the same site, including those under construction, and any property on the same site used in connection with any such installation.[22]

VI. Liability amount

Perhaps the most important amendment of the Vienna Convention affected by the protocol is the increase in liability amounts. This can be explained by the fact that one of the main motives for revising the convention was precisely the consideration that the USD 5 million limit, as the lowest amount at which the liability of the operator may be established, had become unrealistic in view of the extent of damage that might result from an eventual nuclear incident.

It should be remembered that of all the amendments mentioned above, the extension of the geographical scope of the convention and of the concept of nuclear damage are particularly significant, as they will result in a larger number of victims of nuclear incidents, and, as a consequence, there will be more victims to share in the liability available.

Increasing the amount of liability was discussed at length in the Standing Committee. According to revised Article V of the Vienna Convention[23] the legislation of the Installation State may limit the operator's liability for any one nuclear incident to not less than SDR 300 million. (This also means that, in future, the limit of liability for nuclear damage will be fixed, not in US dollars, but in Special Drawing Rights (SDR), the unit of account defined by the International Monetary Fund).[24] The operator's liability amount may be lower than this, but in no case may it be less than SDR 150 million. Naturally, the upper limit of the operator's liability may be a higher amount. If, under the national law of the Installation State, the upper limit of the operator's liability is less than SDR 300 million, the difference between that upper limit and SDR 300 million must be secured from public funds.

The provisions for a phasing-in mechanism were included in Article V.1(c) of the revised Vienna Convention on the motion of some states who are coping with significant economic difficulties. This mechanism allows for a transitional period of 15 years from the date of entry into force of the protocol during which the minimum limit of liability of an operator for nuclear damage occurring during that period may be set at SDR 100 million. The provision makes it possible for the Installation State to limit the operator's liability to an amount less than SDR 100 million within the

22. The revised Article IV.5 and 6 reads as follow:

> "5. The operator shall not be liable under this Convention for nuclear damage
>
> a) to the nuclear installation itself and any other nuclear installation, including a nuclear installation under construction, on the site where that installation is located; and
>
> b) to any property on that same site which is used or to be used in connection with any such installation.
>
> 6. Compensation for damage caused to the means of transport upon which the nuclear material involved was at the time of the nuclear incident shall not have the effect of reducing the liability of the operator in respect of other damage to an amount less than either 150 million SDRs, or any higher amount established by the legislation of a Contracting Party, or an amount established pursuant to sub-paragraph (c) of paragraph 1 of Article V."

23. Article 7.2 of the protocol.

24. Cf. Article I.1.(p) of the revised Vienna Convention.

phasing-in period, provided that the difference between that lesser amount and SDR 100 million is secured from public funds.

There is no doubt that the inclusion of the phasing-in provisions is a solution less favourable to victims of an eventual nuclear incident. One should not overlook the fact, however, that the SDR 300 million liability amount established by the protocol is not only too high for some states, but that even the phasing-in amount of liability is much higher, over 40 times higher than the amount required under the 1963 Vienna Convention. Many believe that the phasing-in mechanism does a great deal to promote accession to the Protocol to Amend the Vienna Convention.

VII. Financial security

At the time the Vienna Convention was adopted, one hardly anticipated that the national law of any state would provide for the operator's unlimited liability. Thus, little attention was paid to the question of reconciling unlimited liability under national law with the convention's provisions fixing the amount of financial security. This problem was, however, settled by Article 9.1 of the protocol, which adds to Article VII of the Vienna Convention a sentence providing that where the liability of the operator is unlimited, the Installation State shall ensure that the operator's financial security shall not be less than SDR 300 millions.

VIII. Amendment of liability amount

Article VD of the Vienna Convention addresses the adjustment of liability amounts in view of inflation and other factors via a relatively simplified procedure. This "simplified" procedure is, in fact, a rather complicated multi-tier mechanism. Its main advantage lies in allowing the liability amount to be raised without the need for the traditional time-consuming procedure generally followed for amendment of treaties.

The procedure governed by Article 7.2 of the protocol is as follows: a meeting of the Contracting Parties shall be convened by the Director General of IAEA on the proposal of one-third of the States Party to the revised Vienna Convention to amend the limits of liability; amendments shall be adopted by a two-thirds majority, provided that at least one-half of the Contracting Parties are present and voting; any amendment adopted shall be notified by the Director General of IAEA to all Contracting Parties and shall be considered accepted at the end of a period of 18 months after it has been notified, provided that at least one-third of the Contracting Parties have communicated to the Director General that they accept the amendment; an amendment accepted under this procedure shall enter into force 12 months after its acceptance for those Contracting Parties which have accepted it.

This simplified procedure undoubtedly makes it possible for the amounts of liability to be amended, but it should be stressed that the increased amount applies only to those states which have expressly accepted it and, even in that case, 12 months after acceptance. The period of 12 months may, *inter alia*, enable a state accepting the amended liability amount to prepare for fulfilment of its resultant obligations by amending its national laws and regulations accordingly, enabling operators to make contracts of insurance for higher amounts, etc. Nevertheless the question arises as to whether the said 12 month period is really sufficient for a state to prepare for fulfilment of its obligations resulting from the acceptance of a considerably higher amount of liability.

Of course, states may happen to disagree with an amended liability amount. This possibility is also contemplated by the protocol by providing that if within a period of 18 months from the date of

notification by the Director General of IAEA an amendment has not been accepted, the amendment shall be considered rejected. According to Article VD.6, a state which becomes Party to the Vienna Convention after the entry into force of an amendment adopted under the simplified procedure shall be considered bound by the liability amount so amended only if it has failed to express a different intention. This provision can be viewed as helping to guarantee any increased amount of liability.

IX. Time limit for submission of claims

The time limit for submission of claims for nuclear damage was similarly affected by the revision of the Vienna Convention, with Articles 8.1, 8.2 and 8.3 of the protocol differentiating between various types of damage and repealing the rules on special prescription periods for incidents arising from lost, stolen, jettisoned or abandoned nuclear materials. The Vienna Convention originally established a prescription period of 10 years for nuclear damage, specifying a period of 20 years only for nuclear damage caused by lost, stolen, jettisoned or abandoned nuclear materials. The protocol recognises that personal injury caused by radioactive contamination might not become manifest for some considerable time after exposure thereto, and accordingly, it establishes a longer period, 30 years from the date of the nuclear incident for actions for compensation for loss of life and personal injury, while retaining the 10-year prescription period for all other types of damage, and repealing the special 20-year prescription period. Thus, in future it will be irrelevant whether or not the nuclear material causing a nuclear incident was under the operator's control at the time of the incident.

It should be noted that the 10-year prescription period is much longer than that established by the national laws of numerous states for damage resulting from certain ultra hazardous activities, allowing for the fact that damage caused by radioactive contamination to flora, fauna, livestock, etc. may become evident only many years after exposure. The revised Article VI of the Vienna Convention appears to be sufficiently flexible to address problems of such a nature and leaves it up to the legislation of the competent court to regulate related matters.

The discovery rule or the so-called subjective prescription period was likewise modified. Whereas under Article VI. 3 of the 1963 Vienna Convention "the law of the competent court may establish a period of extinction or prescription not less than three years from the date on which the person suffering damage had knowledge of the damage and the operator liable", the revised article provides that an action for compensation shall be brought within three years from the date on which the person suffering damage had knowledge or ought to have had knowledge of the damage and the operator liable. No revision was made to the requirement that the subjective prescription period of three years may not exceed the prescribed 10 and 30 year periods or such or a longer period of extinction or prescription as is established by the national law of the Installation State.

The extension of the prescription or extinction period inevitably gives rise to certain practical problems, notably the question of financial coverage for claims for compensation for loss of life or personal injury decades after the occurrence of a nuclear incident. Since, according to the national legislation of most states, liability for nuclear damage is a specific amount, this may, in practice, convey the suggestion that a certain portion of the liability amount would be available to compensate claims of loss of life or personal injury lodged by victims decades after an incident. Article 8.1(c) of the protocol was intended to eliminate similar suggestions by providing that actions for compensation which, pursuant to the extended period of prescription or extinction noted above, are brought after a period of ten years from the date of the nuclear incident, shall in no case affect the rights to compensation of any person who has brought an action against the operator before the expiry of that period.

Any extension of the prescription or extinction period, either by virtue of the protocol or the law of the Installation State, makes sense only if the operator's liability is covered, by insurance or other financial security, including state guarantee, for such longer period. It is for this reason that Article 8.1(b), of the protocol provides the following: "If, however, under the law of the Installation State, the liability of the operator is covered by insurance or other financial security including state funds for a longer period, the law of the competent court may provide that rights to compensation against the operator shall only be extinguished after such a longer period which shall not exceed the period for which his liability is so covered under the law of the Installation State."

It is clear that the protocol definitely impacts upon the role of nuclear liability insurers, since the revised Vienna Convention has both considerably increased the minimum liability amount to be fixed for operators, and provided for extended prescription periods.[25] As a discussion of this question would go far beyond the scope of this paper, I would rather confine myself to emphasising the need to rely upon the solidarity of states and the international community, it being clear that regardless of whether they are covered by legislative provisions, victims should receive compensation from public funds where the operator's liability is not covered by insurance due to the passage of time.

X. Non-discrimination between victims

Article XIII of the Vienna Convention, prohibiting any discrimination between victims suffering nuclear damage, was amended by Article 15 of the protocol,[26] the result being that in certain extreme cases, rather rare in practice, some foreign victims may be excluded from the compensation provided by the convention. Derogation from the non-discrimination principle is allowed by the protocol only within very narrow limits. Accordingly, discrimination may only be practised (a) in respect of amounts in excess of the operator's liability, namely, it may affect compensation from public funds only; and (b) in respect of nuclear damage suffered in the territory or any maritime zone of a state which has a nuclear installation in such territory, to the extent that it does not afford reciprocal benefits to the Installation State. This latter restriction makes it clear that such discrimination is not allowed in respect of victims of non-nuclear states; for that matter, the underlying motive for this article is similar to that for the article on the geographical scope of the convention.

In point of fact, the new Article XIII. 2 of the convention is understandable, for it reflects the view that compensation from public funds should not be paid to victims whose state ensures no compensation under similar circumstances. Still, an approach that results in innocent victims of nuclear damage not receiving compensation because their state once failed to comply with its obligations under similar circumstances raises the question of how to reconcile that approach with improving the situation of victims and with humanitarian considerations. This, however, is a separate matter which goes beyond the scope of the present paper.

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25. On this questions see, G.C. Warren: "Vienna Convention revision: a review of the exercise and insurance implications in the provisions under discussion". in: *Nuclear Law Bulletin*, No. 55, June 1995.

26. Article XIII.2. of the revised Vienna Convention (Article 15 of the Protocol) reads as follow:

"Notwithstanding paragraph 1 of this Article, insofar as compensation for nuclear damage is in excess of 150 million SDR's, the legislation of the Installation State may derogate from the provisions of this Convention with respect to nuclear damage suffered in the territory, or in any maritime zone established in accordance with the international law of the sea, of another State which at the time of the incident, has a nuclear installation in such territory, to the extent that it does not afford reciprocal benefits of an equivalent amount."

XI. Priorities given to certain victims

During the revision of the Vienna Convention the was most commonly held view was that victims claiming compensation for loss of life or personal injury should be brought into a more favourable position and priority should be given to those claims. This view is reflected not only in the aforementioned articles which extend the period of prescription or extinction to 30 years, but also in the provision amending Article VIII of the Vienna Convention on the nature, form and extent of compensation.

Article 10 of the protocol states in part that "...priority in the distribution of the compensation shall be given to claims in respect of loss of life or personal injury." This provision accords priority only to those claims for compensation for loss of life and personal injury which are submitted within ten years from the date of the nuclear incident; that is to say, priority is inapplicable to claims brought after the ten-year period. Moreover, priority applies to cases where the damage to be compensated exceeds or is likely to exceed the maximum amount of liability made available pursuant to Article V.1. It may be noted that the extension of the priority rule to the whole period of prescription or extinction would entail the risk of attempts being made to withhold a portion of the compensation amount, on the ground that personal injuries would become evident at a later period of time. Obviously this would not serve the interests of victims who bring actions for compensation within ten years from the date of a nuclear incident, for then they could only expect a reduced amount of compensation. Thus, in the interest of all victims, it appears much more equitable to give priority to claims in respect of personal injury or loss of life, but only for a certain specified period.

In reality, it will be naturally rather difficult to specify the manner in which to prioritise claims for compensation in respect of a certain group of victims. Precisely for this reason, it appeared useful to preserve the relevant provision of the Vienna Convention which states that, "Subject to the provisions of this convention, the nature, form and extent of compensation, as well as the equitable distribution thereof, shall be governed by the law of the competent court" [Article VIII.1]. Thus, priority for claims for compensation in respect of loss of life or personal injury is a matter for the law of the competent court to decide.

XII. Jurisdictional provisions

The revision of the Vienna Convention witnessed a rather sharp debate on the question of jurisdiction over claims for nuclear damage which continued right up to the adoption of the protocol at the Diplomatic Conference. Interestingly, the debate addressed not so much the question of jurisdiction in general as one instance thereof, notably the occurrence of nuclear incidents in an exclusive economic zone of a Contracting Party. The debate focused on problems of the law of the sea associated with the fact that issues relating to exclusive economic zones (EEZ) were not precisely regulated by the 1982 Convention on the Law of the Sea. That convention gives coastal states jurisdiction with regard to the preservation of the marine environment in their EEZ. However, to what degree a state would be able to exercise this jurisdiction is still a matter of controversy.[27] States favouring inclusion in the protocol of jurisdictional provisions on exclusive economic zones advanced the argument that, according to Article 56. 1(b)(ii) of the 1982 UN Convention on the Law of the Sea, coastal states have jurisdiction with regard to the preservation of the marine environment, and that if nuclear damage occurred in such a zone, damage would be suffered chiefly by the natural resources

27. Cf. David Attard: *The exclusive economic zone in international law*, Clarendon Press, Oxford, 1987, p. 94-106.

for which they bear responsibility under maritime law. This argument is otherwise supported by the fact that there are frequently cases of carriage of nuclear materials in exclusive economic zones.

The provisions on jurisdiction were finalised only at the Diplomatic Conference and the outcome is a rather complicated paragraph, breaking with the general rule that is characteristic of nuclear liability conventions, that jurisdiction over actions for compensation lies with the Installation State. Under Article XI.1bis. of the revised Vienna Convention "Where a nuclear incident occurs within the area of the exclusive economic zone of a Contracting Party or, if such a zone has not been established, in an area not exceeding the limits of an exclusive economic zone, were one to be established, jurisdiction over actions concerning nuclear damage from that nuclear incident shall, for the purposes of this Convention, lie only with the courts of that Party." This is conditional upon there being notification by that Contracting Party to the depositary, of such area, prior to the nuclear incident. In order to avoid any misunderstanding concerning the law of the sea, the same paragraph adds that "Nothing in this paragraph shall be interpreted as permitting the exercise of jurisdiction in a manner which is contrary of the international law of the sea, including the United Nations Convention on the Law of the Sea."

There is another new paragraph in Article XI on jurisdiction, which incontestably serves the interests of potential victims and facilitates the equitable distribution of compensation funds. That paragraph provides that the Contracting Parties shall ensure that only a single juridical forum has jurisdiction in relation to any one nuclear incident.

XIII. Actions for compensation

The addition to the jurisdiction provisions of the convention of a new Article XIA concerning actions for compensation is very important. It protects the interests of potential victims by allowing states to bring actions on behalf of their citizens and other victims who have suffered nuclear damage and have their domicile or residence in their territory. This provision was inspired by the fact that litigation in a foreign forum may subject the victims to undue inconvenience. It should be noted that it is very important, in cases of industrial accidents where there are potentially thousands of victims, to decide in advance who will have the right to represent the victims. For example, after the Bhopal catastrophe of 2 December 1984, one of the greatest industrial accidents of all time, one primary issue was whether India had the right to represent the victims.[28]

The article in question, which is a procedural innovation of the protocol, accords to victims a kind of protection which is rather special in terms of its legal nature. It differs from traditional diplomatic protection since it is not subject to exhaustion of local remedies and the damage to victims is not caused by a foreign state. Thus, to some extent, this protection is closer in nature to consular protection. At the same time, however, it is different in that the protection in this case is not accorded to persons staying abroad. Since the paragraph provides protection on an equal footing with nationals, for those foreigners who are permanent residents of the particular state, it may be possible for a victim, if there are victims in several states, to rely upon action and protection by both the state of his nationality and the state of his domicile or residence.

The last paragraph of the new Article XI A deals with claims by subrogation or assignment and states that those claims should be also admitted by the competent court.

28. Cf Warren Freedman: *Foreign Plaintiffs in Products Liability Actions,* The Defense of Forum Non Conveniens. 1988, p. 135.

XIV. Involvement of public funds in compensation for nuclear damages

One of the greatest novelties about the protocol is that it expressly provides for compensation to be made available from public funds for nuclear damage. It should be added, however, that compensation from public funds will occur only if a State Party exempts an operator for up to half of its liability (during the phasing-in period the proportion may be even greater), in which case the Contracting Party must make public funds available to ensure a total amount of compensation as required by Article V.1. To counterbalance these provisions, the protocol incorporates certain guarantees to protect public funds.

Article 4 of the protocol can be said to contain such guarantees, as it adds to Article II of the Vienna Convention a provision under which the Installation State may limit the liability amounts payable from public funds in cases where several operators are jointly and severally liable. This amendment is intended to ensure that, although several operators are liable for nuclear damage, only one payment is made in respect of the incident itself.

Article 7. 2 of the protocol adds a new Article VC to the Vienna Convention, providing for those cases where the competent court is not that of the Installation State.[29] Once again the protection for public funds appears here, since the Installation State is naturally required to reimburse the state of the competent court all payments made from public funds. According to the protocol, the states concerned shall agree on the procedure for reimbursement. Another new provision quite logically allows the Installation State to intervene in proceedings and to participate in any settlement concerning compensation.

A similar provision, added to Article X of the Vienna Convention, extends the right of recourse to the Installation State insofar as it has provided public funds for purposes of compensation.

In point of fact, Article 15 of the protocol mentioned earlier similarly restricts compensation from public funds, protecting them by allowing derogation from the non-discrimination principle in certain cases.

XV. Dispute settlement

The Vienna Convention originally contained no provisions on dispute settlement.[30] Therefore, almost from the beginning of the discussions in the Standing Committee, the experts generally agreed on the need for the convention to be supplemented in this respect. A variety of rather detailed proposals for the settlement of disputes were discussed including setting up a separate international

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29. Article V.C.

"1. If courts having jurisdiction are those of a Contracting Party other than the Installation State, the public funds required under sub-paragraphs (b) and (c) of paragraph 1 of Article V and under paragraph 1 of Article VII, as well as interest and costs awarded by a court, may be made available by the first-named Contracting Party. The Installation State shall reimburse to the other Contracting Party any such sums paid."

30. There is an optional protocol concerning the compulsory settlement of disputes appended to the Vienna Convention concluded at the same day as the Vienna Convention, however, that protocol never entered into force.

tribunal or a claims commission, and a plan was even drawn up for a separate annex to the Vienna Convention to settle matters relating to the aforementioned tribunal.[31]

Of the many proposals, a rather low-key one was eventually incorporated into Article 17 of the protocol. The core and substance of the new dispute settlement mechanism [Article XXA of the revised Vienna Convention] is this: in the event of a dispute between State Parties to the Vienna Convention concerning the interpretation or application of the convention "the parties to the dispute shall consult with a view to the settlement of the dispute by negotiation or by any other peaceful means of settling disputes acceptable to them"; if a dispute cannot be settled within six months from the request for consultation, any party may submit the dispute to arbitration or refer it to the International Court of Justice; where a dispute is submitted to arbitration and the parties to the dispute are unable to agree on the organisation of the arbitration, any party may request the President of the International Court of Justice or the Secretary-General of the United Nations to appoint one or more arbitrators. It should be noted that in this paragraph the protocol refers to disagreement on the organisation of the arbitration, which could be a disagreement not only on the composition of the arbitral court, but on the rules of procedure as well. However, the protocol points only to the first mentioned difference of opinion, stating that in cases of conflicting requests by the parties to the dispute, the request to the Secretary-General of the United Nations shall have priority. For that matter, a Contracting Party is not under any obligation to accept the dispute settlement mechanism provided by the protocol, and when ratifying, accepting, or approving the convention, it may declare that it does not consider itself bound by either or both of the dispute settlement procedures. The consequence is that the article governing dispute settlement is not to be regarded as valid as between the state making such a declaration and the rest of the Contracting Parties. Such declarations may of course be withdrawn at any time.

XVI. Textual adjustments

The protocol contains certain provisions which are simply textual adjustments to the Vienna Convention. Mention may be made of the following paragraphs.

- Article 7. 2 of the protocol simply rewords the relevant article of the Vienna Convention to the effect that costs and interest awarded by courts in actions for compensation for nuclear damage shall not be chargeable against the liability amounts fixed by the convention, that is, that such costs and interest shall be payable in addition to those amounts.

- The revised version of Article XII of the Vienna Convention, on recognition and enforcement of judgements, can similarly be regarded as nothing but a rewording of the relevant provisions.

- Article 2.1 of the protocol revises Article I.1(j) of the Vienna Convention by redefining "nuclear installation" to include certain facilities which the IAEA Board of Governors deem to be nuclear installations, as a result of technological developments.

- Article 16 of the protocol amends Article XVIII of the Vienna Convention, governing the relationship between the Vienna Convention as *lex specialis* and international law as *lex generalis*. This change can be viewed as a minor amendment refining the existing text,

31. Cf. SCNL Third Session, Note by the Secretariat, p. 13-16.

but, unlike the earlier text, the revised wording refers both to rights and obligations under international law, as not being affected by the provisions of the convention.

- Another amendment of lesser importance, relating to the carriage of nuclear material, is that which modifies Article III of the Vienna Convention and which allows the Installation State to exclude the liable operator's obligation to provide a carrier with a certificate of financial security, in respect of carriage of nuclear material within that state.

XVII. Peaceful co-existence of two Vienna Conventions

As was already noted, technically the Vienna Convention was revised by the adoption of the protocol to amend the instrument, and according to Article 19 of the protocol "A State which is Party to this Protocol but not to the 1963 Vienna Convention shall be bound by the provisions of that Convention as amended by this Protocol in relation to other States Parties hereto, and failing an expression of a different intention by that State at the time of deposit of an instrument referred to in Article 20 shall be bound by the provisions of the 1963 Vienna Convention in relation to States which are only Parties thereto." This solution has created a special situation, because after the entry into force of the protocol[32] there will be living together or operating in practice "two" Vienna Conventions, notably the convention's original text of 1963 and its new version as amended by the protocol.

After the protocol has come into force, a state may only accede to the amended version, but in the *inter se* relations of the States Party to the "old" Vienna Convention the provisions of that convention will remain in force until such time as they have acceded to the new protocol. This rather complicated situation is nevertheless understandable and is fully in accord with Article 40 of the 1969 Vienna Convention on the Law of Treaties, which provides for the amendment of multilateral treaties.

In 1989 the negotiations on the revision of the Vienna Convention had begun with the aim of strengthening the existing nuclear liability regime and of improving the situation of potential victims of nuclear accidents. The Protocol to Amend the Vienna Convention serves those purposes; it also reflects a good compromise, since it is the outcome of a negotiation process in which experts from both nuclear and non-nuclear states, from Contacting Parties and non-Contracting Parties were very active. That affords some assurance that the compromise solution reached is acceptable to all States participating in the adoption of the protocol. All of this holds hope for what, perhaps, matters most, that the protocol will enter into force within a relatively short period of time.

Now that the Vienna Convention has been revised, it is to be expected that, on the one hand, there will be accessions to the revised Vienna Convention by further states, chiefly those which have so far steered clear of its liability regime precisely because of its insufficiencies, and, on the other hand, the present States Party to the Vienna Convention will ratify the protocol or accede to it, thereby causing the 1963 Vienna Convention to eventually lose its effect.

32. According to Article 21 "This Protocol shall enter into force three months after the date of deposit of the fifth instrument of ratification, acceptance or approval."

The Compensation Convention: Path to a Global Regime for Dealing with Legal Liability and Compensation for Nuclear Damage

by Ben McRae*

Introduction

The adoption of the Convention on Supplementary Compensation for Nuclear Damage (Compensation Convention) opens a new chapter in international nuclear liability law. The Compensation Convention provides the world community with the opportunity to deal with legal liability and compensation for nuclear damage through a global regime that includes all countries that operate nuclear power plants (nuclear power generating countries) and most countries that do not operate nuclear power plants (non-nuclear power generating countries). Such a global regime can remove legal uncertainty as an impediment to (1) ensuring the highest level of safety in nuclear activities and (2) arranging international co-operation in nuclear projects, while guaranteeing the availability of meaningful compensation in the event of a nuclear incident.

This article describes the features of the Compensation Convention that create the opportunity for a global regime. It also discusses some of the provisions in the convention that underlie these features.

Features of the Compensation Convention

Free-standing

The Compensation Convention is a free-standing instrument open to all states. As a free-standing instrument, it offers a country the means to become part of the global regime without also having to become a member of the Paris Convention[1] (Paris State) or the Vienna Convention[2] (Vienna State).[3]

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* This article was initially published in *Nuclear Law Bulletin* No. 61 (1998). Ben McRae is Assistant General Counsel for Civilian Nuclear Programs in the Office of General Counsel, US Department of Energy. Facts given and ideas expressed in this article are the responsibility of the author alone.

1. The 1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy.

2. The 1963 Vienna Convention on Civil Liability for Nuclear Damage, including the amended version established by the 1997 Protocol to Amend the Vienna Convention. Where a reference only refers to the original version or the amended version, the terms “existing Vienna Convention” and “revised Vienna Convention” are used, respectively.

3. Although the Compensation Convention is free-standing with respect to other liability conventions, it is not entirely free-standing. Article XVIII.1 requires a country with one or more civil nuclear power plants on its territory to be a member of the Convention on Nuclear Safety in order to be a member of the Compensation Convention (a member country). Unless otherwise identified, cited articles are those of the Compensation Convention, including the annex.

The free-standing nature of the Compensation Convention is important because many nuclear power generating countries and most non-nuclear power generating countries are not members of the Paris Convention or the Vienna Convention. Of the ten countries with the largest amount of installed capacity[4] (Canada, France, Germany, Japan, the Republic of Korea, the Russian Federation, Sweden, Ukraine, the United Kingdom, and the United States), only half (France, Germany, Sweden, Ukraine, and the United Kingdom) are either Paris States or Vienna States and only one (Sweden) is a member of the Joint Protocol[5] that links the Paris Convention and the Vienna Convention. Overall, those nuclear power generating countries that do not belong to the Paris Convention or the Vienna Convention account for more than half of worldwide installed capacity.

The Compensation Convention makes a global regime possible by providing the basis for treaty relations to link Paris States and Vienna States with those countries that do not belong to either liability convention but are willing to accept the basic principles of nuclear liability law in the context of the Compensation Convention.

Balance

Many countries, and especially non-nuclear power generating countries, have been unwilling to join the Paris Convention or the Vienna Convention because they perceive these conventions as not focusing sufficiently on the concerns of those who might suffer nuclear damage in the event of a nuclear incident. The Compensation Convention maintains the basic principles of nuclear liability law set forth in the Paris Convention and the Vienna Convention, while including provisions to ensure more meaningful compensation for nuclear damage. This more balanced approach is fundamental to attracting the broad adherence necessary for a global regime.

Enhancements

The Compensation Convention addresses many of the issues that have discouraged many countries from joining the Paris Convention or the Vienna Convention. Specifically, the Compensation Convention contains enhanced provisions on the amount available to compensate nuclear damage, the definition of nuclear damage, and the treatment of maritime nuclear incidents.

Many countries, and especially non-nuclear power generating countries, are unwilling to enter into treaty relations on the basis of the compensation amounts potentially available under the Paris Convention and Vienna Convention.[6] The Compensation Convention addresses these concerns by

4. Installed capacity refers to the thermal power (expressed in Megawatts) of a nuclear power plant authorised by the competent national authorities. See Articles I(j) and IV.2 for the definition of installed nuclear capacity and for the use of that definition in determining contributions to the international fund.

5. The 1988 Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention. The Joint Protocol is not a free-standing instrument since it requires membership in either the Paris Convention or the Vienna Convention. Although the Joint Protocol has not proven to be the basis for a global regime, it has demonstrated the potential to create a regional arrangement among European nuclear power generating countries. Efforts to link Paris States and Vienna States through the Joint Protocol and to create a global regime through the Compensation Convention are compatible since a Paris State or a Vienna State can be a member of both the Joint Protocol and the Compensation Convention.

6. Article 7 of the Paris Convention permits a Paris State to limit the liability of an operator (and thus the amount of compensation available) to SDR 15 million. The OECD Steering Committee for Nuclear Energy, which is empowered to adopt recommendations concerning the Paris Convention, has

providing for a substantial increase in the amount that is guaranteed to be available to compensate nuclear damage. First, it requires a member country to ensure the availability of at least SDR 150 million to compensate nuclear damage during the period prior to 29 September 2007, and at least SDR 300 million thereafter. Second, it provides for an international fund of approximately SDR 300 million to supplement the compensation available under national law.[7] And third, one-half of the international fund is reserved exclusively for transboundary damage.[8]

The Compensation Convention responds to longstanding concerns over the definition of nuclear damage by explicitly identifying the types of damage that are considered nuclear damage. In addition to personal injury and property damage, the enhanced definition includes five categories of damage relating to impairment of the environment, preventive measures, and economic loss. The definition is clear that these additional categories are covered to the extent determined by the law of the competent court.[9] The enhanced definition thus provides certainty that the concept of nuclear damage includes impairment of the environment, preventive measures, and certain economic loss, while recognising that detailed implementation of this concept is best left to national law.

The Compensation Convention recognises the concerns of coastal states over maritime shipments of nuclear material by providing the courts of a member country with exclusive jurisdiction over a nuclear incident that occurs within its exclusive economic zone (EEZ).[10] The Compensation Convention is clear that this jurisdictional rule is intended only for determining which member countries' courts have jurisdiction for the purposes of the convention (that is, adjudicating claims for

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recommended that Paris States limit the liability of an operator to no less than SDR 150 million, but several Paris States have not implemented this non-binding recommendation fully. Article V of the existing Vienna Convention permits an existing Vienna State to limit the liability of an operator to 5 million 1963 United States gold dollars (approximately SDR 60 million). Article V of the revised Vienna Convention permits a revised Vienna State to limit the liability of an operator to SDR 100 million during the first fifteen years after the revised Vienna Convention enters into force and thereafter to limit the liability of an operator to SDR 300 million. The revised Vienna Convention has not yet entered into force.

7. For purposes of this article, unless otherwise specified, references to the amount of compensation available assume that the Installation State has elected to make SDR 300 million available under its national law as the first tier amount and that the international fund provides SDR 300 million as the second tier amount. The exact size of the fund will depend on the installed capacity of the member countries at the time of the nuclear incident that triggers the operation of the fund. See Article IV.2. When most nuclear power generating countries join the Compensation Convention, the fund will provide approximately SDR 300 million.

8. Transboundary damage means damage outside the Installation State, which is the country responsible for regulating the liable operator. See Article XI.1(b). Thus, with respect to a nuclear incident at a nuclear installation, transboundary damage means damage outside the country where the incident occurs. However, with respect to a nuclear incident during transportation outside the Installation State, transboundary damage would include damage in the country where the incident occurs.

9. Article I(k) defines law of the competent court as the national law of the member country whose courts have jurisdiction over a nuclear incident, including any rules relating to conflict of laws. Article I(k) corresponds to Article I.1(e) of the Vienna Convention. See also, Article 14(b) of the Paris Convention.

10. The EEZ is a relatively recent concept in the Law of the Sea that recognises the interest of a coastal state in the maritime area adjacent to its territorial sea. In general, an EEZ is the maritime area between the boundary of a country's territorial sea and 200 miles offshore. An EEZ is not considered part of a country's territory. The Paris Convention and the existing Vienna Convention predate the development of the EEZ concept and thus do not address it. The revised Vienna Convention addresses the EEZ concept in the same manner as the Compensation Convention.

nuclear damage resulting from a nuclear incident). The rule does not permit any exercise of jurisdiction that is inconsistent with the Law of the Sea.

Consistency

The Compensation Convention is consistent with the basic principles of nuclear liability law set forth in the Paris Convention and the Vienna Convention, such as (1) channeling all legal liability for nuclear damage exclusively to the operator, (2) imposing absolute liability[11] on the operator, (3) granting exclusive jurisdiction to the courts of the country where a nuclear incident occurs, and (4) limiting liability in amount and in time. The Compensation Convention achieves this consistency by requiring a member country to be either a Paris State or a Vienna State or to have national legislation consistent with the provisions of the Annex to the Compensation Convention (that is, to be an Annex State). The provisions of the annex set forth the basic principles of nuclear liability law in the same manner as the Paris Convention and the Vienna Convention.

Compatibility

To the maximum extent practicable, the Compensation Convention has been developed to be compatible with the Paris Convention and the Vienna Convention.[12] As a result, no change in the Paris Convention or the Vienna Convention is needed in order for a Paris State or a Vienna State to join the Compensation Convention. A Paris State or a Vienna State would have to change its national law only to the extent necessary to reflect the provisions in the Compensation Convention that apply to all member countries. These provisions include (1) ensuring the availability of at least SDR 150 million to compensate nuclear damage until 2007, and at least SDR 300 million thereafter, (2) implementing the enhanced definition of nuclear damage, and (3) extending coverage to include all members countries. None of these actions would be inconsistent with the Paris Convention or the Vienna Convention. Annex States would have to take similar actions, as well as ensure their national laws were consistent with the basic principles of nuclear liability law set forth in the Annex.

The Compensation Convention also takes into account the special situation of the United States whose national law on legal liability and compensation for nuclear damage predates both the Paris Convention and the existing Vienna Convention.[13] Although the national law of the United States is generally consistent with the basic principles of nuclear liability law set forth in the Paris Convention and the Vienna Convention, it uses a different legal theory to achieve the same practical result of

11. Absolute liability means that liability is imposed without the need to demonstrate fault or negligence.

12. The relationship of the Compensation Convention to the Brussels Convention is beyond the scope of this article. However, discussions during the development of the Compensation Convention indicated that it might be possible to use the Brussels Convention either to supply part of the first tier of compensation required by the Compensation Convention (that is, the Brussels Convention could act as a regional pooling arrangement to assist Brussels States in ensuring the availability of SDR 300 million under their national laws) or to provide compensation in addition to that provided under the Compensation Convention (that is, the Brussels Convention could be used to compensate nuclear damage in Brussels States that was not fully compensated through the operation of the Compensation Convention). Article XII.3(a) provides for both possibilities.

13. The United States national law is the Price-Anderson Act, which is section 170 of the Atomic Energy Act of 1954. The Price-Anderson Act was adopted in 1957 and currently provides the basis for commercial arrangements that cover more than 100 nuclear power plants in the United States.

making the operator exclusively responsible for nuclear damage.[14] This difference prevents the United States from satisfying all the requirements of the Paris Convention or the Vienna Convention and thus becoming a Paris State or a Vienna State.

The Compensation Convention addresses this situation through Article 2 of the annex (the "grandfather clause") under which the national law of the United States is deemed to satisfy certain requirements of the annex. By permitting the United States to join the Compensation Convention as an Annex State, the grandfather clause removes a major impediment to achieving a global regime.[15]

Major provisions of the Compensation Convention

Compensation

The Compensation Convention provides for a substantial enhancement in the compensation of nuclear damage as compared to the Paris Convention and the Vienna Convention. Specifically, the Compensation Convention will guarantee the availability of approximately SDR 600 million to compensate nuclear damage, of which approximately SDR 150 million will be reserved exclusively for transboundary damage.

Article III.1(a) provides that the Installation State must ensure the availability of the first tier of compensation. The Compensation Convention does not specify how a country should ensure the availability of the first tier amount. Thus, a country has the flexibility to choose the funding mechanism from options such as private insurance, an operator pool, or a regional agreement.[16] Although a country does have the obligation to use public funds to ensure the availability of the first tier amount if other funding mechanisms are insufficient, there is no obligation to set aside any public funds for this purpose prior to the time, if ever, that the first tier amount is needed to compensate nuclear damage.

Article III.1(a)(i) establishes SDR 300 million as the first tier amount. Article III.1(a)(ii), however, permits a country to establish a transitional first tier amount of no less than SDR 150 million during the period prior to 29 September 2007. This transitional amount reflects the current availability of private insurance and the liability limits in many existing national laws.

Article III.1(b) provides that the second tier of compensation will come from an international fund to which member countries contribute. This international fund should provide approximately SDR 300 million to compensate nuclear damage if its operation is triggered by a nuclear incident.

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14. The primary difference between the national law of the United States and the provisions of the Paris Convention and the Vienna Convention relates to how responsibility for nuclear damage is channelled exclusively to the operator. The Paris Convention and the Vienna Convention prescribe legal channelling under which an operator is the only person legally liable for nuclear damage. The national law of the United States provides for economic channelling under which the operator bears all the economic consequences for nuclear damage, even though other persons might be legally liable. Persons other than the liable operator are indemnified if they incur costs because of legal liability.

15. The United States has been a major proponent of the Compensation Convention as a means to achieve a global regime that includes all nuclear power generating countries and most non-nuclear power generating countries. On 29 September 1997, it became the first country to sign the Compensation Convention.

16. Article XII.3(a) explicitly recognises the possibility of regional agreements being used to fulfil the funding obligations under Article III.1(a).

Article IV.1(a) establishes a contribution formula under which more than 90% of the contributions come from nuclear power generating countries on the basis of their installed nuclear capacity, while the remaining portion comes from all member countries on the basis of their United Nations rate of assessment.[17] Since nuclear power generating countries generally have high United Nations rates of assessment, this formula should result in more than 98% of the contributions coming from nuclear power generating countries.

Article VII.1 provides that a member country shall make contributions to the international fund only to the extent and when such contributions are actually needed. There is no obligation to set aside public funds for this purpose prior to the time they are needed.

Article IV.1(c) provides for a cap on the contributions from any one member. This cap is intended to ensure that countries with relatively large amounts of installed capacity are not obligated to provide an inordinate share of the international fund during the early stages of the growth to a global regime.[18] To minimise the effects of the cap, Article IV.1(c) provides for the cap to phase-out as more nuclear power generating countries join the Compensation Convention[19] and further provides that the cap shall not operate to benefit the member country that is the Installation State with respect to a nuclear incident that triggers the operation of the fund.

Article XI.1(a) provides that half of the international fund will be used to compensate nuclear damage either in the Installation State or outside the Installation State (transboundary damage).[20] Article XI.1(b) provides that the other half of the international fund will be allocated exclusively to cover any transboundary damage not compensated under Article XI.1(a).[21] The reservation of half of the international fund exclusively for transboundary damage recognises the importance that the international community attaches to compensating transboundary damage. Moreover, it provides an important incentive for joining the Compensation Convention to non-nuclear power countries, as well as any nuclear power generating country that does not expect one of its operators to be responsible for a nuclear incident that triggers the operation of the fund.

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17. Article IV.1(a)(i) provides that each member country with one or more nuclear reactors shall contribute SDR 300 for each Megawatt (thermal) of installed capacity. Article IV.1(a)(ii) provides that an amount equal to ten percent of the contributions under Article IV.1(a)(i) will come from contributions allocated among all member countries on the basis of their United Nations rate of assessment. Article IV.1(b) provides that no contribution will be required from member countries on the minimum United Nations rate of assessment with no nuclear reactors.

18. Article IV.1(c) provides that the contribution of a member country to the international fund shall not exceed a specified percentage of what the total fund would be in the absence of the cap. The specified percentage is a member country's United Nations rate of assessment expressed as a percentage plus eight percentage points.

19. Article IV.1(c) provides for the phase-out by increasing the specified percentage as the total installed capacity of member countries increases, that is as more nuclear power generating countries join the Convention. Specifically, the specified percentage increases by one percent when total installed capacity reaches 625 000 Megawatts and thereafter by one percent for each additional 75 000 Megawatts increase in total installed capacity.

20. Article XI does not use the term "transboundary damage". Instead, Article XI.1(b) refers to "nuclear damage outside the territory of the Installation State."

21. Article XI.1(c) contains a special rule for the case where an Installation State uses the transition rule in Article III.1(a)(ii) to make available a first tier amount of less than SDR 300 million. In such a case, Article XI.1(c) provides for adjustments in the amounts identified in Article XI.1(a) and (b) that result in more than half of the international fund being reserved exclusively for transboundary damage.

The reservation of half of the international fund exclusively for transboundary damage also reflects the fact a first tier amount of SDR 300 million is considerably lower than many countries would have preferred. In order to give member countries an incentive to provide a larger first tier amount, Article XI.2 eliminates the reservation for transboundary damage if the Installation State ensures the availability of a first tier amount of no less than SDR 600 million. The combination of such a first tier amount and the second tier international fund would make almost SDR 1 billion available to compensate nuclear damage.

Article XII.2 recognises the right of a member country to establish a third tier of compensation in addition to the first and second tiers. With one minor exception, the Compensation Convention does not govern the distribution of this third tier.[22]

Definition of nuclear damage

The Compensation Convention enhances the definition of nuclear damage by explicitly identifying the types of damage that are considered nuclear damage.[23]Article I(f) is the same as the definition of nuclear damage in Article I.1(k) of the revised Vienna Convention, which enhances the definition in Article I.1(k) of the existing Vienna Convention. The Paris Convention does not refer to nuclear damage, but incorporates a similar concept through the definition of nuclear incident in Article 1(a) and the identification in Article 3(a) of damage for which the operator is liable. In addition to personal injury and property damage, the enhanced definition identifies five categories of damage relating to impairment of the environment,[24] preventive measures,[25] and economic loss[26] that must be

22. Article XII.2 provides that a member country cannot use lack of reciprocity as a basis to exclude damage from compensation under the third tier if such damage occurs in another member country having no nuclear installations on its territory.

23. Article I(f) defines nuclear damage to include: (i) loss of life or personal injury, (ii) loss of or damage to property; and each of the following to the extent determined by the law of the competent court: (iii) economic loss arising from loss or damage referred to in (I) or (ii), insofar as not included in (i) or (ii), if incurred by a person entitled to claim in respect of such loss or damage; (iv) the costs of measures of reinstatement of impaired environment, unless such impairment is insignificant, if such measures are actually taken or to be taken, and insofar as not included in (ii); (v) loss of income deriving from an economic interest in any use or enjoyment of the environment, incurred as a result of a significant impairment of the environment, and insofar as not included in (ii); (vi) the costs of preventive measures, and further loss or damage caused by such measures; and (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 definition is clear that damage within all these categories, except preventive measures, must be caused by the release of radiation.

24. Subsections (iv) and (v) of the definition of nuclear damage deal with damage resulting from impairment of the environment. The Compensation Convention does not define impairment of the environment. Article I(g) does define measures of reinstatement as reasonable measures which aim to reinstate or restore damaged or destroyed components of the environment, or to introduce, where reasonable, the equivalent of these components into the environment. Article I(g) requires that the measures be approved by the competent authorities of the state where the measures are taken and that the measures be taken by a person entitled to take such measures under the law of the state where the measures are taken.

25. Subsection (vi) of the definition of nuclear damage deals with preventive measures. Article I(h) defines preventive measures as reasonable measures taken by a person after a nuclear incident has occurred to prevent or minimise other nuclear damage. The taking of these measures is subject to approval by competent authorities if such approval is required by the law of the state where the measures are taken.

26. Subsections (iii) and (vii) of the definition of nuclear damage deal with economic loss.

treated as nuclear damage. The definition is clear that national law determines the extent to which these additional categories are covered.

The Compensation Convention also revises the definition of nuclear incident[27] to make clear that, in the absence of an actual release of ionising radiation, preventive measures can be taken only in response to a grave and imminent threat of a release of radiation that could cause other types of nuclear damage. The use of the phrase "grave and imminent" makes clear that preventive measures cannot be taken on the basis of speculation that radiation might be released and that some damage might occur. Rather, there must be a credible basis for believing that a release of radiation with severe consequences is impending and likely to occur in the very near future.

The Compensation Convention is explicit that preventive measures and measures of reinstatement relating to impairment of the environment must be reasonable. The importance of reasonableness is confirmed by the inclusion of a definition of reasonable measures.[28] This definition is clear that the competent court is responsible for determining whether a measure is reasonable under its national law, taking into account all relevant factors.

Exclusive jurisdiction

Article XIII of the Compensation Convention reaffirms the basic principle of nuclear liability law that exclusive jurisdiction over a nuclear incident lies with the courts of the member country where the incident occurs or with the courts of the Installation State if the incident occurs outside any member country.[29] Article XIII is, in effect, the primary linking mechanism in the Compensation Convention because it commits all member countries to recognise the jurisdiction of the courts of other member countries and provides that only one member country's courts will have jurisdiction over a nuclear incident.[30]

Article XIII enhances the jurisdiction provisions in the Paris Convention and the existing Vienna Convention by recognising recent developments in the Law of the Sea and the concerns of coastal States over maritime shipments of nuclear material. Specifically, it provides that the courts of a member country will have exclusive jurisdiction over claims for nuclear damage resulting from a

27. Article I(i) defines nuclear incident as any occurrence or series of occurrences having the same origin which cause nuclear damage or, but only with respect to preventive measures, creates a grave and imminent threat of causing such damage. Article I(i) is the same as the definition in Article I.1(l) of the revised Vienna Convention, which enhances the definition in Article I.1(l) of the existing Vienna Convention through the addition of the concluding clause relating to preventive measures. This enhancement is necessary to permit preventive measures to qualify as nuclear damage in the case where there is no release of ionising radiation but there is a grave and imminent threat of such a release. See also, Article 1(a)(i) of the Paris Convention.

28. Article I(l) defines reasonable measures as measures which are found under the law of the competent court to be appropriate and proportionate. In making this determination, the competent court must take into account all the circumstances, including but not limited to: (i) the nature and extent of the damage incurred or, in the case of preventive measures, the nature and extent of the risk of such damage; (ii) the extent to which, at the time they are taken, such measures are likely to be effective; and (iii) relevant scientific and technical expertise.

29. Article XIII corresponds Article XI of the Vienna Convention and Article 13 of the Paris Convention.

30. Article XIII also sets forth the rules on enforcement of judgements. These rules correspond to the rules in Article XII of the Vienna Convention and Article 13 of the Paris Convention.

nuclear incident in its EEZ.[31] Article XIII is clear that the EEZ jurisdiction is only for purposes of the Compensation Convention and relates only to the adjudication of claims for nuclear damage. Article XIII does not create any rights or obligation concerning actual shipments.

Although Article XIII grants jurisdiction over a nuclear incident to the member country in whose EEZ the incident occurs, the liability of the operator is determined by the national law of the Installation State.[32] Since the EEZ is not part of the territory of a coastal state, a member country cannot make transit through its EEZ subject to the acceptance of a higher liability amount.[33]

Article XIII was placed in the main body of the Compensation Convention to make clear that Article XIII applies to all member countries and takes precedence over similar jurisdictional provisions in the Paris Convention and the Vienna Convention.[34] The likelihood of a different jurisdictional outcome is very slight and can only occur in a situation where a nuclear incident occurs in the territory or EEZ of a member country during the transportation of nuclear material. Giving precedence to the provisions of the Compensation Convention in these situations ensures that jurisdiction will lie with the member country most affected by a nuclear incident, namely the country where the incident occurs.

Scope

Article II.2 restricts the scope of the Compensation Convention to nuclear incidents involving nuclear installations used for peaceful purposes. The Compensation Convention establishes no rights or obligations with respect to military installations.

Article XV makes it clear the Compensation Convention deals only with civil liability. It does not address or affect the rights and obligations, if any, of a member country under the general rules of public international law.[35]

Article III.2(a) provides that the first tier amount shall be distributed equitably without discrimination on the basis of nationality, domicile or residence.[36] Article III.2(a), however, permits the exclusion of nuclear damage in a non-member country from compensation under the first tier

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31. Article XIII provides that if the exercise by a member country of jurisdiction over nuclear damage resulting from a nuclear incident in its EEZ is inconsistent with its obligations under the Paris Convention or the Vienna Convention to a non-member country, then jurisdiction shall be determined as if the nuclear incident occurred outside the territory or the EEZ of any member country.

32. Article 7(d) of the Paris Convention, Article V of the Vienna Convention, and Article 6.1 of the annex provides that the maximum amount of liability of the operator shall be governed by the national law of the Installation State.

33. See Article 7(e) of the Paris Convention and Article 6.2 of the annex, which provide for the possibility of a higher liability amount in the case of transit through the territory of a Contracting Party.

34. The Vienna Convention on the Law of Treaties deals with this issue in Article 30 on the application of successive treaties relating to the same subject matter. The rules in Article 30 are clear that a member country will be bound by the jurisdictional provisions in the Compensation Convention rather than the corresponding provisions in the Vienna Convention or the Paris Convention.

35. Article XV corresponds to Article XVIII of the Vienna Convention.

36. Article III.2(a) corresponds to Article XIII of the Vienna Convention and Article 14 of the Paris Convention.

amount.[37] A Paris State or a Vienna State that is a non-member country cannot be excluded to the extent such an exclusion would be inconsistent with the treaty obligations of the Installation State under the Paris Convention or the Vienna Convention.

Article III.2(b) provides that the second tier amount shall be distributed equitably without discrimination on the basis of nationality, domicile or residence, subject to the conditions in Article V on the geographic scope of nuclear damage covered by the second tier.[38] Specifically, nuclear damage must be suffered (1) in the territory of a member country, (2) in or above the EEZ of a member country or on the continental shelf of a member country in connection with the exploitation or exploration of natural resources therein, or (3) (a) in or above maritime areas beyond the territorial sea of any country and (b) (i) by a national of a member country or (ii) on board or by a ship flying the flag of a member country, or on board or by an aircraft registered in the territory of a member country, or on or by an artificial island, installation or structure under the jurisdiction of a member country.

Annex

Article II.3 makes it clear that the annex constitutes an integral part of the Compensation Convention. The provisions of the Annex, however, only apply to those member countries that join the Convention as Annex States.

The introduction to the annex obligates a member country that is not a Paris State or a Vienna State to ensure its national law is consistent with the provisions of the annex. The introduction permits the provisions of the annex to be incorporated directly into the national law of a member country as self-executing treaty obligations to the extent a member country recognises this concept. It also provides that a member country with no nuclear installations on its territory is required to have only those provisions in its national law that are necessary for that country to give effect to its obligations under the Compensation Convention.

Article 1 of the annex sets forth certain definitions for use in applying the provisions of the Annex.[39] The definitions in Article I of the Compensation Convention also apply to the annex.[40]

Article 2 of the annex is the grandfather clause. Article 2.1 deems the provisions in Articles 3, 4, 5 and 7 of the annex to be satisfied so long as certain conditions were met on 1 January 1995 and

37. Article III.2(a) provides that the national law of the Installation State determines the extent, if any, to which nuclear damage in non-member countries in excluded.

38. Article III.2(b) also recognises that Article XI.1(b) reserves a portion of the second tier amount exclusively for transboundary damage if the Installation State establishes a first tier amount of less than SDR 600 million.

39. These definitions are the same as the corresponding definitions in Article I of the Vienna Convention.

40. The definitions in Article I apply to all the provisions in the Compensation Convention, including the annex. The definitions of nuclear damage and nuclear incident in Article I are the same as the corresponding definitions in the revised Vienna Convention and represent an enhancement of the definitions in the existing Vienna Convention. The definitions in Article I apply to all member countries, whether they are Paris States, Vienna States, or Annex States. Thus, the enhanced definitions of nuclear damage and nuclear incident must be implemented by all member countries, including Paris States and existing Vienna States.

continue to be met with respect to nuclear incidents involving certain specified nuclear installations.[41] In general, these conditions are that (1) absolute liability applies in the event there is substantial nuclear damage off the site where a nuclear incident occurs, (2) all persons other than the liable operator are indemnified for any legal liability they might incur, and (3) compensation for nuclear damage is available in an amount of no less than SDR 1 billion for a nuclear incident at a civil nuclear power plant and in an amount of no less than SDR 300 million for a nuclear incident at any other nuclear installation.

Although the grandfather clause does not refer specifically to the United States, it is the only country that met the conditions set forth in Article 2.1 on 1 January 1995 and thus the only country that can use the grandfather clause to qualify as an Annex State. Moreover, since the conditions in the grandfather clause only apply to a country that is making use of the clause to qualify as an Annex State, these condition apply to no Annex State other than to the United States.

For the most part, the substantive provisions in Articles 3-11 of the Annex repeat the comparable provisions in the Vienna Convention and the Paris Convention. To the extent practicable, Articles 3-11 consolidate overlapping provisions in the Vienna Convention and the Paris Convention and elucidate the essential requirements for national nuclear liability law in a more streamlined manner.

Article 3 of the annex sets forth the requirements relating to the liability of the operator.[42] In particular, it imposes on Annex States two of the basic principles of nuclear liability law, namely legal channeling and absolute liability.

The channelling of legal liability exclusively to the operator is established by Article 3.1, which makes the operator solely liable for nuclear damage, and Article 3.9, which provides that any right to compensation for nuclear damage may be exercised only against the liable operator. Article 3.9 makes it clear that no person can be held legally liable for nuclear damage other than the operator who is exclusively liable under Article 3.1. No additional provisions are necessary to establish the exclusive

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41. Article 2.3 defines nuclear installations for purposes of applying the grandfather clause. It includes civil nuclear reactors and civil facilities for processing, reprocessing or storing spent fuel or radioactive waste resulting from reprocessing spent fuel or containing transuranic elements.

    In order to qualify for using the grandfather clause, these conditions must be met in the national law that applies within the territory of a member country. It is not mandatory for these conditions to be met in the national law that applies to nuclear incidents outside the territory of a member country. To the extent these conditions are not met in the national law that applies to a nuclear incident outside the territory of a member country (such as a nuclear incident in its EEZ), Article 2.4 provides that the provisions of Articles 3-11 of the annex shall apply and prevail over any inconsistent provisions of such national law.

42. Article 3 of the Annex is based on Articles II and IV of the Vienna Convention and Articles 3, 4, 6 and 9 of the Paris Convention. Article 3.1 corresponds to Article II.1 of the Vienna Convention; See also, Article 3(a) and (b) of the Paris Convention. Article 3.2 corresponds to Article II.2 of the Vienna Convention; See also, Article 4(d) of the Paris Convention. Article 3.3 corresponds to Article IV.1 of the Vienna Convention; See also, Articles 3 and 4 of the Paris Convention. Article 3.4 corresponds to Article IV.4 of the Vienna Convention; See also, Article 3(b) of the Paris Convention. Article 3.5 corresponds to Article IV.3(a) and (b) of the Vienna Convention; See also, Article 9 of the Paris Convention. Article 3.6 corresponds to Article IV.2 of the Vienna Convention; See also, Article 6(c)(i)(1) of the Paris Convention. Article 3.7(a) and (b) correspond to Article 3(a)(ii)(1) and (2) of the Paris Convention; See also, Article IV.5 of the Vienna Convention. Article 3.7(c) corresponds to Article IV.6 of the Vienna Convention. Article 3.8 corresponds to Article IV.7 of the Vienna Convention. Article 3.9 corresponds to Article 6(a) of the Paris Convention; See also, Article II.5 and II.7 of the Vienna Convention. Article 3.10 corresponds to Article 6(c)(ii) of the Paris Convention.

legal liability of the operator for nuclear damage and to ensure that no legal actions may lie against any other person and, in particular, any person who has supplied any services, materials or equipment in connection with the planning, construction, modification, maintenance, repair or operation of a nuclear installation.

Article 3.3 provides that the liability of the operator shall be absolute. In other words, an operator is liable, irrespective of fault, for nuclear damage resulting from a nuclear incident involving a nuclear installation of the operator. It is only necessary to demonstrate that the nuclear damage is caused by the nuclear incident.

Article 4 of the Annex establishes SDR 300 million as the minimum amount to which an Annex State can limit the liability of an operator.[43] Article 4.2 provides for the possibility of a two-tier approach under which an Annex State can limit the liability of an operator to no less than SDR 150 million, provided that the Annex State makes available public funds for the difference between SDR 300 million and the limit on the liability of the operator.[44]

Article 4 is explicit that the SDR 300 million requirement is "subject to Article III.1(a)(ii)". Article III.1(a)(ii) establishes the transitional rule for the Compensation Convention as to when a member country must ensure the availability of at least SDR 300 million to compensate nuclear damage. Thus, an Annex State can limit the liability of an operator under Article 4 to no less than SDR 150 million during the period prior to 29 September 2007, without having to make public funds available to cover the difference between SDR 300 million and the limit on the liability of the operator.[45]

Article 5 of the annex sets forth the requirements on financial security to cover the liability of an operator and the obligation of an Annex State to satisfy claims if the financial security is insufficient to cover claims up to the limit on liability established pursuant to Article 4 of the annex.[46] Article 5 makes it clear that if an Annex State imposes unlimited liability on an operator, it may limit the financial security requirement to SDR 300 million and thereby limit its obligation to satisfy claims for which the financial security is insufficient.[47]

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43. Article 4 differs significantly from the comparable provisions in Article V of the existing Vienna Convention and Article 7 of the Paris Convention with respect to the minimum amount to which a country can limit the liability of an operator. The SDR 300 million minimum amount established by Article 4 is the same as the amount established by Article V of the revised Vienna Convention, but comes into effect sooner.

44. Article V of the revised Vienna Convention provides for a similar two-tier approach.

45. The provisions of Article III of the Compensation Convention apply to all member countries. Thus, all member countries must ensure the availability of SDR 150 million to compensate nuclear damage during the period prior to 29 September 2007, and SDR 300 million thereafter. This obligation is not affected by the possibility of lower limits on the liability of an operator under the Paris Convention, the existing Vienna Convention, or the revised Vienna Convention.

46. Article 5 corresponds to Article VII of the Vienna Convention; See also, Article 10 of the Paris Convention.

47. The treatment of an Annex State that imposes unlimited liability on its operators is the same as that of a revised Vienna State under Article VII.1(a) of the revised Vienna Convention.

Article 6 of the annex sets forth certain rules concerning the operation of the annex with respect to the transportation of nuclear material.[48] Article 6.1 provides that the liability of the operator for a nuclear incident during the transportation of nuclear material shall be determined by the national law of the Installation State. Article 6.2 provides that a member country can make transit through its territory subject to the acceptance of a higher liability limit.[49] A member country cannot impose a higher liability limit than it imposes on operators situated within its territory. Article 6.3 makes it clear that the restriction in Article 6.2 does not apply to maritime transport involving the right of entry in cases of urgent distress or the right of innocent passage or to air transport where there is a right to fly over the territory of a member country by agreement or under international law.

Article 7 of the annex deals with nuclear incidents where more than one operator is liable.[50]

Article 7 makes it clear that the involvement of more than one operator doe not have the effect of increasing the amount of public funds that a member country is obligated to make available under Article 4 of the annex.

Article 8 of the annex addresses several issues relating to compensation under national law. Article 8.1 provides that the amount of compensation is determined without regard to interest or costs.[51] Article 8.2 establishes the rule that compensation for transboundary damage must be provided in a form freely transferable among member countries.[52] Article 8.3 states that national law shall determine the relationship between compensation under the Compensation Convention and compensation under national or public health insurance, social insurance, social security, workmen's compensation or occupational disease compensation systems.[53]

Article 9 of the annex limits the time period during which an operator is liable.[54] In general, the period of liability is the ten years after the date of the nuclear incident. A member country can establish a longer period to the extent the liability of the operator is covered by insurance or other financial security or public funds for a longer period. If a member country establishes a longer period, its national law must contain provisions for the equitable and timely satisfaction of claims for loss of life or personal injury filed within the ten year period after the nuclear incident. Article 9 also permits a member country to limit the time period further by requiring a person to bring a claim for nuclear

48. Article 6 corresponds to Article 7(d), (e), and (f) of the Paris Convention. Article V of the Vienna Convention provides that the liability of the operator is determined by the national law of the Installation State, but the Vienna Convention has no comparable provisions to Article 7(e) and (f) of the Paris Convention.

49. This provision only applies to transit through the territory of a member country and thus does not apply to transit through its EEZ.

50. Article 7 corresponds to Article VII of the revised Vienna Convention. See also, Article II.3 of the existing Vienna Convention and Article 5 of the Paris Convention.

51. Article 8.1 corresponds to Article V.2 of the existing Vienna Convention, Article VA.1 of the revised Vienna Convention, and Article 7(g) of the Paris Convention.

52. Article 8.2 corresponds to Article 12 of the Paris Convention. See also, Article V.4 of the existing Vienna Convention and Article VA.2 of the revised Vienna Convention.

53. Article 8.3 corresponds to Article IX.1 of the Vienna Convention and Article 6(h) of the Paris Convention.

54. Article 9 of the Annex corresponds to article VI of the existing Vienna Convention and Article 8 of the Paris Convention. See also, Article VI of the revised Vienna Convention.

damage within three years of the date on which the person had knowledge or should have had knowledge of the damage and its cause.

Article 10 of the annex makes it clear that national law may provide an operator with a right of recourse against a supplier or other person only in certain identified situations.[55] Specifically, an operator can be granted a right of recourse only where a written contractual provision explicitly provides for such a right or where a nuclear incident results from an act or omission with the intent to cause damage.

Article 11 of the annex provides that national law shall govern the nature, form, extent and equitable distribution of compensation, subject to the explicit provisions of the Compensation Convention.[56]

55. Article 10 corresponds to Article X of the Vienna Convention and Article 6(f) of the Paris Convention.

56. Article 11 corresponds to Article VIII of the Vienna Convention and Article 11 of the Paris Convention.

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

by Wolfram Tonhauser and Odette Jankowitsch-Prevor*

I. Introduction

The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention) was adopted on 5 September 1997 – after two years of *travaux préparatoires* – by 84 states at a Diplomatic Conference convened at Vienna by the International Atomic Energy Agency (IAEA).[1]

The Joint Convention was opened for signature on 29 September 1997 in conjunction with the 41st session of the General Conference of the IAEA. As of one week following opening for signature, 23 states had signed the convention.

The convention will enter into force on the 19th day after the 25th instrument of ratification is deposited with the IAEA, including the instruments of 15 states that each have an operational nuclear power plant.

II. The Joint Convention (a summary description)

The convention combines two discrete subject matters, namely the safety of spent fuel management and the safety of radioactive waste management in a "joint" structure which constitutes its essential originality.

There is a common Preamble and common Chapter 1 on "Objectives, Definitions and Scope of Application", which sets out the two distinct subjects; Chapters 2 and 3 contain parallel sets of requirements governing the "Safety of Spent Fuel Management" and the "Safety of Radioactive Waste Management"; Chapter 4 "General Safety Provisions" contains those requirements which apply both to the safety of spent fuel management and to the safety of radioactive waste management; Chapter 5 entitled "Miscellaneous Provisions" covers the transboundary movement of spent fuel and radioactive waste and, separately, legal commitments concerning disused sealed sources. Finally, Chapters 6 and 7

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* This article was initially published in *Nuclear Law Bulletin* No. 60 (1997). Wolfram Tonhauser is Head of the Nuclear and Treaty Law Section of the Office of Legal Affairs of the IAEA and served in this capacity as Scientific Secretary to the Group of Experts on the Joint Convention. Odette Jankowitsch-Prevor is former Section Head, Governmental and Inter-Agency Affairs, Division of External Relations at the IAEA, and served as a Senior Legal Officer of the IAEA and as Scientific Secretary to the Group of Experts on the Joint Convention. The views expressed in this article are those of the authors and do not necessarily represent those of the IAEA.

1. The text of the Joint Convention and the summary records of the plenary meetings are contained in IAEA document GOV/INF/821-GC(41)/INF/12.

on “Meetings of the Contracting Parties” and “Final Clauses” again join both spent fuel and radioactive waste management.

The Preamble

The Preamble, drafted as a quasi resolution, consists of explanatory elements regarding certain provisions in the convention text, elements that found no consensus to be written as obligations and, given the subject matter of the convention, a reference to a broad array of other instruments of a binding and non-binding nature relating to nuclear safety, adopted under IAEA auspices, and, reflecting environmental consensus, a reference to Agenda 21 as well as to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention).

Particularly worth mentioning are paragraphs (i), (ii), (iii) and (vii) of the Preamble which explain, in short, why the joint structure for the convention was adopted, paragraphs (ix) and (x) of the Preamble on technical co-operation originally drafted as obligations under the convention, and paragraph (xi), an attempt to combine the concept that waste should be disposed of in the state in which it was generated with the possibility, or even encouragement to establish regional or international repositories, should safety and efficiency criteria so warrant. The concept of public participation in the siting process is also confined to a preambular paragraph.

Objectives, definitions and scope of application

In addition to the general premises enumerated in the Preamble, the convention defines in Article 1 three sets of “objectives”: (i) the General Nuclear Safety Objective, (ii) the Radiation Protection Objective and (iii) the Technical Safety Objective.[2]

Article 3 on “scope of application” is focused predominantly on specific activities rather than on substances.

Pursuant to this article, the convention applies, with certain restrictions to: (i) the safety of spent fuel management, defined as “all activities that relate to the handling or storage of spent fuel, excluding off-site transportation”, (ii) the safety of radioactive waste management, defined as “all activities, including decommissioning activities, that relate to the handling, pretreatment, treatment, conditioning, storage, or disposal of radioactive waste, excluding off-site transportation”, (iii) the safety of management of spent fuel or radioactive waste resulting from military or defence programmes (if and when such materials are transferred permanently to and managed within exclusively civilian programmes, or when declared as spent fuel or radioactive waste for the purpose of the convention by the Contracting Party) and (iv) to discharges, defined as “planned and controlled releases into the environment, as a legitimate practice, within limits authorised by the regulatory body, of liquid or gaseous radioactive materials that originate from regulated nuclear facilities during normal operation”.

2. The convention thereby strictly follows Article 1 of the Convention on Nuclear Safety (for further reference see article by Odette Jankowitsch on the Convention on Nuclear Safety, *Nuclear Law Bulletin* No. 54/1994).

Obligations

The obligations to be undertaken by the Contracting Parties are principally of two types.

The first type are general obligations *de moyens* contained in Chapters 2, 3 and 4 and are based to a large extent on modified provisions of the Convention on Nuclear Safety and on the principles contained in the IAEA Safety Series document No. 111-F, "The Principles of Radioactive Waste Management". In particular, they require Contracting Parties to take the appropriate legislative, regulatory and administrative measures to govern the safety of spent fuel and radioactive waste management and to ensure that individuals, society and the environment are adequately protected against radiological and other hazards, *inter alia*, by appropriate siting, design and construction of facilities and by making provision for ensuring the safety of facilities both during their operation and after their closure.

The second set of obligations contained in Chapter 6 of the convention is of a different nature. It is the reporting and peer review mechanism which is directly binding on Contracting Parties.

Final clauses

Chapter 7 of the convention contains the Final Clauses:

(a) Resolution of disagreements

The convention, in keeping with the peer review mechanism, provides only for a simple consultation mechanism to resolve disputes. Article 38 of the convention provides that Parties "shall consult within the framework of a meeting of the Contracting Parties with a view to resolving the disagreement". Only in the event that these consultations prove unproductive can recourse be made to mediation, conciliation and arbitration mechanisms.

(b) Reservations

No provision is included in the convention regarding reservations, it being understood that in the absence of such a clause, should a Contracting Party choose to make a formal reservation, the mechanism foreseen under Articles 19 *et al.* of the Vienna Convention on the Law of Treaties would apply.

(c) Signature, ratification, acceptance, approval, accession

The convention is subject to ratification, acceptance or approval by the signatory states; after entry into force it is open for accession by all states. As in most of the international instruments of a more recent date, the article on signature, ratification, acceptance, approval and accession provides for the accession by "regional organisations of an integration or other nature, provided that any such organisation is constituted by sovereign States and has competence in respect of the negotiation, conclusion and application of international agreements in matters covered by the Convention". What is

referred to here is the European Union, which may claim a certain competence in respect of specific matters regulated by the Joint Convention, notably questions of radiation protection.[3]

(d) Amendments

Also in keeping with the nature of the convention and its peer review mechanism, amendments to the convention can only be made through a stringent formal amendment process laid out in Article 41. Amendments eventually require the convening of a diplomatic conference and a two-thirds majority.

(e) Denunciation

The convention is of unlimited duration. However, each Contracting Party has the right to withdraw from the convention, without providing reasons, by way of written notification to the depositary. Denunciation takes effect one year – or later if so required – following the date of receipt of the notification by the depository.

(f) Secretariat

According to Article 37 of the convention, the IAEA shall provide the secretariat for "meetings of Contracting Parties" under the peer review mechanism. Other services which Contracting Parties may also require in support of these review meetings shall either be provided by the IAEA in the frame of its regular programme and budget or as a separately funded activity.

According to Article 43, the Director General of the IAEA is the depositary of the convention.

III. The Negotiation Process

III.1 The initial consensus

During the development of the Convention on Nuclear Safety in the early 1990s, a group of like-minded states argued that all safety issues related to the production of nuclear energy including those related to the management of radioactive waste should be covered by that convention. No consensus was reached on this, and the scope of that convention was therefore limited to the safety of civil nuclear power plants. Preambular paragraph (ix) of that convention, however, did affirm "the need to begin promptly the development of an international convention on the safety of radioactive waste management as soon as the ongoing process to develop waste management safety fundamentals has resulted in broad international agreement".[4]

This phrase clearly demonstrated that the process of international law making on nuclear safety was not yet completed. Consequently, the Agency's General Conference in September 1994 "invite[d] the Board of Governors and the Director General... to commence preparations for a convention on the safety of radioactive waste management..."[5] Pursuant to that resolution and following agreement by

3. See Articles 35 *et al.* Euratom Treaty.

4. INFCIRC/449, IAEA Legal Series No. 16.

5. GC (XXXVIII)/Res/6.

the Board of Governors at its December 1994 session, the Director General convened an open-ended meeting of experts from Member States with the objective of holding preliminary discussions on basic concepts and the possible scope of such a convention and to examine working mechanisms and procedures for its preparations. That meeting was held at the Agency's headquarters in February 1995. The Secretariat of the IAEA at that time provided participants with a list of reference material and a note on conventions and other instruments that could be consulted in the preparation of a convention. The modest outcome of this meeting was an "inventory of issues raised" and a request that the Agency, following concurrence by the Board of Governors, convene a group of experts on a convention on the safety of radioactive waste management.

The IAEA's Board of Governors in March 1995 approved the convening of such a group of experts and at the same time also adopted the relevant Safety Series Document at the fundamentals level, namely that on "The Principles of Radioactive Waste Management".[6] Having so been provided with a generally accepted guide to best practices in this area, the condition contained in the Preamble of the Convention on Nuclear Safety was met and the road was paved for the work of the group of experts to commence.

The first meeting of what then became a formal Group of Legal and Technical Experts on a Convention on the Safety of Radioactive Waste Management open to all states was held in Vienna in July 1995 with well over 100 participants from 53 countries and observers from four international organisations. The meeting elected Professor Alec Jean Baer, the former Deputy Director General of the Federal Office for Energy of Switzerland, as its chair.

Based on the broad consensus just reached in the Convention on Nuclear Safety on main modalities, language and implementation mechanism, work on the future instrument seemed to be clearly marked: to many experts, there already existed a blueprint for the new instrument; indeed even the technical input was available and generally agreed. It was therefore no surprise that the first meeting of the Group of Experts rapidly agreed on the following points:

- that the Convention on Nuclear Safety was to be considered as a model for the Convention on the Safety of Radioactive Waste Management, notably, that it should also be an "incentive" convention, a term created during the negotiating process of the Convention on Nuclear Safety;
- that a Convention on the Safety of Radioactive Waste Management should take over where the Convention on Nuclear Safety ceases to apply so as to avoid gaps in coverage; and
- that consideration should also be given to including in the convention the substance of the IAEA Code of Practice on the International Transboundary Movement of Radioactive Waste.

Regarding the technical aspects of the convention, there was broad agreement that the general message embodied in the Safety Series Document No. 111-F, as adopted by the IAEA Board of Governors in March 1995, was suitable for incorporation in the convention and that even a number of safety related provisions which are contained in the Convention on Nuclear Safety could be transferred to the new convention, of course, with the appropriate adjustments and changes in wording.

6. The "Principles of Radioactive Waste Management", IAEA Safety Series No. 111-F.

Finally, the Group of Experts felt that the convention should apply to the full range of radioactive wastes as described in the Safety Series Document No. 111-F, namely to radioactive wastes in "liquid", "gaseous" and in a "solid form".

III.2 The first draft text

With these conclusions, the basic concepts for the convention appeared to be clearly laid down and the chair of the Group of Experts was thus assigned the task of producing a first draft text for consideration at the next meeting – without any request for national positions or drafted contributions by other experts.

The chair prepared his first draft text in the summer months of 1995 in consultation with so-called "friends of the chair", a small group of national, mainly technical experts in the field of radioactive waste management and with the help of the IAEA Secretariat.

Basically, all articles of the Convention on Nuclear Safety except for Article 12 on "Human Factors", and the "Principles of Radioactive Waste Management" as contained in the Safety Series Document No. 111-F found their counterpart, with appropriate modifications, in the first draft text of the convention.

The chair's first draft achieved wide support at the second meeting of the Group of Experts in December 1995 and was considered a very good basis for further discussion. Consequently, the second and also the third meeting of the Group of Experts mainly focused on an article-by-article review of the first draft text and within the fairly short period between July 1995 and April 1996, the Group of Experts was able to agree on most of the radioactive waste management provisions in the convention.

With that consensus achieved, it seemed that the Group of Experts, from their fourth meeting on, could focus on refinement of the draft.

Specific elements, however, which had been shelved during the first three meetings of the Group of Experts and which went beyond the original understanding of the Group i.e. the modified contents of the Convention on Nuclear Safety and the IAEA Safety Series Document No. 111-F, had to be added. The entire negotiating and drafting process concentrated thereafter on these specific issues, some of them only to be resolved at the Diplomatic Conference, or even not resolved, thus resulting in a voted majority adoption of the instrument.

III.3 The search for a new consensus: specific elements of disagreement

(1) The subject of spent fuel and the concomitant question of the structure of the convention

The first and single most important issue of the negotiation was the subject of spent fuel and inseparable therefrom the question of the structure of the convention.

The Group of Experts was faced with the problem of whether or not a convention covering the safety of radioactive waste could and should include or exclude the safety issue associated with what, in fact, can be defined as a "mixture" of radioactive waste and other material, called spent fuel.

Initially, a number of countries, notably these concerned with reprocessing, were opposed to the inclusion of spent fuel in a Convention on Radioactive Waste. Various arguments were forwarded: one

of the arguments was that the Group of Experts as established by the Board of Governors had no specific mandate to consider spent fuel, as its mandate seemed to read as *expressis verbis* limited to radioactive waste. Another argument was that spent fuel, considered a resource as part of the nuclear energy production cycle, could not legally be included in any definition of radioactive waste – or associated with the phrase generally applied "for which no further use is foreseen". National policy arguments were raised.

After a long impasse, an informal open-ended meeting of the Group of Experts expressly devoted to this issue was convened by the chair of the Group in September 1996. The negotiating problem seemed to be how to reach a common denominator – a common basis – for three divergent schools of opinion: some states advocating a single text, still modeled on the Convention on Nuclear Safety, which would include radioactive waste and also spent fuel; others, as mentioned above, remaining strictly opposed to any attempt to address spent fuel and, a third group arguing for two texts, a double or two-track text which would sufficiently separate the two subject matters and at the same time cover the common denominator, namely the safe management of certain nuclear matters not regulated elsewhere. Among the latter school of opinion proposals circulated for twin conventions, i.e. two separate instruments adopted at the same time or a main convention and an optional protocol on spent fuel.

A first breakthrough was achieved during the fifth meeting of the Group of Experts in South Africa in November 1996, a meeting which was originally designated to focus on general topics, in particular those relevant to African countries: (i) France submitted a proposal for a single convention text with two parallel sets of requirements, one on the safety of spent fuel management and one on the safety of radioactive waste management in an order reflecting the logical sequence of the nuclear fuel cycle; (ii) the Group objected in principle to an additional protocol on spent fuel which entailed the risk of two sets of Contracting Parties or, worse, a protocol treated as an option; and (iii) the Group was concerned that two legally separate instruments may create a lacuna in the safety regime of spent fuel and radioactive waste, as states may choose not to sign or ratify a protocol (as it turned out later, it was in fact the inclusion of spent fuel in the Joint Convention that ensured that there would be no gap with the scope of application of the Convention on Nuclear Safety). The concept of a "joint convention" therefore prevailed from the sixth meeting onward, based on the consensus that the safety of management as the common denominator for both types of materials would justify the common legal instrument.

(2) The relation of the Joint Convention with the Convention on Nuclear Safety

A second specific element of both technical and legal relevance was that of the relation of the Joint Convention with the Convention on Nuclear Safety.

Three issues emerged in this context: (i) the question of a possible overlap of the two conventions both applying to radioactive waste "on site", (ii) the coverage of nuclear installations that ceased to be covered by the Convention on Nuclear Safety and therefore the possibility of a gap between the two conventions, and (iii) the content of the reporting requirements, notably for States Parties to the Convention on Nuclear Safety. It is recalled that the Convention on Nuclear Safety defines its scope of application as to

> "the safety of nuclear installations...[i.e] any land-based civil nuclear power plant under [the] jurisdiction [of a Contracting Party] including such storage, handling and treatment facilities for radioactive materials as are on the same site and are directly related to the operation of the nuclear plant".

This language, in the view of many experts, allowed for a different interpretation as to what is located "on site".

Regarding the first and in effect the third above topic, it was felt that an overlap between the two conventions was not harmful and could, in any event, be clarified at the respective meetings of Contracting Parties, should the Contacting Parties of the Convention on Nuclear Safety adhere to the new Joint Convention. Moreover, the two conventions had different objectives and it was preferable and caused no practical difficulties to accept the possibility of some double reporting rather than accept gaps in the reporting mechanism thus allowing Contracting Parties to keep sites, facilities or wastes outside the report.

Regarding the second topic, the Group of Experts felt that as nuclear installations ceased to be covered by the Convention on Nuclear Safety once a decommissioning programme had been agreed [see Article 2 (i) of the Convention on Nuclear Safety] there was a need to cover such installations under the Joint Convention and, accordingly, the definition of the term "radioactive waste management" was expanded to include "decommissioning" to mean "all steps leading to the release of a nuclear facility, other than a disposal facility, from regulatory control; [including] the processes of decontamination and dismantling".[7] The term "nuclear facility" should be understood as defined in the Safety Series Document No. 111-F, i.e.

> "a facility and its associated land, buildings and equipment in which radioactive materials are produced, used, handled, stored or disposed of (for example, repository) on such scale that consideration of safety is required".

(3) Radioactive waste or spent fuel resulting from military or defence programmes

A third element in the Joint Convention was whether, and if so, how, to cover radioactive waste and spent fuel within or resulting from military or defence programmes under the jurisdiction of states with nuclear weapons programmes, under the convention.

After much negotiation conducted in open-ended sub-groups, essentially among states with such programmes, radioactive waste or spent fuel within or resulting from military or defence programmes were dealt with in a package and covered under three different items in the Joint Convention:

- Article 3(3) on scope reads: "This Convention shall not apply to the safety of management of spent fuel or radioactive waste within military or defence programmes, unless declared as spent fuel or radioactive waste for the purposes of this Convention by the Contracting Party. However, this Convention shall apply to the safety of management of spent fuel and radioactive waste from military or defence programmes if and when such materials are transferred permanently to and managed within exclusively civilian programmes."

- For spent fuel or radioactive waste excluded from the Joint Convention because it is within military or defense programmes a reference is contained in the Preamble: paragraph (viii) of the Preamble recognises that such fuel and waste "should be managed in accordance with the objectives stated in the Joint Convention".

7. See Article 2 (b) of the Joint Convention.

- Finally, an extensive confidentiality clause was adopted in Article 36 (3) to provide for the "exclusive discretion" of the Contracting Parties concerned to decide "(i) whether such information is classified or otherwise controlled to preclude release; (ii) whether to provide information referred to in sub-paragraph (i) above in the context of the Convention; and (iii) what conditions of confidentiality are attached to such information if it is provided in the context of this Convention".

The experts, when considering this issue, discussed what was termed a "voluntary submission" of such fuels and wastes under the convention versus what was termed a "mandatory inclusion". This distinction, coded in language either as "shall not apply to such wastes, unless...."or "shall apply to such wastes, except..." was negotiated with arguments of transparency and public perception in mind. In the end, the views of the majority of the five nuclear weapon states prevailed and the concept of "voluntary submission", as described in (1) above, was adopted. However, this did not happen without a number of non-nuclear weapon states maintaining their preference for the "mandatory" submission of military fuels and wastes and expressing their concern that with the above-mentioned provisions in the convention text, such material could be managed at a lower safety level than that accorded to similar material from civilian nuclear applications.

(4) Transboundary movement of spent fuel or radioactive waste

A fourth controversial issue in the negotiation was that of drafting international norms regarding the transboundary movement of spent fuel or radioactive waste.

The subject is dealt with in Article 27 of the Joint Convention and is also addressed in preambular paragraph (xii) of the text, and is largely based on the IAEA's Code of Practice on International Transboundary Movement of Radioactive Waste as adopted by the General Conference in September 1990.[8] The code presumably will continue existing as a non-binding text reflecting good state practice.

Following the spirit and the purpose of the Code of Practice, preambular paragraph (xii) of the Joint Convention text recognises the sovereign right of every state to prohibit the import of radioactive waste into its territory. Furthermore, Article 27 of the Joint Convention ensures that transboundary movements of radioactive waste take place in accordance with internationally accepted safety standards and respective national laws and regulations. Finally, as did the Code of Practice in the form of a recommendation only, Article 27 of the Joint Convention, in effect, definitely disapplies the Basel Convention on Transboundary Movement of Hazardous Waste. Article 1 (3) of the Basel Convention reads: "Wastes which, as a result of being radioactive, are subject to other international control systems, including international instruments, applying specifically to radioactive materials, are excluded from the scope of this Convention."

In discussing the question of transboundary movement of radioactive waste, experts also had to take into account that some states have enacted laws forbidding final disposal of foreign waste on their territory. On the other hand, national industries reprocess foreign radioactive waste and return it to its country of origin. The convention could therefore neither directly encourage the setting up of regional

8. That code was requested by the IAEA General Conference in 1988, following reports on illicit transfer and disposal of hazardous wastes – a practice commonly called "dumping" – in territories of developing countries, notably in Africa.

repositories, nor prohibit it. The solution found was to refer the matter to the Preamble[9] and adopt language that was similar to the Basel Convention.[10]

Different from the Code of Practice, Article 27 of the Joint Convention prohibits the shipment of spent fuel or radioactive waste to Antarctica and, also different from the Code of Practice, the Joint Convention seems to accord less protection to states of transit, meaning states through whose territory a transboundary movement of spent fuel or radioactive waste takes place. The Group of Experts argued that the Joint Convention could not create new international law in this regard but had to refer to existing law including, *inter alia*, the body of law codified by the United Nations Convention on the Law of the Sea (UNCLOS). States not Parties to that body of law, however, maintained their opposition and achieved the exclusion of any specific reference to UNCLOS.

The Group finally decided upon a reference to existing international instruments in a twofold manner: (1) Article 27(1)(ii) provides that "transboundary movement through states of transit shall be subject to those international obligations which are relevant to the particular modes of transport utilised", it being understood that international obligations were only to include binding legal instruments; and (2) Article 27(3)(i) of the Joint Convention reads: "Nothing in this Convention prejudices or affects:...(i) the exercise, by ships and aircraft of all States, of maritime, river and air navigation rights and freedoms, as provided for in international law". The right of innocent passage, whether through straits or the exclusive economic zone, therefore remained unchanged.

(5) Disused sealed sources

A fifth somewhat extraneous element was that of so-called "disused sealed sources" which, depending on the applicable technical definitions, might or might not be considered to be radioactive waste when returned to the manufacturer. Given the safety risk of such sealed sources – if not properly and safely disposed of – notably for developing countries importing them for use in medicine or agriculture, the Group of Experts felt that a specific article in the Joint Convention should address this subject. The problem, however, was that of creating a legal obligation in certain countries with a potentially wide range of producers, sellers, trade companies etc. to import a matter they were not necessarily licensed to handle. The compromise reached was included as Article 28 in the convention text which provides that: "(1) Each Contracting Party shall, in the framework of its national law, take the appropriate steps to ensure that the possession, remanufacturing or disposal of disused sealed sources takes place in a safe manner", and furthermore, (2) that "A Contracting Party shall allow for reentry into its territory of disused sealed sources if, in the framework of its national law, it has accepted that they be returned to a manufacturer qualified to receive and possess the disused sealed sources."

(6) The reporting requirements

A sixth element of the Joint Convention was to be found in respect of the reporting requirement which, due to the specific subject matter, could not be modeled after the Convention on Nuclear Safety.

9. See Section II above.

10 . See eighth preambular paragraph of the Basel Convention.

According to Article 32 of the Joint Convention, national reports should not only address the measures taken by each Contracting Party to implement each of the obligations of the convention,[11] but should also contain a national list of radioactive waste and of spent fuel management facilities subject to the convention, their location, main purpose and essential features, and an inventory both of spent fuel and of radioactive waste that is in storage, that has been disposed of, or for radioactive waste, that has resulted from past practices. Furthermore, the inventory to be submitted to the review meetings of Contracting Parties should also contain a list of nuclear facilities in the process of being decommissioned and the status of decommissioning activities at those facilities.

This comprehensive obligation, in fact, requires Contracting Parties to report all national waste sites and facilities including a description of the material held at such facilities. The concept of an international inventory under IAEA auspices, floated by some experts, was not accepted.

(7) Participation of Contracting States in the meetings of Contracting Parties

A seventh element was, in fact, a legal and procedural matter and a "lesson learned" from the Convention on Nuclear Safety. When the preparatory meeting for the Convention on Nuclear Safety was held at the IAEA Headquarters in April 1997, some countries which had ratified the Convention on Nuclear Safety were not yet Contracting Parties due to the delay of ninety days, as provided for in Article 31 of the convention, and hence could not participate in the preparatory meeting for this Convention; a meeting, which, *inter alia*, adopts the rules of procedure and therefore sets the pace for any future review meetings. Article 29(3) of the Joint Convention therefore uses a distinction known to the Vienna Convention on the Law of Treaties between Contracting Parties and Contracting States (i.e. states that have signed and ratified the convention but for which the convention has not yet entered into force) and provides for the participation of Contracting States in the preparatory meeting for the Joint Convention.

(8) Environmental aspects

The last but not least novelty of the Joint Convention, or rather, an additional perspective from which the convention might be seen, are its references to environmental aspects for the safe management of spent fuel and radioactive waste.

The Joint Convention, during the early negotiation phase, was often referred to as the "sister convention" to the Convention on Nuclear Safety. However, as would need to be analysed in depth, the Joint Convention covers a much broader range of subjects and therefore has the potential to attract the attention of different national authorities and groups in society, notably those concerned with the environment.

Of the environmental elements in the Joint Convention the most obvious is contained in paragraph (xi) of the Preamble of the Joint Convention. It is the principle which is reflected in many national waste policies and which was only recently reiterated during the Special Session of the UN General Assembly on Sustainable Development (UNGASS) in June 1997 that "radioactive waste

11. As does Article 5 of the Convention on Nuclear Safety.

should, as far as is compatible with the safety of the management of such material, be disposed of in the State in which it was generated."[12]

Moreover, all major technical articles in the convention, such as the Articles on "General Safety Requirements", "Siting of Proposed Facilities", "Design and Construction", "Safety Assessment" of radioactive waste and of spent fuel management facilities contain an explicit reference to the environment. The Articles on "Siting of Proposed Facilities", in line with Agenda 21, address the potential transboundary effects of radioactive waste or of spent fuel management facilities providing for the need to consult Contracting Parties in the vicinity. Article 32 of the Joint Convention on reporting, as mentioned above, provides for an inventory of spent fuel and radioactive waste held in the territory of a Contracting Party and a resolution recognising, *inter alia*, "States' responsibilities in respect of the protection and preservation of the environment" and was adopted by consensus at the Diplomatic Conference.

In this context it must be borne in mind that the measures taken to implement each of these Articles not only have to be reported to the review meetings of Contracting Parties but first have to be adopted by legislative assemblies and defended vis-a-vis the public in the respective countries.

IV. The Diplomatic Conference

IV.1 The negotiations

On the basis of the above-described results, the Group of Experts, in March 1997, agreed to present its draft text to a Diplomatic Conference. Informal negotiations on open issues were conducted during the June 1997 session of the IAEA Board of Governors and continued until the eve of the Conference.

The Diplomatic Conference, convened in Vienna from 1 to 5 September 1997 by the IAEA, was attended by representatives from 84 states and four international organisations.

The substance of all of the 44 articles of the Joint Convention, as drafted by the Group of Experts, were agreed to by the Conference without challenge or even further discussion, except for the articles relating to three legal and political points which had eluded consensus.

These points were :

- an amendment to the scope of the Joint Convention [Article 3 (1)], proposed by the United Kingdom;
- the question whether or not the transboundary movement of spent fuel or radioactive waste required notification and consent of a state of transit; and
- the question of waste transactions conducted independently by Contracting Parties with non-sovereign entities.

12. However, as mentioned in Section II above, this paragraph cannot be interpreted as to preclude regional or international repositories because preambular paragraph (xi) at the same time "recognises that, in certain circumstances, safe and efficient management of spent fuel and radioactive waste might be fostered through agreements among Contracting Parties to use facilities in one of them for the benefit of the other Parties, particularly where waste originates from joint projects".

Regarding the latter issue, China sought to rule out that Taiwan (China), which has nuclear facilities producing spent fuel and radioactive waste, might receive by implication the status of a sovereign state. A number of delegations, however, felt that express language to this effect was not needed in the convention and therefore opposed the inclusion of a specific paragraph proposed by China during the Diplomatic Conference.

Regarding the question of transboundary movement, some transit states, in particular Turkey, Morocco, some South American countries and New Zealand speaking also for some states in the south pacific region, strongly requested a notification and consent procedure.

These states argued that the principle of prior notification and consent had received widespread support in relation to transboundary movement of hazardous wastes, as was reflected in a number of international instruments such as the Basel Convention, the Convention on the Ban of the Import of Hazardous Wastes into Africa and on the Control of their Transboundary Movements within Africa (Bamako Convention), the IAEA Code of Practice, the IAEA Regulations for the Safe Transport of Radioactive Material and Euratom Directive 92/3. Countries of origin or destination of such transboundary movements however, gave preference to their right of innocent passage as embodied in UNCLOS. By a vote of 57 in favor and 5 against, with 2 abstentions, the article on transboundary movement stayed as drafted by the Group of Experts.

The question of prior notification and consent, however, endured in a different form, namely, as a resolution adopted by the Conference by consensus and included in the Final Act. In the operative part of this resolution, the Conference "urges all States parties to the Convention to take into full consideration the IAEA Regulations for the Safe Transport of Radioactive Material (1996), in particular in the case of transboundary movement of spent fuel and radioactive waste, notably in the formulation and implementation of their national laws and regulations". In addition, the Conference invited the Agency, in consultation and where appropriate in collaboration with the competent organs of the United Nations and with the specialised agencies concerned, including IMO and UNEP to keep under review the existing rules and regulations with respect to the safety of the transboundary movement of spent fuel and radioactive waste.[13]

Regarding the first issue, the United Kingdom submitted an amendment to the Diplomatic Conference providing that the Joint Convention apply to the full range of spent fuel management activities and therefore include the reprocessing activity as such. The proposal was understood as a further broadening of the scope of the convention. Other states, while not objecting to this concept, felt that the proposed amendment on such an important matter should have been consulted in advance. In the end, after a number of votes, a drafting proposal submitted by India relating to the scope of application of the Joint Convention was adopted, so that Article 3(1) of the Joint Convention is now divided into two sentences. The first sentence reads: "This Convention shall apply to the safety of spent fuel management when the spent fuel results from the operation of civilian nuclear reactors" thereby clearly including, as a matter of principle, the safety of spent fuel management in the Joint Convention. The second sentence reads: "Spent fuel held at reprocessing facilities as part of a reprocessing activity is not covered in the scope of the Convention unless the Contracting Party declares reprocessing to be part of spent fuel management" and therefore excludes only the reprocessing activity as such from the scope of the convention. In this context, France, the United Kingdom and Japan made a declaration during the Diplomatic Conference to the effect that they "shall report within the context of the Convention on reprocessing as part of spent fuel management".

13. See IAEA document GOV/INF/821-GC(41)/INF/12.

IV.2 Adoption by vote

The Diplomatic Conference rose after a motion by New Zealand to put the convention as a whole to a vote on the grounds that the issue of transboundary movement and more particularly the question of notification and consent of transit states was not sufficiently addressed in the convention.[14]

The adoption of the convention, however, was not at stake. Out of 67 states present at the time of voting 2, namely New Zealand and Pakistan voted against the convention. Three states abstained and an overwhelming majority of 62 states voted in favour. The Final Act of the Diplomatic Conference was signed on 5 September 1997 by 65 states; three states present did not sign the Final Act.

V. Outlook

In establishing a convention with a broad scope of application closely tied to the Convention on Nuclear Safety, the negotiations clearly intended to complete a norm-making project initiated at the 1991 "International Conference on Nuclear Safety: strategies for the future". This project was to elevate to international law, the body of recommendations, codes and principles generally referred to as "soft law" containing internationally accepted best safety practices applicable to the entire nuclear fuel cycle. Safety culture should indeed cease to be a lofty concept but rather be described in detailed technical terms and worded in the language of international law.

A first analysis could conclude that, added to the existing norms on the physical protection of nuclear material, the rules of international notification, cooperation and assistance in case of accidents and the liability regime, the international community has now endowed itself with a complete finite *corpus juris* – the international law of nuclear safety.

Such static interpretation, however, in the opinion of the authors, does not seem to be satisfactory. The norms established in the 1960s and the 1970s are not necessarily adequate to meet the stricter legal demands of the present and the future – as demonstrated by the recent amendment and complimentary norms adopted in the field of nuclear liability.

Moreover, implementation of the Convention on Nuclear Safety and of the Joint Convention will presumably create new state practice by the mere functioning of the peer review mechanism. Bilateral and regional agreements will further develop the basic principles so far internationally agreed.

Therefore, while the adoption of the Joint Convention no doubt constitutes a major leap in codifying nuclear safety norms, many steps are still required to give this instrument its full potential.

14. See also the negotiations in the Group of Experts, Section III.3(4) above.

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

by Roland Dussart Desart*

A. Introduction

A.1. The beginnings: the fundamental principles

The arrival of nuclear energy gave rise to the need, almost half a century ago, to devise a regime of liability in keeping with the new risks associated with this technology: risks that were not only catastrophic, but also insidious, because they were incapable of detection by ordinary human beings. The principles underlying this regime have stood the test of time, even if the accusation is now sometimes made that some of them were also designed to protect an industry in its infancy.

These principles are as follows:

- the operator of a nuclear installation is objectively liable, meaning that the victim of nuclear damage does not have to prove fault in order to be compensated;
- channelling of the liability onto the operator alone, both to avoid sterile debate between professionals and to allow the insurance sector to mobilise the necessary resources;
- financial limitation on the liability of the operator.

The international nature of the nuclear industry, the serious risk of transborder damage and the carriage operations in this sector led to international conventions being entered into which, having enshrined the three abovementioned principles, were designed in particular to:

- avoid jurisdictional conflicts arising between a number of courts belonging to more than one state;
- prevent the available coverage from being unwisely used up by excluding from its benefit those assets connected with the operation of installations;
- fix uniform periods of limitation;
- regulate transport operations in order to guarantee continuity of coverage;

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* This article was initially published in *Nuclear Law Bulletin* No. 75 (2005). Roland Dussart Desart is the Head of Division in the Office of President of the *Service Public Fédéral Économie, PME, Classes Moyennes & Énergie* in Belgium. Facts given and opinions expressed in this article are the responsibility of the author alone.

- unify and limit clauses excluding liability.

These were the guiding principles that led to the signing, in succession, of the Paris Convention on Third Party Liability in the Field of Nuclear Energy,[1] a regional instrument within the framework of the OEEC (which became the OECD in 1961) in 1960 (referred to hereinafter by the initials PC), and the Vienna Convention on Civil Liability for Nuclear Damage,[2] a worldwide instrument under the auspices of the IAEA, in 1963 (the VC).

The perceived need to increase the amounts of cover paid for out of public funds led to a third instrument being entered into on 31 January 1963, the Brussels Supplementary Convention (BSC)[3] which offers some states that are Parties only to the Paris Convention the security of two additional tiers of compensation: a second one payable by the installation state where the incident originated and a third made up of contributions from the Parties, prorated according to their Gross National Product and their installed nuclear capacity.

There have been some interim modifications to this machinery, mostly to increase the amounts of money available, but overall it is still in place.

A.2. The impetus for the modernisation process

The Chernobyl catastrophe acted as a catalyst for the negotiation and adoption of a number of international conventions in the field of nuclear energy. I will cite here instruments such as the Convention on Early Notification of a Nuclear Accident (1986), the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (1986) or the Convention on Nuclear Safety (1994).[4]

It further demonstrated how inadequate was the coverage provided under the existing conventions on liability for nuclear damage, and showed the extent of crossborder damage, which had previously been a virtual concept but which suddenly took on a very real dimension.

The Joint Protocol

In the field of liability for nuclear damage, the first bridge to be hastily put in place between the Vienna and Paris Conventions, came with the Joint Protocol on the Application of the Vienna Convention and the Paris Convention[5] (adopted on 21 September 1988, entered into force in 1992), which extends the benefit of the application of whichever of these two Conventions the installation state is Party to, to the States Parties to the other convention, provided they have ratified the Joint

1. The text of the Paris Convention currently in force is available on the Web site of the NEA at: www.nea.fr/html/law/nlparis_conv.html.

2. The text of the Vienna Convention of 1963 is available on the Web site of the IAEA at: www.iaea.org/Publications/Documents/Infcircs/1996/inf500.shtml.

3. The text of the Brussels Convention currently in force is available on the Web site of the NEA at: www.nea.fr/html/law/nlbrussels.html.

4. The text of these three Conventions is available on the Web site of the IAEA at: www.iaea.org/Publications/Documents/Conventions/index.html.

5. The text of the Joint Protocol is available on the Web site of the NEA at: www.nea.fr/html/law/nljoint_prot.html.

Protocol. If the Parties to the VC have for the most part ratified this Protocol, the Parties to the PC have been less diligent about doing so.[6]

Revision of the Vienna Convention[7]

In the same time-frame, programmes for international cooperation on nuclear safety have been developed, and this has revived interest in the Vienna Convention, to which several countries from Central and Eastern Europe have now adhered. In the same way as the Paris Convention, that convention however seemed to have become outdated in a number of respects. In 1990, as a result, the IAEA set in motion the process of revision of the Vienna Convention. The Parties to the Paris Convention played an active part in this work and drew on it quite openly when they began their own process.

The Convention on Supplementary Compensation for Nuclear Damage (CSC)[8]

Given the relatively low levels of coverage suggested by the Parties to the Vienna Convention, the proposal was made to supplement it from the outset by an instrument calling upon international cooperation.

This Convention on Supplementary Compensation, which for a long time was referred to as the "Umbrella", is intended to offer a worldwide supplement to the amounts provided for under national law, whether these are based on the Vienna Convention or the Paris Convention, or comply with a number of criteria that guarantee equivalence, which are listed in an Annex. This formulation has been called the "grandfather clause". In practice, as currently drafted, especially as regards the provision in its Annex requiring compliance with the legal conditions in force on 1 January 1995, it affects only the United States.

The CSC was also designed to serve as an umbrella for regional supplementary conventions, both those already in existence, like the Brussels Supplementary Convention, or still at the concept stage, like the regional convention discussed during the drafting work by the South American states, or another one that might be put in place in the Far East.

Given the small number of ratifications, everyone is asking when this Supplementary Convention will enter into force. It will require ratification by states with a substantial number of nuclear installations, foremost among them being the United States, the main promoter of the convention, or perhaps France, Russia or Japan, before this instrument becomes a reality and attracts other states to adhere to it.

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6. As at 10 March 2005, 14 Parties to the VC (Bulgaria, Cameroon, Chile, Croatia, the Czech Republic, Egypt, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic and Ukraine) were Parties to the Joint Protocol while only nine Parties to the PC (Denmark, Finland, Germany, Greece, Italy, the Netherlands, Norway, Slovenia and Sweden) have ratified that instrument.

7. For a general analysis of the topic, see Vanda Lamm "The Protocol amending the 1963 Vienna Convention", *Nuclear Law Bulletin* No. 61, p. 7.

8. For a general analysis of the topic, see Ben McRae "The Compensation Convention: Path to a Global Regime for Dealing with Legal Liability and Compensation for Nuclear Damage", *Nuclear Law Bulletin* No. 61, p. 27.

Revision of the Paris Convention on Third Party Liability in the Field of Nuclear Energy (PC) and the Brussels Supplementary Convention to the Paris Convention (BSC)

The completion in 1997 of the process of revision of the Vienna Convention coincided with the official start of work on revising the Paris Convention, which in turn was followed by work starting on the revision of the Brussels Supplementary Convention (1999).

Because the Vienna and Paris Conventions are so closely related, it is possible here to make an almost systematic comparison between the results of the two revisions.

The two Supplementary Conventions will be examined at the end of the article.

B. The Revision of the Paris Convention[9]

B.1. Problem areas

The revision process will always seem too long to an outside observer. The time it took to revise the Vienna Convention and to update the Convention on Supplementary Compensation will remain in people's minds: the temptation to go back to the beginning was too great, especially in a forum where the Contracting Parties, in particular those of them that have nuclear installations, were in the end in the minority. Much time was also lost in trying to find ways of making the state liable as the issuer of operating licences.

It also has to be admitted that the length of time it took to revise the Paris and Brussels Conventions, from 1998 to 2004, was also fraught with setbacks.

The different approaches of the Law of the Sea

Even the extension of geographical scope to cover exclusive economic zones, with all its corollaries in terms of jurisdiction of the courts, gave rise, as it did in Vienna but between different Parties, to a prolonged dispute illustrating the different approaches to the law of the sea.

The search for other means of financing

In setting themselves very ambitious standards at the outset, especially with regard to the minimum amounts to be offered, the negotiators found themselves faced with a hesitant insurance market. True, the convention also allows resort to financial guarantees, but the cost of these and their scarcity make them unattractive. At one point during the Vienna negotiations the setting up of "managed" voluntary pools of operators had been envisaged, but in the end this did not attract sufficient support.

9. The Protocol of 12 February 2004 amending the Paris Convention is available on the NEA Web site at : www.nea.fr/html/law/paris_convention.pdf.

Assessing the terrorist threat after the attacks of 11 September 2001

The 11 September attacks undoubtedly gave the insurers a rude awakening in their assessment of the risks. Though the risk of terrorism was clearly well covered by the Paris Convention, since there is no clause excluding terrorism in Article 9, the probability of a nuclear power station becoming the object of such an attack was suddenly dramatically increased, which quite naturally prompted a new assessment of capacity, and a request from the insurance sector for Article 9 to be reviewed. In the final analysis, terrorism will remain covered by the conventions; what is more, the way in which it is covered will, as in the past, for reasons connected with « historic » forms of terrorism, sometimes be subject to special arrangements whereby the state acts to insure the risk, in exchange for a premium.

Adaptation or adoption of other international conventions or instruments containing clauses excluding nuclear risks

The development of other international instruments has had to be kept under constant scrutiny, given the risk that the negotiators of such texts would base themselves on a literal reading of the old Paris Convention, only to find that their cover was inadequate and delete the nuclear exception, or allow claims for damages beyond those covered by the twin Paris/Brussels instruments. It was therefore necessary not only to explain in other fora the existing regime with all its extensions and interpretations (for example the PC provides a coverage of 15 million Special Drawing Rights (SDR) but there is a recommendation by the NEA[10] to increase this to SDR 150 million), but also to "sell" the positive effects of a revision whose date of entry into force nobody knew, on the basis of a protocol that had not yet been opened for signature. The most striking example in this respect is still that of the EU Directive on environmental liability,[11] which was being negotiated while work was going on to revise the Paris Convention and which was adopted a short time later.

Adoption of European Union Council Regulation (EC) 44/2001[12]

This regulation, on jurisdiction and the recognition and enforcement of judgments in civil et commercial matters, suddenly deprived most of the Parties to the Paris Convention that are also members of the European Union (excluding Denmark) of the right to adopt international conventions derogating from the provisions of that regulation. That was indeed the purpose of revising Article 13, which derogated from the Community law principle of deciding which court has jurisdiction on the basis of the domicile of the victim, thus allowing one single forum. In the end, it took two years to convince the competent European Union bodies of the relevance of the provisions proposed, and for the Parties that are members of the EU to be authorised to sign the Amending Protocols, on 12 February 2004.

10. Recommendation of the Steering Committee of 20 April 1990 [NE/M(90)1].

11. Directive 2004/35/EC of the European Parliament and the Council of 21 April 2004 on environmental liability, as to the prevention and compensation of environmental damage [*Official Journal* No. L 143 of 30/04/2004 p. 0056-0075].

12. Council Regulation (EC) n° 44/2001 of 22 December 2000 on jurisdiction, recognition and enforcement of judgments in civil and commercial matters [*Official Journal* No. L 012 of 16/01/2001 p. 0001-0023].

B.2. Key points in the revision of the Paris Convention, in light of the Vienna Convention

B.2.a. Definitions

1. Nuclear incident

The first definition to feature in the Paris Convention [Article 1(a)(i)] is noticeably shortened, reducing a nuclear incident to any occurrence or succession of occurrences having the same origin which causes nuclear damage.

The part of the original definition of an incident relating to the radioactive properties and hazardous properties that go to make up a nuclear incident are moved into the new definition of nuclear damage, which means that the notion of a nuclear incident still has all the same components, once all the various elements are brought together.

This phrase in the definition confirms the interpretation already given to the pre-existing definition, whereby even emissions authorised by the rules could qualify as an incident where they gave rise to nuclear damage.

On the other hand, the corresponding definition that appears in Article I(l) of the Vienna Convention adopted identical wording, but was accompanied by supplementary language that also included "as regards preventive measures, [any occurrence that] creates a serious and imminent threat of damage of this kind".

The Vienna definition thus includes a temporal paradox which assimilates a nuclear incident to a threat of damage, while nuclear damage can only be caused by a nuclear incident. The Vienna Convention resolves this paradox in its definition of preventive measures, which are presented as being taken after a nuclear incident. The serpent is thus biting its own tail.

The Paris Convention attempts another solution to avoid this paradox, by its definition of preventive measures, which are subject to compensation, whether they are taken after a nuclear incident has occurred or after an event that creates a serious and imminent threat of nuclear damage, to reduce nuclear damage once it has actually happened, in other words after a "true" nuclear incident. This is designed to avoid a situation where only "ordinary" safety measures such as acquiring equipment or training emergency teams are eligible, while, as will be seen later with regard to the definition of safety measures, some national laws have mechanisms that are if not equivalent in effect, then at least very similar.

2. Nuclear installations

The Protocol to amend the Paris Convention expanded the definition of the nuclear installations covered by Article 1(a)(ii) to those installations in the course of decommissioning as well as installations intended for the disposal of nuclear substances. These two extensions clearly do not prevent one of the Parties from relying on Article 1(b) of the convention, in order to obtain an exemption for these installations from the Steering Committee of the OECD/NEA on the grounds that they present a reduced risk. In the case of the disposal, their operator will most probably be a public authority, given the exceptionally long-lasting nature of the operation.

If the revised Vienna Convention remains silent as to these two types of installations, it still appears that they are covered, because final disposal is after all still storage.

The Vienna Convention is more explicit on a different issue: it now expressly states in the new Article I B that it does not apply to nuclear installations used for non-peaceful purposes, even though one French diplomat did point out the paradox in the adage *si vis pacem para bellum.*

It differs in this respect from the Paris Convention which, in the absence of any express exemption, can be taken to apply to military installations where these installations fulfil the criteria in the definition. As to the BSC, it expressly refers, in its one paragraph of preamble, to the use of nuclear energy for peaceful purposes, and says so in Article 2. It therefore does not apply to military nuclear installations; it is hard to see how a mechanism for inter-state co-operation could apply to manifestations of national sovereignty such as these.

3. Damage

Both the Paris Convention [Article 3] and the Vienna Convention [Article I] offer a laconic definition of damage, limited to personal injury and damage to property, and excluding damage to the installation. National legislators were thus free in practice to come up with an ad hoc definition, or even to refer to the general law.

A laconic definition or an incomplete one?

The definition of damage was the subject of long debate during the review of the Vienna Convention, the concern being to expressly cover the broadest field possible, while at the same time laying down certain safeguards to avoid abuses that could result in the available coverage being prematurely used up, at the expense of the most "traditional" kinds of damage.

In the Paris Convention as amended [Article 1(a)(vii)], nuclear damage now covers:

"1. loss of life or personal injury;

2. loss of or damage to property;

and each of the following to the extent determined by the law of the competent court:

3. economic loss arising from loss or damage referred to in sub-paragraph 1 or 2, insofar as not included in those subparagraphs, if incurred by a person entitled to claim in respect of such loss or damage;

4. the cost of measures of reinstatement of impaired environment, unless such impairment is insignificant, if such measures are actually taken or to be taken, and insofar as not included in subparagraph 2;

5. loss of income deriving from an economic interest in any use or enjoyment of the environment, incurred as a result of a significant impairment of that environment, and insofar as not included in subparagraph 2;

6. the costs of preventive measures, and any loss or damage caused by such measures."

For all these types of damage, with the exception of those referred to in item 6, the loss or damage must result from ionising radiation emitted by a source inside a nuclear installation or emitted by fuel in a nuclear installation, or nuclear substances that are being transported (…) whether the loss

is caused by the radioactive properties of this matter or from a combination of these properties with toxic, explosive or other properties (…).

Subtle differences between Paris and Vienna: a detail or an obstacle?

It should be noted here that there is a difference from the amended Vienna Convention which includes in the foregoing list – which served as a model for the Paris text – an Article I(1)(k)(vii) referring to "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 actual object of this last subsidiary provision was never very clear in Vienna and its promoters, who wanted more than anything else to have a "catch-all" type of clause, were unable to put forward any convincing examples. Faced with this uncertainty, and the impossibility of giving it a meaningful definition, this item did not appear in the final amended Paris Convention. The fear was expressed that this difference might cast doubt on the ratification of the CSC by one of the Parties to the Paris Convention as amended. In this respect, Article II of the CSC makes the States Parties to the Paris and Vienna Conventions, as well as to their respective amendments, fully eligible; ratification of the CSC would also mean adoption of the provisions on the definition of damage found both in the body of the CSC and in its Annex. All the Parties concerned would have to do is make a finding that such a provision "is not permitted" in the law of the competent court.

Definitions ancillary to that of damage

The definition of damage contains new concepts which in turn require supplementary definitions:

> Measures of Reinstatement: reasonable measures, approved by the competent authorities, which aim to reinstate or restore damaged components of the environment or to reintroduce such components into the environment. The law of the state where the damage is suffered shall determine which authorities are competent to give such approval.
>
> Preventive Measures: reasonable measures taken by any person, after a nuclear incident has occurred or an event taken place that causes a serious and imminent threat of nuclear damage, to prevent or reduce the damage referred to above, authorised by the competent authority if this is required by the law of the state where the measures were taken.
>
> Reasonable Measures: found under the law of the competent court to be appropriate and proportionate, having regard in particular to the nature and extent of the damage, the extent to which such measures are likely to be effective, and the relevant scientific and technical expertise.

Damage to the environment: a reasonable challenge

Where environmental damage is concerned, it should be borne in mind that it is often forgotten that cases of *res nullius* are increasingly rare: much of what we consider as being part of the environment belongs to an actual or legal person, which may be a public body, and which, as such, already has the right to seek reparation for damage to property, and this reparation, under the general law, must in principle be made in kind.

The extent of the environmental damage that can be taken into consideration is governed by a number of factors:

- it is limited to the effective reinstatement of the impaired environment;
- insignificant impairment is excluded;
- the reinstatement measures must be reasonable;
- they have to be approved by the competent authorities;
- measures to reintroduce destroyed components must also be reasonable.

This framework is even rounded off by a definition of reasonable measures which could well appear shocking to judges who apply the principle of proportionality on a daily basis, but they will be consoled by the fact that the circumstances to be taken into account are given for information only.

Loss of profit deriving from enjoyment of the environment

The most original feature, and the one most likely to present a new risk for the insurance companies, is undoubtedly that of loss of profit deriving from use of the environment.

However, this notion too is narrowly drawn. While the principle has to be present in the laws of the Parties, they are free to vary its scope of application. It is only loss of income that is subject to compensation: anyone who merely has rights of enjoyment of the environment without earning money from it has no right to be compensated. What is more, the loss of income must derive from a significant impairment to that environment. There will no doubt be attempts to emphasise the adjective significant, but on the basis of current trends, it is probable that this test will more and more often be satisfied. The essential feature is the requirement that there be actual impairment to the environment itself. There can thus be no question of compensation for loss resulting simply from fear or rumour.

One assessment among others of the new definition of damage

Great importance was attached to the definition of damage both in Vienna and Paris. However, for civil law countries that have watched the notion of damage developing through case-law rather than the building up of a body of statutory provisions, the respective scope of the damage covered before and after ratification of the Protocol will often be quite similar, simply more clearly delineated.

A detailed demonstration of this can be given by reference to the law of one State Party, Belgium. Items 1 and 2 of Article 1(a)(vii) do not pose any problems, in the PC text; item 3 was already included under items 1 and 2. Preventive measures (6) are covered by application of the general insurance regime, and the extent of environmental damage (4) is, in the end, relatively limited in the sense that a substantial portion of the reinstatement measures will fall under item 2.

The new definition certainly has several things to recommend it: to a large extent, it unifies the concept of damage, even if items 3 to 6 are limited by the law of the competent court; it follows the trend and the concepts used in other “modern” conventions; it is compatible with the VC and the CSC and it allows the Joint Protocol to be applied. Finally, in spite of everything, it leaves states freedom to manœuvre in the definition of some aspects of damage and, ultimately, it provides for recourse to the courts to decide whether certain measures are reasonable and proportionate.

A further direct and immediate advantage of this extensive and explicit definition finally emerged with the justification of the nuclear exclusion clause in the European Directive on environmental liability.[13] Without this definition, the nuclear exclusion clause adopted in that draft directive would not have survived, and that would have cast doubt on the exclusive nature of the cover of nuclear incidents by the twin Paris/Brussels regime, and with it the whole basis of the system that had been in existence for some forty years.

However, one cannot hide the fact that, for all its detail, the definition of damage will continue to be written about and will still be of interest to the legislators.

As to preventive measures, for example, there could be a number of very different approaches to having the cost of intervention borne by the various public services. In the most extreme case, such intervention would be deemed to be part of the normal duties of the authority concerned, and it would therefore not be able to recover the costs. At the opposite extreme, some legal systems appear to provide for fixed amounts to be billed upon intervention, which are supposed to represent a share of the costs incurred in keeping these services available in readiness for an incident. In the case of a major disaster exceeding the available coverage, the state might be expected to waive any such claims (this has already happened in Belgium with fire insurance); the impact of "pricing" of this kind might be greater in the case of minor incidents.

B.2.b. Geographical Scope

While the original Vienna Convention was silent on this point – and thus, in principle, generous – Article 2 of the Paris Convention confined its application to incidents and damage occurring within the territory of the Parties alone, except where a Party enacted more generous provisions in its national law. Certain Parties have made use of this option, but most of them have not; this timid provision, in contradiction with the principle that the polluter pays, was finally unable to hold out against the global trend.

The new machinery set up under Article 2(a) extends the benefit of the Paris Convention to cover damage that occurs within the territory:

- of the Contracting Parties;
- of the Parties to the Vienna Convention that are also Parties to the Joint Protocol, provided the state of the operator is also a Party to the said Protocol;
- of non-Contracting States that do not have nuclear installations;
- of other non-Contracting States that have such installations but offer reciprocal advantages based on principles identical to those in the Paris Convention, such as the objective and exclusive liability of the operator, recognition and enforcement of judgments and the free transfer of compensation.

This machinery thus satisfies "non nuclear" states that are neighbours of Parties to the Paris Convention and often highly critical of them, because they will now be able to benefit unconditionally from it. The risk remains, however, that the victims of damage in the territory of such states will try to make use of the Convention both in the courts of the installation state and the courts of the place where the damage occurred, if, for example, they did not obtain full satisfaction from the first court to

13. See note 11.

hear the case. The execution of the judgments of courts that do not have jurisdiction under the PC can be prevented in the territory of the Parties; on the other hand, if the operator has assets in the territory of this non-Contracting State, the issue becomes more problematic.

As to states with nuclear installations, it should be noted that Article 7(g) provides that a Contracting Party may set amounts of liability for nuclear damage that are lower than those fixed under Article 7 or Article 21(c) (phasing-in, see below), where the non-Contracting State does not grant equivalent reciprocal advantages. Article 7(g) thus defines the principle of reciprocity contained in Article 2(a)(iv), as applying only to the compensation offered. The content of Article 7(g) might have formed part of Article 2, but it seemed more logical to group all the financial provisions together in Article 7. This provision could give rise to problems of allocation, *a fortiori* if several non-Contracting States are claiming different amounts. It is, of course, always possible to find mathematical formulae to express this unequal division, but, on the ground, the fact that damage is spread out over time means that those responsible for dividing up the amounts of compensation could be faced with an extremely delicate task.

Article I A, introduced into the Vienna Convention, sets out machinery which has a similar effect but is based on the reverse logic: the scope of application is, *a priori*, generous, but counterbalanced by the possibility each Party has of excluding damage occurring in the territory of non-Contracting States where these have nuclear installations and do not offer reciprocal advantages. However, it does not go into the same level of detail as the Paris Convention; it will be a matter for interpretation which of the texts will in the end be judged to be clearer.

B.2.c. Transport

The transport regime, governed by Article 4 of the Paris Convention, underwent only one change of substance, with the insertion of a new Article 4(c), of which there is no equivalent in the Vienna Convention. This provision limits the option of transferring liability for carriage to another nuclear operator to cases where the latter has a direct interest in the said carriage. This is a novel measure, the object of which is to put an end to the practice noted by some Parties of designating operators subject to very low levels of liability as the operators liable for certain carriage operations. This practice could be viewed as distorting competition; it also increases the risk and the amount of the compensation to be paid by the state if a disaster should occur, with the difference between the reduced amount and EUR 700 million being payable by the authorities responsible for such undervaluations.

B.2.d. The amounts

The amounts discussed below are sometimes covered by insurance, sometimes by financial guarantees, and sometimes by commitments made by the public authorities. We are not referring here to budgetary funds that are called upon on a regular basis such as those set up by the IOPC Funds[14] to compensate the victims of oil spills: it is a characteristic feature of the Paris and Brussels Conventions that they have never been put into practice. It would thus be counterproductive to permanently tie up the capital committed to them, the management of which would give rise to problems on a daily basis and require cumbersome permanent structures to be set up.

14. International Oil Pollution Compensation Funds.

The units of account

The Vienna Convention used the gold dollar as its unit of reference. Questions were raised about the actual value of this unit of account. The problem was solved by adopting the only workable unit for a global instrument, the special drawing right [Article V]. This basket of currencies managed by the International Monetary Fund was put together, during the revision process, from American dollars (USD), pounds sterling (GBP), Japanese yen (JPY), French francs (FRF) and German marks (DEM). Since then, the euro (EUR) has taken the place of the franc and the mark.

Up until now, the Paris and Brussels Conventions had used the SDR as the unit of account. The SDR was supposed to offer the Contracting Parties two appreciable advantages: on the one hand, a degree of stability in the face of the risk of competitive devaluations, and on the other, neutrality for the Parties each of whom had their own monetary instruments. It was, however, paradoxical to make the compensation of victims who were presumably European depend on the progress of a currency as unstable as the dollar or as distant as the yen. These two currencies in fact represent between them more than 50% of the SDR basket.

The introduction of the euro changed the nature of the problem: this currency is already shared by 9 of the 14 "historic" Contracting Parties, among them most of the main contributors under the Brussels Supplementary Convention.

The replacement of the SDR by the euro brings a series of immediate advantages:

- complete transparency not only for Parties that have already adopted the euro but also for their citizens;
- easier mobilisation of insurance capabilities which, in the euro zone, no longer need to take account of exchange risks between their national currency and the SDR;
- greater stability for most of the other Parties whose economy and currencies have a natural tendency to converge with those in the euro zone rather than those of the United States or Japan.

The base amounts

Article V of the Vienna Convention henceforth provides, instead of USD 5 million gold which could be valued at EUR 50 million, for an amount of liability of SDR 300 million (equivalent to EUR 360 million), which may be reduced to SDR 150 million where the installation state makes up the difference.

Article 7 of the Paris Convention set a maximum amount of liability of the operator at SDR 15 million, or EUR 18 million. This amount could further be reduced by two-thirds, for low-risk installations or for transport operations. Most of the Contracting Parties did not wait for work to begin on revising the Paris Convention, any more than did those concerned with the Vienna Convention, to make substantial changes to the amounts laid down in their respective national laws. Taking into consideration the growing disparity between the amounts offered by the legal systems of the Contracting Parties, the inadequacy of the amount in the Paris Convention and the Chernobyl disaster, the Steering Committee of the NEA adopted a recommendation in 1990[15] whereby the Contracting

15. See note 10.

Parties were invited to bring the amount for a nuclear operator's liability up to at least SDR 150 million, or around EUR 180 million.

Article 7 of the convention thus underwent several fundamental changes. Going forward, it presents the amount at which the Parties must fix the operator's liability as a common minimum and no longer as a maximum. This new baseline thus expressly leaves the Parties free either to fix a different, higher level of liability (which still represents a maximum for the operator), or to adopt an unlimited liability regime.

The new base amount is raised to EUR 700 million, which represents almost a fourfold increase in the SDR 150 million recommended in 1990. It was arrived at by taking into account not only currency erosion, but also the multiple factors which serve to increase the amount needed if an incident should occur, in different degrees depending on the law of the Parties, such as the extension of the geographical scope to non-Contracting States, on certain conditions, or also the new definition of damage extending to the environment or to preventive measures. The ultimate criterion for setting the common base was, finally, that of insurance capability for civil liability for nuclear damage.

A novel option henceforth institutionalised: unlimited civil liability

It should be pointed out here that Germany chose the option whereby the operator is subject to unlimited liability, with German law nonetheless always fixing that portion of the operator's liability for which it must have cover from a third party. Beyond that, the operator must compensate the victims until its own assets are exhausted.

The compatibility of this system with the Paris Convention and its implications in the light of the tiers in the Brussels Supplementary Convention have long fuelled the debates of the NEA Group of Experts on nuclear third party liability which led to the adoption of recommendations that make fairly free with the texts so that Germany can continue to benefit from the international tier of the BSC. Since Switzerland took the same course without however having ratified the Paris Convention, the negotiators thus had two additional reasons to amend the Paris and Brussels Conventions: to better integrate the unlimited liability regimes, while satisfying Germany and preparing the way for Switzerland's entry.

Article 10(b) of the revised PC adapts, for those operators whose liability is not limited, the obligation already incumbent on "ordinary" operators under Article 10(a), to have and maintain a financial security of the amount established under Article 7(a) or (b). Since, in the absence of a ceiling, an operator cannot obtain unlimited security or insurance, the Contracting Party must assign it a minimal limit, which clearly may not be less than the minimum established for operators benefiting from a regime of limited civil liability, under the same Article 7 (a) or (b).

Phasing-in

The Vienna negotiators put in place a transitional formula for states unable to offer the new base amounts straight away. By virtue of the option opened up by Article V(1)(c), states (which includes Parties to the VC) may, for 15 years from the entry into force of the Protocol, offer a transitional amount of liability of not less than SDR 100 million (= EUR 120 million). The same article allows a still lower amount, provided the state compensates up to SDR 100 million.

The raising of the base amount in the Paris Convention could also have proved an obstacle to its ratification by new Parties. Article 21(c) of the final provisions of the Paris Convention was also amended so that only those states adhering after 1 January 1999 (in which respect the Protocol amending the PC is visibly more restrictive than the one that amends the VC), may limit the operator's liability to EUR 350 million for a period of five years starting from 12 February 2004**.** It should be noted here that a Party that relies on this technique may nevertheless ratify the Brussels Supplementary Convention as long as it agrees to cover, from public funds, the difference between the operator's liability and the EUR 700 million minimum [BSC, Article 3(e)].

Special cases: carriage and low-risk installations

Article V(2) of the revised Vienna Convention now allows a special amount to be fixed for low-risk installations, as long as this is not less than SDR 5 million (equivalent of EUR 6 million).

The revised Vienna Convention thus arrived at the amount set in the old Paris Convention for these same installations.

In Paris, these amounts were also the subject of an upward revision, proportionately much higher than the rise in the amount of the civil liability of the operator.

The minimum amount for low-risk installations is multiplied by 12, giving EUR 70 million pursuant to Article 7(b)(i); the minimum amount for carriage is multiplied by 14, giving EUR 80 million pursuant to Article 7(b)(ii).

It would be difficult to analyse these amounts objectively since they were the fruit of political compromise, and, for instance, to justify the difference of EUR 10 million between the respective minimum amounts for low risk installations and carriage. The increase coefficient could be explained, for carriage, by concern about drawing attention to an activity that is often controversial and, for low-risk installations, by the realisation of what the cost of pollution, even at a low level, would be in populated areas like university campuses.

In the end, in Vienna as well as Paris, it is the state that assumes the risk of the wrong decision having been taken with regard to the "base" amounts, in other words EUR 700 million for Paris and EUR 360 million for Vienna.

The State guarantee

The Paris Convention, by contrast with Article VII(1) of the Vienna Convention, did not contain any fallback clause for cases where the insurance or the financial security of the operator became unavailable, for example in case of bankruptcy. It might indeed have been thought that the Installation State, even if it had complied with its international obligations by enacting adequate legislation, would be in default for not ensuring that these were effective. The insertion of an express provision had the clear advantage of obviating any discussions that would cause delay in an emergency situation. Article 10(c) henceforth imposes on the state the obligation to pay the compensation for nuclear damage for which the operator is liable to the extent that its insurance or financial security is either unavailable or insufficient to cover the amounts referred to in Article 7(a) (at least EUR 700 million) or 21(c) (phasing-in).

Even if it is highly improbable that the same installation would be the scene of two separate incidents in the same year, there is one other case in which the state guarantee might be called on. This would be where the sum offered by the insurer is not, as the strict wording of Article 7(a) requires, at least EUR 700 million for each nuclear incident, but only EUR 700 million per year covered by the premium. Other, minority, Parties want these policies to include a clause requiring immediate reconstitution (meaning within one or two months) of the cover, thus decreasing the risk that they will have to intervene under Article 10(c). Such a reconstitution clause still represents a cost, however, in terms of insurance capability as well as premiums, and it is not impossible that the question will one day arise in terms of distortion of competition.

The amounts in the Supplementary Conventions

The first Supplementary Convention, that of Brussels, had made it possible to increase the amount of liability of the operator under the Paris Convention. This complement is made up of two tiers of public funds offered in succession, according to need, by the installation state of the incident, and afterwards by the community of Contracting Parties.

The tier borne by the Installation State was intended to cover the difference between the amount for which the operator was liable and SDR 175 million, or around EUR 210 million. With the progressive increase in national amounts, the installation state tier has been "wiped out" in part or even entirely for many states over the years.

The international tier allocated by the Contracting Parties covered the reparation of damages between SDR 175 million and 300 million, in other words between EUR 210 million and 360 million.

The revised Brussels Convention maintains the principle and the nature of these three tiers in Article 3(b).

In order to grant the Parties the possibility of continuing with the practice of making the operator bear all or part of their own tiers, the tier for which the installation state is liable now covers the difference between the amount offered under the first tier and EUR 1.2 billion. Put another way, the second tier will be borne entirely by the operator under an unlimited liability regime, even though this tier is by nature considered as coming out of public funds.

The third tier is always fed exclusively from the public funds of the Contracting Parties, with an initial amount of EUR 300 million. When this tier was increased this was not done in the same proportion as the operator's tier; this was in particular because the new contribution formula increased the part played by the installed nuclear capacity.

The total amount of the three available tiers is thus now EUR 1.5 billion, in other words a fourfold increase in compensation by comparison with the system as it was before.

The Vienna conference devoted a great deal of attention to the Brussels Supplementary Convention in an attempt to supplement the Vienna Convention with a similar system, but one which would have the advantage of serving as an umbrella not only for Vienna but also for Paris, or even for other regional conventions. Its principles will be examined later. What the Convention on Supplementary Compensation intrinsically proposes is an amount that depends on the number of Contracting Parties, and more especially of their installed nuclear capacity. This Supplementary Convention therefore still remains subject to a question mark, both as to what its effects will be and when it will enter into force.

The following is a comparative table allowing the few available figures to be better understood:

Table showing amounts of civil liability for nuclear damage (1) (M = Million)				
Notes	**Paris Convention**	**Revised Paris Convention**	**Revised Vienna Convention**	**Vienna Convention**
Amount of operator's civil liability	EUR 18 M maximum (2)	EUR 700 M minimum	EUR 360 M	USD-gold 5 M = approx. EUR 50 M
Phasing-in	–	EUR 350 M	EUR 120 M	–
Duration	–	5 years	15 years	–
Reduced civil liability Transport	EUR 6 M	EUR 80 M	EUR 6 M	–
Reduced civil liability Installations	EUR 6 M	EUR 70 M	–	–
Supplementary Conventions				
	Brussels Supplementary Convention	*revised BSC*	*Convention on Supplementary Compensation*	
Operator	From EUR 6 M to (2)	EUR 700 M minimum	EUR 360 M	
Installation State	Up to EUR 210 M (3)	Up to EUR 1 200 M (3)	Optional	
International Tier	Up to EUR 360 M (4)	Up to EUR 1 500 M	Depends on Parties	
(1) Amounts in SDR (PC, BSC, VC, RVC) are converted here at the rate 1 SDR=1.2 EUR (2) Raised to EUR 180 M by a 1990 NEA recommendation (3) Tier that could be "wiped out" if it is absorbed by the one for which the operator is liable (4) Total amount available depending on the amount of civil liability of the operator				

B.2.e. Periods of limitation

By virtue of Article 8 of the Paris Convention, actions for compensation had to be begun within ten years from the nuclear incident, if they were not to be time-barred, but national legislation could allow more generous time limits provided this did not prejudice the rights of those who had begun actions within the ten-year time period. It was also open to the national legislator to fix a period of limitation of at least two years to run from the moment the victim became aware of the damage and of which operator was liable.

These provisions were unfavourable to victims, especially in the case of personal injury happening a long time after the incident itself, and they have now been radically modified by the Protocol.

The period of limitations for actions for compensation for personal injury has gone from ten to 30 years [Article 8(a)(i)], and the period for other forms of damage stays fixed at ten years. The revised Convention still allows longer periods to be laid down by the national legislature, subject to the same reservation that the rights of claimants who filed a claim during the principal period must be protected. Even though the causal connection between the nuclear incident and the personal injury suffered will be more and more difficult to establish with the passage of time, the new time limit of 30 years (which some Parties were already applying) undoubtedly responds to a social need.

The "optional" time limit that starts to run from awareness of the injury has gone from two to three years [Article 8(d)].

It should be noted that the revised Vienna Convention provides for identical periods of limitation in Article VI but that Article VIII(2) now gives mandatory priority to cases of personal injury.

However, this option was rejected for the Paris Convention. Some Parties saw this as an attack on the constitutional principle of equality, while others raised questions about the practical workings of such a mechanism which would have obliged them to build up reserves for a hypothetical future, not to mention its potentially perverse effects on the triggering of the application of the Brussels Supplementary Convention. The attitude when faced with the principle of priority obviously varies depending on which options were chosen with regard to the amount of the liability. Under one regime, that of unlimited civil liability, it is a simple matter to reject any notion of priority, even if, on the facts, the assets available belonging to the operator liable are also limited and will tend to decrease over time.

Finally, we should note that one provision common to both conventions, setting a limitation period of 20 years for incidents involving fuel, radioactive products or radioactive waste that are stolen, lost, thrown overboard or abandoned at the time of the incident, has disappeared from both conventions [Article VI(2) of the Vienna Convention of 1963 ; Article 8(b) of the Paris Convention of 1960].

B.2.f. Exclusion clauses

Article 9 of the Paris Convention exempts the operator from all liability if the damage is caused by acts of armed conflict, civil war or insurrection; as has been mentioned earlier, this clause has been interpreted from time immemorial as not granting exemption for acts of terrorism, on whatever scale.

By contrast, the Paris Convention allowed the Parties to exempt the operator from liability in cases of natural disasters of an exceptional character. This possibility to derogate is abrogated by the Amending Protocol. This modification is in line with a culture of security that is unable to come to terms with the fact that installations might not be able to resist such events and, a fortiori, that the victims of such an unforeseen circumstance should be deprived of compensation.

The maintenance of coverage of terrorism and the deletion of the possibility of excluding risks of disaster are two important gains at a time when both terrorism and the vagaries of nature have shaken the confidence of the insurance world. As to terrorism in particular, it should be noted that special temporary mechanisms have cast some states that are particularly exposed in the role of insurer, on payment of a premium. These exceptional systems have – and will for the future – made it possible to face up to severe difficulties in securing an adequate overall insurance capability.

Article IV(3)(b) of the Vienna Convention, which used to exclude natural disasters and left it to the Parties to add them, has also been deleted, despite momentary hesitation on the part of certain countries that are particularly vulnerable to earthquakes. Acts of terrorism are covered here, too.

B.2.g. The rules on jurisdiction

Under the original Conventions [Article 13(a) and (b) of the PC ; Article XI(1) and (2) of the VC], the courts of the Contracting Party in whose territory the incident occurs have jurisdiction. Where the incident occurs outside such territory or in a place which cannot be determined with certainty, actions shall lie with the courts of the Contracting Party in whose territory the installation of the operator liable is situated. There are special rules to resolve jurisdictional conflicts [Article 13(c) of the PC ; Article XI(3) of the VC].

Jurisdiction over the exclusive economic zone or its equivalent

Article 13 of the Paris Convention, like the corresponding provision in the Vienna Convention, was the subject of protracted debate when it came to extending jurisdiction to exclusive economic zones or their equivalents established by maritime states with differing conceptions of the law of the sea.

From now on, under Article 13 of the revised Paris Convention or Article XI *bis* of the revised Vienna Convention, nuclear incidents that occur within the exclusive economic or similar zones, provided these have been notified to the Secretary-General of the OECD before the incident, fall under the jurisdiction of the courts of the Party that has established the said zone. This provision was controversial because it sets up a system of “floating” jurisdiction, less obvious than the rule of the courts of the installation state of the operator liable, but justified by the need to favour the court that will probably also be the closest to the greatest number of victims. Fears persist, however, that it will be no easy matter to determine which is the competent court, because this depends on knowing the exact time and place of the incident, while the courts of the state of the operator liable had the advantage of remaining a constant factor throughout.

The new Article 13(e) of the revised Paris Convention refines this provision so that it will not be taken as a precedent for other purposes than those of the convention; it was not thought necessary to go into such detail in the Vienna Protocol.

The single forum

Another provision introduced as Article 13(h) of the Paris Convention and also featuring in the revised Vienna Convention [new Article XI(4)] obliges national legislators to ensure that only one court has jurisdiction over any given incident.

The object of this provision is to make it easier to do this as a sort of “closed bid” process without having to decide disputes between the courts. It also allows states to select, at the outset, the court best able to deal with a large number of claims: to take the example of Belgium, the Court of First Instance of Brussels was chosen as, though there is no nuclear installation within its area, it has the best logistical resources and can hear cases in both the country’s main languages.

Action by the state on behalf of its nationals

While the drafters of the revised Vienna Convention were inspired to adopt a single forum by the Parties to the Paris Convention, who introduced it into "their" convention after the fact, the new Article XI A of the Vienna Convention is itself an innovation in that it obliges the Contracting Parties to allow states to bring actions on behalf of their nationals or persons resident in their territory, provided these persons have given their consent. A similar provision was introduced in Article 13(g) of the Paris Convention. It will greatly facilitate the representation of victims who, without it, would have thought twice about taking proceedings in a foreign court, with all the expense and problems of language, traditions and legal procedure that this involves.

B.2.i. Joint and several liability

Article 5(d) of the Paris Convention governs the situation where several operators are liable for the same nuclear damage. This article, or at any rate its French text, created a problem resulting from a literal translation into French of the expression "joint and several liability", which came out as "*solidaire et cumulative*" which is at the very least ambiguous: what was the extent of this joint liability, were the debtors each liable for the whole or could they still discuss it between themselves and divide it up? The new wording of Article 5(d) removes this doubt by keeping only the term "*solidaire*".[16] Each operator may thus be subject to a claim for the whole of the damage, leaving him free to make a claim against the other operator liable for that portion which exceeds his own liability. "Own liability" here does not necessarily mean the amount fixed for him by the applicable legislation pursuant to Article 7(a), but the actual part of the damage for which he is responsible. This might not necessarily be a simple matter of dividing by the number of operators involved, but could be arrived at by a study of causation or by reference to contractual agreements entered into before or after the incident, always provided that these factors have no impact on the total compensation available for the victims. This reasoning clearly only makes sense in the case of nuclear incidents causing an amount of damage that is less than the sum total of the amounts for which the operators concerned are liable.

The revised PC maintains the exception in this context for cases where the nuclear damage occurs in the course of carriage, whether in one and the same means of transport or during incidental storage at one and the same nuclear installation, limiting the total amount of liability to the highest amount established for any one of the operators pursuant to Article 7.

As in the pre-existing regime, in no case may the final amount of the operator's liability be greater than that established for it pursuant to Article 7.

B.2.j. Other amended provisions

The Protocol to Amend the Paris Convention covers various other provisions: these are of course changes made necessary by the adoption of new definitions or the renumbering of some of the articles; they also include modifications of a more technical nature, such as the exclusion of definitions of national law and national legislation, the conflict of law rules [Article 14], a reservation concerning the application of general rules of public international law [Article 16 *bis*], a minor simplification of the dispute resolution clause [Article 17], the setting up of five-yearly consultations between the Parties [Article 22], and changes to the final clauses to bring them into line with current treaty practice [Articles 18, 19, 20, 23 and 24].

16. Translator's note: literally "joint", but normally used to translate the legal concept of "joint and several".

C) The Brussels Supplementary Convention (BSC)[17]

C.1 Basic Principles

In the end, the revision of the Brussels Supplementary Convention went into less detail than that of the Paris Convention: its main principles remained the same, as do its relationship to the Paris Convention and its geographical scope.

C.1 a. Its origins

The Brussels Supplementary Convention was born out of the realisation that the amounts of liability of operators bore no relation to the actual consequences of a serious incident. On 31 January 1963, 13 of the Parties to the Paris Convention thus adopted this supplementary instrument.

C.1 b. Supplementing the Convention and its limits

The supplementary nature of this instrument is clear from Article 1 – left intact by the revision – which states that the regime set up under the BSC is subject to the provisions of the Paris Convention. It follows – and unrevised Article 19 of the BSC expressly says so – that no state may become or remain a Party to the BSC if it is not a Party to the PC.

In the case of a nuclear incident causing nuclear damage for which an operator covered by the Paris Convention is liable, the amount of which exceeds the cover provided by the said operator, the BSC is triggered on the basis of the definitions and mechanisms in the Paris Convention, subject however to two exceptions:

- the BSC only applies to installations for peaceful use;

  To avoid any disputes arising out of this provision, each Party must communicate to the Depository of the BSC, pursuant to Article 13, a list of the nuclear installations for peaceful use located in its territory. This article has not been substantially modified.

- the scope of application of the BSC is limited to the territory of the Contracting Parties to the BSC;

  The territory referred to has indeed also been extended to include the exclusive economic zone of a Contracting Party and to such Party's continental shelf where the said shelf is explored or exploited. It still remains the case, though, that states that are not Parties to the BSC, even if they are Parties to the PC, are excluded from the benefit of this provision [Article 2].

C.1 c. The basis of intervention: solidarity not liability

There was no debate, as there had been over the underlying premises of the revision of the Vienna Convention itself, about the possibility of imputing liability to states as holders of the powers of authorisation and supervision over installations that proved defective.

17. The Protocol of 12 February 2004 to amend the Brussels Convention is available on the Web site of the NEA at: www.nea.fr/html/law/brussels_supplementary_convention.pdf

Article 3(c) thus continues to provide that the laws of each Contracting Party must:

- either establish the liability of the operator at not less than EUR 1.5 billion (except where this is increased pursuant to Article 12 *bis*);
- or provide that where the liability of the operator is limited to EUR 700 million (or to a higher amount established by the same legislature), the public funds allocated by the Installation State as well as by all the Contracting Parties are allocated on a basis other than coverage of the liability of the operator.

C.2 Modifications to the BSC

The modifications made to the BSC are thus mainly of a technical nature. Their purpose was mostly to bring the BSC into line with unlimited liability regimes, to avoid situations where the international tier was held back until the operator's resources were completely used up: from now on, the international tier may, under the provisions of the convention itself, be called up once the threshold of EUR 1.2 billion is reached, with no need to wait until the operator's cover is exhausted. The text of the convention is thus brought into line with declarations made by the Parties in the past that they did not wish to penalise the most generous regimes.

C.2 a. The amounts

The amounts provided for by this Convention have already been discussed above; they fall under the same regime as those distributed pursuant to the Paris Convention [Article 1, BSC], unless they are reserved for victims in the territory of Parties to this Supplementary Convention alone, subject to the extension already described in item C.1.c [Article 2, BSC].

C.2 b. The structure

The structure in three tiers is maintained in Article 3(b), with the necessary adaptations required by the introduction of phasing-in or state security:

- the tier falling under the Paris Convention, the amount of which is at least EUR 700 million, payable by the operator liable [or the state called upon to intervene in case the latter defaults, pursuant to Article 10(c) PC, or also the state relying on phasing-in pursuant to Article 21(c) PC, in which case its adhesion to the BSC is subject to coverage of the difference between the reduced amount and EUR 700 million];
- followed by the tier of the installation state, which can be from EUR 500 million to zero, according to whether or not the national legislators have chosen to burden the operator with cover obligations exceeding EUR 700 million, and finally;
- an international tier, jointly provided by all the Parties, of EUR 300 million.

C.3 c. Trails that lead nowhere

At the Vienna negotiations, other sources of additional finance, for example the setting up of voluntary pools to which operators could contribute; either based on the number of reactors in service, or on the installed nuclear capacity, were contemplated.

C.3 d. Calculation of contributions

A new balance can be seen in the method of calculating the contributions of the Contracting Parties: formerly, these contributions were calculated with 50% based on gross national product (GNP) and 50% based on the level of thermal power. From now on, this will be 35% based on gross domestic product (GDP) and 65% based on thermal power [Article 12, BSC].

This new ratio is the fruit of political negotiation concerned with the need to reconcile the application of the principle that the polluter pays, which is only partly relevant here, since public funds are involved (it would be more appropriate to say that the licence-giver pays) with the need to maintain the principle of solidarity between Parties that have nuclear installations and those that do not. As to replacing the GNP by the GDP, this was prompted by the concern to use the nomenclature best suited to national accounting, now that the former GNP has become less reliable as between the European Union States whose intra-Community exchanges are becoming more difficult to calculate.

C.3. e. The variability of the international tier

Finally, while in the original BSC the international tier was fixed, irrespective of the number of Parties [Article 3(b)(iii) BSC], there is now a new Article 12 *bis* that, by an extrapolation of the formula used in Article 12, allows the international tier to be increased pro rata according to the GDP and the nuclear installations brought into the existing "baskets" by a new Party. The expected effect will be limited in financial terms, unless a lot of states with nuclear installations ratify the BSC; the new formula is however much more satisfactory from the political and intellectual standpoints – for one thing, the proselytising tendency of the Parties to the BSC can no longer be suspected of being aimed at reducing the Parties' contributions, and for another, the increased risk resulting from new adhesions is compensated by an increase in the third tier.

This mechanism at last offers some consolation for the relatively low increase in the third tier in comparison with the other two. The third tier in practice represents no more than 20% of the total funds available, as against 40% before the revision, and this can be explained by the substantial increase in the contribution of the state having the greatest number of nuclear installations, and *inter alia* by the new weighting of factors in Article 12 which mean that one single Party bears almost 40% of this tier. This same pitfall arose in Vienna when the financing of the CSC was discussed; the impact of even more extreme weighting factors is compensated for in that case by introducing a mechanism for setting a ceiling on contributions.

C.3. f. Reciprocity

The notion of reciprocity appears in several provisions of the revised convention. It first concerns non-Contracting States:

Article 2(a)(iv) of the Paris Convention, to which we refer above, introduces reciprocity in relation to geographical scope, laying down the conditions under which the benefit of the Convention may be extended to damage suffered in non-Contracting States which have nuclear installations and which themselves offer reciprocity based on legislation affording equivalent benefits. Article 7(g) clarifies the principal of reciprocity in respect of compensation, allowing a Party to limit the amount available for such a state if its legislation does not afford reciprocal benefits of an equivalent amount.

Each Party, even though bound by the principal of reciprocity laid down in Article 2(a)(iv) (provided that requirements are effectively met), remains free pursuant to Article 7(g) to give effect to this reciprocity in relation to the amount available for non-Contracting States. It remains to be seen how Parties will exercise this option, which shall certainly impact on the speed at which Paris funds are exhausted and therefore on the mobilisation of the Brussels Supplementary Convention.

Lastly, reciprocity could also apply to certain States Party to both the Vienna Convention and the Joint Protocol. Even where some of these states accede to the revised Vienna Convention, the difference in amounts offered by the two systems could lead some Parties to express a reservation pursuant to Article 18 of the Paris Convention. Such a reservation could also apply to damage suffered in other territories to which a Contracting Party extends the scope of application of its legislation pursuant to Article 2(b).

Nevertheless, even amongst Parties, the increase of the operator liability amount to the highest common denominator has not eliminated all disparities and therefore the door has been left open for the application of the reciprocity principle.

In fact, when Parties adopt an unlimited liability regime, the non-discrimination rule set out in Article 14 of the Convention can no longer reasonably be considered to apply. Article 15(b) of the Paris Convention, which provides that compensation for damage in excess of the SDR 5 million initial amount may be applied "under conditions", only applies to the public funds. Revised Article 15(b) does away with this criterion and therefore allows the application of the principle of reciprocity to the amount to be made available by the operator in excess of EUR 700 million. After application of the Brussels Supplementary Convention, the authorisation to derogate from the non-discrimination rule will be applied beyond EUR 1.5 billion. This discrimination may not be applied either to states without nuclear installations, or to states designated in Article 2(a)(ii) or (iv) or Parties designated in Article 2(a)(i) which offer reciprocal benefits, whether in the form of unlimited liability or of amounts higher than the minimum laid down in the convention. These principles of application of the reciprocity principle are set out in the Recommendation on the Application of the Reciprocity Principle to Nuclear Damage Compensation Funds adopted by the Contracting Parties during the Conference on the Revision of the Paris Convention and of the Brussels Supplementary Convention, and attached in Annex III to the Final Act of this Conference dated 12 February 2004.

The principle of reciprocity sometimes gives rise to criticism; nevertheless, it should also be considered as a factor generating emulation for all states involved, whether or not they are Parties to the international third party liability conventions.

C.3. g. Changes to other provisions

The Protocol to Amend the BSC includes a variety of other provisions: these changes are consequential upon the modifications to the Paris Convention, such as adaptation of the following:

- Articles 6 and 7 to the new rules on limitation periods;
- Article 5(a) extending the rights of recourse of the Contracting Parties that intervene pursuant to Article 3(b) and (g), where the operator has such a right by virtue of Article 6(f) of the PC;
- Article 14(b) to reflect the impossibility of excluding natural disasters of an exceptional nature; or
- renumbering of certain articles.

They also include modifications of a more technical nature, such as:

- the deletion of Article 4 which was an unnecessary transposition of the rules on joint and several liability in Article 5(d) of the PC to apply to public funds;
- the minor simplification of the dispute resolution clause [Article 17 PC]; and
- the adaptation of the final clauses to bring them into line with current treaty practice [Articles 18, 20, 21 and 25 PC].

C.3. h. A gateway to the Convention on Supplementary Compensation (CSC)

The Convention on Supplementary Compensation, concluded in Vienna, was drafted from the outset with the possibility in mind that it would be superimposed on the "regional" Conventions, whether they already existed, like the BSC, or were still at the concept stage. The Parties to the BSC did not wish to exclude that possibility. However, since funds under the BSC are by definition reserved to the Contracting Parties alone, the possibility that third tier funds could be used to satisfy obligations under another international agreement (e.g. the CSC) is made subject, in the new Article 14(d), to the agreement of all the Contracting Parties to the BSC. In other words, all the Parties would have to simultaneously ratify the CSC. Such a move could only be envisaged if the CSC were to attract a number of other states with a lot of nuclear installations, failing which the risk of public funds being called upon by a larger number of states will increase, without the prospect of a better return to compensate.

This provides a good opportunity to refer briefly to that other Supplementary Convention.

D. The Convention on Supplementary Compensation (CSC)

Is there really any point in comparing the CSC and the BSC? The CSC is admittedly described as supplementing the regional solidarity agreements, where appropriate, and Article XII(a) thereof expressly recognises these mechanisms, whether they involve the Parties acting together to fulfil their "national" obligations or to provide supplementary financing falling outside the scope of the CSC. The fact must not be lost sight of that most of the Parties to the BSC claimed that they found it hard to envisage signing two complementary conventions with different mechanisms, allocation rules and beneficiaries.

The BSC has the advantage of being part of one single regime, that of the PC. The CSC is open not only to Parties to the Vienna and Paris Conventions, but also to Parties whose legislation bears some relationship, but presents a higher risk of divergence.

Intrinsically, the BSC proposes clear thresholds for its three tiers, even if the first two might become confused. What is more, the amount of EUR 1.5 billion is available from the date of entry into force of the protocol of amendment, and if new Parties adhere this can only increase.

The CSC has offered an open formula from the outset. In order to enter into force it needs at least five Parties and 400 000 units of nuclear power [Article XX CSC]. But, even if the principal states in terms of installed power were to adhere, the CSC would still only offer EUR 360 million (equivalent of SDR 300 million), mostly because of the effect of a mechanism that caps the intervention of those states that are potentially its largest contributors [Article IV(c) CSC].

Lastly, the CSC provides for the available funds to be shared, with half divided on an equal basis among all the eligible victims, and half going only to those victims located outside the installation state [Article XI(1) CSC]. This mechanism is only overridden if the Installation State "offers" at least EUR 720 million (equivalent of DTS 600 million) under its national laws [Article XI(2) CSC].

To conclude, if states without any nuclear installations look favourably on a CSC that

- favours the compensation of damage incurred outside the borders of the Installation State [Article XI CSC]; and
- exempts them or considerably reduces their contributions using a contributions system that gives a 90% weighting to the installed nuclear capacity [Article IV(a)(i) CSC] and 10% to the rate of assessment at the United Nations [Article IV(a)(ii) CSC];

in spite of everything, the final result will on the whole be disappointing. Other states that have nuclear installations and are thus potential contributors have shown hesitation with regard to the CSC because it grants preferential treatment to damage suffered outside the borders of the state of the installation that is liable, a form of discrimination that is difficult to justify to their national parliaments. However, what is required of the Parties to the PC in order to circumvent this discrimination is never more than EUR 20 million, plus a margin to protect against fluctuations in the SDR.

E. Conclusions

We have thus arrived at the end of a long process of international negotiations that are now slowly being transposed into national legislation. The revised Vienna Convention came into force on 4 October 2003, between Argentina, Belarus, Latvia, Morocco and Romania.

Pessimists will ask why, from three Conventions (PC, VC, BSC) at the start, we will soon have five (RPC, VC, RVC, CSC, BSC), since both the revised and unrevised Vienna Conventions will no doubt also be cohabiting for a time. They will be sorry, too, that it was not possible to find a timely solution to some of the thorny old problems, such as the paradox of property at the site of the installation, or why other, simpler, issues have not been expressly dealt with, such as the treatment of military installations. They will also say that there was a lack of foresight in not covering nuclear fusion installations, and that certain aspects of the geographical scope of the instruments are already proving controversial. It is regrettable, too, that reciprocity, a concept that is anathema to multilateral international conventions, has infiltrated each instrument to a greater or lesser degree. It would be surprising if anyone had actually made a full study of the impact reciprocity that varies according to circumstance would have in the operational context of a major disaster.

Optimists will say that the new instruments all show a substantial increase in the amount of cover they provide, this in spite of the difficult climate prevailing in the insurance sector and where public authorities are concerned. What is more, it has proved possible to achieve this result in a world in which, even for the Contracting Parties, there are a number of exceptional factors weighing on the future of the nuclear industry.

Apart from the amounts themselves, there are some substantial improvements in the RPC and the RVC:

- to the limitation periods, now extended;

- to the limits on the exemption clauses;
- to the fate of victims in the territory of non-Contracting States;
- in the clarification of which court has jurisdiction;
- in the coverage of damages to the environment;
- with the principle of the single competent court.

In the RPC:

- to the list of installations referred to;
- by the introduction of objectivity for transport operations;

In all the conventions:

- by the inclusion of unlimited liability regimes.

In the Supplementary Conventions:

- to the observance of the polluter pays principle in the contribution factors under the Supplementary Conventions.

The revised Vienna Convention has already entered into force, and it should not be long before the Paris Convention follows. In practice, Parties that are also members of the European Union were invited to deposit their instruments of ratification simultaneously, and to do so no later than the end of 2006. It is important to keep to this timetable, because it will serve to justify the “nuclear exception” that appears in several community law provisions.

We can thus now look at the choices made by each of the Parties with regard to the options opened up by the Protocols.

How many Parties will adopt base amounts above EUR 700 million or an unlimited liability regime?

Will unlimited liability not one day become the rule, with conventions limited only to the much less vital tasks of setting the amounts to be covered by insurance and financial assistance mechanisms?

Will they decide that it is necessary to define the extent to which the types of damage described in Article 1 (vii)(3) to (6) are covered?

How will they settle the amounts of less than EUR 700 million for carriage and low-risk installations?

How many of them will enact limitation periods longer than those in Article 8?

What limits will they set on the kinds of damage covered, other than personal injury and damage to property?

Will the Convention on Supplementary Compensation for Nuclear Damage enter into force one day?

Aside from these questions, which will provide much food for thought for specialists in international and comparative law, my lasting impression is that the seal of approval has been set on this system and these principles which, despite major geopolitical upheavals, have remained relevant for over 45 years, and will continue to be relevant for a long time to come.

International Nuclear Law in the Post-Chernobyl Period

The accident at the Chernobyl nuclear power plant in 1986 heightened awareness of the need to improve the international legal framework governing the safe and peaceful uses of nuclear energy. Numerous legal instruments have subsequently been adopted.

This compendium examines the developments which have taken place in international nuclear law since 1986. It reproduces a number of articles which have been published in the OECD/NEA *Nuclear Law Bulletin*, accompanied by some previously unpublished works. The principal legal instruments examined in this publication govern early notification and assistance in the event of a nuclear accident, nuclear safety, the safety of radioactive waste and spent fuel, and nuclear liability and compensation.

OECD Nuclear Energy Agency
Le Seine Saint-Germain – 12, boulevard des Îles
F-92130 Issy-les-Moulineaux, France
Tel.: +33 (0)1 45 24 10 15 – Fax: +33 (0)1 45 24 11 10
E-mail: nea@nea.fr – Internet: www.nea.fr

ISBN 92-64-02293-7

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