



IAEA

International Atomic Energy Agency

International Expert Group On Nuclear Liability (INLEX):

A Collective View on the First Two Decades

INTERNATIONAL EXPERT GROUP
ON NUCLEAR LIABILITY (INLEX):
A COLLECTIVE VIEW ON
THE FIRST TWO DECADES

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INTERNATIONAL ATOMIC ENERGY AGENCY
VIENNA, 2024

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FOREWORD

Nuclear power provides a reliable source of low-carbon energy that fuels economic development while helping to mitigate climate change and pollution. As they redouble efforts to meet economic and environmental goals, more and more countries are looking to nuclear energy as a solution, and to the IAEA for guidance.

With a track record of more than half a century, nuclear power is one of the safest forms of energy, comparable to solar and wind, and far safer than fossil fuels and other major sources.

The nuclear industry must show, as it has, a deep sense of responsibility as a mature sustainable activity. Having a solid scheme for compensation in case of accidents is part of that. This reality necessitates, on the one hand, an assurance of the prompt availability of meaningful funds to compensate a wide range of damage, without discrimination and recourse to protracted litigation. On the other hand, it requires, from the perspective of the industry, a legal certainty that third party civil liability claims for nuclear damage will be channelled to the operator of a nuclear installation and that such claims are adjudicated exclusively in the courts of one State, usually the State where the nuclear incident occurred. Suppliers, investors, lenders and insurers simply will not participate in nuclear projects unless their concerns over potential liability are addressed adequately.

This explains why in the early 1960s, there was a recognized need to establish a special international system on civil liability for nuclear damage. The system should, in the interests of potential victims, States and the industry, assure compensation, harmonize national laws, provide legal certainty and eliminate any discrimination among victims. In doing so, the regime avoids the complications and issues arising from general tort law and the rules of private international law, which can result in protracted litigation in multiple jurisdictions, against multiple defendants, with uncertain outcomes, and with no guarantee of judgements being enforceable or funds being available to pay judgements. This system, embodied in the various conventions agreed by the international community, is a key element of the legal framework necessary to support the safe, secure and peaceful uses of nuclear energy.

Nuclear liability and compensation are of global concern and therefore every State should participate in the system. Currently, three quarters of the world's operating civil nuclear power reactors are covered by one or more of the international nuclear liability instruments. The entry into force of the Convention on Supplementary Compensation for Nuclear Damage in April 2015, established a single instrument covering the greatest number of reactors worldwide. However, despite the benefits of the global nuclear liability regime, the degree of participation continues to remain too low.

Since its establishment in September 2003, the International Expert Group on Nuclear Liability (INLEX) has played an important role in raising awareness and understanding of the nuclear liability instruments adopted under the IAEA's auspices. As an expert advisory body to the Director General, INLEX provides the IAEA with authoritative advice and guidance on nuclear liability issues and assists the Secretariat in conducting outreach activities.

Over the course of the past two decades the Group has advised on many issues related to nuclear liability and reached conclusions and made recommendations on a number of possible gaps and ambiguities in the scope and coverage of the existing instruments.

This publication marks INLEX's 20th anniversary and includes papers on several nuclear liability topics and the work of INLEX. Thanks to the Group's current members, and especially those who contributed their thoughts here.

Together with INLEX, the IAEA remains committed to increasing the number of countries that are part of the Global Nuclear Liability Regime.

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1. THE INTERNATIONAL EXPERT GROUP ON NUCLEAR LIABILITY (INLEX) AND ITS ROLE IN FACILITATING THE ACHIEVEMENT OF A GLOBAL NUCLEAR LIABILITY REGIME

P. JOHNSON¹ AND A. WETHERALL^{2,3,4}

1.1. INTRODUCTION

Despite the low probability of a major nuclear accident, should one occur there is potential for cross-border damage of an extreme magnitude, including personal injury, loss of life and property damage. Answers would be needed for several questions: Who would be liable for nuclear damage and for how much? Who would be entitled to make a claim for compensation? How much compensation would be available? What type of damage would be compensable? In which court could this compensation be sought?

This explains why in the early 1960s, there was a recognized need to establish a special international civil liability regime for nuclear damage to facilitate the compensation of victims and to address the economic concerns of the nuclear and insurance industries. The international system should, in the interests of potential victims and also of states and of the industry, assure compensation, harmonize national laws, provide legal certainty and eliminate any discrimination among victims. Since that time, the system has been strengthened with the adoption of new and modernized instruments.

For some years now, efforts have been focused on establishing a global nuclear liability regime that addresses the concerns of all States that might be affected by a nuclear accident with a view to providing appropriate compensation for nuclear damage. Established in September 2003 the International Expert Group on Nuclear Liability (INLEX), an advisory body to the Director General of the IAEA, has played an important role in raising awareness and understanding of

¹ P. Johnson is the Legal Adviser and the Director of the IAEA Office of Legal Affairs.

² A. Wetherall is the Head of the Nuclear and Treaty Law Section, IAEA Office of Legal Affairs.

³ This article was written with the support of Chenchen Liang, Associate Legal Officer, Nuclear and Treaty Law Section, IAEA Office of Legal Affairs.

⁴ The views expressed remain the responsibility of the named authors and do not necessarily reflect those of the IAEA or its Member States.

the nuclear liability instruments adopted under the IAEA's auspices. Moreover, in 2012 INLEX adopted recommendations to facilitate the achievement of a global nuclear liability regime [1], as requested by the IAEA Draft Action Plan on Nuclear Safety [2], and since that time has been implementing various activities aimed at realizing this regime.

1.2. NUCLEAR LIABILITY — WHY AND HOW, INSTRUMENTS AND PRINCIPLES

The origins of a special international regime on civil liability for nuclear damage date back to the early 1960s, when the first international instruments, the Convention on Third Party Liability in the Field of Nuclear Energy (Paris Convention) [3] and the Vienna Convention on Civil Liability for Nuclear Damage (Vienna Convention) [4], were adopted under the auspices of the then Organisation for European Economic Co-operation (OEEC), in 1960,⁵ and the IAEA, in 1963.⁶ The Paris Convention was supplemented by the Brussels Supplementary Convention adopted in 1963 [5] to provide additional funds to compensate damage as a result of a nuclear incident for which Paris Convention funds proved to be insufficient.⁷ The Vienna Convention was adopted under the auspices of the IAEA and is open to all Members of the IAEA, the United Nations or any of its specialized agencies.

At the time, the Paris and Vienna Conventions represented a major step forward in the development of international law. The conventions lay down uniform rules and are designed to facilitate compensation for transboundary damage. They are based on several general principles, which include, among others, the exclusive liability of the operator of a nuclear installation (in accordance with the basic principle of the responsibility of the operator for

⁵ OECD, 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. First, adopted on 29 July 1960, it entered into force on 1 April 1968. A third Protocol of 12 February 2004 entered into force on 1 January 2022. The Paris Convention is open to any OECD country as of right and to any non-member with the consent of the other contracting parties.

⁶ IAEA, Vienna Convention on Civil Liability for Nuclear Damage, 1063 UNTS 266 (1963), INFCIRC/500, IAEA, Vienna, 1996. The current status of the 1963 Vienna Convention is available at: https://www.iaea.org/sites/default/files/24/03/63_vc_status.pdf

⁷ OECD, Convention of 31 January 1963 Supplementary to the Paris Convention of 29 July 1960. The 1963 convention was first amended by the additional Protocol of 28 January 1964 and then by the Protocol of 16 November 1982. A third Protocol of 12 February 2004 entered into force on 1 January 2022.

nuclear safety and security), and that this operator is strictly liable for a minimum amount of liability, which in turn is guaranteed through mandatory financial coverage, typically in the form of insurance, as well as the vesting of jurisdiction in a single state.

However, the 1986 Chernobyl nuclear power plant accident revealed the need for further improvements. In 1988, the Joint Protocol Relating to the Application of the Vienna Convention and Paris Convention [6] was adopted to link the Vienna and Paris Conventions into one system.⁸ In 1997, two new instruments were also concluded under the auspices of the IAEA: the Vienna Convention was amended on 12 September 1997 and entered into force on 4 October 2003⁹ [7]; and the Convention on Supplementary Compensation for Nuclear Damage (CSC, 1997) [8] was also adopted on 12 September 1997.¹⁰ In 2004, the Paris Convention and the Brussels Supplementary Convention were also amended and entered into force on 1 January 2022 [9, 10].¹¹

The adoption of these new and modernized instruments marked a major milestone in the development of international nuclear liability law. Improvements have been made to incorporate developments in the legal, technical and economic aspects of nuclear liability and, at the same time, to reinforce the recognized

⁸ IAEA, Joint Protocol Relating to the Application of the Vienna Convention and Paris Convention, INFCIRC/402, IAEA, Vienna, 1992. The Joint Protocol was adopted on 21 September 1988 under IAEA and OECD auspices; it entered into force on 27 April 1992. The current status of the Joint Protocol is available at: https://www.iaea.org/sites/default/files/23/09/jp_status.pdf

⁹ IAEA, Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage, INFCIRC/566, IAEA, Vienna, 1998. The current status of the 1997 Vienna Convention is available at: https://www.iaea.org/sites/default/files/23/09/protamend_status.pdf

¹⁰ IAEA, Convention on Supplementary Compensation for Nuclear Damage, INFCIRC/567IAEA, Vienna, 1998. The current status of the 1997 CSC is available at: https://www.iaea.org/sites/default/files/22/06/supcomp_status.pdf

¹¹ The 2004 Protocols to amend the 1960 Paris Convention and 1963 BSC entered into force on 1 January 2022. These Protocols were adopted and signed on 12 February 2004 at the Conference on the Revision of the Paris Convention and of the Brussels Supplementary Convention. For the text of the 2004 Paris Convention amendment protocol see: http://www.oecd-nea.org/law/paris_convention_protocol.pdf and for the unofficial consolidated text see: <https://www.oecd-nea.org/law/Unofficial%20consolidated%20Paris%20Convention.pdf>

For the text of the 2004 BSC amendment protocol see: https://www.oecd-nea.org/jcms/pl_20467/2004-protocol-to-amend-the-brussels-supplementary-convention and for the unofficial consolidated text see: https://www.oecd-nea.org/jcms/pl_81342/unofficial-consolidated-text-of-the-brussels-supplementary-convention-english-and-french?preview=true

principles in this field.¹² The instruments provide for higher compensation; broader definition of damage; wider geographical scope of application; reduced grounds for exoneration of the operator's liability; longer prescription periods for personal injury; and updated jurisdiction rules. They follow general developments and the main civil liability features of international law regarding other hazardous and dangerous activities, and in most cases even go beyond them. The combined effect of these changes is to enhance the protection of victims of a nuclear accident.

In addition to enhancing the existing international nuclear liability regime, the 1997 CSC [8] provides the framework for establishing a global regime. As a free-standing instrument, it is open to all States and offers the means for a State to become part of the global regime without also having to become a member of the Paris Convention or the Vienna Convention. The 1997 CSC requires a State Party to accept the higher compensation amounts, including participation in the international fund, the broader definition of nuclear damage and the updated jurisdiction rules. With its entry into force in April 2015, the 1997 CSC is now the single instrument covering the greatest number of reactors worldwide.

1.3. ORIGINS AND ESTABLISHMENT OF INLEX

The issue of nuclear liability is important not only with respect to incidents at land based installations, but also because of potential incidents that may arise during the transport of nuclear material. Indeed, the idea of creating an expert group on nuclear liability stems from the negotiations between coastal and shipping states on legal liability and compensation resulting from an accident during the transport of nuclear material that typically took place during the nuclear safety resolutions of the annual General Conference. In the light of the findings of the IAEA International Conference on the Safety of Transport of Radioactive

¹² The new and modernized instruments build on the basic nuclear liability principles enshrined in the so-called old instruments and enhance them in a number of significant ways: (1) liability is channelled to one identifiable person, the operator of the nuclear installation, to the exclusion of any other suppliers; (2) the operator's liability is without fault — victims need only demonstrate the causal link between the damage and the accident; (3) the operator's liability can be limited in amount to ensure availability of adequate funds and insurance coverage; (4) the operator's liability is guaranteed by insurance, other financial security or a State guarantee; (5) liability is limited in time to facilitate adequate compensation distribution and coverage of latent injuries; (6) compensation is without discrimination among victims on the basis of nationality, domicile or residence; and (7) liability claims are channelled to one single court, generally that of the accident State.

Material held at IAEA Headquarters, Vienna, Austria, 7–11 July 2003,¹³ and with a view to fostering a global and effective nuclear liability regime, the IAEA Director General announced the establishment of INLEX in September 2003 to the IAEA Board of Governors and to the IAEA General Conference.

The Director General specified that INLEX would serve three major functions, namely: to explore and provide expert advice on general issues relating to nuclear liability and the need to develop further the IAEA nuclear liability regime; to promote global adherence to this regime; and to assist Member States in developing their national legal frameworks related to nuclear liability.

Further to the Director General's announcement, the 2003 General Conference adopted a resolution (GC(47)/RES/7.C on 19 September 2003), which among other things recognized the importance of having effective liability mechanisms in place.¹⁴ Further to the adoption of the resolution, INLEX was established as an expert group in order to provide advice on issues related to nuclear liability as requested by the Director General or the Director of the IAEA Office of Legal Affairs. More specifically, INLEX was entrusted with a number of advisory functions in the three main areas outlined above. The group currently consists of 20 members, nominated by the Director General, who serve in their individual capacity as experts in the field of nuclear liability (see Annex V of this publication).

¹³ IAEA, IAEA International Conference on the Safety of Transport of Radioactive Material held at IAEA Headquarters, Vienna, Austria, 7–11 July 2003. The Conference President in his Summary and Findings 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, he noted that “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. The Agency Secretariat should prepare such an explanatory text, with the assistance of an independent group of legal experts appointed by the Director General.”

¹⁴ IAEA, General Conference resolution GC(47)/RES/7.C, inter alia, stressed “the importance of having effective liability mechanisms in place to insure against harm to human health and the environment as well as actual economic loss due to an accident or incident during the maritime transport of radioactive materials”, acknowledged the International Conference President's conclusion that “the preparation of explanatory text for the various nuclear liability instruments would assist in developing a common understanding of the complex issues and thereby promote adherence to these instruments.”

1.4. ACHIEVEMENTS AND OUTPUTS OF INLEX

Over the past two decades, INLEX has held 23 regular annual meetings and one special meeting in 2012, all at IAEA Headquarters, the latest from 18 to 20 July 2023 (see Annex IV of this publication). During its regular meetings, INLEX has analysed and considered many issues: for example, proposals concerning the exclusion of certain small research reactors and of installations being decommissioned; issues of denial of shipments and the relevance of the nuclear liability principles; gaps in insurance coverage; liability mechanisms for radioactive sources; the liability coverage for floating nuclear power plants; the scope of application of the IAEA liability conventions as regards fusion installations; liability issues concerning long term storage and disposal facilities; and liability issues concerning the transport of nuclear material.

During its meetings, INLEX finalized the discussion and review of explanatory texts on the nuclear liability instruments adopted under IAEA auspices in 1997, namely, the 1997 Vienna Convention and the 1997 CSC (most recently updated in 2020) [11], as well as on the 1988 Joint Protocol (published in 2013) [12]. Further, INLEX also discussed and reached conclusions and recommendations on several possible gaps and ambiguities in the scope and coverage of the existing international nuclear liability instruments. Many of its conclusions and recommendations in this context are reflected in the aforementioned explanatory texts. In addition, INLEX has issued several papers and commissioned several studies on specific subjects. For example, the group prepared inputs on the Establishment of Maximum Limits for the Exclusion of Small Quantities of Nuclear Material from the Application of the Vienna Conventions on Nuclear Liability, which were most recently adopted by the Board of Governors on 20 November 2014 [13]. Further, in 2007 INLEX developed a position paper, Advantages and Disadvantages of Joining the International Nuclear Liability Regime, which is available on the IAEA's web site to provide further information to IAEA Member States [14].

To provide a platform for fostering adherence to the international nuclear liability regime and a forum for open discussions on possible difficulties, concerns or issues States may have with the regime, INLEX has conducted several outreach activities, including missions, regional and sub-regional workshops, bilateral meetings with Member States and workshops for the diplomatic community in Vienna and in capitals where the IAEA and INLEX meet senior political leaders, government representatives and senior technical experts.

The group's outreach activities were strengthened in 2012 further to its discussion of activities aimed at facilitating the achievement of a global nuclear liability regime. At that time, INLEX agreed that these activities should promote adherence to the relevant instruments as a step toward achieving such a regime.

In this context, the group agreed that IAEA/INLEX missions should be carried out in specific target countries particularly relevant for establishing a global nuclear liability regime and willing to host such missions. A total of 14 regional and sub-regional workshops were organized between 2005 and 2023, focusing respectively on the Asia and Pacific, Latin America and Africa regions (see also Annex III of this publication). These activities have also been focused on those countries embarking on a nuclear power programme for the first time. Based on the request from the 2022 annual INLEX meeting, the Secretariat organized the regional workshop for Latin America and the Caribbean in Rio de Janeiro, Brazil, in October 2023.

Since 2012, ten workshops for diplomats on nuclear liability have been held at IAEA Headquarters (see Annex III of this publication). All such workshops consist of standard presentations and case studies on nuclear liability, as reviewed by INLEX, which set out the main features of the regime and include a dedicated session and ensuing discussion specifically on the CSC. In addition, several dedicated IAEA/INLEX missions have also been dispatched to a number of Member States, in particular, Viet Nam (March 2012), Republic of Korea (April 2012), Jordan (May 2012 and December 2015), South Africa (July 2012 and December 2015), Ukraine (July 2012), Malaysia (August 2013), Nigeria (February 2014), Saudi Arabia (April 2014), China (December 2014, March 2016 and July 2017), Mexico (June 2015), Uruguay (April 2022), Armenia (November 2023), and most recently Poland (December 2023).

Over these past two decades, the various activities of INLEX have been reported to the IAEA's policy making organs and recognized in annual resolutions of the General Conference. In the latest of such resolutions adopted in September 2023, the General Conference

“[r]ecognizes the valuable work of INLEX, and takes note of its recommendations and best practices on establishing a global nuclear liability regime, including through the identification of actions to address gaps in and enhance the existing nuclear liability regimes, encourages the continuation of INLEX, especially for its support for the IAEA's outreach activities to facilitate the achievement of a global nuclear liability regime, and requests that INLEX, via the Secretariat informs Member States on a regular and transparent basis about the work of INLEX and its recommendations to the Director General”¹⁵.

¹⁵ IAEA General Conference resolution on nuclear and radiation safety, GC(67)/RES/7, para. 36.

1.5. 2012 INLEX RECOMMENDATIONS AND THE GLOBAL NUCLEAR LIABILITY REGIME

Further to the adoption of the IAEA Draft Action Plan on Nuclear Safety [2] in response to the accident at the Fukushima Daiichi nuclear power plant on 11 March 2011, INLEX was also assigned a special task with respect to the achievement of a global nuclear liability regime. Adopted by the Board of Governors and subsequently endorsed by the General Conference in September 2011, the Action Plan stated that Member States should “work towards establishing a global nuclear liability regime that addresses the concerns of all States that might be affected by a nuclear accident with a view to providing appropriate compensation for nuclear damage” and “give due consideration to the possibility of joining the international nuclear liability instruments as a step toward achieving such a global regime”, and that INLEX should “recommend actions to facilitate achievement of such a global regime” [2].

In response to the Action Plan, a special session of INLEX was held at IAEA Headquarters from 14 to 16 December 2011. At this special session, the group had a preliminary discussion, based on work already done, on the ways and means whereby a global nuclear liability regime could be established. During its 12th regular meeting, held from 30 May to 1 June 2012, INLEX further discussed and finalized its recommendations to facilitate the achievement of a global nuclear liability regime [1], as requested by the Action Plan. INLEX’s recommendations are available on the IAEA/Office of Legal Affairs web site.

Most notably, INLEX recommended that “[a]ll Member States with nuclear installations should adhere to one or more of the relevant international nuclear liability instruments” [1]. Further, they should also “adopt national laws that are consistent with the principles in those instruments” and “should strive to establish treaty relations with as many States as practical with a view to ultimately achieving universal participation in a global nuclear liability regime” [1, 15]. INLEX also noted “that the CSC establishes treaty relations among States that belong to the Paris Convention, the Vienna Convention or neither, while leaving intact the Joint Protocol that establishes treaty relations among States that belong to the Paris Convention or the Vienna Convention”[1]. In other words, the 1997 CSC serves as an umbrella instrument for Paris and Vienna States, including Paris and Vienna States that belong to the Joint Protocol, as well as 1997 CSC Annex States and thus provides the mechanism to achieve treaty relations with as many countries as practical and thereby universal participation in the global nuclear liability regime.

Further, INLEX noted:

“[i]n addition to providing treaty relations, the CSC mandates the adoption of the enhancements developed under the auspices of the IAEA and contains features to promote appropriate compensation, including an international fund to supplement the amount of compensation available for nuclear damage” [1].

Significantly, further to the entry into force of the 1997 CSC on 15 April 2015, it is now the single instrument covering the most nuclear power plants worldwide. Finally, INLEX recommended that countries with no nuclear installation should consider adherence to the global regime once the regime contains a significant number of countries with nuclear installations.

In the same spirit, and largely based on its 2012 Recommendations [1], INLEX adopted in 2013 a paper entitled Benefits of Joining the International Nuclear Liability Regime and Corresponding Key Messages. In 2022, after thoroughly discussing several issues (including the meaning of a global nuclear liability regime, the primary benefits of such a regime and the pathway to it), an agreement was reached on the substance of a statement on the Benefits of Joining the Global Nuclear Liability Regime by INLEX during its 22nd Annual Meeting. This statement is available on the IAEA’s web site [16].

1.6. CONCLUSION

Nuclear energy can and should play an important role in addressing issues related to climate change, energy security and economic development. To do so, it is vital that citizens be assured that, in the unlikely event of a nuclear incident, meaningful funds will be promptly available to compensate a wide range of damage suffered by all victims, without discrimination and recourse to protracted litigation. From the perspective of the industry, there is also a need for legal certainty that third party civil liability claims for nuclear damage arising from such an incident will be channelled to the operator of a nuclear installation — who shall be exclusively liable to pay compensation, regardless of fault — and that such claims are adjudicated exclusively in the courts of one State, usually the State where a nuclear incident occurs.

Several international conventions have been adopted to ensure a degree of harmonization of national laws in this area. The international system created by these conventions was further enhanced after the 1986 Chornobyl nuclear power plant accident. Following the 2011 accident at the Fukushima Daiichi nuclear power plant, efforts are focused on establishing a global nuclear liability regime. However,

the absence of treaty relations between State Parties to different conventions, as well as the comparatively low level of adherence to some of those conventions, have so far prevented the achievement of such a regime with full participation.

In conclusion, INLEX has played a vital role over the course of the past two decades in providing advice on nuclear liability related issues and supporting the establishment of a global nuclear liability regime, including through its many outreach activities and explanatory texts.

2. THE INTERNATIONAL EXPERT GROUP ON NUCLEAR LIABILITY (INLEX): TWENTY YEARS OF ADVICE AND ASSISTANCE TO ENHANCE ADHERENCE TO THE GLOBAL NUCLEAR LIABILITY REGIME

D. MCCAULEY¹⁶

2.1. INTRODUCTION

The year 2023 marks the twentieth anniversary of the IAEA's International Expert Group on Nuclear Liability (INLEX). INLEX was established by the Director General of the IAEA in 2003 with the objectives, as defined in the original Terms of Reference¹⁷, to:

- (i) Create a forum of expertise to explore and advise on issues related to nuclear liability;
- (ii) Enhance global adherence by nuclear and non-nuclear States to an effective nuclear liability regime based on the various international nuclear liability conventions¹⁸;

¹⁶ D. McCauley has been the Chair of INLEX since March 2023.

¹⁷ IAEA, Terms of Reference (2003), IAEA International Expert Group on Nuclear Liability (INLEX), October 3, 2003.

¹⁸ The Convention on Supplementary Compensation for Nuclear Damage and the Annex thereto, the Vienna Convention on Civil Liability for Nuclear Damage, the Paris Convention on Third Party Liability in the Field of Nuclear Energy, the Joint Protocol relating to the Application of Vienna Convention and the Paris Convention, and the amendments thereto.

- (iii) Assist in the development and strengthening of the national nuclear liability legal frameworks in IAEA Member States to protect the public and the environment and to enhance nuclear safety.

The current nineteen members of INLEX are international experts on nuclear liability who participate in their personal capacities providing authoritative advice and assistance on nuclear liability issues as requested by the Director General and/or the Director of the Office of Legal Affairs. Since its first meeting on 16–17 October 2003, INLEX has met at least annually (see Annex IV of this publication).

The motivation for the creation of the group came from at least two sources. Specifically, the summary of the July 2003 International Conference on the Safety of Transport of Radioactive Material (2003 Transport Safety Conference) noted that the “lack of broad adherence to a global liability regime creates uncertainty as to the legal consequences of a transport accident,”¹⁹ and the Conference concluded that explanatory texts of the nuclear liability instruments should be prepared, with the assistance of an independent group of legal experts appointed by the Director General.²⁰ The Conference concerns reinforced prior recommendations from various Member States, and particularly the United States of America, on the need for greater adherence to the international nuclear liability instruments, by both nuclear and non-nuclear states, to advance a global regime of nuclear liability.

The goal of this section is to provide a high level understanding of the functions of INLEX and its work over the last twenty years. In a summary, such as this, it is impossible to deal with the many issues that the group has dealt with in any detail. The attempt here is to identify some of the enduring and key subjects INLEX has addressed, the context for those discussions, as well as some of the current issues under review and future matters that would seem apt for the group’s consideration.

2.2. THE OBJECTIVES AND FUNCTIONS OF INLEX

The INLEX terms of reference, first established in 2003, were subsequently revised in 2019 to better reflect the practical evolution of the group’s activities over the years, particularly as a well-established forum of expertise, recognized by the IAEA Director General, Board of Governors and the General Conference.

¹⁹ IAEA, *Safety of Transport of Radioactive Material: Proceedings of An International Conference held in Vienna, Austria, 7–11 July 2003* (2004), Executive Summary, p. vi.

²⁰ *Ibid.*, p. vi.

The new terms of reference also recognized the role of INLEX in fulfilling essential functions in regard to the role of the Board of Governors for the liability instruments under IAEA auspices, assistance to Member States in developing their own liability legislation, and in advancing the IAEA's objective of a global liability regime. The objectives of INLEX under the 2019 terms of reference are to:

- (i) Provide authoritative advice and guidance on issues relating to civil liability for nuclear damage;
- (ii) Assist the IAEA Secretariat in conducting outreach activities and providing legislative assistance in IAEA Member States;
- (iii) Contribute to IAEA activities aimed at ensuring a global nuclear liability regime and its implementation at the national level.²¹

The functions of INLEX, as revised, provide a greater understanding of the specific roles of the group in pursuing its objectives. The functions of INLEX are to:

- (a) Advise on all issues relating to civil liability for nuclear damage;
- (b) Consider and address the nuclear liability instruments adopted under IAEA auspices, as well as the international nuclear liability regime as a whole, and identify and explore issues pertaining to their application;
- (c) Advise on issues relating to the performance by the IAEA Board of Governors of the functions attributed to it by the relevant nuclear liability conventions;
- (d) Consider the need to develop further the IAEA nuclear liability regime, taking into account the specific concerns of both States with nuclear installations and States without such installations;
- (e) Assist the IAEA Secretariat in developing explanatory texts and training materials on the nuclear liability instruments;
- (f) Assist the IAEA Secretariat in conducting outreach activities (such as national, regional or sub-regional workshops and follow-up missions) in the field of civil liability for nuclear damage;
- (g) Perform such other functions as may be requested by the Director General or the Director of the Office of Legal Affairs.²²

²¹ IAEA, Terms of Reference (2019), IAEA International Expert Group on Nuclear Liability (INLEX), February 2019.

²² IAEA, Terms of Reference (2019).

2.3. THE INITIAL PROGRAMME OF WORK AND THE FIRST TEN YEARS

From the outset, INLEX advanced three key initiatives to progress the objectives in its mandate.

2.3.1. The explanatory texts

INLEX undertook to develop explanatory texts for the 1997 Vienna Convention and the 1997 CSC [11]. This undertaking very much responded to concerns of the Conference on the Safety of Transport of Radioactive Material that, in its conclusions, recommended that such a document be prepared. As the President of the Conference explained, “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”²³.

Andrea Gioia led the development of the explanatory texts. The goal was an authoritative document that would assist diplomats and non-lawyers in their understanding of the international nuclear liability regime. Draft texts were reviewed by INLEX, discussed and revised over multiple meetings. The drafts drew heavily on historic documents, including the records of negotiation of the conventions, including the 1963 Vienna Convention [4], as well as the negotiating history and other relevant documents of the liability conventions under the auspices of the OECD/NEA [3, 5].²⁴ In 2004, the texts were approved by both the IAEA Board of Governors and the General Conference. The final version of the texts was circulated among Member States, submitted to the 50th General Conference of the IAEA and, in 2007, published in the IAEA International Law Series. Since then, INLEX has contributed to two important updates to the texts that were reflected in published revisions by the Secretariat in 2017 and 2020 [11].²⁵ The explanatory texts are an excellent authoritative guide to the international nuclear liability regime and a hallmark contribution by the IAEA Secretariat and INLEX to the field.

²³ IAEA, Safety of Transport of Radioactive Material, (2004), p. vi.

²⁴ The Convention on Third Party Liability in the Field of Nuclear Energy (1960 Paris Convention) and its amendments, and the Convention of 31 January 1963 Supplementary to the Paris Convention (Brussels Supplementary Convention) and its amendments.

²⁵ The explanatory texts were first updated in 2017 in the light of important developments, including INLEX’s adoption in 2012 of recommendations on how to facilitate achievement of a global nuclear liability regime and the entry into force of the 1997 CSC in April 2015. The second revision of 2020 also reflects further discussions within INLEX.

2.3.2. Analysis of ambiguities and gaps

In parallel to the work on the explanatory texts, INLEX undertook a further detailed review of the issues that had been raised, primarily by coastal States, at the 2003 Transport Safety Conference. This work was facilitated by the Secretariat, which had consolidated a number of general issues and concerns from the Transport Conference with additional issues and questions that came out of the development and review of the draft explanatory texts.

The full scope of these issues, referred to as ambiguities and gaps associated with the nuclear liability instruments, is too broad to address in this summary. From the Transport Safety Conference came an overarching concern regarding the complexity of the international regime; multiple conventions with diverse scope and obligations, and the need to better clarify the relationship between the conventions and to encourage greater adherence to them. Highlighted areas of concern related to the treatment of economic loss and damage in the international nuclear liability conventions; differing liability limits across the conventions and especially those applicable to transport; time limits; the process necessary to pursue claims; the fairness of the need for contributions to the CSC by non-nuclear contracting parties; and the proposal for a detailed regime covering liability during transport specifically. The items brought forward from the development of the draft explanatory texts were quite specific and pertained to interpretations of the actual wording of provisions in the 1997 Vienna Convention [7] and the CSC [8].

The ensuing discussions, over a number of the early meetings offered the opportunity to conduct a deeper dive into the issues themselves and develop responses and clarifications. The exercise was quite effective in establishing a collective view on the issues raised. The consensus was reflected either in the form of revisions to the explanatory texts and/or advice to be factored into the nuclear liability outreach activities for Member States. In cases where gaps were identified, INLEX was pressed to identify actions to address those gaps. While some proposed actions were recognized as not entirely closing the relevant gap, it was accepted that they went quite far, perhaps as far as is possible without amending the instruments.

INLEX acknowledged the complexities of the system resulting from the existence of different instruments but it also highlighted that the CSC [8] was established as an overarching global liability regime that could be joined by Vienna Convention states, Paris Convention states, or those that wished to join as CSC Annex states. The group acknowledged that adherence to the Vienna Convention and the Paris Convention would also advance the objective of a global nuclear liability regime and that the 1998 Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention (Joint

Protocol) [6] establishes treaty relations between the Vienna Convention and the Paris Convention states to eliminate conflicts with the application of both conventions in the event of a nuclear incident [6]. Nonetheless, there continues to be uncertainty on the application of the various instruments, and with the more recent entry into force of the 2004 Protocol to amend the Paris Convention [9] that raises significantly the amount of liability in States party to that Convention, there are ongoing questions regarding reciprocity between Parties to the 1963 and 1997 Vienna Conventions and the Paris Convention, including those who are also Parties to the Joint Protocol [6].

To address uncertainties regarding some of these relationships, in 2008, INLEX requested that the Secretariat prepare an explanatory text on the Joint Protocol. Once again, Andrea Gioia led the preparation of the publication with the cooperation of representatives of the OECD/NEA and the assistance of INLEX members; it was published in 2013 in the IAEA International Nuclear Law Series [12]. It serves to further clarify the relationship between the Vienna Convention and Paris Convention, however, there may be scope for further revisions to the text pursuant to ongoing INLEX discussions and the entry into force of the 2004 Protocol to amend the Paris Convention [9] and the Protocol to amend the Brussels Supplementary Convention [10].

2.3.3. Outreach activities

The third key element of the group's initial programme of work, was its planned outreach activities to Member States to encourage their development and adoption of national nuclear liability legislation as well as their participation in one of the international liability conventions in order to advance the goal of a global regime of nuclear liability. The Secretariat began the development of a programme for standardized workshops on nuclear liability that could be delivered in host countries to a regional audience. The workshops would cover, inter alia, the basic principles of nuclear liability, the importance of national laws in this area, an introduction to the international instruments governing nuclear liability, and case studies on the application of the instruments in nuclear incident scenarios. The workshops would be delivered by INLEX members and representatives of the Secretariat.

Outreach activities have been a very active and successful facet of the work of INLEX. The first workshop was held in Sydney, Australia, in 2005 for Member States of the Asia and Pacific region. Since that time, regional workshops — and later targeted workshops for individual Member States — have been held regularly on at least an annual basis. From the initial workshop, adaptations have been made to respond to feedback received from Member State participants and from INLEX members delivering the sessions. INLEX has played an active role in

supporting the development of new products that communicate key messages on the importance and benefits of participation in the international nuclear liability regime. The IAEA's Legal Assistance Programme, managed by the Office of Legal Affairs, also included a section on nuclear liability and provided another opportunity to communicate the importance of nuclear liability legislation as part of a national legislative framework for nuclear. INLEX provided input to the Secretariat on Member States that might be targeted for such assistance. It also assisted the Secretariat in its update to the chapter on nuclear liability in the IAEA Handbook on Nuclear Law [15], which, for the first time, included suggested model provisions for nuclear liability legislation.

2.3.4. Decision making authorities of the Board of Governors on nuclear liability

As early as the third meeting of INLEX in 2004, its Chair, Steven McIntosh, recommended that the group take on the additional role of providing advisory support to the Director General and the IAEA Board of Governors on decision making authorities explicitly set out for the Board under the nuclear liability instruments adopted under IAEA auspices, the 1963 Vienna Convention [4], the 1997 Vienna Convention [7], and the CSC [8]. Article I.2 of the 1963 Vienna Convention permits the installation state to exclude, if the small extent of the risks so warrants, small quantities of nuclear material from application of that convention.²⁶ Both Article I.2 of the 1997 Vienna Convention and Article 1.2 of the CSC Annex permit the installation state to exclude, once again if the small extent of the risks so warrants, any installation or small quantities of nuclear material from the application of those conventions.²⁷ Any exclusion, however, has to satisfy criteria or limits established by the IAEA Board of Governors for such exclusion. The 1997 Vienna Convention (Article II(j)(iv)) also permits the Board of Governors to expand the list of nuclear installations covered by the Convention, something not provided for in either the 1963 Vienna Convention or in the CSC.²⁸

In the context of the above proposal, INLEX considered the validity of the then current maximum limits in the IAEA Transport Regulations for the exclusion of small quantities of nuclear material from the application of the 1963 Vienna Convention. The limits had been established in 1978. At the request of INLEX, the Secretariat prepared an updated decision in consultation with the relevant IAEA technical committee and the Nuclear Law Committee of the OECD/NEA,

²⁶ 1963 Vienna Convention, Article I.2.

²⁷ 1997 Vienna Convention, Article I.2; CSC Annex, Article 1.2.

²⁸ 1997 Vienna Convention, Article I.1(j)(iv).

which was at that time considering the issue pursuant to a similar provision of the Paris Convention. Subsequently, INLEX reviewed and endorsed a draft Board resolution which was later considered and adopted by the Board of Governors at its 2007 meeting.²⁹

2.4. THE FUKUSHIMA ACCIDENT AND THE IMPLICATIONS OF THE 2011 IAEA ACTION PLAN ON NUCLEAR SAFETY

A key response of the IAEA to the 2011 nuclear events at the Fukushima Daichii nuclear power plant was the development of an Action Plan on Nuclear Safety [2]. The plan was approved by the Board of Governors and then endorsed at the General Conference in September 2011. The Action Plan “defined a programme of work to strengthen the global nuclear safety framework” [2]. It set out actions in 12 areas, including the international legal framework, to strengthen safety. The Action Plan called on Member States to work toward the establishment of a global nuclear liability regime and called on INLEX to recommend actions to facilitate achievement of such a global regime. It also called on Member States to give due consideration to the possibility of joining the international nuclear liability instruments as a step toward achieving such a global regime [2].

As a result, INLEX met at a Special Session in December 2011 to discuss a proposed strategy and activities to respond to the Action Plan. INLEX was well-positioned to address expectations as it already had an effective programme of Outreach Activities in place to encourage Member States to establish national laws on nuclear liability and join one of the international nuclear liability instruments. Through the development of its Outreach Activities and its deliberations over the years on Ambiguities and Gaps, INLEX also developed documentation that could be utilized to formulate specific recommendations. It was able to quickly launch a number of Outreach Activities, including targeted liability workshops and meetings as well as liability sessions incorporated into other IAEA learning sessions and IAEA missions.

In May 2012, the Group met again to formalize and adopt its recommended actions that Member States should take to facilitate the achievement of a global liability regime: Recommendations on How to Facilitate Achievement of a Global Nuclear Liability Regime [1]. At the same time, INLEX committed to continue its more aggressive approach to Outreach. An excellent review of the INLEX response to the IAEA Action Plan on Nuclear Safety and its results is provided in

²⁹ IAEA, The Establishment of Maximum Limits for the Exclusion of Small Quantities of Nuclear Material from the Application of the Vienna Conventions on Nuclear Liability, Resolution [GOV/2007/39 (Corrected)], 2007.

a paper written by the former INLEX Chair, Steven McIntosh: Nuclear Liability and Post-Fukushima Developments³⁰.

2.5. THE SECOND DECADE: RENEWED EFFORTS TO ENHANCE THE GLOBAL LIABILITY REGIME

In its second decade, INLEX has witnessed greater growth in the number of Contracting Parties to the international nuclear liability conventions under IAEA auspices than in its first decade. In particular, it witnessed the entry into force of the CSC in 2015 and the spread of the global nuclear liability regime to four major nuclear power producing States: Canada, India, Japan, and the United States of America. Today, more reactors are covered by the nuclear liability regime of the CSC than any of the other international liability instruments. Great enhancements in the nuclear liability conventions under the auspices of the OECD/NEA have also been seen, with the entry into force in 2022 of the 2004 Protocol to Amend the Paris Convention [9] and the 2004 Protocol to Amend the Brussels Supplementary Convention [10].

Through this second decade INLEX made ongoing efforts to ensure that the explanatory texts of the 1997 Vienna Convention and the 1997 Convention on Supplementary Damage remained current. Two revisions have been published since the original publication in 2007. Each revision considered ongoing interpretations of the conventions by INLEX. Notably, the 2017 revision also reflected the entry into force of the CSC in 2015 and included the recommendations prepared by INLEX to respond to the Action Plan on Nuclear Safety. The more recent 2020 version reflects additional deliberations of INLEX [11]. Furthermore, the explanatory text on the Joint Protocol was also finally published in this second decade [13]. The explanatory texts are an excellent authoritative guide to the international nuclear liability regime and an important contribution to the development and strengthening of national liability legislation.

Matters concerning ambiguities and gaps associated with the nuclear liability instruments continue to be monitored. INLEX has stayed abreast of interpretations on matters pertaining to the heads of damage, particularly economic loss and environmental damage. It is also updated regularly on the administration of claims associated with Japan's response to the nuclear

³⁰ McIntosh, Steven, Nuclear Liability and Post-Fukushima Developments, in Nuclear Law: The Global Debate, (IAEA, 2022), Chapter 12, p. 249.

incident³¹ at the Fukushima Daiichi nuclear power plant, which has proven very useful. Issues concerning the rights and obligations of non-nuclear states, be they Contracting or Non-Contracting Parties are considered regularly. The associated issue of the complexity of the international regime also continues to receive attention with INLEX providing interpretations of the application of the conventions to nuclear incidents that may involve multiple States, invoking different international nuclear liability instruments.

INLEX also has continued to be very active in the planning and implementation of the outreach activities, which have expanded to include not only regional meetings on liability, but also country specific targeted outreach, and annual workshops for diplomats in Vienna that are held on the periphery of the INLEX annual meetings. Instruction on nuclear liability is included in the Office of Legal Affairs's Legal Assistance Programme. INLEX continues to work with the Secretariat to improve the outreach programme, recognizing its importance to achieving a global nuclear liability regime.

Finally, INLEX has continued to carry out its advisory function to the IAEA Board of Governors on the Board's decision making authorities set out under the IAEA nuclear liability conventions. On the advice of INLEX, in 2014, the Board of Governors updated its decision pertaining to the Exclusion of Small Quantities of Nuclear Material from the Application of the Vienna Conventions on Nuclear Liability [13]. Further, INLEX considered the necessity for it to engage the Board on the potential exclusion of certain small risk installations from the application of the Vienna Conventions. In the end, it considered that such an exclusion was not warranted.³²

Beyond these ongoing matters, in the second decade, INLEX dealt with a number of new issues shaped by developments in the nuclear industry. A former INLEX Chair identified a number of important issues considered by INLEX in its second decade³³. Three of these issues are summarized here due to their importance and the extended discussions that took place. These issues concern the application of the conventions to: (i) radioactive sources, (ii) transportable nuclear power plants, and (iii) radioactive waste disposal facilities.

³¹ In the area of civil liability for nuclear damage, the defined term 'nuclear incident' encompasses the term 'nuclear accident'.

³² In the view of INLEX, liability questions related to low-risk facilities were best served from within the existing regime, noting that the Vienna Conventions and the CSC both permit Contracting Parties to establish quite limited financial liability requirements on the operations (5 million special drawing rights (SDRs)).

³³ McIntosh, Steven, *op. cit.*, p. 257.

2.5.1. Radioactive sources

The nuclear liability conventions, under the auspices of both the IAEA and OECD/NEA, exclude radioactive sources from their application.³⁴ In the findings of the 2013 IAEA International Conference on the Safety and Security of Radioactive Sources in Abu Dhabi, the President of the Conference acknowledged that radioactive sources were excluded from the liability conventions, but expressed concern regarding the lack of clarity on liabilities associated with sources and the availability of adequate compensation to deal with claims from potential victims in the event of an incident. The Conference recommended that the IAEA should further examine the issue and that one option would be for INLEX to review it.³⁵

INLEX accepted the recommendation and confirmed that radioactive sources were excluded from the liability conventions. Further, it considered that the issue did not warrant a separate international liability regime given the scope of potential damages, the likelihood that damages would not likely extend beyond national boundaries, and that general tort law and any applicable environmental laws would apply. At subsequent meetings, INLEX took up the question of the availability of insurance for such damage. Based on the availability of insurance in most States, it was recommended that users of high-activity radioactive sources be required as a condition of licensing to carry insurance addressing third-party liabilities.

2.5.2. Transportable nuclear power plants

First raised at its meeting in 2012, INLEX has held extended discussions regarding the application of the liability conventions to transportable nuclear power plants. All conventions under IAEA auspices are clear that they do not apply to reactors that form a part of the operational functioning of a means of sea or air transport.³⁶ However, the prospect of the deployment of mobile nuclear power plants that could be, and now have been, transported by sea and installed in a fixed position to generate electricity externally, raised many issues.

³⁴ The IAEA conventions — Vienna Conventions Article I.1(g), CSC Annex Article 1.1(e) — like the Paris Conventions, do not apply to “radioisotopes which have reached the final stage of fabrication so as to be usable for any scientific, medical, agricultural, commercial or industrial purpose”.

³⁵ IAEA, *Safety and Security of Radioactive Sources: Proceedings of an International Conference held in Abu Dhabi, United Arab Emirates, 27–31 October 2013* (2015), p. 720.

³⁶ Under the IAEA conventions, the term ‘nuclear installation’ includes, inter alia, “any nuclear reactor other than one with which a means of sea or air transport is equipped for use as a source of power, whether for propulsion thereof or for any other purpose.”

INLEX took the view that, once such a reactor was in a fixed position and generating electricity, the conventions would apply. The State in which the reactor would be installed would be considered the installation state. As to the question of liability during the transport of the reactor, the group agreed that during the transport to the location of the installation, the conventions would apply only if the reactor was fuelled because of the presence of nuclear material. On any subsequent re-transport of the reactor, after it had been used to generate electricity, the conventions would also apply due to the continued presence of nuclear material in the form of radioactive products or waste. The group recognized that a variety of arrangements might be possible in the deployment of transportable nuclear power plants. Those specific arrangements would influence the determination of a number of questions, including the liable operator.

2.5.3. Radioactive waste disposal facilities

Another issue that underwent more detailed scrutiny by INLEX over recent meetings, was the application of the liability conventions under IAEA auspices to radioactive waste disposal facilities. The conventions apply to nuclear installations, which include “any facility where nuclear material is stored, other than storage incidental to the carriage of such material”³⁷. ‘Nuclear material’ is defined to include “radioactive products or waste” [5]. However, neither the Vienna Conventions nor the CSC explicitly indicate that disposal facilities are within their scope. The same situation applies to the 1960 Paris Convention [3]. In 1984, the OECD/NEA Steering Committee took a decision that “[i]nstallations for the disposal of nuclear substances shall, for the pre-closure phase, be considered as ‘nuclear installations’ within the meaning ... of the Paris Convention”³⁸ [3]. The Paris Convention, amended by the 2004 Protocol [5], now explicitly includes “installations for the disposal of nuclear substances”, without any reference to the pre-closure phase of disposal [3].³⁹

In the view of INLEX, it was important to keep disposal facilities within the purview of the nuclear liability conventions and it considered that the term ‘storage’ could be interpreted to apply throughout the period while the facility was under license through the facility’s operation, closure and in the post-closure period while institutional controls are in place. This was similar to the decision taken by the OECD/NEA Steering Committee in 1984. However, in the very long term, in the latter part of the post-closure phase, when there are no active

³⁷ 1997 Vienna Convention, Article I.1(j)(iii), CSC Annex, Article 1.1(b)(iii).

³⁸ OECD/NEA, Paris Convention: Decisions, Recommendations, Interpretations, Paris, 1990, p.6.

³⁹ 2004 Paris Convention, Article I(a)(ii).

institutional controls and the licence may no longer be in place, INLEX took the view that the liability would pass to the State which had agreed to the terms of the closure and the termination of the licence.

2.6. UPCOMING ISSUES

Going forward, there are a number of important issues that will engage the attention of INLEX over the coming years.

The global reach of the conventions has increased over the last 20 years, but there still remain very many countries that are not members of any convention, including several major nuclear energy producing States. Enhancing global adherence by nuclear and non-nuclear States to an effective nuclear liability regime based on the various international nuclear liability conventions is one of the objectives of INLEX. INLEX will continue to assist the IAEA Secretariat in developing and delivering an effective programme of outreach activities aimed at increasing the number of States that adopt national nuclear liability legislation and participation in the international nuclear liability conventions.

Related to this priority, the United Kingdom (UK), a member of the Paris Convention and Brussels Supplementary Convention, has indicated that it intends to become a Party to the Convention on Supplementary Compensation. This is an important and welcome development. INLEX, building on some earlier general discussions in this area, is likely to further examine the application of the two regimes simultaneously in order to better understand the potential implications with a view to clarifying the situation, particularly in regard to other States that may also wish to take similar action in coming years.

At a more technical level, INLEX is also expected to give further consideration to the application of the international nuclear liability instruments to nuclear fusion installations and small modular reactors.⁴⁰

INLEX has already taken up the issue of nuclear fusion installations in more recent meetings, but discussions continue as developments in the technology and its application evolve. The liability conventions under IAEA auspices, similar to the Paris Convention, do not include fusion reactors within the definition of ‘nuclear installation’ and, similarly, the radioactive waste produced by these reactors does not fit within the scope of ‘radioactive products and waste’ in the conventions. INLEX has considered whether fusion facilities should be included within the scope of the conventions, whether they should be the subject of a special international or national liability regime, or whether they should be

⁴⁰ Steven McIntosh, *supra* note 30, also highlights these two areas, among others, on p. 264.

treated in the same manner as other industrial facilities outside of the scope of the conventions such as large chemical facilities or uranium mines and refineries. Briefings from experts within the IAEA indicate that a catastrophic accident associated with a fusion facility is not a credible scenario. However, such reactors do produce significant quantities of low and intermediate level radioactive waste. While INLEX has to date taken the view that fusion reactors should not be brought within the scope of the conventions, it continues to study the matter.

Concepts for small modular reactors are being advanced in a number of countries with anticipated deployment horizons in the short to medium terms. While a variety of technologies are being considered — some incremental improvements on existing reactor designs and others groundbreaking new technologies — the expectation is that they will fall within the scope of the liability conventions. Nonetheless, proponents of these technologies will desire clarity on liability issues from the jurisdictions in which they will be deployed. They will seek certainty that they will be covered by national liability legislation, want clarity on the financial limit of their liability, and may consider their facilities to be low risk, for which lower liability limits should be imposed. Some of the technologies will be land based, some may be deployed in very remote locations, others may be mobile facilities, and yet others may be located in coastal waters. States where such technologies are to be deployed are in varying stages of developing their regulatory framework for these technologies and some are already contemplating these questions. INLEX has only begun its discussions on these issues and has chosen to seek further information at this juncture on the technologies that may be deployed and the scope of the risks that they may represent.

2.7. CONCLUSIONS

Over the last two decades, INLEX has made significant strides in addressing its original objectives of: (i) creating a forum of expertise to explore and advise on issues related to nuclear liability; (ii) enhancing global adherence to an effective nuclear liability regime; and (iv) assisting in the development and strengthening of the national nuclear liability legal frameworks in IAEA Member States.

INLEX progress on its programme of work has resulted in much greater clarity on the international nuclear liability instruments and their application, in the development of key products and tools to enhance understanding, and in the delivery of a programme of outreach to Member States to encourage greater participation in the global nuclear liability regime.

While a strengthening of the global regime has been witnessed, with new adherents, the entry into force of the Convention on Supplementary

Compensation [8] and the Protocols to the Paris Convention [9] and the Brussels Convention [10], there remains much to be done. INLEX is well-positioned to continue its work in the next decade and build on the results achieved thus far.

3. INTERNATIONAL EXPERT GROUP ON NUCLEAR LIABILITY (INLEX) AND THE GLOBAL REGIME

B. MCRAE⁴¹

3.1. ORIGINS OF THE GLOBAL REGIME

In the 1950s, the United States of America decided to encourage the peaceful use of nuclear energy by changing its Atomic Energy Act to permit private companies to construct and operate nuclear power plants to produce electricity. However, after this change was made, nothing happened because of concerns about liability for nuclear damage that might result if there were to be a nuclear incident (that is, a release of radiation) at a nuclear power plant. While the probability of such an event was (and continues to be) extremely small, the magnitude of the damage was potentially catastrophic and more than potential participants in nuclear power plant projects were willing to accept. This situation engendered a public policy debate as to how to secure the benefits of the peaceful use of nuclear energy, while also ensuring proper compensation in the event of a nuclear incident. On the one hand, there were environmental justice concerns on the need to identify potential harmful consequences from the operation of nuclear power plants and to have mechanisms in place to deal with those consequences equitably, efficiently and effectively. On the other hand, there were concerns from operators, suppliers, investors, lenders, insurers and other potential participants as to their legal and financial exposure in the event of a nuclear incident. After considerable consideration, the US Congress adopted the Price-Anderson Act (PAA) to address these concerns. The PAA has served as an essential element in the deployment of the largest fleet of nuclear power plants in the world. In general, the PAA retains normal tort law, but superimposes a comprehensive system that caps liability at a relatively high amount (currently

⁴¹ B. McRae is the Assistant General Counsel for Civilian Nuclear Programs at the United States Department of Energy (DOE). The views expressed in this article are those of the author and do not necessarily represent those of DOE.

approximately 13 billion USD), requires operators to have insurance, and provides for the indemnification by operators and the federal government of all persons legally liable for nuclear damage. The PAA operates to ensure prompt and equitable compensation for nuclear damage and to provide the legal certainty necessary for nuclear power plant projects to go forward.

Soon after the United States of America embarked on the peaceful use of nuclear energy, a number of countries in Western Europe began to consider a similar course of action. As a preliminary and necessary measure, under the auspices of the OECD, these countries adopted the 1960 Paris Convention (1960 PC) [3] to address issues related to liability for and compensation of nuclear damage. Normal tort law often results in protracted litigation in multiple jurisdictions, against multiple defendants, with uncertain outcomes, and with no guarantee of judgements being enforceable or funds being available to pay judgements. To overcome these problems, the 1960 PC replaced normal law with a special regime that reflected the then state of the art legal thinking on how to deal with potentially complex litigation involving ultra-hazardous activities. In general, this special regime operates as follows: the operator is exclusively liable on the basis of strict liability for all nuclear damage resulting from a nuclear incident at a nuclear power plant or other nuclear installation or during transport to or from such an installation and claims for nuclear damage can only be brought in one court, usually a court in the country where the nuclear incident occurred.

The basic principles of this special regime are:

- Legal Channelling: operator is exclusively liable for all nuclear damage resulting from a nuclear incident; no claim for nuclear damage can be brought against a supplier, investor, lender or any other person;
- Strict Liability: operator is liable without the need to show fault, intent or negligence; only needs to show nuclear incident caused the nuclear damage;
- Minimum Operator Liability: liability of operator may be limited to specified minimum amount; a country may impose a higher amount of liability or even unlimited liability on operator;
- Mandatory Financial Coverage: operator has to maintain a minimum amount of insurance or other financial security;
- Limitation of Liability in Time: claims for nuclear damage need to be brought within a specified period of time;
- Equal Treatment of Victims: all victims treated the same; no discrimination permitted on the basis of nationality, domicile or residency within the geographical scope of the applicable regime;
- Exclusive Jurisdiction: one court has exclusive jurisdiction over all claims for nuclear damage arising from a nuclear incident, usually a court in the

country where the nuclear incident occurs; judgements are enforceable in all countries within the applicable regime.

In 2022, the 2004 Paris Convention (2004 PC) [8] came into effect and replaced the 1960 PC [3]. The 2004 PC retains the basic principles and adds enhancements in several areas, including compensation, definition of nuclear damage and jurisdiction. The Paris Regime (i.e. the group of countries that previously belonged to the 1960 PC and now belong to the 2004 PC) is a regional regime since all the countries within that regime are located in Europe (primarily Western Europe). Currently, the Paris regime covers 104 nuclear power plants, located in 10 Western European countries.

In 1963, under the auspices of the IAEA, the 1963 Vienna Convention (1963 VC) [4] was adopted and contains the same basic principles as the 1960 PC. In 1997, again under the auspices of the IAEA, the Protocol to Amend the 1963 VC (1997 VC) [5] was adopted. The 1997 VC retains the basic principles and adds enhancements in several areas, including compensation, definition of nuclear damage and jurisdiction. Although open to all countries and having members around the world, the Vienna Regime (i.e. countries that belong to the 1960 VC and/or the 1997 VC) has been focused primarily on Eastern Europe up to now. Currently, the Vienna Regime covers 81 nuclear power plants, of which 72 are located in nine Eastern European countries. It should be noted that some of the non-European members of the Vienna Regime have indicated they have plans to initiate or expand nuclear power programs in their countries.

Most countries with nuclear power plants outside of Europe have chosen, for various reasons, not to join the Paris or the Vienna Regime (see Table 3.1). With the exception of the United States of America, which continues to rely on the PAA, these countries have adopted national laws that, for the most part, reflect the basic principles. Of the 262 nuclear power plants located outside Europe, 251 are located in countries that do not belong to the Paris or the Vienna Regime. With the entry into force of the Convention on Supplementary Compensation for Nuclear Damage (CSC) [8] in 2015, 167 of the nuclear power plants located outside of Europe now belong to the CSC Annex Regime (that is, the group of countries that belong to the CSC and have national law consistent with the provisions of the Annex to the CSC) (see Table 3.1).

Prior to 1986, many thought that the nuclear liability problem had been solved. The Chernobyl nuclear power plant accident exposed that misconception. The Chernobyl nuclear accident was a catastrophic event that resulted in

TABLE 3.1. REACTORS BY NUCLEAR LIABILITY REGIME
Adapted from IAEA, Nuclear Power Reactors in the World (2022)

Paris Regime	No. of power reactors	Vienna Regime	No. of power reactors	CSC Annex Regime	No. of power reactors	No regime (unaligned)	No. of power reactors
Belgium	7	Armenia	1	Canada	19	China	53
Finland	4	Belarus	1	India	22	Iran	1
France	56	Brazil	2	Japan	33	Korea, Republic of	24
Germany	3	Bulgaria	2	United States of America	93	Pakistan	5
Netherlands, Kingdom of	1	Czech Republic	6	—	—	South Africa	2
Slovenia	4	Hungary	4	—	—	—	—
Spain	7	Mexico	2	—	—	—	—
Sweden	6	Russian Federation	37	—	—	—	—
Switzerland	4	Slovakia	4	—	—	—	—
UK ^a	12	Ukraine	15	—	—	—	—
—	—	Argentina ^b	3	—	—	—	—
—	—	Romania ^b	2	—	—	—	—
—	—	UAE ^b	2	—	—	—	—
Total	104	—	81	—	167	—	85

^a Announced intent to join CSC.

^b Also a CSC Party.

the death or illness of a number of persons,⁴² the long term contamination of large tracts of land, and transboundary damage to persons, property and the environment thousands of miles away. Since the Soviet Union did not belong to any international nuclear liability instrument and had no special law on nuclear liability, questions that led to the development of the basic principles were raised, including the following:

- Who could be sued and on what basis?
- What damage was covered?
- How much compensation would be awarded, and would financial resources be available to pay any such compensation?
- Did victims of transboundary damage have standing to sue in Soviet courts?
- Could claims be brought in courts outside the Soviet Union and would foreign judgements be enforceable in the Soviet Union?

None of these questions were answered satisfactorily, and in particular, none of the very substantial transboundary damage was compensated by the Soviet Union or anyone involved in the operation of the Chernobyl nuclear power plant. A major lesson from the Chernobyl nuclear accident was that, in order for the special regime to be effective, it has to be incorporated into national laws and it has to apply to all countries affected by an accident through treaty relations among those countries. As a result, under the auspices of the IAEA, the international community undertook an intensive five-year negotiating effort to update and enhance the liability regimes, giving special attention to creating a pathway to a global regime that would cover nuclear damage in any country that might be affected by a nuclear incident and that would increase the funds available to compensate nuclear damage.

In developing a pathway to a global regime, the international community had to balance the same two goals that had been at the centre of the discussions that had resulted in the special regime more than three decades earlier. First, the primary purpose of a global regime is to ensure prompt and equitable compensation for nuclear damage to persons, property and the environment, including transboundary damage. Second, a global regime needs to provide the legal certainty necessary to achieve the full promise of nuclear power to provide clean, affordable and secure energy. In addition to these goals, the

⁴² Chernobyl's Legacy: Health, Environmental and Socio-Economic Impacts and Recommendations to the Governments of Belarus, the Russian Federation and Ukraine, The Chernobyl Forum: 2003–2005, 2nd rev., April 2006; and Health effects of the Chernobyl accident and special health care programmes, Report of the UN Chernobyl Forum Expert Group "Health", World Health Organization, May 2006.

international community had to devise a mechanism that could achieve universal participation through treaty relations among all countries that might be affected by a nuclear incident.

3.2. ROLE OF THE CSC IN ACHIEVING THE GLOBAL REGIME

The CSC [8] was proposed, negotiated and adopted for the purpose of providing the basis for a global regime that would: increase compensation; preserve and enhance the basic principles that underlie the Paris and Vienna Regimes; and provide a practical mechanism for establishing treaty relations among all countries that might be affected by a nuclear incident, including countries without nuclear power plants.

3.2.1. Compensation

The CSC [8] increases the amount of compensation available through a two-tier system. The Tier 1 amount is provided by the obligation of every Contracting Party with a nuclear power plant to ensure the availability of at least 300 million special drawing rights (SDRs)⁴³ to compensate nuclear damage resulting from a nuclear incident covered by the CSC. The CSC does not specify how a Contracting Party needs to ensure the Tier 1 amount, although the expectation was that most Contracting Parties would ensure this amount by setting the operator liability amount at 300 million SDRs and requiring an operator to have 300 million SDRs of insurance or other financial security. The 300 million SDRs amount was selected since it was the maximum amount of insurance available when the CSC was adopted.

The Tier 2 amount is provided by the obligation of every Contracting Party to contribute to an international fund that supplements the first tier amount. Ninety percent of the Tier 2 amount comes from contributions based on installed capacity. Each CSC country with a reactor(s) has to contribute the product of 300 million SDRs multiplied by the aggregate installed capacity of all its reactors in terms of maximum megawatts (MW) of thermal power authorized by the regulator. For example, if a country were to deploy a new small modular reactor (SMR) with an

⁴³ The SDR is an international reserve asset created by the IMF in 1969 to supplement the official reserves of its member countries. The value of the SDR is based on a basket of five currencies — the US dollar, the euro, the Chinese renminbi, the Japanese yen, and the British pound sterling. The SDR value in terms of the US dollar is determined daily based on the spot exchange rates and is posted on the IMF web site here: https://www.imf.org/external/np/fin/data/param_rms_mth.aspx

authorized capacity of 300 MW thermal, their Tier 2 amount would increase by 90 000 SDRs (approximately 120 000 USD as of April 2023). Ten percent of the Tier 2 amount comes from contributions based on the UN rate of assessments. Each Contracting Party has to contribute the portion of the ten percent amount equal to the ratio of its UN rate of assessment to the aggregate UN rate of assessment of all Contracting Parties.

The Tier 2 amount is open-ended. As the installed capacity of reactors in Contracting Parties increases, the Tier 2 amount increases. For example, with the current CSC membership, the Tier 2 amount is approximately 150 million USD. When a global regime is achieved and all countries with nuclear reactors are Contracting Parties, the Tier 2 amount will be 550 million USD.

3.2.2. Legal certainty

The CSC [8] provides legal certainty as follows (see Fig 3.1). First, the CSC preserves the special regime and ensures its uniform application throughout the geographic scope of the CSC. Specifically, the CSC requires each Contracting Party to be a member of the Paris or the Vienna or the CSC Annex Regime. The CSC provides that operator liability under the CSC will be determined through the exclusive application of one of these regimes and provides specific rules for determining which regime will apply. In other words, operator liability within the

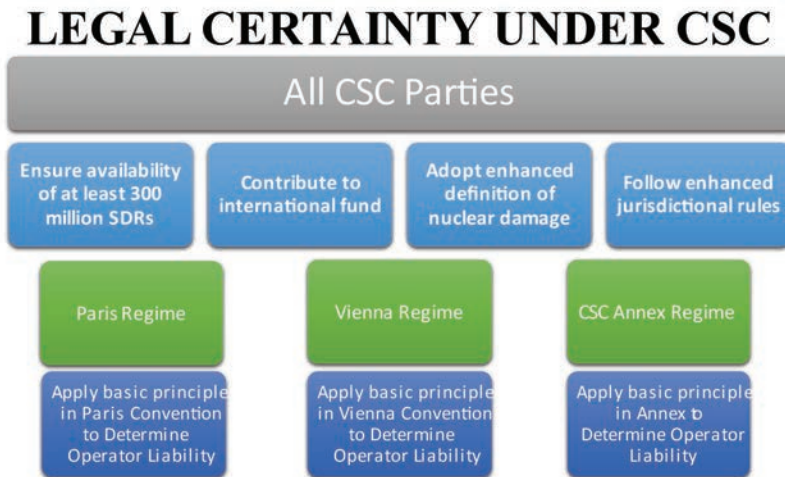


FIG. 3.1. Legal certainty under the CSC.

geographic scope of the CSC will be determined by applying the basic principles as set forth in the Paris or the Vienna or the CSC Annex Regime (see Fig. 3.1).

Second, the CSC provides for certain enhancements among other things: requiring Contracting Parties to ensure compensation as described above; revising the definition of nuclear damage to explicitly cover environmental damage, economic loss and preventive measures; and granting a country exclusive jurisdiction over nuclear incidents in its exclusive economic zone (EEZ).

In the aftermath of the accident at the Chornobyl nuclear power plant, it became clear there was no consensus on whether or, if so, to what extent the 1960 PC [3] and the 1963 VC [4] covered categories of damage such as loss of income, damage to the environment or preventive measures. The enhanced definition of nuclear damage is clear that, in addition to damage to persons and property, a court can award compensation for loss of income from use or enjoyment of the environment, measures of reinstatement of a significantly impaired environment, preventive measures and any economic loss permitted under general tort law. This enhanced definition is particularly important for attracting countries without any nuclear power plants.

Coastal States have long been very concerned about maritime accidents involving nuclear material that might occur near their shores. During the Vienna negotiations, such States were very insistent on expanding the jurisdiction of a Contracting Party to include nuclear incidents in their EEZs. The CSC grants a Contracting Party jurisdiction over a nuclear incident in its territory, territorial sea or EEZ.

3.2.3. Treaty mechanism

The CSC [8] provides a practical mechanism for establishing treaty relations among all countries that might be affected by a nuclear incident, including countries without nuclear power plants (see Fig. 3.2). Specifically, the CSC is an umbrella instrument designed to fit over the Paris and Vienna Regimes, as well as the CSC Annex Regime established by the CSC. As such, it permits countries to establish treaty relations with other countries with minimal disruption to their existing situations. The Annex is clear that its provisions are self-executing to the extent permitted by the legal system of a Contracting Party and that a Contracting Party with no nuclear installations only has to implement those provisions necessary to fulfill its obligations under the CSC (see Fig. 3.2).

CSC TREATY MECHANISM

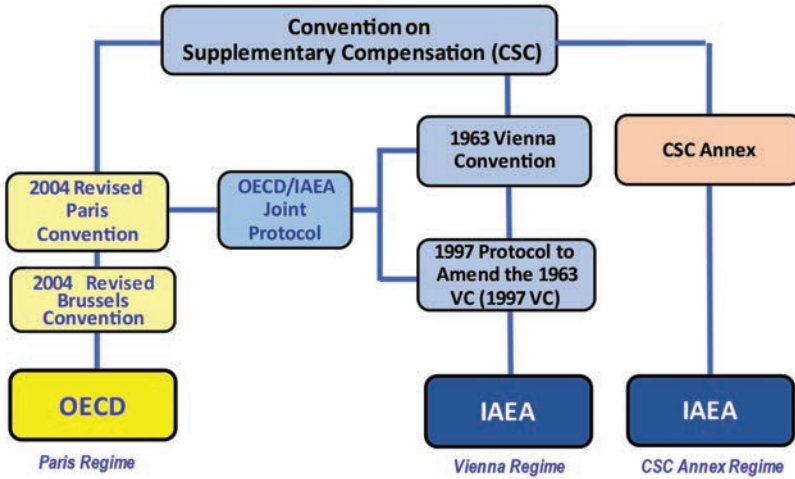


FIG. 3.2. CSC treaty mechanism.

3.3. ROLE OF INLEX IN ACHIEVING THE GLOBAL REGIME

Since its creation in 2003, INLEX has played an important role in promoting adherence to a global regime. During the past 20 years, INLEX has examined a variety of issues related to how a global regime would operate and confirmed that a global regime would further the goals of prompt and equitable compensation and legal certainty. In particular, INLEX has focused on the concerns of coastal States over perceived possible gaps in the coverage of damage that might result from a maritime accident involving nuclear material in their territorial seas or EEZs. INLEX has found that the enhanced definition of nuclear damage and the expanded jurisdiction rules provide a sound basis for coastal State courts to award compensation for a broad range of damage that might result from a maritime accident involving nuclear material near their shores.

Following the Fukushima nuclear incident, the IAEA Action Plan on Nuclear Safety [2] reaffirmed the need for a global regime and requested INLEX to recommend ways to establish such a regime. In response to this request, a special session of INLEX was held at IAEA Headquarters, from 14 to 16 December 2011. At this special session, INLEX agreed on a number of activities aimed at facilitating the achievement of a global nuclear liability regime as described in the Action Plan, including carrying out joint IAEA/INLEX missions in order to raise awareness of the international nuclear liability regime and

encourage wider adherence to the relevant international legal instruments in specific target countries; making presentations on nuclear liability at various IAEA and other meetings during 2012; and organizing a workshop on nuclear liability at IAEA Headquarters for diplomats and experts from Member States. INLEX also held preliminary discussions on specific recommendations to facilitate the achievement of a global nuclear liability regime, with a view to finalizing these recommendations at its 12th regular meeting in 2012. At this meeting, held at IAEA Headquarters from 30 May to 1 June 2012, INLEX further discussed and finalized its recommendations to facilitate the achievement of a global nuclear liability regime [1], as requested by the Action Plan.

INLEX recommended that Member States with nuclear installations should seek treaty relations with as many other Member States as practical, with a view to universal participation in a global regime based on treaty relations among all States. INLEX recommended that Member States without nuclear installations should give serious consideration to adhering to a global regime, taking into account the benefits such a regime could offer. INLEX noted that the CSC provides a basis for a global regime since it provides for treaty relations for all States that belong to the Paris, Vienna or CSC Annex Regime.

INLEX also recognized that the amount of compensation was an important factor in the decision to adhere to a global regime and recommended actions to increase compensation and thus facilitate universal participation in a global regime. Specifically, INLEX recommended that Member States with nuclear installations ensure there are adequate funds available to compensate all victims of a nuclear incident, without discrimination, by establishing compensation and financial security amounts considerably higher than 300 million SDRs and by reviewing the adequacy of these amounts on a regular basis. INLEX also recommended that Member States be prepared to set up funding mechanism if the amount of nuclear damage exceeds the available compensation and financial security amounts.

At the 22nd regular meeting of INLEX, held at IAEA Headquarters from 6 to 8 September 2022, INLEX discussed the benefits of a global regime and issued a statement on the benefits [16], which can be summarized as follows. The global nuclear liability regime is an essential part of the infrastructure for nuclear energy and countries should take all necessary steps to become part of this regime. The global nuclear liability regime: assures prompt and equitable compensation for nuclear damage, including transboundary damage; addresses the consequences of a maritime nuclear incident; and facilitates international commercial cooperation in nuclear projects. The global nuclear liability regime assures prompt and equitable compensation by requiring each country to adopt national laws that incorporate the nuclear liability principles that replace complex tort law with a simple system in which liability is channeled exclusively

to the operator without the need to prove intent or fault and compensation is provided promptly without discrimination among victims. In addition, the global regime requires countries to ensure the availability of meaningful amounts of compensation. The global nuclear liability regime requires each country to incorporate enhancements on compensation, definition of nuclear damage and jurisdiction over maritime incidents into its national law. The global regime addresses the concerns of coastal States by granting them exclusive jurisdiction over nuclear incidents in their EEZs and by expanding the definition of nuclear damage to cover environmental damage, economic loss and preventive measures. The global regime provides the legal certainty necessary for suppliers, investors, lenders and insurers to participate in nuclear projects. To achieve the benefits of the global nuclear liability regime, countries need to establish treaty relations with as many countries as practical in furtherance of universal participation in the global regime and adopt national law consistent with the enhanced nuclear liability principles. The CSC [8] provides the mechanism to achieve universal participation in the global nuclear liability regime, as well as to increase the amount of compensation available under that regime.

4. COASTAL STATE PERSPECTIVES ON THE GLOBAL NUCLEAR LIABILITY REGIME

J. LUDBROOK⁴⁴

4.1. INTRODUCTION

A key factor in the establishment of INLEX was concern on the part of coastal States with no nuclear industries regarding access to compensation and remediation measures should an accident ever occur during the shipment of radioactive materials in proximity to them. This was a particular concern to island states in the Pacific, whose fragile economies were seen to be especially at risk if an incident of this kind should ever occur. One of the early focuses

⁴⁴ J. Ludbrook is an INLEX member and a lawyer from New Zealand who worked for 33 years in the foreign affairs and trade ministry, working at various times in the legal division on international legal issues, including human and indigenous rights. The views expressed remain the responsibility of the named author.

for the group was therefore on any gaps or ambiguities in the international liability regime which might adversely impact the interests of such coastal States. The group sought to address these in part through its development of explanatory texts relating to the international liability regime and in part through its development of a set of Recommendations in 2012 arising from the accident at the Fukushima Daiichi nuclear power plant in Japan. This work has helped clarify and harmonize coverage across the three pillars of the nuclear liability regime.⁴⁵ There remain, however, issues for coastal States around continuing complexity, breadth of coverage, still greater harmonization across the three pillars, and broader adherence across the regime by states with nuclear industries.

4.2. HISTORY

Island states in the Pacific in the 1990s grew increasingly concerned by the risks associated with the transportation of radioactive materials across the Pacific between Japan and Europe when spent fuel from Japanese nuclear reactors was transported to France and the United Kingdom for reprocessing and the resulting mixed oxide fuel and radioactive waste returned to Japan. These concerns were shaped in part by the history of atmospheric and underground testing of nuclear weapons in the Pacific in the years following the Second World War, and serious concern from the 1960s regarding the uncertain long term effects not only on the atmosphere and environment of the atolls where the tests were conducted, but also over time in the wider region to fisheries and tourism.

The states with responsibilities for these shipments assured the region that there was little or no risk, but Pacific states maintained their concerns, as did island states in the Caribbean through whose waters these same shipments also passed. Other states potentially affected by shipments passing their coasts supported these concerns. The difference of views between states with nuclear industries and coastal states like those in the Pacific concerned about the possible risks in transport led to contentious debates at the annual General Conference of the IAEA. These concerns were a factor in the convening of a General Conference on the Safety of the Transport of Radioactive Material in 2003, out of which came a recommendation for the establishment of an expert group to advise the Director General on issues relating to civil liability for nuclear damage. The functions of this group, INLEX, included promotion of widespread

⁴⁵ These pillars comprise: (i) the Paris and Brussels Conventions; (ii) the Vienna Convention; and (iii) the Convention on Supplementary Compensation (CSC), developed to provide a linkage mechanism across the first two alongside a third pillar of the CSC for States not party to either of the first two.

adherence to the nuclear liability regime but, importantly for non-nuclear coastal States, the recommendation of possible changes to fill any identified serious gaps in the regime.

4.3. KEY CONCERNS OF COASTAL STATES

The key concerns of non-nuclear coastal States have been, and continue to be the following:

- (a) The adequacy of compensation available for victims of accidents occurring during the maritime transportation of radioactive material;
- (b) The forms of damage and loss able to be compensated;
- (c) The complexity of the so-called ‘regime’ with its multiple instruments and differing memberships;
- (d) Their ability to access the regime without their necessarily being a party to it, given the attendant costs and complexities which establishment of a regime in their domestic law can entail, and for a risk which is remote, which they have played no part in creating, and from which they derive no benefit;
- (e) The ease of pursuing claims for compensation should an accident occur.

INLEX in its work has considered these issues and taken them into account in its development of explanatory texts to clarify the nature and scope of the new IAEA-based instruments.

In its 2012 set of Recommendations [2], the group examined areas where there were differences between the terms on which compensation would be payable to victims so that, even though there were three sets of liability instruments [7–10]⁴⁶, the substantive provisions of each would be substantially similar, even if not identical. Since replacement of the three regimes by one was unlikely to be feasible, the next best option was to harmonize the substantive terms of each pillar so that the limits and scope of each was clear and common across all three, with the main substantive difference being the levels of compensation available and the membership of each.

At the same time, the Convention on Supplementary Compensation for Nuclear Damage (CSC) [8] provided an umbrella whereby the two existing pillars (of Paris and Vienna) could be brought together under the one overarching instrument, if states were willing to go this far, thereby creating a mechanism

⁴⁶ Revised Paris/Brussels Convention, revised Vienna Convention and the CSC.

for a more unified and harmonized regime while preserving those two existing pillars and their respective memberships.

The various concerns of non-nuclear coastal States are considered in the following subsections.

4.3.1. The adequacy of the compensation available

The revised conventions significantly increased the amounts of compensation available:

- (a) Revised Paris [9] — a minimum limit of 700 million euros;
- (b) Revised Brussels [10] — a maximum limit of 1.5 billion euros;
- (c) Revised Vienna [7] — a minimum limit of 300 million SDRs;
- (d) CSC [8] — a limit of 300 million SDRs for the installation state and a maximum additional to this, collectively across Member States, of approximately 300 million SDRs.

This represented a significant improvement over the limits in the original conventions.

But from the perspective of a non-nuclear coastal State, there remain three areas of continuing weakness:

- (a) Victims in non-nuclear states can access these increased compensation funds for an accident and harm wherever it occurs even if their states have not signed up to the regime. While this is a big improvement, they can only access what is sometimes called the first tier of compensation (which is payable by the operator or its installation state), and not the second tier (funded by all states who are members of that regime)⁴⁷. Given that harm from a transport accident would likely be less than for an accident at a power plant, this may not be such a shortcoming, but this will in part depend on the actual limit available under the particular convention regime and the effect of time on the adequacy of the limits set. But the lower limit remains a material consideration for coastal States in weighing their options. They would need to become a party to one of the second-tier regimes in order to access any second-tier higher pool of compensation. If the aim is to adequately compensate innocent victims, it would be better for non-nuclear

⁴⁷ Under the Paris system, the second tier of funding is provided by the revised Brussels Convention. Revised Vienna has no second tier of funding. Parties to the CSC do commit to a second tier of funding, as specified above.

state victims (for whom no issues of reciprocity of treatment arise) to be able to access the full amount of compensation, not just the first tier.

- (b) While each of the new updated conventions allows victims in non-nuclear states to claim compensation under the first tier of compensation, states joining the ‘regime’ through the Annex to the CSC (Article III(2)(a)) [8] can opt to exclude their right to claim even against the first tier⁴⁸; at least one state (Canada) has in its implementing legislation opted to do so. If the international regime is to be harmonized across all three pillars, this anomaly needs also to be better addressed.⁴⁹
- (c) A non-nuclear state has the option of adhering to one of these new liability conventions in order to assure its nationals of access to the full levels of compensation (the second tier as well as the first) available under them. But, under the rules for the CSC specified in Article IV(1)(b) [8], they could then, if above the minimum United Nations Scale of Contributions⁵⁰, have to contribute toward the compensation payable to a victim, even though they do not themselves have any nuclear generation industry and so are not contributing at all to the risks. Further, should there be more than one accident, they could be obliged to contribute funds for each, depending on the scale of compensation payable. This was a concern raised by New Zealand in the final stages of the negotiation of the Convention, and it continues to be a concern.

There is also a facility in the revised Paris Convention [9] for the liability of an operator, for a transport accident, to be limited to €80 million. It seems clear, however, from the group’s discussions, that the higher limit of €700 million remains available from the relevant installation state. This clarity is important for ensuring access to adequate compensation for a transport accident and for also ensuring a consistent approach across all three pillars.

INLEX recommended in 2012 that Member States with nuclear installations establish compensation and financial security amounts significantly higher than the minimum amounts envisaged under the existing instruments [2]. This will be a continuing focus for INLEX, not least where many states party to the original Vienna Convention with its much lower limits have not yet adhered to the

⁴⁸ See Article III(2)(a) of the CSC.

⁴⁹ INLEX has in its 2012 Recommendations urged all states with nuclear installations to ensure adequate compensation for victims of a nuclear incident ‘without discrimination’. All of the updated instruments allow access for victims in states with nuclear industries to be conditioned on their state allowing reciprocal access to victims from a contracting state. But, that situation aside, victims in non-nuclear states can (the Annex states exception aside) seek the same access to first-tier compensation as nationals in a contracting party.

⁵⁰ See Article IV(1)(b) of the CSC.

revised Vienna Convention with its increased limits, let alone to the CSC with its additional second tier of available compensation.

4.3.2. Important issue of what damage or harm is covered

The new liability Conventions negotiated in the 1990s [7–10]⁵¹ vastly improved the scope of damage or loss covered by the nuclear liability instruments. They:

- (a) Made clear that economic loss resulting from an accident would be covered, including but not limited to damage to property or harm to individuals;
- (b) Generally made compensation available to victims wherever injury or harm might be sustained, and regardless of whether the victim was a national of a state party to the relevant Convention⁵²;
- (c) Made provision for the compensation of preventive measures to prevent harm from an accident occurring;
- (d) Made provision for the recovery of costs incurred in reinstating damage caused by an accident;
- (e) Provided a single channel for the prosecution of claims before the courts having jurisdiction.

All of these were significant improvements.

Valuably, the new instruments clearly expand economic loss beyond loss of life, personal injury or loss of or damage to property to consequential economic loss (medical costs, loss of earnings, loss of income from the destruction of crops or halt to production in a factory consequential on damage to a factory). But they also extend to “loss of income deriving from an economic interest in the environment, incurred as a result of a significant impairment of that environment” [7–10]. Thus, fishers, who do not own the fish in the sea, may suffer a loss because such fish are contaminated; similarly, a person managing a hotel at a holiday resort, who does not own the public beach close to the hotel, may suffer a loss because tourists stay away for fear that the beach will be contaminated. Subsistence fishers affected similarly could be compensated.⁵³ These are all areas

⁵¹ Revised Paris/Brussels Convention, revised Vienna Convention and the CSC.

⁵² It is clear under the revised Paris Convention and revised Vienna Convention that victims can claim compensation under the terms of those instruments, wherever an accident occurs and wherever harm or damage is sustained. The exception is for victims in states which have their own nuclear industries but are not party to the instrument; access to compensation by victims of these nuclear non-Contracting Parties is subject to a requirement of reciprocity.

⁵³ See page 35 of the revised explanatory texts, IAEA International Law Series No. 3 (Rev. 2) [11].

of real concern and risk for the island states of the Pacific, so the coverage of these situations is important for them.

The two main areas of continuing concern for coastal States relate to rumour damage and general environmental damage where there is damage to the environment, but no specific (proprietary) interest is harmed.

4.4. RUMOUR DAMAGE

For island states in the Pacific, there has been a longstanding concern that an accident involving the transport of radioactive materials through the region could cause substantial economic losses even if there was no actual release of radiation. This is due to the fear that, with an accident, radiation might be released and might at some point cause harm to fisheries in the seas around the place of the accident or to tourism if an accident should occur in proximity to popular beaches and associated tourism infrastructure. Even if there was no proof of actual physical release of radiation and actual harm to neighbouring waters, fisheries, or tourism facilities, consumers and tourists would likely vote based on their own interests. Since the island states of the Pacific rely heavily for their economic health on fisheries and tourism, real losses would likely be sustained in such a scenario.

Interestingly, in the aftermath of the accident at the Fukushima Daiichi nuclear power plant the Japanese Government and the system set up to compensate victims appear to have recognized the compensability of losses clearly linked to the accident based on the response of consumers in not buying products from areas thought by them to be susceptible to contamination, even when any evidence of any actual contamination was absent. It was necessary, however, for claimants to show that there was a clear causal link between their losses and the accident at Fukushima.

This is a useful precedent, but the language of the liability instruments does seem to require an actual release of radiation for any of the new heads of damage to kick in. The one exception is the allowance for the taking of ‘preventive measures’ after a nuclear incident “or an event creating a grave or imminent threat of nuclear damage has occurred” [11]. If a ship transporting radioactive materials were to sink or get into difficulties, with a potential grave risk of a release of radiation, then an affected coastal State or installation state might be able to authorize ‘preventive measures’ to prevent a discharge of radiation occurring, with its attendant risks. These preventive measures might also encompass steps being taken to minimize any risks, including by ensuring an adequate flow of information about the nature of the incident and any attendant risk of a release of

radiation. The provision of adequate information is one means by which the risk of rumour damage might be reduced.

Despite the useful facility for preventive measures, a limited ability to pursue redress for rumour damage remains a significant gap in the coverage of the current nuclear liability regime and will likely remain a major concern for coastal States in weighing the merits of becoming party to it — or relying on accessibility to the courts of states responsible for the transport of radioactive materials.

In principle, there is of course nothing to stop coastal States concerned about this sort of risk from covering it in their own domestic liability legislation. The difficulty is that they may struggle to enforce any judgements which they obtain in their own courts. If it were adequately covered in the liability regime, then victims in non-nuclear states could take action, and enforce outcomes, through the court of the installation states responsible for the incident.

4.5. ENVIRONMENTAL DAMAGE

The provision for reimbursement for preventive measures as well as for reinstatement measures in the new nuclear liability instruments [7–9], with the latter encompassing any reasonable measures approved by the competent authorities of the State where the measures are taken, is a positive development. Further, it covers measures taken with the aim of reinstating or restoring damaged or destroyed components of the environment or to introduce, where reasonable, the equivalent of these components into the environment. An important qualification is that the measures taken need to have been taken by the competent authorities of the State where the measures were taken.

It seems reasonable to conclude that this could include measures taken by a coastal State to safeguard or restore its fisheries or protected species or to protect or restore other activities (wind farms, oil drilling platforms) located within its exclusive economic zone or territorial sea.

It is less clear that, currently, there would be recourse for more general and irreparable degradation of the environment where the harm done is such that aspects of the environment damaged as a result cannot be restored because of the nature and extent of the damage. Nevertheless, the facility for recovering the costs of reinstatement measures which are widely defined is positive. This is an area where INLEX has continued to monitor further developments in international law encompassing environmental damage.

4.6. COMPLEXITY OF THE REGIME

The elaboration by INLEX of explanatory texts relating to the revised Vienna Convention, the Joint Protocol and the CSC proved very useful in helping the group identify areas of slight difference between the three pillars of the international liability regime⁵⁴, which the group drew on for its 2012 Recommendations [2] to encourage greater consistency of provisions across the three pillars as part of its efforts to encourage more widespread adherence. Continued efforts to strengthen this harmonization will likely improve prospects for wider adherence.

Despite efforts to promote greater harmonization, membership using the umbrella of the CSC has remained limited and the three updated pillars remain standing largely in parallel with each other, but each with its separate group of adhering states. This will continue to lessen the attractiveness of adherence by non-nuclear states whose judgements will likely be shaped by those states with nuclear industries whose operations, whether through generating plants or transport operations, potentially most affect them.

4.7. ATTRACTIVENESS OF ACCESSING THE BENEFITS WITHOUT ADHERING TO THE UPDATED INSTRUMENTS

There is little appeal for many, particularly smaller, coastal states in enacting domestic laws to give effect to the new liability instruments when they have no nuclear power stations themselves and no clear need for the creation of a compensation and liability structure which seems well removed from the realities of their economies. The benefit for them would be the ability to secure jurisdiction, define the parameters of liability in their own law based on the relevant convention, and secure the enforceability of judgements delivered by their own courts in an installation state party to the same convention. But for most, the remoteness of any likelihood of an incident affecting them, coupled with the perceived complexity of any implementing legislation required, means that most would likely prefer to rely on a structure whereby victims in their territory or waters can access the courts of the installation state whose activities have impacted them.

Continuing efforts to explain the operation of the global regime and to facilitate the access of victims in small non-nuclear states to it as non-Contracting Party victims seems a more likely route for achieving a regime that is global in its reach and effectiveness, albeit not necessarily through having all non-nuclear

⁵⁴ Including, therefore, the revised Paris Convention.

states party to it. At the same time, it is useful for the IAEA through its outreach activities to inform all states about the regime and of the benefits, even for non-nuclear states⁵⁵, of themselves adhering to it.

4.8. FACILITATING ACCESS OF CLAIMANTS BEFORE THE COURTS OF AN INSTALLATION STATE

An important issue for small island states potentially affected by an incident involving transportation of radioactive material is the ease of pursuing claims for damage or harm suffered, the more so if relying on the pursuit of claims before the courts of a foreign and likely distant installation state having jurisdiction for any claims under the relevant liability convention.

The updated Paris Convention [9] usefully provided for the pursuit of claims before a single court within an installation state's jurisdiction. Since the other updated conventions did not do the same, the 2012 Recommendations [2] recommended that claims arising from an incident should be dealt with in a single forum and, usefully, in a prompt, equitable and non-discriminatory manner with minimal litigation, which could include a claims handling system which might be set up in close cooperation with insurers or other financial guarantors. This encouraged greater harmonization across the three pillars but went further in recommending a claims-handling mechanism to facilitate the making of claims without the need necessarily for time-consuming and expensive claims before the courts.

This was a concrete example of the group listening to concerns raised from the perspective of small non-nuclear states and seeking to identify and recommend concrete improvements which could sit alongside the provisions of the updated conventions and respond to concerns raised.

4.9. CONCLUSION

The group has succeeded through its work in providing greater clarity and consistency of provisions across the three pillars of the updated nuclear liability regime. However, the regime remains complex by nature of the subject matter but especially by virtue of the existence of three parallel regimes. Further work by INLEX should continue to examine ways of ensuring greater consistency across

⁵⁵ The key benefits are that their courts might be the ones which would have jurisdiction in respect of an accident impacting them through a transport accident, and their laws implementing the regime would determine the parameters of liability.

the three pillars but also of providing simplified guidance concerning how the three pillars function, both through outreach and also through more basic information materials. It might also be useful if INLEX could make recommendations from time to time, at least in respect of the revised Vienna Convention and the CSC, concerning either amendments or operational guidelines to assist those relying on these instruments to access compensation. Above all, it should be accepted and clear that victims in non-nuclear states (coastal or otherwise) should be assured of access to the liability regimes, regardless of whether their states have adhered to one or another of the updated nuclear liability instruments. For, their own governments not having established a nuclear industry, such victims are best regarded as innocent of having contributed to any harm sustained as a result of an incident affecting them.

5. INTERNATIONAL EXPERT GROUP ON NUCLEAR LIABILITY (INLEX): THE FIRST TWO DECADES OF THE ORIGINS OF INLEX

O. BROWN⁵⁶

In the IAEA's 3 October 2003 terms of reference, Director General Mohammed ElBaradei stated his intention to set up an International Expert Group on Nuclear Liability (INLEX). The group was to serve three functions, namely (i) to create a forum of expertise to explore and advise on issues related to nuclear liability; (ii) to enhance global adherence by nuclear and non-nuclear States to an effective nuclear liability regime, inter alia, on the basis of the Convention on Supplementary Compensation for Nuclear Damage and the Annex thereto [8], the Vienna Convention on Civil Liability for Nuclear Damage [4], the Paris Convention on Third Party Liability in the Field of Nuclear Energy [3], the Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention [6], and the amendments thereto [7, 9]; and, (iii) to assist in the development and strengthening of the national nuclear liability legal frameworks in IAEA Member States to protect the public and the environment, and to enhance nuclear safety. Members were to be nominated by the Director General and serve in their individual capacity as experts in the field of nuclear liability. The group was to meet at regular intervals, originally normally twice a year. The first

⁵⁶ O. Brown is the head of the Omer F. Brown, II Law Office. The views expressed remain the responsibility of the named author.

meeting of INLEX was held at IAEA Headquarters in Vienna on 16–17 October 2003. As the terms of reference then provided, Steven McIntosh of Australia was elected as Chair to preside at the group’s meetings.

There is a misconception that the creation of INLEX was prompted by the nuclear liability concerns of coastal States. In reality, the proposal grew from concerns about the Eurocentricity of the OECD/NEA and its concentration on and promotion of nuclear liability conventions to which the United States of America could not be party, in particular because its national legislation predated the adoption of the conventions. Following the collapse of the Soviet Union and the introduction of Western governments’ initiatives to improve the safety of Soviet-designed nuclear power plants following the 1986 Chernobyl accident, OECD/NEA set up a Contact Group on Liability Associated with Nuclear Safety Assistance Programmes for Eastern Europe. At about the same time, the IAEA opened discussions to improve upon the then existing nuclear liability conventions [3, 4]. That resulted in the adoption in 1997 of both the Protocol to Amend the Vienna Convention [7] and the Convention on Supplementary Compensation for Nuclear Damage (CSC) [8]. Earlier, the 1988 Joint Protocol [6] linking the Paris and Vienna Conventions was adopted under IAEA auspices. While the CSC’s ‘grandfather clause’ allowed the United States of America to join a nuclear liability convention, the OECD/NEA was more of an advocate for the Joint Protocol, and then coordinated the negotiations that led to the adoption of the 2004 amendments to the regional Paris Convention by its Western European members. INLEX was conceived as a counterbalance to the OECD/NEA’s advocacy of instruments that excluded the United States of America and, therefore, could not provide for a global nuclear liability regime.

A small group of nuclear liability experts, consisting of O. Brown, N. Horbach and B. McRae, first proposed the establishment of INLEX, presenting an outline of the need for an IAEA expert group on nuclear liability on 3 April 2002. At this time, it had been almost five years since the IAEA adopted the 1997 Protocol to Amend the Vienna Convention and the CSC. A draft list of possible members was circulated in September 2002. In a letter to O. Brown dated 31 October 2002, then IAEA Legal Director J. Rautenbach indicated that the IAEA was pursuing the idea of such an expert group “preferably to be linked in some form to an offer we have informally received from the Japanese Government for an extrabudgetary contribution in connection with strengthening the international nuclear liability regime”. On 31 January 2003, O. Brown met with J. Rautenbach, W. Tonhauser of his staff, and US Nuclear Attaché J. Blaha, at which time Rautenbach indicated that IAEA staff favoured the creation of the expert group. The next step was to get the approval of Director General ElBaradei. Rautenbach said it would be ‘ideal’ to announce the formation of the group before the IAEA International Conference on the Safety of Transport of Radioactive Materials

that July, particularly since the nuclear liability conventions were important for transport activities. He further indicated it also would be important to ensure the expert group delivered a consistent message (i.e. the benefits of the IAEA's worldwide nuclear liability conventions). On 16 April 2003, O. Brown heard that the Director General had approved the expert group concept. In a letter dated 12 May 2003, Rautenbach invited O. Brown to attend a meeting on 26–27 May 2003 to develop the terms of reference for the expert group. That meeting included a discussion of possible members.

In parallel, and unaware of the efforts to establish INLEX, a group of coastal States proposed the creation of an IAEA nuclear liability working group at the July 2003 Transport Conference. However, their proposal was geared more toward considering the 'shortcomings' of the current international nuclear liability regime. At the time, there was concern that coastal States (led by Chile, Ireland, New Zealand and Peru) might have proposed opening discussion on development of a nuclear liability convention specific to transportation at the 2003 IAEA General Conference. In the margins of the 2003 Transport Conference, there were two more small meetings to work on the establishment of INLEX⁵⁷, in which they talked about expanding the group to include coastal State representatives. Meanwhile, there were to be further communications with Japanese, Dutch and other authorities on INLEX funding in addition to the US Government contribution of about 80 percent of the proposed two-year cost of about US \$500 000. (In the end, financial contributions were made by the Dutch and US Governments, both of which had supported the formation of INLEX.)⁵⁸

At the 8 September 2003 IAEA Board of Governors meeting and on 15 September 2003 at the General Conference, the Director General, as planned, announced the formation of INLEX, putting it into the context of the July IAEA Transport Conference. The Director General indicated that while most of the technical issues were successfully addressed during the Conference, given the complexity of some topics — notably nuclear liability and communications — not all differences among Member States were resolved. He said that the IAEA would continue to promote constructive dialogue on these topics. On 19 September 2003, the General Conference, in resolution GC(47)/RES/7.C, welcomed the decision of the Director General to appoint the expert group, and acknowledged that the preparation of explanatory text for the various

⁵⁷ Participants in attendance were representatives of Australia, Japan, Kingdom of the Netherlands, South Africa, the United States of America (USA) and the IAEA.

⁵⁸ Ultimately, 80% of the funding was provided by the US Government, with the remainder provided by the Dutch Government, both of whom had supported the formation of INLEX.

nuclear liability instruments would assist in developing a common understanding of the complex issues and thereby promote adherence to these instruments.

Between July and September 2003, INLEX's draft terms of reference were modified to accommodate concerns of the coastal States and to deemphasize the CSC as the basis for a global nuclear liability regime. For example, Section I.1(b) of the 'Objectives' was changed from 'comprehensive' liability regime to 'effective' liability regime, apparently because the coastal States expressed the view that the current regimes adopted under IAEA auspices were inadequate (not 'effective' to cover all types of economic damage that might result from a ship sinking in or near a coastal State's exclusive economic zone). The 24 July 2003 draft of the terms of reference, Section I.1(b), said the group would serve to:

“[e]nhance global adherence by nuclear and non-nuclear States to the comprehensive nuclear liability regime on the basis of the Convention on Supplementary Compensation for Nuclear Damage (CSC), through wide participation of States Parties to the Vienna Convention on Civil Liability for Nuclear Damage (the Vienna Convention), States Parties to the Paris Convention on Third Party Liability in the Field of Nuclear Energy (the Paris Convention), and other States with national laws consistent with the Annex to the CSC....”

The 9 September 2003 version of the terms of reference thereby significantly dropped referral to the CSC as the primary basis for enhancing global adherence to the nuclear liability regime.⁵⁹ The final 3 October 2003 terms of reference included not only the CSC, but also the Vienna Convention, the Paris Convention and the Joint Protocol.

In the course of its first three meetings on 16–17 October 2003, 22–26 March 2004, and 13–16 July 2004, INLEX finalized the discussion and review of explanatory texts on the IAEA nuclear liability regime as modernized in 1997. A separate explanatory text on the 1988 Joint Protocol was published in 2013 [12]. INLEX revised the explanatory texts on the Vienna Convention and CSC in 2017, in part to reflect the CSC's entry into force on 15 April 2015, and again in 2020 [11]. In 2004, INLEX conducted a comparative analysis of civil liability regimes for other ultra-hazardous activities, which was used as a part of the curriculum for the regional nuclear liability workshops discussed below. These were perhaps INLEX's greatest contributions.

⁵⁹ This modification was undertaken without any consultation with the USA, whose financing of INLEX was predicated on it being an effective mechanism to promote greater adherence to the only nuclear liability convention the USA is eligible to join.

Four-year term limits for INLEX members were introduced in 2019. Of the original participants from the first meeting on 16–17 October 2003, six are still serving INLEX members⁶⁰, having been reappointed in 2023. In 2003, INLEX also had participants from Australia, China, France, Germany, Japan, Russian Federation, Switzerland and the United Kingdom, as well as from the coastal States Chile, Ireland and Peru. As of 2023, in addition to the six original participants, there were members from Argentina, Brazil, China, Euratom, France, Italy, Japan, OECD/NEA, Russian Federation, South Africa and the United Kingdom. During the period that INLEX has met, there have been two chairs and one interim chair.⁶¹

Beginning in 2005, INLEX has held a number of regional nuclear liability workshops (see Annex III), in addition to briefing diplomats and other interested parties.

In retrospect, it is the view of the author that the consistency of messaging regarding what constitutes either an effective or comprehensive international nuclear liability regime was not fully achieved. As a result of advocating for three treaties rather than one, the expected impression may not have been made on workshop participants as previously envisaged. Had INLEX's final terms of reference not been modified in 2003 to deemphasize the CSC as the basis for a global nuclear liability regime, it is feasible that the number of IAEA Member States who are CSC Members could have been increased from the current figure of eleven. In contrast, the Nuclear Safety Convention has 91 members, and the Assistance Convention has 127 members. The result is that 90 reactors in seven States (plus two that are under construction in Bangladesh) are not covered by any nuclear liability convention. Of the 99 reactors in the 27 European Union member states, 97 are not linked by treaty relations with Canada, Japan or the USA. When States are not in treaty relations, there is a significant risk that lawsuits may be filed in States other than the one where the nuclear incident occurred; this is illustrated by the ten years of litigation in US courts following the Fukushima accident that finally concluded in 2021.

Recognizing this enables improvements to be made into how workshops are designed and implemented, so that going forward this consistency can be achieved.

On the whole, over the last twenty years INLEX has provided a useful forum for evaluating IAEA's nuclear liability instruments, provided a mechanism

⁶⁰ M. Beyens (Belgium), D. McCauley (Canada), N. Horbach (Netherlands, Kingdom of the), J. Ludbrook (New Zealand), O. Brown (USA), B. McRae (USA).

⁶¹ S. McIntosh (Australia) served as Chair for INLEX meetings 1–21, B. McRae (USA) served as interim chair for INLEX meeting 22, D. McCauley (Canada) became INLEX Chair in 2023.

for publishing comprehensive studies of their complicated terms, and organized a series of regional nuclear liability workshops. It is beneficial that the IAEA Director General has extended INLEX by appointing a diverse group of experts to serve another four years from 2023 onwards.

6. COMPENSATION FOR DAMAGE CAUSED BY THE FUKUSHIMA DAIICHI NUCLEAR POWER PLANT ACCIDENT IN 2011: THE LEGAL FRAMEWORK, THE PRACTICE AND THE INTERNATIONAL ASPECTS

T. HOKUGO⁶²

6.1. FUKUSHIMA DAIICHI NPP ACCIDENT AND SUBSEQUENT COMPENSATION

The accident at the Fukushima Daiichi nuclear power plant (NPP) was caused by the Tohoku earthquake and subsequent tsunami on 11 March 2011; it was the most powerful earthquake ever recorded in Japan with a reported magnitude of 9.0–9.1. Although all of the operating reactors were shut down safely in response to the earthquake, the loss of cooling function caused by the tsunami led to the overheating of the reactors and, finally, to the core meltdowns and hydrogen explosions.

In spite of the seriousness of this accident, no direct health damage caused by radiation to the public was reported. This was due to the large scale evacuation under the instruction of the Government in response to the emergency, which, in turn, required large scale and prompt compensation to the evacuees. The evacuations were accompanied by the loss of income, the loss of property value, the serious inconveniences in many aspects of evacuees' daily lives, and sometimes deterioration of health, which, in some cases, led to the loss of life. The nuclear industry was also strongly affected by the accident. For example,

⁶² T. Hokugo is the Chair of the Third Meeting of the Contracting Parties and Signatories of the Convention on Supplementary Compensation for Nuclear Damage (CSC Third Meeting); Advisor to the Ministry of Education, Culture, Sports, Science and Technology (MEXT); and Managing Director of Nuclear Damage Compensation and Decommissioning Facilitation Corporation (NDF).

some business activities were placed under Government restrictions in response to the accident. The retail businesses and local service industry in the evacuation areas lost customers. In addition, consumers refraining from purchasing products from the locality of the accident to avoid the risk of radioactivity caused serious business damage: so-called ‘harmful rumour’.

The scale of compensation for the nuclear damage caused by this accident has reached 101 411.1 billion JPY with about 2.4 million individual claims and about 478 000 business claims as of 1 April 2022⁶³. This mass compensation has been mostly executed based on out of court settlements guided by the legally non-binding guidelines on the scope of the damage to be compensated, issued by the Disputes Reconciliation Committee for Nuclear Damage (DRC) established under the Ministry of Education, Culture, Sports, Science and Technology (MEXT). To arrange the draft settlements of the cases for which agreement between victims and the liable operator cannot be reached, the Nuclear Damage Compensation Dispute Resolution Center (ADR Center) was established under the DRC and has been offering settlement mediation without fees. The ADR Center has arranged 23 124 out of court settlements out of 30 185 applications for this procedure as of 31 December 2023.⁶⁴ However, even with available schemes promoting out of court settlements, more than 600 lawsuits have been filed against the liable operator and more than 100 cases are still pending.⁶⁵

6.2. JAPAN’S NUCLEAR DAMAGE COMPENSATION SYSTEM

Although Japan was not a party to any of the conventions on liability and compensation for nuclear damage at the time of the accident, it had its own domestic nuclear damage compensation regime, which was consistent with all of the international nuclear liability principles except the limitation of liability amount of the nuclear operators.⁶⁶ The Act on Compensation for Nuclear Damage (Nuclear Compensation Act, Act No. 147 of 1961) forms this national regime

⁶³ Data were obtained from TEPCO’s web site (<https://www.tepco.co.jp>).

⁶⁴ The data from the Activity Report of ADR Center (March 2022). Out of 30 185 applications that ADR Center received until the end of March 2024, 23 124 cases have been terminated with settlements, 2578 cases have been terminated by decisions to discontinue, 3402 cases have been terminated by the withdrawals of application, and 1079 cases are in process.

⁶⁵ According to the report of TEPCO to DRC at its 55th meeting on 31 January 2022, TEPCO recognized 630 lawsuits filed against it, and 143 cases are pending among them.

⁶⁶ See “The Japanese nuclear liability regime in the context of the international nuclear liability principles,” X. Vázquez-Maignan in *Japan’s Compensation System for Nuclear Damage*, (OECD/NEA, 2012). The international nuclear liability principles are explained in detail in the IAEA’s *Handbook on Nuclear Law* (IAEA, 2003) [15].

as the special law on the nuclear damage to the general tort liability stipulated by the Civil Code. The Act has maintained its basic articles unchanged since its enactment in 1961, through amendments about every ten years.

This Act provides for no-fault and exclusive liability of nuclear operators for nuclear damage and the obligation of each operator to have the financial security for its liability. This liability is to be exonerated when the nuclear damage occurs due to a ‘grave natural disaster of an exceptional character’ or an ‘insurrection’.⁶⁷ The liability of any party other than a liable nuclear operator is denied explicitly in this Act.⁶⁸ It is interpreted that the coverage of the compensation liability should be within the causality of a reasonable range from “the effects of the fission process of nuclear fuel or of the radiation from nuclear fuel, etc., or of the toxic nature of such materials”⁶⁹ resulting from the operation of a nuclear installation, based on the standard interpretation on the scope of liability of a tortfeasor under general tort.

Regarding the financial security, the Government’s indemnity agreements cover the damage caused by natural disasters⁷⁰ and the damage claimed more than 10 years after the accident, which have not been covered under the policy of the nuclear liability insurance. The operators are obliged to conclude both the nuclear liability insurance and the Government’s indemnity agreements so that they will have available funds to execute the compensation for nuclear damage regardless of the cause of such damage. The Act also allows the deposit reserved for compensation as a means of financial security.

The stipulated amount of financial security for nuclear power plants was originally 5 billion JPY in 1962, when the Nuclear Compensation Act was enacted. It has been increased by the amendments to reflect the growth of the insurance market and was 120 billion JPY at the time of the accident.

The Nuclear Compensation Act also provided for the establishment of the DRC in case of necessity, for the mediation of disputes respectively or for the promotion of voluntary out of court settlements collectively by issuing the guidelines on the scope of damage to be compensated.⁷¹ Originally, the function

⁶⁷ See Article 3, para. 1, of the Nuclear Compensation Act. It has been interpreted that a war, an armed attack by foreign countries and a civil war satisfy the exoneration condition as ‘insurrection’ but the situation of riots and uprising in the limited areas or a terrorist act does not. See Genshiryoku-Songai-Baishouhou-Konmentaru (Commentary of Nuclear Damage Compensation Act) by T. Nomura, M. Dogauchi and S. Toyonaga (Daiichi-Houki).

⁶⁸ See Article 4, para. 1, of the Nuclear Compensation Act.

⁶⁹ See Article 2, para. 2, of the Nuclear Compensation Act.

⁷⁰ The Coverage of the Government’s indemnity agreements is specified as earthquakes, volcanic eruptions and tsunamis by the Act on Indemnity Agreements for Compensation of Nuclear Damage (Act No. 148 of 1961) and the cabinet order based on it.

⁷¹ See Article 18 of the Nuclear Compensation Act.

of the DRC had been limited to the former one, namely, respective dispute mediation. The latter function, the collective promotion of settlements by the guidelines, was added by the amendment in 2010, based on the experience of compensation for the 1999 Tokaimura nuclear accident (JCO criticality accident), which was the first case of nuclear damage compensation in Japan, and which observed the importance of out of court settlements in compensating a large number of victims and the benefit of the compensation guidance decided by neutral, independent and relevant experts in promoting prompt, impartial and fair compensation.⁷²

6.3. IMPLEMENTATION OF THE NUCLEAR DAMAGE COMPENSATION ACT AND THE COMPENSATION PRACTICE

6.3.1. Possibility of exoneration

Due to the scale of the earthquake in March 2011, the biggest in Japan's recorded history, the possibility of exoneration for the damage caused by a 'grave natural disaster of an exceptional character' became an issue. Since it was an issue of a civil nature, the Japanese Government did not have the authority to decide on it; even a final and enforceable court decision on this issue would not have a binding power on the third parties.

Eventually, the Government initiated the preparation of measures for smooth compensation, such as the establishment of the DRC, based on the presumption that the operator was not exonerated.⁷³ Although the court denied the possibility of exoneration in the dictum in the lawsuit filed by a shareholder of the operator, the legal situation on exoneration was settled when the operator submitted its application for financial assistance for compensation to the Government in October 2021, which was based on the operator's recognition of its liability.

⁷² See "Japan's nuclear liability system," T. Nomura, T. Hokugo and C. Takenaka in Japan's Compensation System for Nuclear Damage, OECD/NEA, pp. 22–24. See also Genshiryoku-Songaibaishou-Seido-no-Arikata-nikansuru-Kentokai, Daiichiji-Houkokusho (The 1st Report of the Study Group on the Ideal System for Nuclear Damage Compensation) in 2009, issued before the amendment of 2010. The study group was chaired by Nomura and Hokugo served as the secretariat (https://www.mext.go.jp/b_menu/shingi/chousa/kaihatu/007/gaiyou/_icsFiles/afieldfile/2009/06/29/1279826_1_1.pdf).

⁷³ See "Japan's nuclear liability system" by T. Nomura, T. Hokugo and C. Takenaka (Japan's Compensation System for Nuclear Damage, OECD/NEA, p. 18) for the reason behind the decision.

6.3.2. Financial assistance for the excess amount to the financial security

The Nuclear Compensation Act provides for a discretionary provision requesting the Government to provide the liable operator with the financial assistance for compensation when the compensation amount exceeds the financial security amount, and it recognizes the necessity to do so.

Recognizing that the total compensation amount would surely exceed the financial security amount, the Government started to prepare a bill to embody such financial assistance within a month after the accident. After amending the original bill submitted by the Government, the Diet (legislature) enacted the Nuclear Damage Compensation Facilitation Corporation Act (NDF Act)⁷⁴ in August 2011. This Act provides for the financial assistance based on the mutual assistance among the nuclear operators engaged in electricity supply, relying on the financial credit of the Government, and stipulates that this assistance is applicable to this accident exceptionally.

The Nuclear Damage Compensation Facilitation Corporation (NDF)⁷⁵, established by the Act, has provided TEPCO the funds needed for compensation since November 2011, by cashing the required amount of the government bonds granted from the Government, collecting the general contributions from the nuclear operators and the special contributions from TEPCO, and paying TEPCO's profit after reducing the necessary expense to the Government, annually.⁷⁶

6.3.3. Promotion of out of court settlement by the DRC

The Government established the DRC in April 2011 based on the Nuclear Compensation Act. The DRC issues the guidelines, which are guidance on the criteria of compensation, to promote prompt, impartial and fair compensation through out of court settlements. The first guidelines on the damage related to evacuation, the governmental instructions as preventive measures, and the harmful rumours, were issued in April 2011. The DRC issued the 'Interim Guidelines', covering the overall picture of the damage caused by the accident, in August 2011.

⁷⁴ The name of this Act (Act No. 94 of 2011) was changed to the Nuclear Damage Compensation and Decommissioning Facilitation Corporation Act by the amendment in 2014.

⁷⁵ The name of this organization was also changed to the Nuclear Damage Compensation and Decommissioning Facilitation Corporation (NDF) by the amendment of the Act in 2014.

⁷⁶ See "The financial support by the Nuclear Damage Compensation Facilitation Corporation" by Y. Takahashi (Japan's Compensation System for Nuclear Damage, OECD/NEA) for the background considerations and detailed explanations of the system.

The operator, TEPCO, executed the large scale operation of claim handling of compensation based on the guidelines, and most of the compensation was executed based on the out of court settlements. TEPCO dedicated more than 10 000 full time staff to handling compensation at the peak.

The ADR Center established under the authority of the DRC in September 2011 has been mediating individually between the operator and the victims who are not satisfied by TEPCO's offers based on the guidelines and has proposed draft settlements. These proposed draft settlements are not legally binding but TEPCO committed to respect them in its Emergency Special Business Plan, which was submitted in the process of obtaining the financial assistance for the compensation under the NDF Act.

6.3.4. Effort to disburse prompt compensation

The people who were forced to evacuate were considered to be dependent on the compensation payment for their living expenses to some extent. In this regard, prompt payment of compensation to the victims was expected, but the difficulty of arranging the necessary out of court settlements within a short period was also recognized. Therefore, the Government requested that TEPCO execute provisional payments of compensation to victims on the condition that such payments should be offset after the agreement on compensation. In response to the request, TEPCO executed provisional payments to evacuees, small business entities, farmers and fishers from April 2011, up to about 153 billion JPY. The provisional payments are considered to have played an important role in supporting the living expenses of the evacuees before TEPCO established its operation for claim handlings, which enabled the process of out of court settlements within a reasonable time.

There was also a political initiative to promote prompt compensation originating in the Diet. In August 2011, the Act on Emergency Measures Relating to Damage Caused by the 2011 Nuclear Accident (Provisional Payment Act) was enacted by the legislators' initiative. This Act required the Government to execute provisional payments as a part of the compensation to be offset in the later proceedings. Eventually, during the execution of the Provisional Payment Act by the Government, TEPCO initiated the large scale compensation payment, so that most of the victims went to TEPCO; the payment based on the Act was limited to 5 billion JPY for 50 claims. However, this legislative action demonstrates the Diet's strong concern in the prompt delivery of compensation payment to the victims.

6.3.5. Extension of the term of prescription

In Japan, the Civil Code provides for the prescription for claims for damage within three years of the acknowledgement of the act of torts. When the ADR Center faced difficulty in dealing with the mounting number of claims after its establishment, it was feared that the victims who had to wait for compensation for some months would be disadvantaged in the possible later civil proceedings regarding the time left before the prescription. It was difficult for the ADR Center to appropriately function under such circumstances. Thus, the Government decided to introduce the interruption of prescription during the procedure of mediation under ADR Center by the Special Act of June 2013. This was to be applied to the damage caused by the accident and was later replaced by the generalized provision of the Nuclear Compensation Act, which can be applied to any accident, by its Amendment in December 2018. This process demonstrates the significance of the influence of the prescription on the mediation procedure for compensation, and the necessity of legislative measures to make such a procedure neutral regarding the progression of time toward the prescription period.

In December 2013, the Diet also enacted a Special Act, based on the legislators' initiative, to extend the three year prescription to ten years, and to change the starting point of the prescription of 20 years from the date of the torts to the occurrence of damage.

6.3.6. Special acts for decontamination activities

Decontamination activities have been executed by the Government based on the plans provided for by the Special Act enacted by the legislators' initiative in August 2011. The Government claims the decontamination cost from TEPCO based on this Act and the Nuclear Compensation Act.

The Diet also enacted a similar Special Act for the decontamination of living areas of local residents and school sites in the contaminated areas in June 2012.

6.3.7. Practice of out of court settlement agreements

In Japan, it has been quite common for the out of court settlements for tort claims to include a termination clause of the disputes for the case, which provides that no further claims of the damage concerning the case are allowed. This has been a regular practice for tort cases.

However, considering the difficulty of foreseeing the possibility of further damage under the long evacuation and the continuing accident conditions, this kind of termination clause was difficult for most of the victims to accept. In addition, victims, especially the evacuees, needed to receive the compensation

funds to sustain their post-evacuation lives before determining the whole figure of the damage they suffered.

Considering these factors, TEPCO decided to accept out of court settlements without a termination clause in general at the early stage of compensation. Based on this decision, TEPCO accepts out of court settlements with evacuees in general. This practice has been contributing to the smoothness of the compensation process.

6.4. LAWSUITS FOR COMPENSATION

6.4.1. General situation

TEPCO reported at the DRC meeting on 6 February 2023, that there have been 663 lawsuits filed against TEPCO for compensation; as of 31 December 2022, 545 cases had been settled, and 118 cases were still pending. In actuality, the number of lawsuits is small, considering the total number of compensation claims and total number of victims. This shows that the compensation disbursed by TEPCO out of court and based on the guidelines of the DRC has so far functioned effectively for most of the victims, and that the ADR Center has effectively solved the disputes which have arisen in the process of settlement between TEPCO and the victims.

Although court decisions make up a small proportion of settled compensation claims, they have played an important role in compensating victims, who have suffered damage not covered by the guidelines or who have suffered more costly damage even though such damage is within the guidelines.

6.4.2. Challenge against channelling

There have been some lawsuits which have challenged the principle of legal channelling to the operator.

There was a lawsuit for compensation against the suppliers of the nuclear facilities, which directly challenged the legal channelling provided for by the Nuclear Compensation Act. An action was filed by 1415 individuals at the Tokyo District Court against the manufacturers of the Fukushima Daiichi nuclear power plant for compensation for mental anguish, on the grounds of the subrogation of TEPCO's rights of recourse against the manufacturer, product liability and the joint acts of torts provided for by Article 719 of the Civil Code. The District Court dismissed all the claims on 13 July 2016 by recognizing the constitutionality of legal channelling and applying it. The Tokyo High Court dismissed the appeal from the plaintiffs withholding the constitutionality of legal channelling on 8

December 2017. The High Court decision was affirmed by the Supreme Court Decision on 23 January 2019 not to accept the appeal from the plaintiffs.

In addition, many collective lawsuits included the claim based on Article 709 of the Civil Code, which provides for general tort liability. The acceptance of the claims solely on the grounds of Article 709 regarding nuclear damage could have affected the validity of legal channelling provided for by Nuclear Compensation Act. However, the courts have rejected all claims on the grounds of Article 709 of the Civil Code.

6.4.3. Collective lawsuits and their impacts

There have been several collective lawsuits pursuing compensation. The courts have sometimes admitted an excess amount that was unsupported by the DRC's guidelines, but such court decisions have mostly tended to be based on the original respective evaluation of individual victims. Thus, such court decisions could be considered as the collective decision on individuals with an exceptional situation. However, the number of court decisions on the collective lawsuits admitting excess amounts based on an evaluation of the geographical or categorical attributes of the victims (as the DRC has done in drafting its guidelines) increased. These court decisions were considered to have some impact on the effectiveness of the guidelines.

With this, in response to the situation where some High Court decisions for collective lawsuits were affirmed by the Supreme Court decision in March 2022, the DRC decided in April 2022 to initiate a survey and analysis of the High Court decisions by appointed expert members. After a thorough survey and analysis, the DRC created the 5th addendum to the Interim Guidelines in December 2022, in which the additional amounts of damage for mental anguish are admitted for (a) the severe evacuation conditions during the term just after the accident and before reliable information on radiation effects was reasonably shared, (b) the loss or transformation of livelihood caused by the long term evacuation, (c) the health concerns arising from a stay in areas with a substantial radiation dose for a certain period of time, and (d) voluntary evacuation.

The collective lawsuits often accompanied state liability claims. In these lawsuits, the Government has not alleged that the legal channelling provided for by the Nuclear Compensation Act excludes state compensation claims, even regarding nuclear damage; court decisions on state liability claims depend on a consideration of causation. State liability claims were admitted in some District Court decisions and some High Court decisions. If these court decisions had been affirmed as final, the state compensation claims might have constituted the joint liability with the compensation claims against TEPCO. However, on 17

June 2022, the Supreme Court dismissed the state compensation claims upon the appeals of several High Court Decisions.

6.5. INTERNATIONAL ASPECTS

6.5.1. Treatment of foreign victims

The foreign victims who suffered damage in Japanese territory are eligible for compensation on an equal basis with Japanese victims under Japanese law. However, the treatment of foreign victims who suffered damages outside of Japanese territory has involved some legal uncertainties regarding the choice of law, although the jurisdiction of Japanese courts is generally approved. If a foreign victim files a lawsuit in a foreign court and obtains the final and binding judgement, the foreign victim has to obtain an execution judgement by a Japanese court to execute such a foreign judgement in Japan.

6.5.2. Lawsuits in foreign courts

There have been some lawsuits filed in the USA against TEPCO and its suppliers. As Japan was not in a treaty relationship with the USA regarding nuclear damage compensation at the time of the accident, the jurisdiction of the US courts was not easily denied. However, all such lawsuits were dismissed based on the forum non-convenience after a review of the availability of appropriate compensation in Japan, which took close to ten years.

6.5.3. Accession to the CSC

After the accident, in the process of the dialogue between the USA and Japan on cooperation in the decommissioning of the Fukushima Daiichi nuclear power plant and the treatment of the contaminated water, the CSC [8] came to be considered as a necessary legal arrangement of the business environment involving foreign engineering companies. After discussions on the CSC at the summit meeting between the USA and Japan on 30 April 2012, Japan expressed its intention to join the CSC at the meeting between the US Secretary of Energy and the Japanese Chief Cabinet Secretary on 30 October 2013.

After the CSC and the bill to enforce the CSC were approved by the Diet, Japan deposited the acceptance of the CSC on 5 January 2015. The CSC entered into force by this acceptance on 15 April 2015.

6.6. SOME OBSERVATIONS

6.6.1. Legislation

Legal channelling to the operator has played an important role in specifying the liable entity in the policy debate to establish the scheme for financial assistance, in securing the work to stabilize the situation and in decommissioning work, both of which involve many contractors.

In addition, there was a necessity to compensate the newly introduced heads of damage established by the nuclear liability conventions adopted under IAEA auspices in 1997. The damage caused by the evacuation, which accounts for a considerable part of the compensation awarded, falls in the definition of the costs of preventive measures. Considering that evacuation was initiated before the actual release of radioactive materials, the definition of this head of damage includes the measures in response to an occurrence or a series of occurrences which creates a grave and imminent threat of causing nuclear damage. The decontamination cost of agricultural fields falls under the costs of measures of reinstatement of an impaired environment in the conventions, although the decontamination work was executed by the Government based on the Special Act, which is consistent with the conventions. The definition of newly introduced heads of nuclear damage proved effective in guiding the compensation.

The necessity to have the financial security as high as possible and to have the preparedness to provide additional financial assistance, including Governmental assistance, in cases of excess amount of damage, is strongly recognized.

Further, the necessity of the international nuclear liability conventions for the legal predictability and stability for the operation of the NPPs and for the recovery following an accident was also recognized.

In addition, the possibility of debt over the unlimited liability scheme where the estimated compensation liability exceeds the asset amount and the available financial security is exhausted was also recognized.

6.6.2. Compensation practice

Considering the burden of claims handling, nuclear operators need to be prepared for possible compensation practices prior to an accident occurring. Japanese nuclear operators were obligated to prepare a plan of compensation through the amendment of the Nuclear Compensation Act, based on the lessons learned from the Fukushima Daiichi accident.

The provisional payment of compensation has proved its effectiveness despite the uncertain legal perspective. Japan introduced the mechanism to

promote provisional payments by the same amendment, and further developments regarding the practices of provisional payments are expected.

7. THE NUCLEAR LIABILITY REGIME AND OTHER REGIMES ON CIVIL LIABILITY FOR ULTRA-HAZARDOUS ACTIVITIES: COMPARISON AND GAPS

N. HORBACH⁷⁷

7.1. PREFACE

The International Nuclear Liability Expert Group (INLEX) conducted a comparative analysis of civil liability regimes for ultra-hazardous activities⁷⁸ in 2004. The main objective of this study was to compare relevant principles and concepts adopted within the various liability and compensation regimes of relevant existing agreements and instruments applicable in respect of ultra-hazardous and dangerous activities. The aim was to identify differences and/or gaps with regard to liability rules where action within the framework of the modernization or creation of comparable international environmental instruments could add value to further clarification and/or improvement of the main nuclear liability principles as contained within the modernized nuclear liability conventions. For this purpose, an initial inventory of relevant multilateral agreements dealing with civil (third party) liability regimes for ultra-hazardous and dangerous activities was made, while excluding all agreements which do not contain specific civil liability and/or State responsibility regimes. Beginning in 2005 and continuing to date, INLEX organized a number of regional nuclear liability conferences, which included presentations outlining the results of the comparative analysis

⁷⁷ N. Horbach is an independent nuclear law consultant and honorary lecturer at the Centre for Energy, Petroleum and Mineral Law and Policy at Dundee University, United Kingdom. Horbach obtained her law degree from the University of Leiden, Faculty of Law, with a specialization in public international law, comparative law, and international environmental law, and studied economics at the University of Amsterdam.

⁷⁸ An 'ultra-hazardous activity' (abnormally dangerous or extra-hazardous activity, as described differently within various international agreements) is an activity by a person that is so inherently dangerous that it typically involves no-fault or strict liability.

on liability regimes for other ultra-hazardous activities. This served to highlight the comprehensive provisions and advantages for public protection of the nuclear liability conventions.

7.2. INVENTORY OF CIVIL LIABILITY REGIMES ANALYSED

The comparative analysis included a selection of international agreements and instruments that cover liability rules which can or are likely to be applicable in case of incidents causing (environmental) transboundary damage as a result of hazardous or dangerous activities, including those covered by the nuclear liability regimes. In very general terms these instruments would involve activities:

- (a) Of a typically dangerous nature and/or causing environmental damage (Lugano Convention and EU Environmental Liability Directive)⁷⁹;
- (b) Involving transboundary effects of industrial accidents on transboundary waters (Water Liability Protocol)⁸⁰;
- (c) Involving sea transport of dangerous and Hazardous and Noxious Substances (HNS Convention)⁸¹;
- (d) Involving inland navigation/rail/road carriage of dangerous goods (CRTD Convention)⁸²;
- (e) Involving the transboundary movements of hazardous wastes and their disposal (Basel Protocol)⁸³;

⁷⁹ Lugano Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment (Lugano Convention, 1993); EU Directive 2004/35/CE of the European Parliament and of the Council on environmental liability with regard to the prevention and remedying of environmental damage (Environmental Liability Directive, 2004).

⁸⁰ Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters (Water Liability Protocol, Kyiv, UNECE, 2003).

⁸¹ International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea (HNS, London, 1996) and the HNS Fund Convention (2010).

⁸² Convention on Civil Liability for Damage Caused during Carriage of Dangerous Goods by Road, Rail and Inland Navigation Vessels (CRTD, 1990).

⁸³ Protocol on Liability and Compensation for Damage resulting from Transboundary Movements of Hazardous Wastes and Their Disposal (Basel Protocol, 1999).

- (f) Involving the carriage of oil or related matter (CLC, Oil Pollution Fund, Bunker Convention, Seabed Liability Convention)⁸⁴;
- (g) Involving the use of nuclear materials (Maritime Carriage Convention, Vienna Conventions (1963/1997), Paris Conventions (1960/2002), Brussels Supplementary Conventions (1963/2002), CSC (1997))⁸⁵.

7.3. SUPPLEMENTAL INTERNATIONAL INSTRUMENTS

Although not providing for rules on liability and compensation per se, the comparative analysis also took into account the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters. The Aarhus Convention was deemed relevant to the extent that it explicitly guarantees access to information for victims which, inter alia, facilitates them to establish a causal link between the damage and the damaging activity or substance. Similarly, the EEX Lugano Convention on jurisdiction and the enforcement of judgements in civil and commercial matters (including its revised and extended version) negotiated between EU and EFTA Member States was included. This Convention aims to ensure reciprocal recognition and enforcement of judgements of courts or tribunals, important in those situations where other relevant conventions are not applicable or do not ensure such right explicitly.

7.4. COMPARISON OF CIVIL LIABILITY REGIMES FOR DANGEROUS ACTIVITIES

The existing nuclear liability conventions (1963/1997 Vienna Convention [4, 7], 1960/2004 Paris Convention and Brussels Supplementary Convention

⁸⁴ International Convention on Civil Liability for Oil Pollution Damage (CLC, 1969) and amendments (1992, 2000); International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (IOPC Fund, 1971) and amendments (1992, 2003); International Convention on Civil Liability for Bunker Oil Pollution Damage (Bunker Convention, 2001); Convention on Civil Liability for Oil Pollution Damage resulting from Exploration for and Exploitation of Seabed Mineral Resources (Seabed Liability Convention, 1977). And in general, Convention on Limitation of Liability for Maritime Claims (LLMC, 1976) and amendments (1996, 2012).

⁸⁵ Convention relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material (Maritime Carriage Convention, 1975).

[3, 5, 9, 10], and the 1997 Convention on Supplementary Compensation [8])⁸⁶ contain a set of key civil liability principles dealing with nuclear damage that are comparable to the international agreements on civil liability for other ultra-hazardous activities. Areas compared included, inter alia, the scope of application, type of liability and exonerations, liability limits, compensation rights and funds, prescription limits, heads of damages covered and jurisdictional rules.

7.5. GENERAL

The various civil liability rules incorporated in international legal instruments cover topics varying from very wide and general to very specific and confined types of transboundary damage. Those analysed are either of a global nature or cover the wider European region. Most of these conventions explicitly exclude in their coverage any type of damage that is covered by another source-specific existing liability convention (nuclear damage, oil pollution). Nevertheless, a possible gap or overlap might result from the fact that the older instruments do not always explicitly exclude application of the modernized or new versions of the source-specific liability agreements. Moreover, it should be noted that a large number of these conventions have not yet entered into force.

Virtually all of these conventions provide for strict liability imposed upon a type-identified liable person, subject to traditional (restricted) exonerations, liability limitation in time and amount, while covering traditional types of damage (personal injury, property and related loss therefrom) which are compensable if the victim proves a certain relaxed causal link before multiple or one single court(s), the judgement of which is enforceable and recognized in other State Parties. Less uniformity exists in respect of the applicable geographical scope, additional compensation funds, types of environmental damage explicitly covered, the use of thresholds and coverage of damage resulting from types of continuous or non-accidental incident (normal operations).

⁸⁶ Convention on Third Party Liability in the Field of Nuclear Energy, Paris, 29.7.1960, as amended by Protocols of 1964 and 1982; Protocol to Amend the Convention on Third Party Liability in the Field of Nuclear Energy, Paris, 26.2.2002; Convention on Civil Liability for Nuclear Damage, Vienna, 21.5.1963; Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage, Vienna, 12.9.1997; Joint Protocol relating to the Application of the Vienna Convention and Paris Convention, Vienna, 21.9.1988; Brussels Convention Supplementary to the Paris Convention on Third Party Liability in the Field of Nuclear Energy, Brussels, 31.1.1963 as amended by Protocols of 1964 and 1982; Protocol to Amend the Brussels Convention Supplementary to the Paris Convention on Third Party Liability in the Field of Nuclear Energy, Brussels, Paris, 26.2.2002; Convention on Supplementary Compensation for Nuclear Damage (CSC), Vienna, 12.9.1997.

7.6. GEOGRAPHICAL SCOPE OF APPLICATION

The nuclear liability regimes apply in principle to nuclear damage and nuclear incidents occurring within the territory (including the territorial sea) of Contracting Parties and occurring in the high sea; however, this can be broadened by domestic law. The modernized nuclear liability conventions extended the scope to include the exclusive economic zone (EEZ) and require covering nuclear damage ‘wherever suffered’, including costs of preventive measures in case of threat of a nuclear incident. Only in respect of non-Contracting States with nuclear installations that do not provide for reciprocal benefits by law, a Contracting Party may exclude damage suffered in those non-Contracting States.

Most civil liability regimes analysed similarly apply to transboundary damage caused and suffered in the Contracting Parties, with an exception as to costs of preventive measures which are not covered if taken elsewhere (Basel Convention, HNS, CLC, Bunker Convention and Environmental Liability Directive). None of these civil liability regimes are extended to explicitly cover the territory of non-Contracting States, except for the 1993 Lugano Convention that applies to damage wherever suffered and can apply to incidents occurring in non-Contracting States. Only some conventions cover damage suffered in the EEZ (HNS, Seabed Liability Convention).

7.7. CHANNELLING OF LIABILITY

The nuclear liability regimes provide for legal channelling of strict liability with limited exoneration. Liability is channelled exclusively to one person, the operator; this liability is strict or ‘absolute’ (without fault). Liability may only be exonerated if the nuclear incident and resulting nuclear damage are directly due to warlike events and grave natural disasters if so provided by domestic law but no longer allowed under the modernized conventions.

Virtually all conventions provide for a system of strict liability channelled to an identified person or entity (shipowner, carrier, notifier, exporter, operator). Exoneration of such liability is generally broader, and includes acts of war, natural disasters or force majeure (all relevant treaties) as well as intent of a third party and in case of contributory negligence, which either entirely or partly would exonerate the liable person. Some conventions provide for additional reasons for exonerations (compliance with measure from competent authority). Specific additional rules on fault-based liability are also found sporadically in civil liability regimes (Basel Protocol, Lugano Convention, Water Liability Protocol).

7.8. LIABILITY LIMITATION IN AMOUNT AND TIME — MANDATORY INSURANCE

The nuclear liability regimes provide for minimum amounts of operator's liability, covered by a State guarantee. The operator is required to take out liability insurance or other financial security. Supplementary compensation over and above the operator's liability are available under the 1997 CSC [8] and 2004 Brussels Supplementary Convention [10], to be paid by State public funds only when a nuclear incident occurs. The time within which to submit claims for compensation for nuclear damage is limited to 10 years after the incident, and extended 30 years for personal injury, with a subjective prescription of 2/3 years.

Strict liability generally is limited in amount and time in all the international treaties analysed, except for the Lugano Convention, which contains no liability limit. A system of mandatory insurance or financial security is stipulated in all treaties, except for the Lugano Convention and the Environmental Liability Directive. In the treaties involving transport of dangerous goods, the limits of financial guarantees coincide with the limits of liability; other treaties allow for lower insurance limits.

The time prescription limits vary greatly in the relevant treaties, but are generally implemented in order to enable availability of insurance. Subjective time limits have been established by virtually all treaties, except for CLC and the Bunker Convention. Only the Lugano Convention extended the objective time limit to 30 years.

Supplementary (public) funds or other funding mechanisms have been established by only a few conventions. These are not financed by the State public funds and require an annual contribution regardless of an actual accident. In respect of oil pollution, the International Oil Pollution Compensation (IOPC) Funds provide for additional funding, financed by contributions paid by entities that receive certain types of oil by sea transport. In respect of hazardous and noxious substances, the 2010 Hazardous and Noxious Substances (HNS) Protocol provides for a second tier of supplementary compensation (HNS Fund) financed by entities which receive such substances in a Member State.

7.9. CHANNELLING OF JURISDICTION

The nuclear liability regimes provide for channelling of jurisdiction exclusively to the court of the Contracting State in which territory the nuclear incident occurs. Judgements of that court are to be recognized in Contracting Parties, without revisiting the merits of the case, and are directly enforceable. The

modernized nuclear liability conventions have extended this exclusive jurisdiction to the court of coastal States should a nuclear incident occur in its EEZ.

In respect of jurisdictional matters, all liability treaties analysed do regulate specifically jurisdiction and issues of the competent court. However, such jurisdiction is not exclusively channelled to a court in an accident State. Claims for compensation under the treaties can generally be brought before courts of a Contracting Party where either the damage was suffered, or the incident occurred, or the defendant has his or her habitual residence or principal place of business (Water Liability Protocol, Basel Protocol, CRTD, Lugano Convention). This means that multiple courts may have jurisdiction in different countries in respect of the same accident. In some treaties, jurisdiction will lie only with the court of the State where the damage was suffered (CLC, HNS, Seabed Liability Convention, Bunker Convention). Such jurisdiction can be extended to the court in the State in which territory the preventive measures were taken (CLC, HNS, Bunker Convention, CRTD). In some treaties such jurisdiction was extended to cover the EEZ (Bunker Convention, CLC, HNS, Seabed Liability Convention). Only in a few cases is jurisdiction of courts regulated by rules of international law or regional instruments, such as EEX Lugano (Environmental Liability Directive).

7.10. (ENVIRONMENTAL) DAMAGE COVERED

The nuclear liability regimes provide for a definition of nuclear damage that covers personal injury and property damage, which was later explicitly extended to cover other heads of damage involving types of economic and income loss, costs of preventive measures and measures of reinstatement of the environment, to the extent covered by the law of the competent court. Such damage should result from a nuclear incident or series of occurrences (including normal operations) and may include environmental damage resulting from continual or gradual pollution.

The treaties are generally confined to types of damage as explicitly defined, such as resulting from oil pollution (CLC, Bunker Convention, Seabed Liability Convention); damage to the environment (Lugano Convention, Environmental Liability Directive); or damage, including personal and property damage, resulting either from hazardous wastes (Basel Protocol), or hazardous and noxious substances (HNS), or from transport of dangerous goods (CRTD), or resulting from pollution of inland waters (Water Liability Protocol). Types of nuclear damage covered by the nuclear liability regimes are explicitly excluded under some conventions by referring to the nuclear liability conventions directly (CRTD, Lugano Convention, Environmental Liability Directive), or indirectly

(Basel Convention, HNS, Water Liability Protocol) whereas other conventions merely exclude this implicitly by the restrictive definition of the type of damage covered (CLC, Bunker Convention, Seabed Liability Convention).

Multiple civil liability treaties also cover and define preventive measures (CRTD, Basel Protocol, Bunker Convention, Lugano, HNS, Seabed Liability), preventive action (Environmental Liability Directive), response measures (Water Liability Protocol), as well as measures of reinstatement (Basel Protocol, Lugano Convention, Water Liability Protocol), or remedial measures/actions (Environmental Liability Directive). However, none of the relevant provisions would cover a situation where preventive measures are taken in response to a mere threat of an accident and/or rumour damage.

Pure ecological damage in cases where restoration or re-establishment of the environment is impossible and cannot be financially evaluated or reinstated (disappearance of an animal species), are in general not covered. Only the Lugano Convention explicitly allows the recoverability of the costs of acquiring the equivalent of the damaged natural resources or replacing them. The CLC eliminates claims for impairment of the environment per se, including any costs for replacement of damaged natural resources. Similar to modernized nuclear liability conventions, compensation is therefore limited to loss of income or profits deriving from an economic interest in any use or enjoyment of the environment, incurred as a result of a significant impairment of that environment (Basel Convention, CRTD, CLC, HNS).

Types of 'normal operation' or types of continuous or synergic pollution generally are not covered, except for the Lugano Convention. However, the definition of 'incident' causing damage may incorporate also a series of occurrences (CRTD, Basel Protocol, HNS, CLC, Bunker Convention, Lugano Convention, Seabed Liability Convention).

7.11. UNIFORMITY IN CIVIL LIABILITY REGIMES

The nuclear liability treaties, especially as they have been recently amended, follow the general developments and various special civil liability features of other international agreements in respect of hazardous or dangerous activities. To some extent, the nuclear liability treaties even provide for a more comprehensive approach in respect of compensation available for covering economic loss, costs of preventive measures and measures of reinstatement of the environment, as well as providing for additional public or joint public funding.

As for the geographical scope of application, the modernized nuclear liability conventions are most progressive in covering 'damage wherever suffered' and making the operator liable for nuclear damage in non-Contracting States with

no nuclear installations. In addition, both the jurisdictional rules and geographical application cover damage suffered and incidents occurring in the EEZ. Most civil liability treaties have (still) a more limited scope of geographical application.

All conventions channel liability in relation to a source or activity identified as dangerous to a specific person or entity. This is strict (no fault) liability with a simple burden of proof for the victim. They contain a limited set of exonerations, but not as limited as under the nuclear liability conventions that do not allow exoneration in cases of terrorism, grave natural disasters or compliance with regulatory measures by the competent authority.

The civil liability treaties analysed all provide for prompt compensation, though jurisdiction is not channelled to one court in the accident State (multiple competent courts/forum shopping). However, uniformity is found in respect of easy access to justice and the recognition and enforceability of judgements, which is either provided in the treaty itself or by reference to supplemental conventions (EEX Lugano Convention).

Liability in general is limited in time and amount with a mandatory insurance requirement, except for the Lugano Convention. However, these time limits are generally shorter, while none of the treaties, except for the Lugano Convention, provide for a 30 year time limit for personal injury. Furthermore, the civil liability limits are generally lower: the nuclear liability conventions provide for minimum fixed liability amounts, which allows for higher amounts or even unlimited liability, whereas the analysed civil liability treaties basically have a fixed maximum liability limit. The nuclear liability conventions also differ in that they require mandatory insurance and a State guarantee for the full operator's liability in place, without which no activity is allowed.

All civil liability treaties cover traditional types of damage, such as personal injury and property damage. There is a tendency to cover also modern types of damage, like environmental damage, costs of preventive measures and measures of reinstatement of the environment and related loss of income or profit. However, in general, most treaties do not cover damage as a result of a mere threat of an accident, like the modern nuclear liability conventions. Uniformity was seen in respect of the fact that none of the treaties would explicitly cover pure ecological loss or gradual environmental degradation, unless such damage can be actually remediated or reinstated.

The modernized nuclear liability conventions therefore are in uniformity with most existing civil liability regimes applicable to hazardous activities, and in certain aspects provide for more stringent and enhanced rules to allow for prompt compensation for nuclear damage, even if occurring in non-Contracting States.

8. THE OECD NUCLEAR ENERGY AGENCY AND INLEX: A HISTORY OF COOPERATION IN THE FIELD OF NUCLEAR LIABILITY

K.S. NICK⁸⁷

8.1. BACKGROUND

The OECD Nuclear Energy Agency (NEA) has a long and fruitful history of cooperation with the IAEA's International Nuclear Liability Experts Group (INLEX), tracing back to the establishment of the group in 2003. Each successive head of the NEA legal office responsible for the Secretariat of the Paris Convention on Third Party Liability in the Field of Nuclear Energy (Paris Convention or PC)⁸⁸ has served as an observer or member of INLEX for the past 20 years⁸⁹, sharing information about NEA developments in the field of nuclear liability, including matters relating to the Paris Convention, and contributing to the discussion and analysis of all nuclear liability instruments.

However, the history of NEA and IAEA cooperation in matters related to nuclear liability goes back much farther. On 3 July 1957, five months before the establishment of the European Nuclear Energy Agency (ENEA), the predecessor to today's NEA, the Group of Governmental Experts on Third Party Liability in the Field of Nuclear Energy 'NEA Group of Experts' was established by the NEA Steering Committee for Nuclear Energy 'NEA Steering Committee'. The NEA Group of Experts' first activity — the drafting of the 1960 Paris

⁸⁷ K.S. Nick is Head of the Division of Nuclear Law of the Organisation for Economic Co-operation and Development's Nuclear Energy Agency (OECD/NEA).

⁸⁸ 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, by the Protocol of 16 November 1982, and by the Protocol of 12 February 2004, entered into force 1 January 2022, unofficial consolidated text available at: www.oecd-nea.org/jcms/pl_79139/paris-convention-consolidated [9]. The OECD Secretary-General is the depositary for the Paris Convention. The Paris Convention is supplemented by the Convention of 31 January 1963 Supplementary to the Paris Convention of 29 July 1960, as amended by the Additional Protocol of 28 January 1964, by the Protocol of 16 November 1982 and by the Protocol of 12 February 2004, entered into force 1 January 2022 (Brussels Supplementary Convention or BSC) [10]. The Belgian Government is the depositary for the Brussels Supplementary Convention.

⁸⁹ P. Reyners (2003–2005); J. Schwartz (2005–2011); S.G. Burns (2011–2014); X. Vásquez-Maignan (2014–2022); K.S. Nick (2022–present).

Convention — was “one of its most significant accomplishments”, and this included participation by the IAEA⁹⁰. Thus, while there is a significant history of NEA participation in INLEX, the root of NEA–IAEA cooperation in matters of civil liability for nuclear damage originated over 65 years ago, in the founding of the NEA and IAEA, and is a positive, concrete example of the importance of the 1960 Cooperation Agreement between the two agencies.

8.1.1. Drafting of the Joint Protocol

Following the adoption of the 1960 Paris Convention [3] and then subsequently the IAEA sister nuclear liability convention, the 1963 Vienna Convention on Civil Liability for Nuclear Damage [4]⁹¹, the NEA Group of Experts focused its attention on “resolving problems arising from the co-existence” of the two conventions⁹². Indeed, and although the Paris and the Vienna Conventions provide for very similar nuclear liability principles (strict and exclusive liability of the operator, limitation of liability in amount and time, compulsory financial security, etc.), certain differences remain, which in turn can lead to practical issues generated by the absence of treaty relations between the contracting parties to each convention.

In 1972, discussion began between the NEA and the IAEA, with the participation of national experts from Paris Convention and Vienna Convention countries, about how to resolve the issuing of two similar conventions with different contracting parties for which the distinction of ‘contracting party’ plays a decisive role in applicability.⁹³ Under the auspices of the NEA Group of Experts, the Secretariats of the NEA and the IAEA, along with several NEA member countries, drafted a series of working papers that examined different options regarding the possibility of creating a treaty link between the Paris Convention

⁹⁰ Schwartz, J. (2007), “The Nuclear Law Committee — A Historical Perspective”, in Colloquium on the Past, Present and Future of the Nuclear Law Committee, NEA Doc. NEA/SEN/NLC(2007)2, p. 10. In 1960, the NEA and the IAEA signed a Cooperation Agreement that provides the foundation for ensuring the two agencies are able to effectively and efficiently meet their respective objectives set out by their member countries. The Agreement, which is still in effect today, outlines a number of forms of cooperation, including “Reciprocal Representation”, “Exchange of Information and Documents”, and “Cooperation between Secretariats”.

⁹¹ Vienna Convention on Civil Liability for Nuclear Damage (1963), IAEA Doc. INFCIRC/500, 1063 UNTS 266 [4], entered into force 12 November 1977 (1963 Vienna Convention).

⁹² Schwartz, J. (2007), *supra* note 89.

⁹³ Group of Governmental Experts on Third Party Liability in the Field of Nuclear Energy, Summary Record of the Meeting held in Paris on 23rd and 24th October 1972, NEA Doc. SEN(72)22, pp. 7–9.

and the Vienna Convention, ultimately producing a Draft Joint Protocol in the first half of the 1970s.⁹⁴ Work largely suspended on the joint endeavour for approximately ten years until 1984, when discussion about the need to establish a treaty link between the two conventions resumed. The 1986 Chernobyl nuclear power plant accident accelerated this discussion by questioning the fit for purpose of the then-applicable nuclear liability conventions, specifically with regard to their ability to properly deal with the transboundary damage caused by a large-scale nuclear incident. As a result, in 1988 the NEA and IAEA Secretariats, together with the respective NEA Group of Experts and IAEA Standing Committee on Liability for Nuclear Damage (IAEA SCNL), finally brought to fruition the bridge between the Paris and Vienna Conventions: the Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention [6]⁹⁵.

8.1.2. From the NEA Group of Experts to the Nuclear Law Committee

In the year 2000, following a proposal by the NEA Group of Experts, the NEA Steering Committee determined to enlarge the mandate for the group and in so doing rename it the Nuclear Law Committee (NLC) to reflect the broader range of nuclear law subjects to be addressed by the group. Despite this wider scope, the NLC

“retained, nevertheless, the reference to harmonisation of legislation on nuclear third party liability and the application of the Paris and Brussels Conventions, but the mandate now also refers to other international instruments on nuclear third party liability adopted under the auspices of the IAEA”⁹⁶.

Among other matters, the new mandate for the NLC for 2000–2004 called for it to, among other activities,

“encourag[e] the development of national legislation governing the peaceful uses of nuclear energy based upon internationally accepted principles, and

⁹⁴ See IAEA (2013), *The 1988 Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention — Explanatory Text*, IAEA International Law Series No. 5, IAEA, Vienna, pp. 5–7 [12].

⁹⁵ Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention (1988), IAEA Doc. INFCIRC/402, 1672 UNTS 293 [6], entered into force 27 April 1992 (Joint Protocol).

⁹⁶ Schwartz, J. (2007), *supra* note 89, p. 14.

in particular to promote world-wide harmonisation of nuclear liability legislation and policies”

and “foster ... a more global regime of civil liability and compensation for nuclear damage including examining issues related to the interpretation and application of the international nuclear liability instruments”⁹⁷. The mandate of the NLC in 2000 was strikingly similar to the IAEA Director General’s intention for the creation of INLEX in 2003, “to foster ... a global and effective nuclear liability regime”⁹⁸, as noted by former INLEX member and NLC delegate N. Pelzer⁹⁹.

8.2. FRAMEWORK TO PRESENT DAY COOPERATION

Article 8(a)(iii) of the NEA Statute provides that “The NEA shall contribute to the promotion of a system for third party liability and insurance with respect to nuclear damage”.¹⁰⁰ Most recently, according to the Strategic Plan of the Nuclear Energy Agency 2023–2028, in the area of nuclear law the NEA will “contribute to the modernisation of international nuclear liability regimes and encourage the strengthening of treaty relations between interested countries to address nuclear liability and compensation for nuclear damage”. In accordance with the NEA Strategic Plan, the NLC will, among other activities, encourage provisions for equitable compensation of damage in the event of a nuclear incident. In particular, the NLC is mandated to deal with issues relating to civil liability for damage caused by a nuclear incident, as well as the financial security mechanisms designed to ensure that funds will be available to compensate for such damage. It addresses these issues in the context of member countries’ nuclear legislation as well as international nuclear liability instruments, including all nuclear liability conventions currently in force and under the auspices of both the NEA and the IAEA. More specifically, the Committee has a mandate to, among other issues:

- (a) Examine issues relating to the interpretation and application of international nuclear liability instruments, especially with respect to their harmonious application under member countries’ national laws;

⁹⁷ NEA (2000), “Review of the NEA Committee Structure”, Note by the Secretariat, NEA Doc. NEA/NE(2000)11/REV1, p. 11.

⁹⁸ IAEA (2004), “Civil Liability for Nuclear Damage; International Expert Group on Nuclear Liability (INLEX)”, IAEA Doc. GOV/INF/2004/9-GC(48)/INF/5.

⁹⁹ Pelzer, N. (2007), “Presentation on the Occasion of the 50th Anniversary of the Nuclear Law Committee”, in Colloquium on the Past, Present and Future of the Nuclear Law Committee, NEA Doc. NEA/SEN/NLC(2007)2, p. 46.

¹⁰⁰ NEA (1995), NEA Statute, OECD Publishing, Paris.

- (b) Contribute to the modernization of international nuclear liability regimes and encourage the strengthening of treaty relations between interested countries to address nuclear liability and compensation for nuclear damage;
- (c) Promote the harmonization of national policies and legislation in the nuclear liability and compensation field amongst its member countries.

In the fulfilment of its responsibilities, the NLC is supported by the NEA Division of Nuclear Law (DNL), which provides Secretariat services to both the NLC and the Contracting Parties to the Paris Convention (CPPCs).

8.3. GENERAL COOPERATION ON NUCLEAR LIABILITY MATTERS

8.3.1. Exchange of information and reciprocal representation

In 2000, in furtherance of the implementation of the 1960 Cooperation Agreement, the NEA and the IAEA signed a memorandum of understanding (MOU) that outlines much of the same information as the earlier agreement (“Co-ordination and Cooperation”, “Exchange of Information”, and “Reciprocal Representation”, among other actions), though with greater specificity.¹⁰¹ In the area of nuclear law, the 2000 MOU provides for IAEA representation on the NEA Group of Experts (now the NLC) and NEA representation on the Standing Committee on Nuclear Liability. The MOU also specifies that “[n]ational, regional or international training seminars, meetings and symposia on liability regimes” are ‘Joint Activities’ and that “[n]ational and international nuclear liability regimes” are ‘Complementary Activities’.

Currently, the Head of the NEA Division of Nuclear Law serves as an observer/member on INLEX, and the IAEA serves as an observer at the NLC and its associated working groups. For the NEA, this means that all NLC information is freely shared with the IAEA. During NLC and INLEX meetings, the NEA and the IAEA provide regular reports on the status of the nuclear liability conventions under their respective auspices. In addition, the exchange of information continues outside of the meetings through Secretariat to Secretariat communications and provision of information. This type of openness and transparency is critical to achieve the NEA’s objectives in the area of nuclear law.

¹⁰¹ NEA (2000), “Memorandum of Understanding between the International Atomic Energy Agency and the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development”, NEA Doc. NEA/NE(2008)8 (2000 MOU).

8.3.2. Work towards a global nuclear liability regime

While the NEA's Strategic Plan and the NLC Mandate use words like modernize and harmonize, in 2014, the NEA Steering Committee, the highest decision making body at the NEA that oversees and shapes the work of the NEA to ensure its responsiveness to member countries' needs, specifically talked about the need for globalization. Following its April 2014 meeting, at which the NEA Steering Committee held a policy debate on 'Progress towards a Global Nuclear Liability Regime', the Committee made a number of conclusions, including that it:

- (a) Stressed the importance of achieving greater globalization and harmonization of nuclear liability regimes in order to ensure adequate and timely compensation for damage to persons and property resulting from a nuclear accident and to promote consistent treatment of potential victims and operators worldwide;
- (b) Acknowledged the current international impetus to achieve a global nuclear liability regime following the 2011 Fukushima Daiichi nuclear power plant accident in Japan;
- (c) Noted the benefits of adhering to one of the nuclear liability regimes, and more particularly to the enhanced nuclear liability regimes, to achieve greater globalization and harmonization of nuclear liability coverage;
- (d) Encouraged NEA member countries with nuclear power programmes and other consenting countries to adhere to one of the enhanced nuclear liability regimes and to adopt consistent legislation if they have not already done so;
- (e) Encouraged NEA member countries party to the regimes established by the Paris Convention or the Vienna Convention to join the efforts to establish a more global nuclear liability regime by adhering to the Joint Protocol [6], and/or to the Convention on Supplementary Compensation for Nuclear Damage (CSC) [8], if they have not already done so;
- (f) Identified the NEA as a useful forum for discussing the benefits of establishing a global nuclear liability regime and facilitating the harmonization of national legislation in nuclear power states which are not yet party to one of the nuclear liability regimes.¹⁰²

These conclusions align with the broad contours of the September 2011 'IAEA Action Plan on Nuclear Safety' [1], the recommendations of the June 2012 INLEX Recommendation [2] associated with the IAEA Action Plan, the

¹⁰² NEA (2014), "Summary Record of the 128th Session of the Steering Committee for Nuclear Energy", NEA Doc. NEA/SUM(2014)1, pp. 13–14.

2015 IAEA Resolution on “Measures to strengthen international cooperation in nuclear, radiation, transport and waste safety” [GC(59)/RES/9], and the September 2022 INLEX Statement on the Benefits of Joining the Global Nuclear Liability Regime [16], all of which encourage multilateral cooperation towards achieving a more global nuclear liability regime.

Therefore, the interests of the NEA member states, the IAEA Member States and INLEX as a body are all aligned on a shared goal of improving adherence to one of the enhanced nuclear liability regimes and striving to establish a more global nuclear liability regime. There is still much progress to be made in this regard — and the impetus created by the accident at the Fukushima Daiichi nuclear power plant has subsided — but the current global situation of increased focus and attention on nuclear energy as a means to mitigate the impacts of climate change creates a renewed focus. And one that could create a new and renewed call to action.

8.4. SPECIFIC COOPERATION ON NUCLEAR LIABILITY MATTERS: HARMONIZATION OF THE PARIS/BRUSSELS REGIME AND THE IAEA NUCLEAR LIABILITY CONVENTIONS

In addition to the general cooperation, there are also more specific and concrete forms of cooperation that have taken place over the past 20 years. In particular, this specific cooperation has mainly taken the form of harmonizing the implementation of the Paris/Brussels regime¹⁰³ with the IAEA nuclear liability conventions.¹⁰⁴

8.4.1. Exclusion of small quantities of nuclear substances/material from the scope of application of the nuclear liability regime

8.4.1.1. Background

As provided in Article 1(b) of the Paris Convention, the NEA Steering Committee may, if in its view the small extent of the risks involved so warrants, exclude any nuclear installation, nuclear fuel or nuclear substances from the application of the Convention. Soon after the adoption of the Paris Convention, it was recognized that within certain defined limits, nuclear substances that

¹⁰³ The ‘Paris/Brussels regime’ refers to the Paris Convention and the Brussels Supplementary Convention.

¹⁰⁴ The ‘IAEA nuclear liability conventions’ refer to the 1963 Vienna Convention, the 1997 Revised Vienna Convention and the CSC.

are in transport or are in use outside a nuclear installation should be excluded from the scope application of the Paris Convention, given the small extent of risks involved. Accordingly, in 1964 the NEA Steering Committee adopted a Decision on the Exclusion of Small Quantities of Nuclear Substances from the Application of the Paris Convention¹⁰⁵. It subsequently revised that Decision in 1977, 2007 and 2016.

Article I.2 in both the 1963 Vienna Convention [4] and the 1997 Revised Vienna Convention [7],¹⁰⁶ as well as Article 1.2(b) of the Annex to the 1997 Convention on Supplementary Compensation [8]¹⁰⁷ authorizes the IAEA Board of Governors to establish maximum limits for the exclusion of small quantities of nuclear material from the application of those conventions in view of the small extent of the risks involved¹⁰⁸. The technical criteria for such exclusion are set in the Resolution of the Board of Governors on the Establishment of Maximum Limits for the Exclusion of Small Quantities of Nuclear Material from the Application of the Vienna Conventions on Nuclear Liability, the first edition of which was first adopted in 1964 and subsequently updated in 1978, 2007 and 2014 [13].

The drafting process of the very first editions of the NEA Steering Committee Decision and the Resolution of the Board of Governors provides another example of the historically very close cooperation between the NEA and the IAEA. The 1964 edition of the Steering Committee Decision was “framed along the broad lines of the Decision of the I.A.E.A. Board of Governors”¹⁰⁹, with para. 2 of the Note by the Director General to the Draft Decision on the Exclusion of Small Quantities of Nuclear Substances from the Application of the Paris Convention providing that:

“[i]n the course of the negotiation of the Additional Protocol to the Paris Convention the Governmental experts on third party liability recommended

¹⁰⁵ NEA (1964), “Decision on the Exclusion of Small Quantities of Nuclear Substances from the Application of the Convention on Third Party Liability in the Field of Nuclear Energy of 29th July 1960”, NEA Doc. NE(64)10(Final), adopted by the Steering Committee on 26 November 1964, NEA Doc. NE/M(64)3, pp. 10–11.

¹⁰⁶ Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage (1997), IAEA Doc. INFCIRC/566, 2241 UNTS 302 [7], entered into force 4 October 2003 (1997 Revised Vienna Convention).

¹⁰⁷ Convention on Supplementary Compensation for Nuclear Damage (1997), IAEA Doc. INFCIRC/567, 36 ILM 1473 [8], entered into force 15 April 2015 (CSC).

¹⁰⁸ The meaning of ‘nuclear material’ in the IAEA nuclear liability conventions is identical to that of ‘nuclear substances’ in the Paris Convention.

¹⁰⁹ NEA (1964), “Exclusion of Small Quantities of Nuclear Substances from the Application of the Paris Convention”, Note by the Director General, NEA Doc. NE(64)10, p. 1.

that, in order to harmonize the scope of the two Conventions as regards the exclusion of small quantities of nuclear substances, the Steering Committee should take no final decision under Article 1(b) of the Paris Convention until such time as the I.A.E.A. Board of Governors had fixed maximum limits for exclusions pursuant to Article I(2) of the Vienna Convention.”

At its meeting on 11th September 1964 the IAEA Board of Governors established such limits¹¹⁰.

8.4.1.2. 2007 revision

Starting in 2004, INLEX began examining the question of whether the 1978 Board of Governors Resolution¹¹¹ excluding small quantities of nuclear material from the scope of application of the Vienna Convention should be revised. The 1978 Board Resolution was based on the 1973 revised edition of the IAEA Regulations for the Safe Transport of Radioactive Material. The IAEA subsequently issued later editions of the Transport Regulations, but the 1978 Board Resolution was never amended. The call to action came with the 2005 revised edition of the Transport Regulations.

As with the 1978 Board Resolution, the 1977 edition of the NEA Steering Committee Decision¹¹² was also based on the 1973 revised edition of the IAEA Transport Regulations. Similarly, prior maximum limits established in 1964 and in 1977 (for the Paris Convention) and 1978 (for the Vienna Convention) for the exclusion of small quantities of nuclear substances/material from the Paris and Vienna Conventions were identical. Therefore, an Expert Group on Transport Liability Issues was established under the auspices of the NLC in November 2004 with a view, *inter alia*, to revising the 1977 NEA Steering Committee Decision.

It was recognized early on that any proposed changes to the established maximum limits for the exclusion of small quantities should not only be coordinated between the NEA and the IAEA Secretariats, but that harmonization of the Paris and Vienna regimes (as was already the case at the time)

¹¹⁰ *Ibid.*

¹¹¹ Resolution on the Establishment of Maximum Limits for the Exclusion of Small Quantities of Nuclear Material from the Application of the Vienna Convention, IAEA Doc. GOV/1913/Corr.2, 16 August 1978, Annex 2.

¹¹² NEA (1977), “Draft Decision on the Exclusion of Small Quantities of Nuclear Substances from the Application of the Convention on Third Party Liability in the Field of Nuclear Energy”, NEA Doc. NE(77)20, Appendix II, adopted by the Steering Committee on 26 October 1977, NEA Doc. NE/M(77)2, pp. 29–30 (the “1977 NEA Steering Committee Decision”).

remained desirable, even more so in light of the Joint Protocol. Therefore, the NLC and INLEX

“both considered this issue, and ... co-ordinated draft texts to incorporate the developments in this field. The intention [was] to obtain identical, or as nearly identical as possible, texts of both agencies’ Decisions. This [was] desirable not only because some NEA member countries are party to the Paris Convention while others are party to one of the IAEA Conventions, but also because of the existence of the 1988 Joint Protocol which forms a bridge between the Paris Convention and certain IAEA Conventions”¹¹³.

The resulting 2007 IAEA Board of Governors Resolution on the Establishment of Maximum Limits for the Exclusion of Small Quantities of Nuclear Material from the Application of the Vienna Conventions on Nuclear Liability [GOV/2007/39 (Corrected)] and the 2007 NEA Steering Committee Decision¹¹⁴ succeeded in harmonizing their approach to incorporate the relevant provisions of the 2005 revised edition of the Transport Regulations.

8.4.1.3. 2014/2016 revision

The IAEA once again revised the Transport Regulations in 2012 by introducing new maximum activity limits below which nuclear material could be excluded from the application of the IAEA nuclear liability conventions. As a result, INLEX determined that the 2007 Board Resolution needed to be revised, as did the NEA regarding the 2007 NEA Steering Committee Decision.

In 2014, the Board of Governors adopted a new Resolution on the Establishment of Maximum Limits for the Exclusion of Small Quantities of Nuclear Material from the Application of the Vienna Conventions on Nuclear Liability [GOV/2014/63] [13]. The NEA recommended to the Steering Committee:

“that the 2007 [Steering Committee] Decision be amended in a manner corresponding as closely as possible to the [2014 Board Resolution] in

¹¹³ NEA (2007), “Draft Decision on the Exclusion of Small Quantities of Nuclear Substances from the Application of the Paris Convention on Third Party Liability in the Field of Nuclear Energy”, Note by the Secretariat, NEA Doc. NEA/NE(2007)8, p. 3, para. 7.

¹¹⁴ NEA (2007), “Draft Decision on the Exclusion of Small Quantities of Nuclear Substances Outside a Nuclear Installation from the Application of the Convention on Third Party Liability in the Field of Nuclear Energy of 29 July 1960 as Amended”, NEA Doc. NEA/NE(2007)8, adopted by the Steering Committee on 18 October 2007, NEA Doc. NEA/NE/M(2007)2, p. 7.

light of the fact that some NEA member countries are party to the Paris Convention while others are party to one of the IAEA Conventions and in light of the existence of the 1988 Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention”¹¹⁵.

In 2016, the NEA Steering Committee adopted the Decision on the Exclusion of Small Quantities of Nuclear Substances outside a Nuclear Installation from the Application of the Paris Convention.¹¹⁶

8.4.2. Definition of ‘nuclear installation’ in the Paris Convention and the IAEA Nuclear Liability Conventions

Starting in 2003, INLEX began discussing the scope of the definition of ‘nuclear installation’ and its possible expansion to include other nuclear installations, focusing in particular on the 1997 Revised Vienna Convention [7]. A few years later this discussion was broadened to include an examination of the differences between the definitions of ‘nuclear installation’ in the Paris Convention and the IAEA nuclear liability conventions. In 2005, INLEX:

“recognized that the definition in the revised Vienna Convention ‘provided the possibility for the Board of Governors to expand the definition of ‘nuclear installation’ to include, for example, ‘waste disposal facilities’ and ‘installations in the process of decommissioning’ and that the revised Paris Convention now expressly includes such facilities within the definition of ‘nuclear installation’”¹¹⁷.

In 2014, following years of discussions of varying intensity, INLEX made its conclusions on the definition of ‘nuclear installation’ as regards waste disposal facilities and nuclear installations in the process of being decommissioned.

¹¹⁵ NEA (2016), “Draft Decision on the Exclusion of Small Quantities of Nuclear Substances Outside a Nuclear Installation from the Application of the Convention on Third Party Liability in the Field of Nuclear Energy of 29 July 1960 as Amended”, Note by the Secretariat, NEA Doc. NEA/NLC/DOC(2016)2/REV1, para. 10.

¹¹⁶ NEA (2016), “Decision on the Exclusion of Small Quantities of Nuclear Substances outside a Nuclear Installation from the Application of the Convention on Third Party Liability in the Field of Nuclear Energy”, NEA Doc. NEA/NE(2016)8/FINAL, adopted by the Steering Committee on 3–4 November 2016, NEA/SUM(2016)2, pp. 10–11.

¹¹⁷ IAEA (2020), The 1997 Vienna Convention on Civil Liability for Nuclear Damage and the 1997 Convention on Supplementary Compensation for Nuclear Damage — Explanatory Texts, IAEA International Law Series, No. 3 (Rev. 2), IAEA Doc. STI/PUB/1906, IAEA, Vienna [11], p. 28, fn. 92.

8.4.2.1. *Waste disposal facilities*

The 1963 Vienna Convention [4], the 1997 Revised Vienna Convention [7] and the CSC [8] provide that the definition of nuclear installation includes any facility where nuclear material is stored, other than storage incidental to the carriage of such material. However, none refer to disposal. The situation was the same in the Paris Convention as amended by Additional Protocols of 1964 and 1982, until a 1984 Decision of the NEA Steering Committee expanded the then applicable definition of ‘nuclear installation’ to include waste disposal facilities in their pre-closure phase only: “Installations for the disposal of nuclear substances shall, for the pre-closure phase, be considered as ‘nuclear installations’ within the meaning of Article I (a)(ii) of the Paris Convention”¹¹⁸. A note by the NEA Secretariat clarified that the decision was without prejudice to “the question of the application of the Paris Convention to the post-closure phase of the repository when operations are completed, the repository closed and the waste no longer the subject of active surveillance”¹¹⁹.

The definition of ‘nuclear installation’ in the Paris Convention was further expanded with the 2004 amending Protocol, which provides that the definition of ‘nuclear installation’ in Article 1(a)(ii) also includes “installations for the disposal of nuclear substances”. According to the Explanatory Report attached to the Final Act of the 2004 Conference on the Revision of the Paris Convention and Brussels Supplementary Conventions, this is understood to mean the post-closure phase as well. As specified by the Contracting Parties to the Paris Convention (CPPCs):

“the Contracting Parties believe that it is desirable to have such facilities considered as ‘nuclear installations’ in their post-closure phase as well, and have decided to include all installations for the disposal of nuclear substances in the definition of ‘nuclear installation’, without distinction”¹²⁰.

¹¹⁸ NEA (1984), “Draft Decision on the Inclusion of Installations for the Disposal of Nuclear Substances within the Scope of Application of the Convention on Third Party Liability in the Field of Nuclear Energy”, NEA Doc. NE(84)5, Annex, p. 4, adopted by the Steering Committee on 10 April 1984, NEA Doc. NE/M(84)1, pp. 10–11.

¹¹⁹ NEA (1990), Paris Convention Decisions, Recommendations, Interpretations, OECD Publishing, Paris, p. 6.

¹²⁰ Final Act of the Conference on the Revision of the Paris Convention and of the Brussels Supplementary Convention, Paris, 12 February 2004, Annex IV, Explanatory Report by the Representatives of the Contracting Parties on the Revision of the Paris Convention and the Brussels Supplementary Convention, p. 73, para. 9.

In 2014, INLEX adopted an interpretation that was similar to the one provided in the 1984 NEA Steering Committee Decision:

“As to disposal installations, the Group recalled that in 1984 the definition of ‘facilities for the storage of nuclear substances’ in the Paris Convention had been interpreted by the Steering Committee for Nuclear Energy as extending to facilities where radioactive waste is disposed of. The Group concluded that a similar interpretation should be followed under the Vienna Convention”¹²¹.

INLEX clarified this interpretation in 2018 by concluding that:

“the IAEA liability conventions would continue to apply during the period when the waste can be regarded as being in storage, institutional controls remain active and there is still an operator. Following the cessation of institutional controls, ... ‘in the absence of an operator, the nuclear liability conventions cannot be applied and therefore the State which has agreed to the closure of the installation would implicitly be expected to assume the responsibility in case of any nuclear incident’”¹²².

8.4.2.2. *Nuclear installations in the process of being decommissioned*

In 1987, the NEA Steering Committee issued an interpretation that the definition of ‘nuclear installation’ in the Paris Convention as amended by Additional Protocols of 1964 and 1982 [3] should be understood as covering nuclear installations in the process of decommissioning¹²³. A note by the NEA Secretariat clarified that “[t]he Paris Convention does not expressly state whether nuclear installations otherwise covered by its provisions continue to be covered when, after having permanently ceased operations, they are in the course of being decommissioned”¹²⁴.

In a subsequent decision in 1990, the NEA Steering Committee decided “that any Contracting Party may cease to apply the Paris Convention to a nuclear installation in the process of decommissioning, provided that” certain

¹²¹ IAEA (2020), supra note 116.

¹²² Ibid.

¹²³ NEA (1987), “Interpretation on the Application of the Paris Convention to Nuclear Installations in the Process of Decommissioning”, NEA Doc. NE(87)2, adopted by the Steering Committee on 28 April 1987.

¹²⁴ NEA (1990), Paris Convention Decisions, Recommendations, Interpretations, supra note 31, p. 6.

conditions are met¹²⁵. The definition of ‘nuclear installation’ was amended in the 2004 Protocol to the Paris Convention, this time with Article 1(a)(ii) specifically including “any such reactor, factory, facility or installation that is in the course of being decommissioned”. In this, the Contracting Parties to the Paris Convention (CPPCs) affirmatively decided not to incorporate into the text of the Paris Convention the 1990 NEA Steering Committee Decision on the potential exclusion of nuclear installations in the process of being decommissioned. However, the Contracting Parties to the Paris Convention (CPPCs) maintained the possibility of ceasing to apply the Paris Convention to such installations if they comply with certain provisions and conditions established by the NEA Steering Committee, which, in 2014, revised the 1990 Decision by updating the technical criteria for the exclusion provided therein¹²⁶.

As was the case with the discussion on waste disposal facilities, INLEX spoke off and on over a number of years about whether or not nuclear installations in the process of being decommissioned were or were not (or should or should not be) included within the definition of ‘nuclear installation’ provided in the IAEA nuclear liability conventions. Ultimately, INLEX settled on an understanding similar to the one provided in the 1987 NEA Steering Committee interpretation and Article 1(a)(ii) of the 2004 Protocol to the Paris Convention [9], finding that:

“a shutdown reactor or an installation being decommissioned could qualify as a nuclear installation under the existing definition in all IAEA liability conventions.... [W]here such an installation would no longer qualify as a ‘nuclear reactor’ as defined in the conventions, it could be considered as a ‘facility where nuclear material is stored’ since the definition of ‘nuclear material’ includes both ‘nuclear fuel’ and ‘radioactive products or waste’, and in view of the broad definition of this latter term”¹²⁷.

¹²⁵ NEA (1990), “Draft Decision and Recommendation of the Steering Committee Concerning the Application of the Paris Convention to Nuclear Installations in the Process of Decommissioning”, NEA Doc. NE(90)7, Appendix, p. 3, adopted by the Steering Committee on 19 April 1990, NEA Doc. NEA/M(90)1, pp. 21–22.

¹²⁶ NEA (2014), “Draft Decision and Recommendation of the Steering Committee Concerning the Application of the Paris Convention to Nuclear Installations in the Process of Being Decommissioned”, NEA Doc. NEA/NE(2014)14/REV1, adopted by the Steering Committee on 30 October 2014, NEA Doc. NEA/SUM(2014)2, pp. 8–9.

¹²⁷ IAEA (2020), *supra* note 116.

8.5. CONCLUSION

Regardless of the names of the bodies, whether the NEA Group of Experts and the IAEA Standing Committee on Liability for Nuclear Damage or the NEA Nuclear Law Committee and INLEX, the frequent and meaningful cooperation on issues related to civil liability for nuclear damage between the NEA and the IAEA should and will continue. Looking to the future, there remain a number of issues that can still be discussed, analysed and potentially resolved such as the operator's right of recourse, the definition of 'nuclear installation' vis-à-vis fusion installations and advanced reactors (including floating nuclear power plants), the appropriate liability and financial security amounts for small modular reactors, exclusions allowed only under the Paris Convention, and the interaction between the Brussels Supplementary Convention and the CSC. None of these issues are simple; in fact, in many ways they are more complicated, and more important than many of the issues addressed by INLEX in its first 20 years. As the nuclear industry continues to change and advance, INLEX needs to be prepared to adapt and respond. This will require even closer cooperation in the years to come. Thankfully, the foundation for such cooperation is there — not just over 20 years, but now well over 65 years' worth of cooperation.

9. INSURANCE PERSPECTIVE

M. POPPLEWELL¹²⁸

9.1. INTRODUCTION — HOW INSURANCE STARTED

The inception of insurance can be traced back to centuries ago, when merchants in ancient China first began to distribute goods across multiple ships as a way to manage risk. In the Middle Ages, European merchants, financiers and shipowners followed suit by sharing risk, and this practice evolved in the 17th century in London coffee houses. One such establishment, Edward Lloyd's coffee shop on the banks of the Thames in London, became a renowned meeting place for entrepreneurs, and merchants would meet with shipowners to provide them insurance for hull and cargo in case their ships failed to return from foreign voyages. Around the same time, modern non-marine insurance emerged, with

¹²⁸ M. Popplewell is Managing Director of Nuclear Risk Insurers Ltd.

the establishment of the first fire insurance company, the Insurance Office for Houses, in 1680.

9.2. THE FORMATION OF NUCLEAR INSURANCE POOLS

In the mid-20th century, insurance had become a worldwide industry, offering coverage for a diverse range of risks, in the marine and non-marine market, and including cover for such risks as earthquakes, hurricanes, floods, tsunamis and wildfires, collectively known as catastrophic risks.

During the early 1950s, European and American governments began to explore the peaceful use of nuclear energy, which could generate electricity by creating steam from the heat generated by a fission reaction. However, this new form of energy posed a significant risk, as the release of radioactive materials into the environment could cause severe health and environmental damage, property damage and economic consequences, as well as evacuation and decontamination costs. Governments sought to insure this new industry as part of the broader ‘social licence’ that nuclear operators needed to obtain.

At the time, insurers debated whether they could accept such a risk and on what basis, considering environmental, social and governance considerations, and how supporting the civil application of nuclear energy would affect their brand and reputation. They were also concerned about the potential for a catastrophic event and accumulation risk, and had to consider factors such as aggregate limit, claims frequency, and reinsuring this new risk type, as there were no actuarial data to model from historical loss events.

To address these challenges, insurers decided to ‘pool’ capacity into civil nuclear insurance pools, with the first being established in the United Kingdom (UK), the United States of America (USA) and Europe. The British Insurance (Atomic Energy) Committee was formed in the UK in 1956 as an association of insurers, with a capacity of around £20 million, and encouraged all UK insurers to participate, offering their net capacity. Insurers also developed a radioactive contamination exclusion to prevent insurers subscribing to a nuclear pool from reinsuring a nuclear risk, maintaining the principle of net capacity. In early records for the British Insurance (Atomic Energy) Committee (BI(AE)C) the following note was recorded:

“[C]ircumstances may arise which can result in loss of control over an atomic reaction. Should this happen it has to be envisaged that radioactive products in the form of vapour or dust, may escape from the normal confines of the

reactor installation into the atmosphere and ... adversely affect all forms of property ... and cause injury to both human and animal life”¹²⁹.

One of the first insurance policies designed to cover a nuclear power station was issued by BI(AE)C for Calder Hall in Cumbria in 1956/57, which had just been commissioned and opened by Queen Elizabeth II. The policy covered physical damage and personal injury, with a limit of liability of £50 million.

Since then, around 28 civil nuclear insurance pools have been established globally, with most operating on a global basis to provide domestic and ‘interpool exchange of risk’ and a few operating on purely domestic lines. The most recent pool to form was the United Arab Emirates Nuclear Insurance Pool in Abu Dhabi in response to the Barakah nuclear power plant’s commissioning and testing at Unit 1 in 2019/2020.

9.3. THE FORMATION OF NUCLEAR MUTUALS, CAPTIVES AND ALTERNATIVE INSURANCE CAPACITY

As the civil nuclear industry has evolved since its inception in the late 1950s, the industry’s understanding of the risks involved has grown. Consequently, due to the low frequency of losses, the industry has looked for ways to manage and retain risks while also creating competitive pressure for nuclear insurance pools. As a result, operators formed mutual insurance associations, starting with the creation of Nuclear Electric Insurance Limited (NEIL), a Property Mutual, in the USA in 1973. Today, NEIL is the principal insurer of all nuclear power plant property risks in the USA and works with the commercial insurance market and the American Nuclear Insurance Pool to diversify the 100% risk. In the late 1970s a similar Property Mutual was formed in Europe. Unlike NEIL, the European Mutual has chosen to diversify its membership and insurance capacity globally, providing insurance to risks outside of Europe. Finally, the European Liability Insurance Mutual was formed in the early 2000s in anticipation of the Revised Paris Convention 2004.

These three mutual organizations are member-led and offer a mix of risk mutualization, a form of ‘self-insurance’ and access to more traditional reinsurance market capital but again respecting the net capacity principles. On one side, these organizations are not-for-profit, and profits are distributed to their members. On the other side, mutuals can act as a post-loss funding mechanism, unlike insurance capital, which is pre-loss funding. In the event of a claim, unless the Mutual has enough funds to pay, it can call for additional funds from all

¹²⁹ Extract from a report on the nuclear industry prepared by UK insurers in April 1957.

members to post-loss finance the claim. While mutuals can be financially strong, they do not operate like insurance companies and do not have the same ability to diversify across a portfolio of risks or access the capital associated with pools and their access to the global insurance markets. Nevertheless, mutuals offer an important and cost-effective alternative risk transfer solution to the pools.

In addition to mutual participation, some larger nuclear operators deploy their own capital to self-insure risks through a Captive dedicated to their own risks. In recent years, capacity has also developed within the insurance market, but outside of the traditional nuclear insurance pools, providing alternative security and giving a further edge to the competitive marketplace that exists today. That said, today the nuclear insurance pooling model has stood as a consistent partner to the civil nuclear industry since its formation.

9.4. HOW NUCLEAR POOLS OPERATE

Nuclear pools provide insurance coverage for nuclear facilities within their respective countries, covering the entire fuel cycle from enrichment to disposal. They can either be insuring pools, where an association or agent covers risks on behalf of insurance company members, or reinsuring pools, where a domestic insurer provides initial coverage and then reinsures 100% into the reinsuring pool, with the ceding company in turn assuming its net share of the risk. The domestic pool then reduces its exposure through the interpool exchange of risk, allowing it to purchase net line reinsurance from other pools¹³⁰. This system creates a credit risk, which is mitigated by the solidarity principle in most pool articles, meaning that insuring members stand in place for any exposed member who fails.

The need for nuclear pools arises from the high risks associated with the nuclear industry, which make it difficult for conventional commercial insurance companies to cover these risks in the same way as other forms of power generation. Given the link between nuclear insurance and the nuclear industry's social licence, the high level of financial security provided by these pools is essential. With an average of 20 plus members per nuclear pool, and 28 nuclear pools worldwide participating in some of the largest and most complex risks, the level of risk diversification is extremely high and as a consequence the level of financial security is high.

¹³⁰ <https://www.nuclearpools.com/about-us/>

9.5. THE NUCLEAR COVERS AND THE NUCLEAR EXCLUSION

Nuclear insurers were established to provide coverage for risks that traditional insurance companies were unwilling to accept. This was done to avoid the accumulation of unintended risk. In order to maintain net capacity principles and protect against the risk of spiral reinsurance experienced in the Lloyd's of London market in the 1980s, nuclear exclusions were adopted in both treaty and facultative reinsurance protection¹³¹. Since the 1950s, nuclear exclusions have become common in insurance contracts and are paired with other general insurance exclusions such as war. Rules were also established to define nuclear liability and transit liability, including strict, no-fault liability and channelling of liability to the licence holder. Liability is also limited in time and amount.

Property and machinery breakdown insurance does not need to follow these same principles, but nuclear exclusions are still utilized to support the net capacity concept that has helped maintain nuclear insurance security to this day.

9.6. CIVIL NUCLEAR EVENTS IN THE PAST 65 YEARS

Since its formation in the mid-1950s, there have been only four significant off-site release events within the civil nuclear industry. This low number of accidents is a testament to the high level of regulation and the safety-first principles of the industry, especially when compared to other energy sectors. The International Nuclear and Radiological Event Scale (INES) is used to communicate the safety significance of nuclear and radiological events to the public, with event details made available through the IAEA's INES web site¹³². The four major events recorded are as follows:

- (1) Three Mile Island (TMI) accident in the USA in 1979, which resulted in a core meltdown due to human error. The event was registered as INES level 5, and around 11 000 people were evacuated. Although no deaths were recorded, the accident resulted in an insurance claim of approximately US\$70 million in compensation.
- (2) Chernobyl nuclear power plant in Ukraine in 1986, which was caused by an explosion due to human error. The event was classified as INES level 7, the most serious major accident classification. Over 100 000 people were evacuated, and up to 50 people died directly from exposure to ionizing

¹³¹ NMA1975 (A) <https://pusatasuransi.com/wp-content/uploads/2020/07/Nuclear-Energy-Exclusion-Clause-1994-NMA-1975-A.pdf>

¹³² <https://www-news.iaea.org/InesScale.aspx>

radiation. The accident was not insured and estimates for costs involved reach close to US\$500 billion.

- (3) Tokaimura accident in Japan in 1999, where three workers received high doses of radiation while preparing fuel for an experimental reactor. Human error was again the cause of the accident. A total of 119 people received a radiation dose over 1 mSv, but only three operators' doses were above permissible limits. Two of the doses proved fatal. The event was insured, with around US\$128 million paid in compensation.
- (4) Fukushima Daiichi accident in Japan in 2011, which was caused by an earthquake followed by a 15 metre tsunami that resulted in three core meltdowns. Like that at Chernobyl nuclear power plant, the event was classified as an INES level 7 accident and resulted in the evacuation of 100 000 people. Although no deaths or cases of radiation sickness were recorded, people have been compensated for their long term displacement, loss of property and evacuation costs, as well as environmental clean-up and economic compensation for loss of income. Official figures indicate that there have been 2313 disaster-related deaths among evacuees from Fukushima prefecture, none of which are radiation dose related. The event was not insured because the Japanese Government had given operators in Japan an exoneration under the Nuclear Liability Act for Grave Natural Disasters. That exoneration did not apply to TEPCO, however, as it was later established that TEPCO could have prevented the event taking place if they had adopted better safety practices. The current loss estimates exceed US\$100 billion.

9.7. THE SOCIAL LICENCE

The World Nuclear Association (WNA) defines social licence to mean the situation in which a project has ongoing approval within the local community and among other stakeholders and also has political and public acceptance. Absence of trust limits the availability of a social licence for governments, institutions and companies to proceed with their activities. Education about a project and confidence in scientific certainty can help reduce public concern.

In terms of nuclear insurance, there are several ways in which it supports and facilitates a social licence.

- (a) Requirement for financial security — legal imperative to provide financial security is the incentive to buy insurance which in the majority of cases is preferred over alternative financial security means.

- (b) Liability channelling — all liability falls to site operator (licensee) with radioactive contamination exclusion clause on all insurance policies giving a victim(s) absolute certainty about where their claim should be made, in the event of an accident.
- (c) Without fault and exclusive liability — ‘strict’ liability provides direct and rapid access to insurance funds and offers certainty of maximum exposure to insurers.
- (d) Nuclear insurance engineering risks inspections — similarly to organizations like the World Association of Nuclear Operators (WANO) and Institute of Nuclear Power Operations (INPO), nuclear insurers regularly survey nuclear sites to gain valuable risk information for technical underwriting purposes. Recommendations are also made, based on best practice, for even greater risk improvement and such recommendations are welcomed and implemented by the visited operator.
- (e) Claims management systems (CMSs) — the insurance industry is recognized for its track record in managing catastrophe claims and making sure that funds are quickly and efficiently made available to claimants in compensation. Nuclear insurers have developed CMS applications with their insurance company members’ support and in collaboration with nuclear operators, governments and other stakeholders such as loss adjuster ‘third party administrators’. These consist of registration systems, both internet based and call centre facilitated, and they are backed up by claims management teams. Such systems require testing and to be regularly updated in cooperation with all stakeholders.

9.8. WHAT DOES THE FUTURE HOLD FOR NUCLEAR INSURANCE?

As INLEX’s 20th anniversary is celebrated, the positive advancements within the nuclear industry have been inspiring. Nuclear power continues to play a crucial role in the transition to a low-carbon future and provides sovereign energy security. Additionally, advancements in reactor enhancements, safety measures and fuels are leading the industry from Generation III+ to Generation IV, further improving the safety and efficiency of nuclear power. With the rapid development of small modular reactor (SMR) and advanced modular reactor (AMR) designs, the future of the nuclear industry looks promising.

However, as the industry evolves, it’s important for nuclear insurers to keep pace with the changes and innovate. While the basic principles of nuclear insurance may remain intact, how insurance is deployed is likely to change. Increasing nuclear liability limits for large reactors, different limits for SMRs and AMRs, and more complex insurance needs for projects developed for the private

sector are among the areas where change is expected. The inclusion of civil marine applications will also present interesting challenges for nuclear insurers, as the industry has up until now traditionally developed along non-marine insurance lines.

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- [3] 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.
- [4] Vienna Convention on Civil Liability for Nuclear Damage, INFCIRC/500, IAEA, Vienna (1966).
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- [7] Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage, INFCIRC/566, IAEA, Vienna (1998).
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Annex I

2012 INLEX RECOMMENDATIONS AND OTHER DOCUMENTS

IAEA Action Plan on Nuclear Safety — Nuclear Liability

I-1. BACKGROUND

The IAEA Action Plan on Nuclear Safety (the Action Plan)¹ calls upon Member States to work towards establishing a global nuclear liability regime that addresses the concerns of all States that might be affected by a nuclear accident with a view to providing appropriate compensation for nuclear damage, and to give due consideration to the possibility of joining the international nuclear liability instruments as a step towards achieving such a global regime. In addition, the Action Plan specifically calls upon the International Expert Group on Nuclear Liability (INLEX) to recommend actions to facilitate the achievement of such a global regime.

I-2. THE EXISTING INTERNATIONAL LEGAL FRAMEWORK FOR CIVIL LIABILITY FOR NUCLEAR DAMAGE²

There are currently two international regimes for civil liability for nuclear damage. On the one hand, there is the so-called ‘Paris regime’, which consists of the 1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy (the Paris Convention), concluded under the auspices of the Organisation for Economic Co-operation and Development (OECD), open to OECD Member States and to other States only if all Parties give their consent. The Paris

¹ GOV/2011/59-GC(55)/14.

² The main features of the international nuclear liability instruments and the principles of nuclear liability law have been described in several IAEA documents, publications and papers prepared by INLEX. See, in particular, GOV/INF/2004/9-GC(48)/INF/5; GOV/INF/2006/4; The 1997 Vienna Convention on Civil Liability for Nuclear Damage and the 1997 Convention on Supplementary Compensation for Nuclear Damage — Explanatory Texts, IAEA International Law Series 3, STI/PUB/1279, 2007; Handbook on Nuclear Law, IAEA 2003, STI/PUB/1160, pp. 107–118; Handbook on Nuclear Law: Implementing Legislation, IAEA 2010, STI/PUB/1456, pp. 99–111; Civil Liability for Nuclear Damage: Advantages and Disadvantages of Joining the International Nuclear Liability Regime, paper prepared by INLEX.

Convention is supplemented by the 1963 Brussels Convention Supplementary to the Paris Convention (the Brussels Supplementary Convention). Both conventions have been amended by Protocols adopted in 1964 and 1982 and will be further amended by Protocols adopted on 12 February 2004, which, however, as of August 2012, are not yet in force.³

On the other hand, there is the so-called ‘Vienna regime’, which consists of the 1963 Vienna Convention on Civil Liability for Nuclear Damage (the 1963 Vienna Convention) and the 1997 Protocol to Amend the Vienna Convention (the 1997 Vienna Convention), both concluded under the auspices of the IAEA and open to all Member States of the United Nations, its specialized agencies or the IAEA, or to all States, respectively.⁴

In order to create a treaty link between the different regimes, two instruments have been adopted: The first is the 1988 Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention (the Joint Protocol), adopted under the joint auspices of the IAEA and the OECD, which aims at bridging the gap between Parties to the Vienna and the Paris regime and extending the rights under one regime to victims in the territory of Parties to the other. The second instrument is the 1997 Convention on Supplementary Compensation for Nuclear Damage (the CSC), concluded under the auspices of the IAEA, which aims not only at establishing treaty relations between States that belong either to the Vienna or the Paris regime but also with other States, provided their national legislation is consistent with uniform rules on civil liability for nuclear damage as laid down in the Annex to the CSC. The CSC also aims at increasing the amount of compensation available in the event of a nuclear incident through supplementary funds to be provided by its Contracting Parties.

I-3. ACTIVITIES CARRIED OUT BY INLEX AND THE SECRETARIAT IN THE CONTEXT OF NUCLEAR LIABILITY

In order to facilitate the implementation of the specific actions envisaged in the Action Plan in relation to nuclear liability, a special session of INLEX was held at IAEA Headquarters, from 14 to 16 December 2011. At this special session, INLEX agreed on a number of activities aimed at facilitating the achievement of a global nuclear liability regime as described in the Action Plan, including carrying out joint IAEA/INLEX missions in order to raise awareness

³ In the following recommendations by INLEX, the term ‘Paris Convention’ covers the 1960 Paris Convention and any amendment thereto in force for a Contracting Party.

⁴ In the following recommendations by INLEX, the term ‘Vienna Convention’ covers the 1963 Vienna Convention and any amendment thereto in force for a Contracting Party.

of the international nuclear liability regime and encourage wider adherence to the relevant international legal instruments in specific target countries⁵; making presentations on nuclear liability at various IAEA and other meetings during 2012;⁶ and organizing a workshop on nuclear liability at IAEA Headquarters for diplomats and experts from Member States.⁷ INLEX also held preliminary discussions on specific recommendations to facilitate the achievement of a global nuclear liability regime, with a view to finalizing these recommendations at its 12th regular meeting in 2012.

At the 12th regular meeting of INLEX, which was held at IAEA Headquarters from 30 May to 1 June 2012, INLEX further discussed and finalized the following recommendations to facilitate the achievement of a global nuclear liability regime, as requested by the Action Plan.

**Recommendations on how to facilitate achievement of a global nuclear liability regime,
as requested by the IAEA Action Plan on Nuclear Safety**

by

The International Expert Group on Nuclear Liability (INLEX)

In order to facilitate the achievement of a global nuclear liability regime, Member States should take the following steps:

- (1) All Member States with nuclear installations should adhere to one or more of the relevant international nuclear liability instruments that contain commonly shared international principles reflecting the enhancements developed under the auspices of the IAEA during the 1990s. In addition, all Member States with nuclear installations should adopt national laws that are

⁵ As of August 2012, five IAEA/INLEX missions were dispatched to the following Member States: Viet Nam (March 2012), Republic of Korea (April 2012), Jordan (May 2012), South Africa (July 2012), Ukraine (July 2012). China has agreed to host an IAEA/INLEX mission in the second half of 2012. Preparations are under way to implement similar missions later this year and in this context the Secretariat continues to conduct informal discussions with potentially interested Member States.

⁶ As of August 2012, presentations were made at the following meetings: Technical Meeting on Topical Issues on Infrastructure Development: Managing the Development of a National Infrastructure for Nuclear Power Plants (24–27 January 2012); 31st Meeting of the Commission on Safety Standards (27–29 March 2012); International Nuclear Safety Group (11–12 April 2012); Sixth Meeting of Representatives of the Competent Authorities identified under the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (17–20 April 2012); and meeting of the Advisory Group on Nuclear Security (23–27 April 2012).

⁷ The workshop was held on 29 May 2012, at IAEA Headquarters and was attended by 59 diplomats and experts from 34 Member States and one international organization.

consistent with the principles in those instruments and that incorporate the best practices identified below.

- (2) All Member States with nuclear installations should strive to establish treaty relations with as many States as practical with a view to ultimately achieving universal participation in a global nuclear liability regime that establishes treaty relations among all States. The INLEX experts note that the CSC establishes treaty relations among States that belong to the Paris Convention, the Vienna Convention or neither, while leaving intact the Joint Protocol that establishes treaty relations among States that belong to the Paris Convention or the Vienna Convention. In addition to providing treaty relations, the CSC mandates the adoption of the enhancements developed under the auspices of the IAEA and contains features to promote appropriate compensation, including an international fund to supplement the amount of compensation available for nuclear damage.
- (3) Member States with no nuclear installations should give serious consideration to adhering to a global regime, taking into account the benefits which such a regime can offer for victims once it achieves adherence by a significant number of States with nuclear installations.
- (4) All Member States with nuclear installations should ensure that there are adequate funds available to compensate all victims of a nuclear incident, without discrimination. Therefore, such Member States should in particular:
 - (a) Establish compensation and financial security amounts significantly higher than the minimum amounts envisaged under the existing instruments;
 - (b) Undertake regular reviews of the adequacy of compensation amounts in order to ensure that their value is maintained and that they reflect developments in the understanding of the possible impact of incidents involving the installations on their territory, noting that there is a trend towards establishing unlimited liability of the operator;
 - (c) Undertake regular reviews of the adequacy of financial security amounts in order to ensure that those amounts reflect available capacity in insurance markets, as well as other sources of financial security;
 - (d) Be prepared to set up appropriate funding mechanisms in cases where the amount of damage to be compensated exceeds the available compensation and financial security amounts;
 - (e) Provide compensation for latent injuries, noting that the revised Vienna and Paris Conventions set a 30-year time limit for filing claims for personal injury; and
 - (f) Ensure that compensation is available in the case of an incident directly due to a grave natural disaster of an exceptional character.

- (5) All Member States should:
- (a) Ensure that all claims arising from a nuclear accident are dealt with in a single forum in a prompt, equitable and non-discriminatory manner with minimal litigation, which could include a claims-handling system (which may be set up in close cooperation with insurers or other financial guarantors) in order to deal equitably and expeditiously with all claims; and
 - (b) Use the model legislation developed by the IAEA as a guide, as appropriate, when drafting or revising national nuclear liability legislation.

Annex II

2022 BENEFITS PAPER/CHAIR'S STATEMENT

Statement of the International Expert Group on Nuclear Liability (INLEX): Benefits of Joining the Global Nuclear Liability Regime

- (1) The IAEA Action Plan on Nuclear Safety (The Action Plan) recommends establishment of a global nuclear liability regime. A global nuclear liability regime requires universal participation through treaty relations among all States with and without nuclear installations that might be affected by a nuclear incident. To achieve this regime, States are encouraged to join as many of the international nuclear liability instruments as practical. These instruments are: the Paris Convention on Third Party Liability in the Field of Nuclear Energy (Paris Convention), the Brussels Convention Supplementary to the Paris Convention on Third Party Liability in the Field of Nuclear Energy (Brussels Supplementary Convention), the 1963 Vienna Convention on Civil Liability for Nuclear Damage (1963 Vienna Convention), the Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage (1997 Vienna Convention), the Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention (Joint Protocol), and the Convention on Supplementary Compensation for Nuclear Damage (CSC).
- (2) A global nuclear liability regime is an important element of the legal framework necessary to support the peaceful uses of nuclear energy. Such a regime should: (1) ensure prompt and equitable compensation for nuclear damage, including transboundary damage; (2) address the consequences of a maritime or any other transport accident involving nuclear material; and (3) provide the legal certainty necessary for international cooperation and commercial participation in nuclear projects.
- (3) General tort law often results in protracted litigation in multiple jurisdictions, against multiple defendants, with uncertain outcomes, and with no guarantee of judgments being enforceable or funds being available to pay judgments. To overcome these problems, the global nuclear liability regime builds upon and enhances the nuclear liability principles developed in the 1960s with the adoption of the Paris Convention and the Vienna Convention. These principles provide for, among other things, the exclusive liability of the operator of a nuclear facility without the need to prove fault (in accordance with the basic principle of the responsibility of the operator for safety and security), the obligation of such operators to carry insurance or other

financial security, the vesting of jurisdiction over a nuclear incident in a single State and the requirement for non-discriminatory treatment of all victims. The global nuclear liability regime requires each State to apply these principles.

- (4) Beginning in the late 1990s, the international nuclear liability instruments were enhanced to, among other things: provide higher compensation; explicitly cover environmental damage, economic loss and preventive measures; and to grant a country exclusive jurisdiction over nuclear incidents in its exclusive economic zone (EEZ). The global nuclear liability regime requires each State to apply these enhancements.
- (5) Coastal States have voiced concerns over maritime accidents involving nuclear material. The global nuclear liability regime seeks to address these concerns by granting a country exclusive jurisdiction over nuclear incidents that occur in its EEZ and by expanding the definition of nuclear damage to explicitly cover environmental damage, economic loss and preventive measures.
- (6) Suppliers, investors, lenders and insurers will not participate in nuclear projects unless their concerns over potential liability are addressed adequately. The global nuclear liability regime addresses these concerns by providing legal certainty that civil liability claims arising from nuclear damage will be channelled exclusively to the operator and adjudicated exclusively in the courts of one State, usually the State where a nuclear incident occurs.
- (7) The IAEA Action Plan called upon INLEX to recommend actions to facilitate achievement of the global nuclear liability regime. INLEX recommended that States with nuclear installations should: (1) establish treaty relations with as many States as practical, with a view to achieving universal participation in the global nuclear liability regime, and (2) apply the enhanced nuclear liability principles. States with no nuclear installation should consider adherence to the global nuclear liability regime once the regime contains a significant number of States with nuclear installations to offer meaningful benefits to those suffering nuclear damage arising from nuclear incidents, including during maritime transport.
- (8) INLEX notes that the CSC provides a pathway to treaty relations among the Paris Convention and Vienna Convention States parties, including those Paris and Vienna States parties to the Joint Protocol, as well as CSC Annex States (those that apply the nuclear liability principles and enhancements as set forth in the CSC and the CSC Annex) and, thus, provides a mechanism to achieve treaty relations with as many States as practical, with the goal of universal participation in the global nuclear liability regime. In addition, the CSC contains features to promote increased compensation, including an

international fund to supplement the amount of compensation available for nuclear damage.

- (9) To further enhance the protection of victims and facilitate more universal participation, States with nuclear installations should ensure that there are adequate funds available to compensate all victims of a nuclear incident, without discrimination, including among other things, establishing compensation and financial security amounts significantly higher than the minimum amounts envisaged under the existing instruments.

Annex III

LIST OF INLEX PUBLICATIONS AND WORKSHOPS

LIST OF INLEX PUBLICATIONS

INTERNATIONAL ATOMIC ENERGY AGENCY, The 1997 Vienna Convention on Civil Liability for Nuclear Damage and the 1997 Convention on Supplementary Compensation for Nuclear Damage — Explanatory Texts, IAEA International Law Series No. 3 (Rev. 2), IAEA, Vienna (2020)

INTERNATIONAL ATOMIC ENERGY AGENCY, The 1988 Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention — Explanatory Text, IAEA International Law Series No. 5, IAEA, Vienna (2013)

REGIONAL WORKSHOPS ON NUCLEAR LIABILITY

Sydney, Australia, 28–30 November 2005

Lima, Peru, 11–13 December 2006

Sun City, South Africa, 11–13 February 2008

Abu Dhabi, United Arab Emirates, 9–11 December 2009

Moscow, Russian Federation, 5–7 July 2010

Hanoi, Viet Nam, 17–18 March 2014

Panama City, Panama, 23–25 June 2015

Sydney, Australia, 15–17 March 2016

Montevideo, Uruguay, 7–9 June 2017

Accra, Ghana, 28–30 November 2017

Bucharest, Romania, 9–11 April 2019

Abu Dhabi, United Arab Emirates, 3–5 March 2020

ASEAN, virtual, 29 June–1 July 2021

Rio de Janeiro, Brazil, 24–27 October 2023

WORKSHOPS FOR DIPLOMATS ON NUCLEAR LIABILITY

Held at IAEA Headquarters

29 May 2012

14 May 2013

19 May 2014

15 April 2015

23 May 2016

8 May 2017

14 May 2018

27 April 2021

9 September 2022

21 July 2023

Annex IV

LIST OF INLEX MEETINGS

Held at IAEA Headquarters

Preparatory meeting	26–27 May 2003
First meeting	16–17 October 2003
Second meeting	22–26 March 2004
Third meeting	13–16 July 2004
Fourth meeting	7–11 February 2005
Fifth meeting	11–15 July 2005
Sixth meeting	24–27 May 2006
Seventh meeting	21–22 June 2007
Eighth meeting	21–23 May 2008
Ninth meeting	24–26 June 2009
Tenth meeting	12–14 May 2010
Eleventh meeting	25–27 May 2011
Twelfth meeting	30 May–1 June 2012
Thirteenth meeting	15–17 May 2013
Fourteenth meeting	20–22 May 2014
Fifteenth meeting	28–30 April 2015
Sixteenth meeting	25–27 May 2016
Seventeenth meeting	9–11 May 2017
Eighteenth meeting	15–17 May 2018
Nineteenth meeting	14–16 May 2019

Twentieth meeting	23 June 2020
Twenty-first meeting	28–30 April 2021
Twenty-second meeting	6–8 September 2022
Twenty-third meeting	18–20 July 2023
Special session	14–16 December 2011

Annex V

LIST OF CURRENT AND PAST MEMBERS

Azurin, C. (Peru)	2003–2006
Beyens, M. (Belgium)	2003–present
Bligh, D. (United Kingdom)	2007–2010
Brown II, O. (United States of America)	2003–present
Bukhari, K. (United Kingdom)	2021–present
Burns, S. (OECD/NEA)	2012–2014
Carroll, E. (Ireland)	2003–2018
Chadha, N. (India)	2019–2023
Chen, G. (China)	2015–2018
Coppa, G.R. (Argentina)	2003–2005
Davies, D.B. (South Africa)	2014–present
Degueuse, D. (France)	2003–2018
Dogauchi, M. (Japan)	2003–2013
Dominguez, C. (Argentina)	2019–present
Dong, B. (China)	2003–2007
Echavarria, C. (Argentina)	2013–2015
Elk, R. (South Africa)	2003–2011
Florea, A.I. (Euratom)	2019–present
Garribba, M. (European Commission)	2010–2011
Geoffroy, F. (France/Ireland)	2019–present
Gioia, A. (Italy)	2023–present
Griffiths, S. (United Kingdom)	2003–2006

Guimarães, L. dos Santos (Brazil)	2019–present
Herrera, G. (Argentina)	2007–2008
Hinteregger, M. (Austria)	2019–2023
Hokugo, T. (Japan)	2019–present
Horbach, N. (Netherlands, Kingdom of the)	2003–present
Huey, P. (United Kingdom)	2014–2016
Kumar, J. (India)	2012–2018
Lamm, V. (Hungary)	2006–2023
Léger, M. (France)	2015–2023
Ludbrook, J. (New Zealand)	2003–present
Matveev, A. (Russian Federation)	2003–2012
McCauley, D. (Canada)	2003–present
McIntosh, S. (Australia)	2003–2023
McRae, B. (United States of America)	2003–present
Montano Chuqui, L. (Peru)	2015–2017
Nick, K. (OECD/NEA)	2022–present
Nomura, T. (Japan)	2013–2018
Park, K.-G. (Korea, Republic of)	2011–2015
Pelzer, N. (Germany)	2003–2016
Popplewell, M. (United Kingdom)	2023–present
Raimundo Aninat, R.G. (Chile)	2003–2005
Reitsma, S. (Switzerland)	2003–2022
Reyners, P. (OECD/NEA)	2003–2005
Schwartz, J. (OECD/NEA)	2005–2011
Shkarbanov, A. (Russian Federation)	2013–present

Touitou-Durand, F. (France)	2023–present
Vasquez Maignan, X. (OECD/NEA)	2015–2021
Zhaohui, L. (China)	2019–present

ABBREVIATIONS

ADR Center	Nuclear Damage Compensation Dispute Resolution Center
CLC	International Convention on Civil Liability for Oil Pollution Damage
CRTD	Convention on Civil Liability for Damage Caused during Carriage of Dangerous Goods by Road, Rail and Inland Navigation Vessels
CSC	Convention on Supplementary Compensation for Nuclear Damage
DRC	Disputes Reconciliation Committee for Nuclear Damage
EEZ	exclusive economic zone
HNS	hazardous and noxious substances
INES	The International Nuclear and Radiological Event Scale
INLEX	International Expert Group on Nuclear Liability
JPY	Japanese Yen
NEA	Nuclear Energy Agency
NLC	Nuclear Law Committee
OECD	Organisation for Economic Co-operation and Development
PAA	Price-Anderson Act
PC	Paris Convention
SDR	special drawing right
TEPCO	Tokyo Electric Power Company
VC	Vienna Convention



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Since its establishment in September 2003, the International Expert Group on Nuclear Liability (INLEX) has played an important role in raising awareness and understanding of the nuclear liability instruments adopted under the IAEA's auspices. Over the course of the past two decades, the group has advised on many issues related to nuclear liability, and reached conclusions and made recommendations on possible gaps and ambiguities in the scope and coverage of the existing instruments. To mark this 20th anniversary, this publication includes papers on several nuclear liability topics and the work of INLEX, contributed by some of the group's current members. The aim of this publication is to increase awareness of the role of INLEX, as well as nuclear liability as an important aspect of nuclear law. The publication is intended for nuclear law professionals, academics and practitioners, as well as policy makers.