Denver Journal of International Law & Policy

Volume 35
Number 1 *Winter*

Article 6

January 2006

The Problems and Gaps in the Nuclear Liability Conventions and an Analysis of How an Actual Claim Would be Brought under the Current Existing Treaty Regime in the Event of a Nuclear Accident

Duncan E. J. Currie

Follow this and additional works at: https://digitalcommons.du.edu/djilp

Recommended Citation

Duncan E. J. Currie, The Problems and Gaps in the Nuclear Liability Conventions and an Analysis of How an Actual Claim Would be Brought under the Current Existing Treaty Regime in the Event of a Nuclear Accident, 35 Denv. J. Int'l L. & Pol'y 85 (2006).

This Article is brought to you for free and open access by the University of Denver Sturm College of Law at Digital Commons @ DU. It has been accepted for inclusion in Denver Journal of International Law & Policy by an authorized editor of Digital Commons @ DU. For more information, please contact jennifer.cox@du.edu,dig-commons@du.edu.

The Problems and Gaps in the Nuclear Liability Conventions and an Analysis of How an Actual Claim Would be Brought under the Current Existing Treaty Regime in the Event of a Nuclear Accident

Keywords
Liability, States, Treaties, Torts

This article is available in Denver Journal of International Law & Policy: https://digitalcommons.du.edu/djilp/vol35/iss1/6

THE PROBLEMS AND GAPS IN THE NUCLEAR LIABILITY CONVENTIONS AND AN ANALYSIS OF HOW AN ACTUAL CLAIM WOULD BE BROUGHT UNDER THE CURRENT EXISTING TREATY REGIME IN THE EVENT OF A NUCLEAR ACCIDENT

DUNCAN E. J. CURRIE[1]

I. EXECUTIVE SUMMARY

This paper addresses the problems and gaps in the existing nuclear liability conventions and conducts an analysis of how an actual claim would be brought under the current existing treaty regime in the event of a nuclear accident.

The nuclear liability conventions have been described with some justification as forming a very complex labyrinth. However since the Labyrinth was an elaborate maze to hold the Minotaur, the description may mislead. In this case, it could be said that the Minotaur largely constructed the labyrinth.

The international nuclear liability regime is extremely patchy, complicated and features sparse participation. While the recent amendments to the Vienna and Paris Conventions are much heralded, they are heavily hedged with exceptions and the amended Protocols enjoy even more sparse participation than the original Conventions. Others, such as the Convention on Supplementary Convention, are not in force; and for those that are in force, many major nuclear countries are not party to them. So discussion of Conventions must take into account their membership.

Characteristics of the system include that no neutral tribunal is provided and claimants are generally required to file claims in the courts where the nuclear installation is located, even with respect to nuclear transports on the high seas, with attendant costs, concerns about neutrality of the courts and law, and limitations of recoverable damages. Liability is limited in time and in amount, amounting to a subsidy of the nuclear industry; the definition of damage is narrow and likely to be interpreted by the courts of the installation state; and the treaties that are there enjoy very narrow participation.

The value of these features to victims of nuclear accidents and to non-nuclear States is limited. While unlimited liability may lead to the ruin of the operator, limited liability may lead to the ruin of the victim. Other arguments are that the

---

1. © 2005 Duncan E. J. Currie. Barrister of the High Court of New Zealand. Email duncanc@globelaw.com. The author gratefully acknowledges the suggestions of Professor Jon van Dyke. All errors are of course those of the author. All web references were as at Oct. 11, 2005 unless otherwise noted.

capacity of the insurance market is limited. Non-nuclear States and others may question why they or the environment at large should be subjected to risks which exceed the capacity of the insurance market. Similarly, with respect to the limitation of time, the existence of radiation may not be known, consequences may not be manifested until later generations, and even when they are manifested, the causes may not be known or may be difficult to prove. Thus even a thirty year time period may be too short for claimants, and ten years clearly would be too short for claims for inter-generational injury.

Other barriers to justice exist, such as high legal costs, security for costs, liability for costs of the opposing party, access to legal aid and standing requirements, particularly to defend the environment, as opposed to property interests. Groups acting in the general interest and to protect the environment should have standing, as should groups representing fishing interest, farmers and communities. The burden of proof and causation issues may place insurmountable barriers on claims, as they have in past cases in the United Kingdom.

Three frequent concerns of non-nuclear States, being terrorist attacks, environmental damage and pure economic loss, are all likely to fall within exceptions. The 1997 Vienna Protocol introduces a poorly defined exception for military installations. There are also some significant pitfalls in joining the Conventions, in exposing Parties to low limits in other Conventions. The absence of explicit provisions on standing raise questions on the ability of groups to act to protect the environment.

The 1997 Vienna Protocol does explicitly extend the geographical coverage of damage covered, covering damage 'wherever suffered', but leaves jurisdiction in the Installation State; and while it extends the definition of damage, it leaves much discretion to the laws of the Installation State. Economic loss arising from loss of life, any personal injury or any loss of, or damage to, property is covered, but economic loss other than that specified in the new definitions is only covered if permitted by the law of the competent court, which will usually be the Installation State. So economic loss to tourism and fisheries, for instance, which is not arising from damage to property or personal injury as such, may well not be compensated. So-called 'rumor damage', or economic loss caused by an incident without necessarily being predicated on actual contamination, is no less real for the lack of contamination.

The 1997 Vienna Protocol does introduce preventive measures, but if nuclear damage has not yet occurred, these measures can only be taken where there is a 'grave and imminent threat'. Costs of reinstatement of the impaired environment are covered, provided the impairment is significant and reinstatement measures are actually taken. So where reinstatement is not possible, compensation may not be forthcoming. The limitation of compensation to measures actually taken omits any value of the impairment of the environment as such where reinstatement or remediation is not possible, taking into account any impact on biodiversity and the non-economic value of the environment including value to future generations. Compensation for environmental impairment is limited to loss of income deriving from an economic interest in any use or enjoyment of the environment, where the environment was significantly impaired. The revised Convention extends the ten

year time limit for claims to thirty years for loss of life and personal injury, as does the 2004 Paris Protocol. On standing, the revised Vienna Convention does provide that the State may bring an action on behalf of victims, but otherwise standing provisions are extremely limited. Standing for groups to claim for economic loss for environmental impairment would depend on whether they are entitled to claim, leaving the matter to the *lex fori.*

The 2004 Paris Protocol has a more restricted geographical application, and does not cover damage caused on the high seas or other areas beyond national jurisdiction. It also does not include the Vienna Protocol residual definition of economic loss. The Paris Protocol does allow a Party to subject passage through its territory to increase the minimum amounts of liability.

A number of recommendations are made including criteria for a liability regime where there is unlimited liability, a broad definition of recoverable damage, absolute liability with few or no exceptions, all responsible parties bear joint and several liability and a neutral tribunal for the adjudication of claims. Three damage scenarios are postulated, to provide an opportunity to examine how the system may work in practice.

II. INTRODUCTION TO THE LIABILITY TREATY SYSTEM

The Paris and Vienna Conventions have a number of features in common. They both:

1. Limit liability to a certain amount and limit the period for making claims
2. Require insurance or other surety by operators
3. Channel liability exclusively to the operator of the nuclear installation
4. Impose strict liability on the nuclear operator, regardless of fault, but subject to exceptions. This is sometimes incorrectly referred to as absolute liability.
5. Grant exclusive jurisdiction to the courts of one country, normally the country in whose territory the incident occurs.

Of these, only the second and fourth offer significant benefits to victims of an accident or incident, and even then, the strict liability is militated by various exceptions.

The international liability regime is primarily contained in two sets of instruments: the International Atomic Energy Agency's [IAEA] Vienna Convention of 1963 which entered into force in 1977,[2] and the OECD's Paris Convention on Third Party Liability in the Field of Nuclear Energy of 1960 which

2. Vienna Convention on Civil Liability for Nuclear Damage, *opened for signature* May 21, 1963, 1063 U.N.T.S. 266, *available at* http://www.iaea.org/Publications/Documents/Infcircs/1996/inf500.shtml [hereinafter Vienna Convention] (Status *available at* http://www.iaea.org/Publications/Documents/Conventions/liability_status.pdf. Status of Conventions given in this paper are according to the latest information made available in the references cited).

entered into force in 1968,[3] and which was bolstered by the Brussels Supplementary Convention in 1963. The Brussels Convention[4] supplements the very low liability levels starting with the Paris Convention of SDR 5 million, or €6 million, to SDR 175 million (about €210 million).[5] Those levels were increased by the 1982 Protocol to SDR 300 million.

Following the Chernobyl nuclear accident, the two main conventions were linked by the 1988 Joint Protocol[6] which entered into force in 1992. However, many important States have not ratified the Joint Protocol, including the United Kingdom and France. Thus those countries are not linked by the treaty system to Vienna Convention arties.

In 1997, the Vienna Protocol[7] and the Convention on Supplementary Convention (CSC)[8] featured increased limits and introduced a somewhat broader, but still limited, definition of nuclear damage to include preventive steps and

3. Convention on Third Party Liability in the Field of Nuclear Energy, *opened for signature* July 29, 1960, 956 U.N.T.S. 264, *available at* http://www.nea.fr/html/law/nlparis_conv.html [hereinafter Paris Convention].

4. Convention of 31st Jan. 1963 Supplementary to the Paris Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy, Jan. 31, 1963, 2 I.L.M. 685, *available at* http://www.nea.fr/html/law/nlbrussels.html [hereinafter Brussels Supplementary Convention].

5. *Id.* at art. 3. (Parties to the Paris Conventions as of Aug. 31, 2005 were Belgium, Denmark, Finland, France, Germany, Greece, Italy, Netherlands, Norway, Portugal, Slovenia, Spain, Sweden, Turkey and the United Kingdom. All Parties are also party to the 1964 Additional Protocol and 1982 Protocol. None are parties to the Vienna Convention, although Spain and the United Kingdom are signatories. Slovenia withdrew from the Vienna Convention on Nov. 12, 2002. Parties to both the Paris and Brussels Conventions are: Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, Sweden, and United Kingdom. Paris only: Greece, Portugal, and Turkey).

6. Joint Protocol Relating to the Application of the Vienna Convention on Civil Liability for Nuclear Damage and the Paris Convention on Third Party Liability in the Field of Nuclear Energy, *opened for signature* Sept. 21, 1988, 1672 U.N.T.S. 302, *available at* http://www.nea.fr/html/law/nljoint_prot.html [hereinafter Joint Protocol] (Status is *available at* http://www.iaea.org/Publications/Documents/Conventions/jointprot_status.pdf).

7. Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage, Sept. 12, 1997, 36 I.L.M. 1462, *available at* http://www.iaea.org/Publications/Documents/Conventions/protamend.html [hereinafter Protocol]. (The Protocol entered into force on Oct. 4, 2003, following the fifth ratification. According to IAEA information provided at Aug. 31, 2005, there were five parties to the Protocol: Argentina, Belarus, Latvia, Morocco, and Romania. Status *available at* http://www.iaea.org/Publications/Documents/Conventions/protamend_status.pdf).

8. Convention on Supplementary Compensation for Nuclear Damage, *opened for signature* Sept.12, 1997, 36 I.L.M 1473, *available at* http://www.iaea.org/Publications/Documents/Conventions/supcomp.html [hereinafter CSC]. Pursuant to Article XX, the Convention will enter into force on the ninetieth day following the date on which at least five States with a minimum of 400,000 units of installed nuclear capacity have deposited an instrument referred to in Article XVIII. After its entry into force, any State which has not signed the Convention may accede to it. CSC, art. XX, ¶¶ 1, 2, *opened for signature* Sept. 12, 1997, 36 I.L.M. 1482 – 83 *available at* http://www.iaea.org/Publications/Documents/Conventions/supcomp.html (Status *available at* http://www.iaea.org/Publications/Documents/Conventions/supcomp_status.pdf. As of Aug. 31, only Morocco, Romania and Argentina had ratified the CSC, Argentina being the last to ratify on Nov. 14, 2000. Signatories are Australia, the Czech Republic, Indonesia, Italy, Lebanon, Lithuania, Peru, Philippines, Ukraine and the United States).

environmental reinstatement[9] and made some other changes, such as allowing compensation to residents of non-Contracting Parties. The minimum amount State Parties must make available under national laws was increased to 300 million SDRs (about €360 million),[10] and the CSC would provide for a supplementary fund.[11] The CSC defines additional amounts to be provided through contributions by State Parties collectively on the basis of installed nuclear capacity and a UN rate of assessment. Any State may adhere to the CSC, whether or not they are Parties to any existing nuclear liability conventions or have nuclear installations on their territories. The CSC has not yet entered into force and is nowhere near entering into force.[12]

In 2004, a Protocol to amend the Paris Convention and a Protocol to amend the 1963 Brussels Supplementary Convention were adopted,[13] bringing total liability amounts, including State backup funding, to €1.5 billion.[14] However, those Protocols are not yet in force.

The Vienna Convention has by far the widest participation, with 33 Parties[15] compared to the Paris Convention's 15 Parties. There are no States party to both, but there are 25 Parties to the Joint Protocol.[16]

The 1971 IMO Brussels Convention Relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material is specifically addressed to nuclear transports[17] and exonerates a person otherwise liable for damage if the operator is

---

9. Vienna Convention, *supra* note 2, art. II.

10. Protocol, *supra* note 7, art. VII. Approximately €357,000,000. On Oct. 18, 2005, 1 SDR = approx. 1.20 Euros or 1.45 USD. International Monetary Fund, *available at* http://www.imf.org/external/np/fin/rates/rms_rep.cfm (last visited Oct. 18, 2005).

11. The fund is financed by nuclear generating States together with a small contribution from non-nuclear States. CSC article 4. CSC, *supra* note 8, art. VI.

12. The CSC requires five States with a minimum of 400,000 units of installed nuclear capacity to ratify or accede. CSC, *supra* note 8, art. XX (Status *available at* http://www.iaea.org/Publications/Documents/Conventions/supcomp_status.pdf. Current parties are Argentina, Morocco and Romania).

13. Final Act of the Conference on the Revision of the Paris Convention and of the Brussels Supplementary Convention, Feb.12, 2004, and see the accompanying Explanatory Report by the Representatives of the Contracting Parties on the Revision of the Paris Convention and the Brussels Supplementary Convention *available at* http://www.nea.fr/html/law/paris_convention.pdf (Status *available at* http://www.nea.fr/html/law/paris-convention-ratification.html).

14. Protocol to Amend the Convention of 31 January 1963 Supplementary to the Paris Convention of 29 July 1960 on Third Party Liability in the field of Nuclear Energy, as amended by the additional protocol of 28 January 1964 and by the protocol of 17 November 1982, art. 3, Feb. 12, 2004, *available at* http://www.nea.fr/html/law/brussels_supplementary_convention.pdf.

15. Vienna Convention, *supra* note 2 (Status as notified by the IAEA on Aug. 31, 2005. The last change of status was May 20, 2005, when Russia ratified the Vienna Convention).

16. Joint Protocol, *supra* note 6.

17. Convention Relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material, Dec. 17, 1971, 974 U.N.T.S. 256, *available at* http://www.admiraltylawguide.com/conven/carriagenuclear1971.html (The object of the Convention is to channel liability to the operator of the nuclear installation. There are seventeen parties to this convention: see http://www.imo.org/Conventions/mainframe.asp?topic_id=247. *See also* the earlier Convention on the Liability of Operators of Nuclear Ships, May 25, 1962, 57 AJIL 268.

liable for such damage under either the Paris or Vienna Conventions, or by virtue of a national law governing liability for the damage.

Convention Limitation Amounts

Convention Party	*Operator Liability*	*State*	*Combined States*
Paris 1960	SDR 5 – 15 million		
Paris 2004 and Brussels (NIF)[18]	€ 700 million	€ 500	€ 300 million
Brussels Supp. 1963		SDR 175 million	SDR 300 million
Vienna 1963	$ 5 million		
Vienna 1997	SDR 150 million	SDR 300 million	
CSC (NIF)			SDR 300 million

III. THE ESSENTIAL ELEMENTS OF A LIABILITY REGIME

An effective and comprehensive liability regime must contain the following essential elements. The international liability regime can be measured against these standards.

An international regime on liability and redress should be based on the polluter pays principle, according to Principle 16 of the Rio Declaration.[19] They should provide means to prevent or remedy environmental damage and should directly and fully compensate victims.[20]

18. NIF = Not in force.

19. Rio Declaration on Environment and Development, June 3 – 14, 1992, princ. 16, UN Doc. A/CONF.151/26 (vol. I) (June 16, 31 ILM 874 (1992), *available at* http://www.jus.uio.no/lm/environmental.development.rio.declaration.1992/doc [hereinafter Rio Declaration]. Principle 16 of the Rio Declaration provides that "National authorities should endeavor to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment." This was reiterated in the 2002 Plan of Implementation of the World Summit on Sustainable Development. World Summit on Sustainable Development, Aug. 26 – Sept. 4, 2002, Johannesburg, South Africa, *Plan of Implementation*, §§ 15(b), 19(b) (Sept. 10, 2002), *available at* http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf., §15(b) and 19(b).

20. Rio Declaration, *supra* note 19, at princ. 13.

A. Absolute Liability Should Govern

Any exception shifts the burden onto the victim, and amounts to a subsidy to the nuclear industry.[21] Terrorist attacks are a common concern, yet the Conventions exclude acts of armed conflict, hostilities, civil war, and insurrection. Where damage has recently been caused by extreme weather events, and where the IPCC has warned that climate change can increase the intensity of storms,[22]exclusions of grave natural disasters of an exceptional character will be of concern. Discussions in the International Law Commission on international liability for transboundary harm arising out of hazardous activities are ongoing,[23] but disagreement between States on whether the topic should even be addressed[24] means that progress is likely to be difficult.

B. Limitation Should be Unlimited in Amount

There are unfortunately no limits on damage that can be caused to nations, the population, other industries or the environment. Many claimants would argue that it is, therefore, logical that liability must be unlimited; and the polluter pays principle would bear this out. The IAEA's Explanatory Text commented about limited liability in noting that the Vienna Convention does not establish a maximum liability amount and the Installation State is free to impose a higher amount of liability, or unlimited liability, as follows: "In practice, few States have opted for unlimited liability, which could easily lead to the ruin of the operator without affording any substantial contribution to the compensation of the damage caused. Indeed, even where the operator's liability is unlimited in amount, insurance cover cannot be unlimited."[25] While it may lead to the ruin of the operator, limited liability may lead to the ruin of the victim. It may also encourage the operator to take additional measures to avoid such ruin. The conclusion implies that nuclear operators are not well capitalized; an argument against exclusive liability. Limited liability assists the nuclear industry to obtain insurance cover; sets relatively low limits, making that insurance cover cheaper; and channels

---

21. *Id.*

22. Intergovernmental Panel on Climate Change [hereinafter IPCC], *Third Assessment Report: Climate Change 2001:, Impacts, Adaptation and Vulnerability*, para. 12.1.5.3, *available at* http://www.grida.no/climate/ipcc_tar/wg2/468.htm, para. 12.1.5.3.

23. International Law Commission Proposed draft principles on *International Liability for injurious consequences arising out of acts not prohibited by international law (International liability in case of loss from transboundary harm arising out of hazardous activities).* U.N. Doc. A/CN.4/540 (March 15,) International Law Commission. Geneva 3 May-4 June and 5 July-6 August 2004) (*written by*, Pemmaraju Sreenivaso Rao, Special Rapporteur), *available at* http://daccessdds.un.org/doc/UNDOC/GEN/N04/271/28/PDF/N0427128.pdf?OpenElement.

24. International Law Commission, *Report of the 55th Session*, ¶¶ 154 – 55 (2003), UN Doc. A/58/10, *available at* http://untreaty.un.org/ilc/reports/2003/2003report.htm.

25. IAEA, *The 1997 Vienna Convention on Civil Liability for Nuclear Damage and the 1997 Convention on Supplementary Compensation for Nuclear Damage Explanatory Texts,* at, note 230, page 12, IAEA Doc. GC(48)/INF/5 (Sept. 2, 2004), *available at* http://www.iaea.org/About/Policy/GC/GC48/Documents/gc48inf-5expltext.pdf [hereinafter IAEA Explanatory Texts].

liability to a single operator, thus relieving others in the nuclear industry, such as suppliers of any liability.

Even if the later agreements were in force, and even if relevant Parties had ratified the relevant agreements, the increased amounts are still nowhere near amounts that could be incurred in the case of a nuclear incident. This means that potential victims may not be fully compensated.

The cost of a serious nuclear accident can be immense, and many estimates of damage vastly exceed the new limits. The total damage of a reactor meltdown in Germany has been estimated to be over €5,000 billion.[26] A 1994 Greenpeace review of the costs of major nuclear accidents[27] has cited various estimates of costs between USD 613 – 652 billion,[28] 10.7 trillion (USD 6.8 trillion)(worst-case),[29] DM 4.5 – 83,250 billion,[30] USD 21.34—695 billion,[31] and USD 67 million—15.536 billion.[32] The potential costs of an accident at sea have been estimated at USD 7 billion.[33] It can thus be seen that even the new limits in the 1997 Vienna Protocol and 2005 Paris Protocol may well fall far short of actual damage suffered. The potential shortfall is recognized in the revised Vienna Convention in that priority in the distribution of the compensation shall be given to claims in respect of loss of life or personal injury.[34]

The IAEA Explanatory text noted that "[t]he limitation of the amount of his liability is clearly designed as an advantage for the operator, in order not to discourage nuclear-related activities."[35] Not only does it not discourage them, it acts as a subsidy. It has been estimated that means that nuclear operators enjoy effective subsidies estimated at €20 billion a year for the EU–15.[36] If a nuclear operator were required to fully cover the potential cost of a nuclear accident, the cost of operating a nuclear power plant would increase significantly. Studies have

---

26. H.J. Ewers and K. Rennings, *Economics of Nuclear Risk – a German Study*, in SOCIAL COST OF ENERGY, PRESENT STATUS AND FUTURE TRENDS, 150, 157 (O. Homeyer and R. Ottinger eds., Springer–Verlag, 1992).

27. Greenpeace International, *Review of Estimates of the Costs of Major Nuclear Accidents,* prepared for the 9th Session of the Standing Committee on Nuclear Liability of the IAEA, Feb. 7–11, 1994.

28. *Id.*

29. *Id.*

30. *Id*

31. *Id.*

32. *Id.*

33. *Id.*

34. Annex to the Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage, art. VIII(2), Sept. 12, 1997, *available at* http://www.iaea.org/Publications/Documents/Conventions/protamend_annex.html.

35. IAEA Explanatory Texts, *supra* note 25, at 12.

36. Greenpeace International, *Invest in a Clean Energy Future*, 15 (July 2005) (*written by* Antony Froggat and Sven Teske), *available at* http://www.greenpeace.org/raw/content/international/press/reports/SubsidiesReport.pdf . The actual value of the subsidy depends on variables including the probabilistic risk of an off-site release of radiation, the location of a plant and its proximity to urban populations and the local meteorological conditions.

suggested that if no ceiling were in place, insurance premiums to French operator EdF would increase the cost of generation by around 300%, or 5 c€/kSWh.[37]

Limits can be increased by two-thirds majority of Parties under a new procedure,[38] taking into account the risk of damage resulting from a nuclear incident, changes in the monetary values, and the capacity of the insurance market.[39] Of course, non-nuclear States and others may question why they or the environment at large should be subjected to risks which exceed the capacity of the insurance market.

C. Just Time Limit of Liability

Nuclear damage is insidious. The very existence of radiation may not be known for some years. The consequences may not be manifested for generations. When they are manifested, the causes may not be known or may be difficult to prove. In many States, there is a thirty year time limitation period. The Conventions, other than the revised Vienna Convention, shorten this time limitation period considerably. Some damage may be latent and may take time to develop or manifest itself, so it is essential that claims can be brought when the damage is found, as well as when it is caused, and that there is a reasonable period to bring a claim after the damage is found or caused. It is important that the time should run from the time it becomes known or reasonably should have become known by the claimant.

D. All Responsible Parties Should Bear Liability

Channeling benefits the nuclear industry and its suppliers, as it focus liability on one party who can then insure, but it prejudices the victim as it limits the parties against whom they may claim. In the case of nuclear shipments, for instance, liability should be borne both by the owner and operator of the vessel and the owner of the radioactive cargo being transported, who is ultimately responsible for creating the risk that has produced the damage.

Liability should be borne by the parties involved, who should bear joint and several liability. The IAEA Explanatory Text said:

> Like the principle of strict liability, the principle of exclusive liability of the operator facilitates the bringing of claims on the part of the victims of a nuclear incident, since it relieves them of the burden of proving the liability of parties other than the operator. But the principle also obviously favors the manufacturer, supplier or carrier of the material or equipment, since it obviates the necessity for them to take out insurance, as well as any other person who may have contributed to the nuclear incident.[40]

37. *Id.* Even being required to insure to €420 million would increase EdF's cost of generation by 8%, increasing insurance premiums from 0.0017 c€/kWH to 0.019 c€/kWH.

38. Protocol, *supra* note 7, art. V D. The decision is still subject to an additional confirmation of acceptance by 2/3 of Parties: art. V D(4).

39. *Id.* at art. V D(3).

40. IAEA Explanatory Texts, *supra* note 25, at 11.

Of course, nuclear victims may not be quite as relieved as the IAEA suggests at having the number of liable parties and potential deep pockets slashed by the Convention. In fact, if relieving parties of the burden of proving the liability of operators is the only advantage, it is of little benefit since claimant lawyers can easily choose whether or not they want to accept that burden.

E. Importance of a Backup Fund

There are a number of reasons that compensation for damage from contamination or some other occurrence may not be forthcoming. If a liable party cannot, or does not pay, or if the liability regime fails for some other reason, compensation must still be paid and/or the reparation for damage to the environment made. Sometimes, for instance, even if a party is found liable, the company is insufficiently capitalized and cannot or will not pay. A multinational may set up a shell company so that the local company has limited liability with few resources, for instance. Secondly, a company may claim an applicable exemption, and so escapes liability. However, in such a case, the victim is still out of pocket. Thirdly, damage may be caused to the environment, but not necessarily to any private interest. In short, a properly structured and well capitalized fund can ensure compensation and remediation regardless of fault, exceptions or the capitalization of defendants.

F. Claimants should be Able to Bring Claims in a Neutral Tribunal

The Vienna Convention grants exclusive jurisdiction to the Installation State, thus preventing victims from claiming in their own State.[41] This is true even where an incident occurs during transport of nuclear material outside the Installation State, such as an accident occurring to a coastal State.[42]

Legal regimes that require claims be brought in the operator state place impecunious claimants at an immense disadvantage. The problems that may face victims in bringing a claim in the UK courts can be illustrated by the following cases. In *Merlin v. British Nuclear Fuels, PLC,*[43] where the court refused to grant any damages to plaintiffs whose house had been contaminated by radionuclides, even though the house lost almost half its value as a result of the contamination, on the basis that the house was not 'physically' affected.[44] The owners decided to move, as they did not want to expose their children to the health risk which they believed would result from long term occupation of the house.[45] They sold the house for a considerably reduced sum.[46] The High Court held that that the mere presence within the plaintiffs' property of alpha emitting radionuclides emanating from waste discharged, which caused no physical damage to the fabric of the

41. Vienna Convention, *supra* note 2, art. XI.1.

42. *Id.* at art. XI.2. The 1997 Protocol amends this for Parties to that Protocol.

43. *Merlin v. British Nuclear Fuels, PLC*, [1990] 3 All ER 711, 720 – 21, [1990] 3 WLR 383.

44. *Id.* at 720 – 21. Section 7 of the Nuclear Installations Act 1965 requires operators to ensure that to ensure that no occurrence involving nuclear matter, or ionizing radiations emitted from any waste discharged from their site causes "damage to any property of any person" other than the defendants.

45. *Id.* at 717.

46. *Id.* at 717 – 18.

property, could not on its own constitute damage under the 1965 Act.[47] It appears that a 'floodgates' argument may have influenced the Court, finding that "it is in the nature of nuclear installations that there will be some additional radionuclides present in the houses of the local population."[48] The Court also found that "the presence of alpha emitting radionuclides in the human airways or digestive tracts or even in the bloodstream merely increases the risk of cancer to which everyone is exposed from both natural and artificial radioactive sources. They do not *per se* amount to injury."[49] These findings starkly illustrate the difficulties victims of a nuclear accident outside the UK claiming in UK courts would face.

In the later *Blue Circle Industries plc v Ministry of Defence* case,[50] where land was contaminated, damage was found to have occurred, but the Court of Appeal explained the *Merlin* case by saying that the dust was in the house and the Judge did not hold that the house and the radioactive material were so intermingled as to mean that the characteristics of the house were altered. So in neither *Merlin* nor *Blue Circle* were the courts willing to recognize that radioactive contamination *per se* constitutes physical damage.

It is clear that victims need access to a tribunal that would be neutral and not linked economically to the nuclear industry, and which is applying law and procedure independent of the Installation State. This may be contrasted with the IAEA's claim that "the principle of non discrimination and equal treatment of victims is often considered to be one of the basic principles of the nuclear liability regime."[51] While the Convention requires the national law be applied without discrimination,[52] the very application of the law of the nuclear operator, and the requirement to go to the nuclear operator's State courts, may be seen as discriminatory. The polluter pays principle and the duty to avoid damage to areas beyond the limits of national jurisdiction[53] both require access to justice

47. *Id.*

48. *Id.* at 720 – 21.

49. *Id.*

50. *Blue Circle Industries plc v Ministry of Defence* [1998] 3 All ER 385, [1999] Ch 289, where the plaintiffs' land was contaminated by radioactive material from an overflowing pond on the Atomic Weapons Establishment land, the land was held to be physically damaged by the admixture with the topsoil of radioactive material, which required the expenditure of money to remove. Section 7 of the 1965 Act includes some alteration in the physical characteristics of the property, in this case the marshland, caused by radioactive properties which render it less useful or less valuable. He had no doubt that there was such an alteration in this case: the plutonium intermingled with the soil in the marsh to such an extent that it could not be separated from the soil by any practical process. The level of contamination was such that the topsoil of the marsh had to be excavated and removed from the site because the level of radioactivity exceeded that allowed by the regulations.

51. IAEA Explanatory Texts, *supra* note 25, at 16.

52. Vienna Convention, *supra* note 2, art. XIII.

53. *See Stockholm Declaration of the United Nations Conference on the Human Environment*, U.N. Doc. A/CONF.48/14 (1972), *reprinted in* 11 I.L.M. 1416 (1972). Principle 21 provides for responsibility to ensure that activities do not cause damage to the environment of other states or areas beyond the limits of national jurisdiction. *See generally* Louis Sohn, *The Stockholm Declaration on the Human Environment*, 15 HARV. J. INT'L. L.423 (1973), and Michael Akehurst, *International Liability for Injurious Consequences Arising out of Acts not Prohibited by International Law*, N.Y.J INT'L. L. 3 (1985). *See also* Rio Declaration, *supra* note 19, at princ. 2, and *Restatement (Third) of Foreign*

administered impartially by States which do not have an economic interest to protect.

If multiple cases are brought in different countries, *forum non conveniens* arguments in common law countries may well result in primary jurisdiction being found at the place where the damage was suffered.[54] In civil law countries, jurisdiction is likely to stay where the case was first filed.[55]

This decision may be made at the expense of obtaining greater damages in the courts of a nuclear installation, but overall it is in the interests of States suffering damage to ensure justice is obtained for the most cases possible at a reasonable cost. Victims should not need to go to the courts of the operator causing the damage for compensation; they should be entitled to have resort to their national courts for protection. This is even more so when reinstatement of an impaired environment[56] or preventive measures are claimed.

With respect to nuclear shipments, both the revised Paris Convention[57] and the revised Vienna Convention grant exclusive jurisdiction to the party in whose

---

Relations Law, Section 601 (1987). Philippe Sands in *Principles of International Environmental Law I* at 186 (1995) concludes that taken together Principle 21 and Principle 2 "establish the basic obligation underlying environmental law and the source of its further elaboration in rules of greater specificity." For consequences for States of the breach of obligations, see the International Law Commission, *Responsibility of States for Internationally Wrongful Acts*, G.A. Res. 56/83, U.N. GAOR, 56th Sess., U.N. Doc. A/RES/56/83 (Jan. 18, 2002) *available at* http://www.un.org/law/ilc/texts/State_responsibility/responsibilityfra.htm. *See* Article 3 of the Convention on Biological Diversity *signed* at Rio de Janeiro on June 5, 1992, *entered into force* Dec.29, 1993, 31 ILM (1992) *available at* http://www.biodiv.org/doc/legal/cbd-en.pdf.

54. In England, the *House of Lords in Spiliada Maritime Corporation v. Cansulex Ltd.* [1987] 1 A.C.460 held that the defendant must show that there is another alternative forum, available and more appropriate than the English forum, where the case will be more suitably tried in the interest of parties and of the ends of justice. If this is shown, the court will grant a stay, unless the plaintiff can show that, even though factors connect the case with the alternative forum, special circumstances exist to show that substantial justice cannot be obtained there. However, see the ECJ ruling in *Andrew Owusu v. Nugent B. Jackson*, Case C-281/02 holding that that the *forum non conveniens* doctrine was incompatible with the United Kingdom's obligations under the Brussels Convention. *See* Ronald A. Brand, Balancing Sovereignty and Party Autonomy in Private International Law: Regression at the European Court of Justice (University of Pittsburgh School of Law, Working Paper Series # 25, 2005) *available at* http://law.bepress.com/cgi/viewcontent.cgi?article=1025&context=pittlwps. In the United States, under *Piper Aircraft Co. v. Reyno*, 454 U.S. 250 (1981), the courts see whether an adequate alternative forum exists and is available, and then weigh public and private interest factors, such as the interests of the parties, such as access to evidence, judicial comity and the interests of the forum State.

55. Brussels Convention on Jurisdiction and the Enforcement of Judgments in Civil and Commercial Matters 1968, Article 21 on lis pendens *available at* http://www.jus.uio.no/lm/brussels.jurisdiction.and.enforcement.of.judgments.in.civil.and.commercial.matters.convention.1968/doc.html#137 [hereinafter Brussels Convention on Jurisdiction], and EC Council Regulation No 44/2001, Regulation 27 of which requires the court other than the first seized court to stay its proceedings until the jurisdiction of the first Court is established.

56. Revised Vienna Convention, art. 1(k). *See also* art. 1(m) and 1(n), which hold that the law of the State where the damage is suffered shall determine who is entitled to take measures of reinstatement and it is the competent authorities of the State where the measures were taken whose approval is required.

57. Revised Paris Convention, art. 13(b), which provides that coastal State must have notified the Secretary–General of the EEZ.

Exclusive Economic Zone (EEZ) a nuclear incident has occurred.[58] This does not apply where the incident occurs outside the EEZ but the damage occurs within it, and thus can only apply when the shipment transits the EEZ. In contrast, with respect to non-nuclear damage, the HNS Convention, concluded the previous year, allows for jurisdiction in any State Party, including for damage caused within an EEZ.[59] The Oil Pollution Liability Convention allows for exclusive jurisdiction in a country suffering damage.[60]

G. Applicable Law should be that of the Claimant

As with jurisdiction, applicable law should normally be that of the place of damage, provided that jurisdiction can be obtained over those who are liable. As one commentator has noted, two reasons militate for the law of the place where the damage was suffered to be applied in the case of international nuclear transports:[61]

> First from the inherent risk of the transport of nuclear material, it is clear that an incident can cause damage in distant countries. Any person liable for the transport incident is and must be aware of that fact. Secondly, most likely and most frequently, the place of damage will be where the potential victim has his or her habitual residence, while the place where the hypothetical incident occurs often will be quite accidental and will depend only on the route of transport. Any potential victim, however, relies and is justified to rely on the expectation that the safety standards of his or her country are observed in order not to be damaged.[62]

English courts, for instance, are likely to apply the *lex loci delicti,*[63] although that may be displaced by significant factors linking the tort or delict to another country.[64] Even with an accident on the high seas, the English courts are likely to apply English law to a UK flagged vessel.[65] Similarly, French[66] and German[67]

---

58. Revised Vienna Convention, *supra* note 56, art. XI(1bis).

59. The Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, art. 38, 3(b), May 3, 1996, 35 I.L.M. 1406 (1996) [hereinafter HNS Convention].

60. International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, art. IX, Dec. 18, 1971, 11 I.L.M. 284, *amended by* 1992 IMO Protocol to Amend The International Convention on Civil Liability for Oil Pollution Damage 1969 [hereinafter Oil Pollution Convention].

61. *See* Ulrich Magnus, Intercontinental Nuclear Transport from the Private International Law Perspective, *in* Reform of Civil Nuclear Liability: Budapest Symposium, at 282 (1999).

62. *See id.*

63. *See* Private International Law (Miscellaneous Provisions) Act 1995, section 11, *available at* http://www.opsi.gov.uk/acts/acts1995/Ukpga_19950042_en_1.htm, and Dicey and Morris, THE CONFLICT OF LAWS 257 (Lawrence Collins ed., 12th ed., vol. 2, 1993).

64. Private International Law (Miscellaneous Provisions) Act 1995, section 12.

65. *See The Esso Malaysia* [1975] QB 198. *See also* Stuart Dutson, *The Conflict of Laws and Statutes: The International Operational of Legislation Dealing With Matters of Civil Law in the United Kingdom and Australia*, 60 MOD. L. REV. 668, 687 – 88 (1997).

66. *See* Magnus, *supra* note 61, at 275, citing Cass. 25 May 1948 Rev. Crit. 1949.

67. *See id.* citing Bundesgerichtshof BGHZ 57, 265 and BGHZ 119, 139.

courts are likely to apply the *lex loci delicti*, as are Chinese,[68] Indian,[69] and Russian courts.[70]

Austria, on the other hand, has a choice of law rule for nuclear damage under its 1999 Act.[71] The Lugano Convention[72] provides for jurisdiction where the damage was suffered, where the dangerous activity was conducted, or where the defendant has his habitual residence.

H. There should a Broad Definition of Recoverable Damage

It is very important that the definition of damage is as broad and clear as possible. Many jurisdictions do not allow for recovery of 'pure economic loss', or loss which is not consequential on physical damage. An accident or incident resulting in market loss caused by perception of contamination, for instance, which may result in markets being closed due to no fault of the producer, is no less real to those suffering the loss if there is no actual contamination that can be proven. An effective international liability regime should cover property damage, economic damage, damage to biodiversity, preventive measures, the cost of reinstatement and reinstatement or remediation of an impaired environment.

Damages should include damages to the marine environment in areas beyond national jurisdiction and damages resulting from perceptions of risk even if damages or health effects are not measurable. Restricting the definition of damages to damages that can be claimed in the operator's jurisdiction is indefensible. The *Merlin* case[73] demonstrates the dangers for claimants of host State jurisdiction. Even the expanded definitions of damages found in the 1997 Protocol do not include damage to the marine environment and damages to tourism and the fishing industry that may occur because of perceptions of risks by tourists and consumers of fish regardless of actual damage caused. Damages should be defined broadly to include all actual economic losses of all sorts and all losses to the marine environment, as well as actual health damages and measurable property losses.

---

68. General Principles of Civil Law, §146(1), *available at* http://en.chinacourt.org/public/detail.php?id=2696. Article 146 provides that the law of the place where an infringing act is committed shall apply in handling compensation claims for any damage caused by the act. If both parties are citizens of the same country or have established domicile in another country, the law of their own country or the country of domicile may be applied. An act committed outside the People's Republic of China shall not be treated as an infringing act if under the law of the People's Republic of China it is not considered an infringing act. *See also* Magnus, note 61, at 280.

69. *See* Magnus, *supra* note 61, at 280, citing Paras Diwan, *Private International Law* (3rd ed.), 552ss, 570.

70. *See id.* at 281, citing Article 167 of the Basic Principles of Civil Legislation of the Russian Union of May 31, 1991.

71. The Law on the Prohibition of the Use of Nuclear Fission for Energy Generation in Austria: Bundesgesetz über die zivilrechtliche Haftung für Schaden durch Radioaktivität (Atomhaftungsgesetz 1999 — AtomHG 1999, BGB1.I No.
170/1998), § 23 permits claimants to opt for Austrian law for damage caused in Austria.

72. Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment, art. 19, June 21, 1993, *not in force*, 32 I.L.M. 1228 – 33.

73. *See* discussion *supra* p. 94.

I. Just Standing and Access to Justice

An instrument should, therefore, have broad provisions on standing. Groups acting in the general interest and to protect the environment should have standing, as should groups representing fishing interest, farmers and communities. Also, the wider issue of access to justice is not limited to the narrow question of standing where legal costs can be a vital consideration. This applies to small farmers or fishing groups as well as organizations. Some legal systems can require security of costs, for instance, which can be a barrier. Many other legal systems dissuade claims by having costs borne by the losing party; others provide for legal assistance to bring environmental claims. Standing should not only be granted to those affected by the damage, but also to those acting in the general interest. Groups should have the right to protect environmental and social interests, which may be wider than direct economic interest. Damage may be caused to the environment and society without necessarily damaging private economic interests as such. This includes so-called 'rumor damage' which may be caused by an incident which does not release radioactivity, but which still causes considerable economic loss due to lost market confidence directly attributable to the incident.[74]

In addition, while capacity building to develop national regimes and harmonization of laws are both important, many developing States would not have the resources and capacity to lodge and pursue major claims in nuclear States. Legal aid from a fund could be part of a solution, but an independent tribunal is essential. Claimants should not be required to participate in the legal systems of nuclear States to have claims resolved.

J. Just Rules on Burden of Proof and Causation

Rules for liability for dangerous activities in place with other regimes frequently require strict liability and shift the burden of proof. In the absence of a regime, they allow unlimited liability and allow plaintiffs to file claims against multiple defendants.

Proof of damage and issues of causation can put an unfair or even insurmountable burden on victims. Slow-moving negative impact, in addition, may be difficult to trace and to attribute. The relevance and importance of the precautionary principle is also important in the context of shifting the burden of proof of damage to nuclear operators and in the context of proving causation.

The problems of proving causality under English law were seen in *Hope v BNFL,*[75] where the court refused to recognize a causal link between the radio nuclides released from the Sellafield nuclear facility and the increased cancers in the surrounding area. Some eight years later, research published in the International Journal of Cancer in 2002 found that children of men exposed to radiation while working at Sellafield have twice the normal risk of developing certain types of cancer such as leukemia and non-Hodgkins lymphoma.[76] The

74. *See* discussion *supra* p. 91.

75. *Hope v. BNFL* and *Reay v. BNFL* (1994) 5 Med. LR 1

76. Heather O. Dickinson & Louise Parker, *Leukemia And Non-Hodgkin's Lymphoma In Children*

theory of a link between radiation dose and cancers among the fathers' children was first postulated in 1990.[77]

These causation difficulties obviously have implications for limitation periods: if research takes 10 years to prove a link between radioactive emissions and an intergenerational effect, then a 30 year limitation period, let alone 10 year period, is clearly too short for claimants. A victim of radiation may well take ten years to conceive and the child may not manifest symptoms for another ten years.

IV. MEMBERSHIP OF THE CONVENTIONS AND OUTLOOK FOR NUCLEAR POWER

A critical issue for the international liability system is the membership of the Conventions. There are currently 440 nuclear power stations operating in 31 countries.[78] However, many nuclear countries, including Canada, the United States, Japan, India and China are not party to any of the liability Conventions. Other major nuclear States such as the United Kingdom and France are party only to the Paris Convention, whereas others, such as Russia which recently ratified, are party only to the Vienna Convention. As noted earlier, many of these are not party to the Joint Protocol, which links the Conventions for States party to the Joint Protocol.

Developing countries account for 60% of the new reactors under construction.[79] In 2004, five new plants were connected to the grid in China, Japan, Russia and the Ukraine. Of those, only the Ukraine is party to the Joint Protocol. One laid up plant was reconnected in Canada, which is not a Party to any of the Conventions, and construction began on a fast breeder reactor in India[80] and a pressurized water reactor in Japan,[81] both of which are likewise outside the system. Finland, which is in the Paris Convention system and which has ratified the Joint Protocol, has begun work on a new reactor. The IAEA has estimated that in 2020 there will be the equivalent of 127 more 1000 MW nuclear plants than in 2000.[82] Belgium, Germany, and Sweden, all Paris Convention countries, are planning to phase out nuclear power. Austria and Ireland, which are party to any Convention, and Denmark, a Paris Convention country, all have policies against

---

Of Male Sellafield Radiation Workers, 99 INT'L J. OF CANCER 437, 437 – 44, May 2002, *available at* http://www3.interscience.wiley.com/cgi-bin/fulltext/92013261/PDFSTART. *See also*, *Sellafield Increases Cancer Risk*, BBC, June 19, 2002, *available at* http://news.bbc.co.uk/1/hi/health/2054694.stm. The researchers compared the records of 9,859 children fathered by men exposed to radiation at Sellafield with those of 256,851 children born to other fathers in Cumbria between 1950 and 1991. Throughout the whole of Cumbria, they found that the incidence of leukemia and non-Hodgkin's lymphoma was twice as high among the Sellafield children.

77. Martin Gardner, *Results of Case-control Study of Leukaemia and Lymphoma Among Young People near Sellafield Nuclear Plant in West Cumbria*, BRITISH MED. J. (1990).

78. International Atomic Energy Agency [IAEA], *Annual report for 2004*, IAEA, at 1, GC(49)/5 (2005), *available at* http://www.iaea.org/Publications/Reports/Anrep2004/anrep2004_full.pdf. Twenty-six more were under construction at the end of 2004, eighteen of them being in Asia.

79. *Id.*

80. *Id.*

81. *Id.*

82. *Id.*

nuclear power.[83] Most of the increase in nuclear capacity over the last decade has come from plant life extensions.[84]

The International Energy Agency (IEA)[85] has forecast that three-quarters of existing capacity in OECD Europe will be retired by 2030, because reactors will have reached the end of their life or because governments will have adopted policies to phase out nuclear power. The IEA expects world nuclear capacity to increase slightly until 2030, but the share of nuclear power in total electricity generation to decline.[86] Nuclear power generation is expected to increase in Asia, particularly China, South Korea, Japan and India.[87] None of these are party to any liability Convention. There are many obstacles to development of any nuclear power station, including financial, environmental, waste, fuel, health, safety, security, proliferation and political issues to name a few, but these developments should frame a discussion of international liability issue.

The membership of nuclear liability Conventions is, therefore, likely to be a critical issue if nuclear power continues to develop as the IAEA and IEA project since the new plants are projected to be built in countries which are not members of the Conventions. In addition, the proliferation of liability Conventions and the many combinations of treaty relations that are possible between States, together with differing national legislation, means that precise liability for the many different kinds of nuclear incidents and their geographical permutations is virtually impossible to ascertain.

V. AN EXAMINATION OF THE VIENNA AND PARIS CONVENTIONS

A. The 1963 Vienna Convention

The 1963 Vienna Convention generally followed the 1960 Paris Convention. Unlike the 1960 Paris Convention, it does not limit itself to damage caused in the territory of States Party. It defines nuclear damage as loss of life, any personal injury or any loss of, or damage to, property arising from a nuclear incident,[88] and any other loss or damage so arising or resulting if and to the extent that the law of the competent court so provides.[89] The operator of a nuclear installation is liable for nuclear damage upon proof that the damage has been caused by a nuclear incident.[90]

---

83. *Id.* at 2.

84. *See generally* Uranium Information Centre, *Plans for New Reactors Worldwide*, (Aug. 2006) *available at* http://www.uic.com.au/nip19.htm (chronicling plant life extensions in the United States, United Kingdom and Russia) (last visited Oct. 17, 2006).

85. International Energy Agency, *World Energy Outlook 2004*, at 34 *available at* http://www.iea.org/Textbase/npsum/WEO2004SUM.pdf (last visited Oct. 17, 2006).

86. *Id.*

87. *Id.*

88. 'Nuclear incident' is defined to mean "any occurrence or series of occurrences having the same origin which causes nuclear damage." Vienna Convention, *supra* note 2, art. I(1)(l).

89. *Id.* at art. I(1)(k).

90. *Id.* at art. II(1).

Liability is strict,[91] but there is an exemption for nuclear damage caused by an act of armed conflict, hostilities, civil war or insurrection, and, subject to the law of the Installation State, damage caused by a grave natural disaster of an exceptional character.[92] Insurance or other financial security is required to the specified limit, which was as little as USD 5,000,000 in 1963[93] for any one nuclear incident.[94]

B. 1997 Vienna Protocol

The 1997 Protocol entered into force in 2003, but its only Parties to date are Argentina, Belarus, Latvia, Morocco, and Romania.[95] The 1997 Protocol contains increased limits to either 300 million SDRs (about €360 million),[96] or from 5 million (about €6 million)[97] to 150 million SDRs (€180 million) where public funds shall be made available by a State to compensate nuclear damage up to at least 300 million SDRs.[98] A transitional period is permitted for 100 million SDRs (€1.20 million) for up to 15 years from the date of entry into force of the Protocol,[99] potentially reducing the available compensation by two-thirds. The paragraph also permits an operator to carry no liability insurance at all, as long as the 100 million SDR is underwritten by public funds.[100] There is no qualification on this opt-out clause. This is a significant potential subsidy for operators.

The Protocol broadens the definition of nuclear damage and extends the period during which claims may be brought for loss of life and personal injury. It also provides for jurisdiction of coastal states over actions incurring nuclear damage during transport if they occurred within the EEZ.[101]

Whether a person is entitled to a claim would most likely be determined by the governing law applied by the courts of the Installation State after applying their conflict of law rules and is likely to be the *lex fori* since the revised Vienna Convention subjects the categories of damage under article I(1)(k) to the law of the competent court, which is defined in paragraph (e) as the law of the court having jurisdiction under the Convention, including any rules of such law relating to conflict of laws.[102] The category 'any other economic loss, other than any caused by the impairment of the environment' is expressly allowed only if "permitted by

---

91. *Id.* at art. IV(1) which uses the term 'absolute.'

92. *Id.* at art. IV(3).

93. The United States dollar used is a unit of account equivalent to the value of the United States dollar in terms of gold on Apr. 29, 1963, "[T]hat is to say US $35 per one troy ounce of fine gold." *Id.* at art. V(3). The current price of gold is about $596/oz as of October 17, 2006.

94. Vienna Convention, *supra* note 2, art. V(1). These amounts are exclusive of interest and costs. *Id.* at art. V(2).

95. Protocol, *supra* note 7.

96. *Id.* at art. 7(1). These amounts are exclusive of interest and costs. *Id.* at art. 7(2).

97. *Id.* at art. 7(1). This lower amount may be established having regard to the nature of the nuclear installation or the nuclear substances involved and to the likely consequences of an incident originating therefrom. *Id.*

98. *Id.* at art. 7(5).

99. *Id.* at art. 7(6).

100. *Id.*

101. Revised Vienna Convention, *supra* note 56, art. XI.

102. *Id.* at art. I(1)(k).

the general law on civil liability of the competent court". This appears to intend a direct reference to the *lex fori*, without application of the conflict laws of the forum, and clearly subjects economic loss to the law to the Installation State.[103]

A potential pitfall for Parties to the Protocol is in article 19 of the Protocol, which provides:

> A State which is a Party to this Protocol but not a Party to the 1963 Vienna Convention shall be bound by the provisions of that Convention as amended by this Protocol in relation to other States Parties hereto, and failing an expression of a different intention by that State at the time of deposit of an instrument referred to in Article 20 shall be bound by the provisions of the 1963 Vienna Convention in relation to States which are only Parties thereto.

Nothing in this Protocol shall affect the obligations of a State which is a Party both to the 1963 Vienna Convention and to this Protocol with respect to a State which is a Party to the 1963 Vienna Convention but not a Party to this Protocol.[104]

In other words, Parties which join the Protocol but not the Convention are bound by the lower limits in the Vienna Convention unless they state otherwise at the outset, but Parties which join the Convention but not the Protocol are not bound by the higher limits of the Protocol in any event.

To date, this provision could only apply to Morocco, as other Parties to the Protocol are also Party to the 1963 Convention. Parties considering joining the 1997 Protocol would be well advised to opt out of the 1963 Convention, since they would find the liability of 1963 Convention State operators limited to the much lower provisions of the earlier Convention, as well as by the more restrictive provisions.[105] However, this must be done at the time of ratification or accession.[106]

There is a new dispute resolution provision,[107] which provides for binding determination by arbitration or the International Court of Justice.[108]

C. The Paris Convention

The Paris Convention covered damage to or loss of life of any person or of any property[109] "caused by a nuclear incident in such installation or involving nuclear substances coming from such installation"[110] or "caused by a nuclear incident outside that installation and involving nuclear substances in the course of

---

103. *See id.* at art. I.

104. Protocol, *supra* note 7, art. 19.

105. States already Party to the 1963 Convention would need to denounce that Convention under article XXV, which requires twelve months' notice of intended termination before the end of the rolling five year periods under that article. Vienna Convention, *supra* note 2, art. XXV(1).

106. Protocol, *supra* note 7, art. 19.

107. Revised Vienna Convention, *supra* note 56, art. XX A.

108. However, Parties can opt out. *Id.* at art. XX A(3).

109. Except the nuclear installation itself and property on the site. Paris Convention, *supra* note 3, art. 3(a).

110. *Id.* at art. 3.

carriage."[111] Claims may only be made against an operator or its insurer.[112] Maximum liability is from 5-15 million SDR[113] (about €6 million - €18 million). Actions must be brought within ten years.[114] There is an exception for damage caused by a nuclear incident directly due to an act of armed conflict, hostilities, civil war, insurrection or a grave natural disaster of an exceptional character.[115] Operators must carry insurance or security to the maximum amount.[116] Jurisdiction lies with the courts of the Contracting Party in whose territory the nuclear incident occurred[117] or in whose territory the nuclear installation of the operator liable is situated.[118] Judgments are enforceable in Convention countries.[119]

D. The 2004 Protocol

The Paris Convention was revised in 2004[120] to increase limits and broaden the definition of damage. The 2004 Protocol would increase the minimum liability to €700 million,[121] although the Installation State could reduce that amount to €70 million for installations, "having regard to the nature of the nuclear installation involved and to the likely consequences of a nuclear incident originating therefrom, or €80 million for the carriage of nuclear substances, "having regard to the nature of the nuclear substances involved and to the likely consequences of a nuclear incident originating therefrom."[122] A Contracting Party may subject the transit of nuclear substances through its territory to the condition that the maximum amount of liability of the foreign operator concerned be increased if it considers that such amount does not adequately cover the risks of a nuclear incident in the course of the transit, provided that the maximum amount thus increased shall not exceed the maximum amount of liability of operators of nuclear installations situated in its territory[123] except where, under international law, there is a right of entry in cases of urgent distress into the ports of such Contracting Party or a right of innocent

111. *Id.* at art. 4(b).

112. *Id.* at art. 4.

113. *Id.* at art. 7(b).

114. *Id.* at art. 8(a).

115. With respect to the last exception, except in so far as the legislation of the Contracting Party in whose territory his nuclear installation is situated may provide to the contrary. *Id.* at art. 9.

116. *Id.* at art. 10(a).

117. *Id.* at art. 13(a).

118. *Id.* at art. 13(b).

119. *Id.* at art. 13(d).

120. Protocol to Amend the Convention on Third Party Liability in the Field of Nuclear Energy of 29 July 1960, as Amended by the Additional Protocol of 28 January 1964 and by the Protocol of 16 November 1982, Feb. 12, 2004, 2004 O.J. (L 97) 55, *available at* http://europa.eu.int/eur-lex/pri/en/oj/dat/2004/l_097/l_09720040401en00550062.pdf [hereinafter 2004 Protocol].

121. *Id.* at art. H, amending Paris Convention art. 7. Costs and interest are exempted under Paris Convention, *supra* note 3, at 7(h).

122. *Id.* at art. 7(b).

123. *Id.* at art. 7(e).

passage through its territory.[124] This provision is limited to transit through territory and would not apply to passage through EEZs.[125]

E. The Brussels Supplementary Convention

The Brussels Supplementary Convention[126] supplemented the liability amounts under the Paris Convention of 15 million SDR (about €18 million) by requiring contributions by the Installation State up to SDR 175 million and other Parties to the Convention collectively on the basis of their installed nuclear capacity to up to a total of 300 million SDRs (about € 357 million).[127] The revised 2004 Brussels Supplementary Convention[128] increased the State contribution to €500 and the top tier to €300 million from public funds provided by all Contracting Parties. The two revised Conventions, combined, bring total compensation available under the revised Paris- Brussels regime to €1.5 billion.[129]

F. The Joint Protocol

The Joint Protocol is in force, but of major nuclear states only Finland, Germany, Lithuania, the Netherlands, Sweden and Ukraine are party to it.[130] The United Kingdom and France are not.

The essence of the Joint Protocol is that the operator of a nuclear installation situated in the territory of a Party to the Vienna Convention shall be liable in accordance with that Convention for nuclear damage suffered in the territory of a Party to both the Paris Convention and the Joint Protocol, and vice versa for the Paris and Vienna Conventions.[131] In the case of a nuclear incident occurring in a nuclear installation, the applicable Convention is that to which the State is a Party within whose territory that installation is situated. Otherwise, in the case of a nuclear incident involving the transport of nuclear material, the applicable Convention is that to which the State is a Party within whose territory the nuclear installation is situated whose operator is liable.[132]

---

124. *Id.* at art. 7(f)(i). A similar exception applies to carriage by air where there is a right to overfly or land on the territory concerned at art. 7(f)(ii).

125. Ben McRae, *The Compensation Convention: Path to a Global Regime for Dealing with Legal Liability and Compensation for Nuclear Damage*, 61 NUCLEAR LAW BULLETIN 25, 33 (1998).

126. Brussels Supplementary Convention, *supra* note 4, art. 3(b).

127. Paris Convention, *supra* note 3, art. 3(b). Interest and costs can be ordered above these amounts. *Id.* at art. 3(f).

128. Protocol To Amend the Convention of 31 January 1963 Supplementary to the Paris Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy, as Amended by the Additional Protocol of 28 January 1964 and by the Protocol of 16 November 1982, *available at* http://www.oecdnea.org/html/law/brussels_supplementary_convention.pdf [hereinafter 2004 Brussels Supplementary Protocol].

129. *Id.* at art. 3.

130. *Id.*

131. Joint Protocol, *supra* note 6, art. II.

132. *Id.* at art. III. Pursuant to either Article II(1)(b) and (c) of the Vienna Convention or Article 4(a) and (b) of the Paris Convention.

This means that the Brussels Supplementary Convention is inapplicable where the Joint Protocol applies, since the Joint Protocol will operate to make the Vienna Convention applicable if the liable operator is a Vienna Convention operator.

G. The 1997 Supplementary Convention (CSC)

The Convention on Supplementary Convention, which is not in force, would increase the limitation amounts under either Convention to 300 million SDR (about €357 million),[133] supplemented by public funds according to a formula.[134]

It is only open to States party to the Vienna Convention or the Paris Convention, or to a State which declares that its national law complies with the provisions of the Annex to the CSC.[135] That Annex requires for instance that no liability shall attach to an operator for nuclear damage caused by a nuclear incident directly due to an act of armed conflict, hostilities, civil war or insurrection, or[136] for a grave natural disaster of an exceptional character.[137] It also has provisions to allow the United States to join.[138]

The CSC predicates its application[139] to Contracting Parties and their territory, maritime zones, EEZs (but only in connection with the exploitation or the exploration of the natural resources of EEZ or continental shelf), and nationals and ships.

Jurisdiction except for incidents within EEZs[140] lies only with the courts of the Contracting Party within which the nuclear incident occurs.[141] But where it is not clear where the incident occurred, or where it occurs outside the territory of any Contracting Party, rather than lying with the State where the damage was suffered, jurisdiction lies only with the courts of the Installation State.[142] The applicable law

133. CSC, *supra* note 8, art. III. An Installation State may specify a greater amount. *Id.* at art. III(1)(a)(i).

134. *Id.* at art. IV(1). The amount is calculated according to the installed nuclear capacity of the Installation State and the United Nations rate of assessment.

135. *Id.* at art. XVIII.

136. CSC Annex art. 3(5)(a) *available at* http://www.iaea.org/Publications/Documents/Conventions/supcomp.html#Annex (last visited Oct. 21, 2006).

137. *Id.* at art. 3(5)(b), except if the law of the Installation State may provide to the contrary.

138. *Id.* at art. 2(1) provides that the national law of a Contracting Party is deemed to be in conformity with the provisions of Articles 3, 4, 5 and 7 if it contained on Jan. 1, 1995 and continues to contain provisions that provide for strict liability in the event of a nuclear incident where there is substantial nuclear damage off the site of the nuclear installation where the incident occurs, require the indemnification of any person other than the operator liable for nuclear damage to the extent that person is legally liable to provide compensation; and ensure the availability of at least 1000 million SDRs in respect of a civil nuclear power plant and at least 300 million SDRs in respect of other civil nuclear installations for such indemnification.

139. CSC, *supra* note 8, art. V.

140. *Id.* at art. XIII(2) provides that the EEZ State has notified the Depositary.

141. *Id.* at art. XIII(1).

142. *Id.* at art. XIII(3).

is in general the law of the competent court, subject to the Vienna or Paris Convention provisions.[143]

VI. A COMPARISON OF THE 1997 VIENNA PROTOCOL WITH THE 1963 CONVENTION

The 1997 Protocol followed a widespread recognition that the liability limitation amounts were too low, that an additional fund was required, that the time limitation periods were too restrictive, that the definition of nuclear damage was too restrictive, that a regime must address environmental damage and that the geographical scope should be widened.[144] Those advances call for a close examination.

On State liability, the 1997 Protocol was a mixed step. The 1963 Convention provided that the Convention "shall not be construed as affecting the rights, if any, of a Contracting Party under the general rules of public international law in respect of nuclear damage."[145] The 1997 Protocol amended this to provide that "This Convention shall not affect the rights and obligations of a Contracting Party under the general rules of public international law."[146] While the new provision avoided the 'if any' language, it dropped the reference to rules "in respect of nuclear damage".[147] On balance, this seems to be a step backwards as respondent States may still deny the existence of any rules in respect of nuclear damage under customary international law, whereas the earlier formulation cast doubt on the rights instead of the rules themselves.[148]

One advance in the Protocol is Article IA, which provides that the Convention applies to nuclear damage 'wherever suffered', whereas the 1963 Convention was silent as to the point. However, Parties may by legislation exclude damage suffered in the territory of non-Party States or their maritime zones where that State has a nuclear installation and it does not provide reciprocal benefits.[149] No change is made to the lack of restriction in the Convention to incidents occurring in the territory of non-Parties.[150]

Under Article XI of the 1963 Vienna Convention a claim can be brought "only with the courts of the Contracting Party within whose territory the nuclear incident occurred" and if that location cannot be determined "with the courts of the Installation State of the operator liable." If an incident occurred on a UK flagged vessel in an area outside the territorial sea of any nation, a claim could be brought only in a British court.

---

143. *Id.* at art. XIV.

144. *See* Protocol, *supra* note 7, at Preamble, and discussion in the IAEA Explanatory Texts, *supra* note 25, at 18 – 21.

145. Vienna Convention, *supra* note 2, art. XVIII

146. Protocol, *supra* note 7, art. 16.

147. *Id.*

148. *See* discussion of negotiations on State liability in the IAEA Explanatory Texts, *supra* note 25, at 25 – 27.

149. Protocol, *supra* note 7, art. IA(2) and (3).

150. This is in contrast to the Paris Convention, article 2 of which excludes nuclear incidents occurring in the territory of non-Parties or to damage suffered in such territory unless the national legislation of the operator otherwise provides. Paris Convention, *supra* note 3, art. 2.

Under the 1997 Protocol a new provision is to be added to Article XI that provides:

> Where a nuclear incident occurs within the area of the exclusive economic zone of a Contracting Party or, if such a zone has not been established, in an area not exceeding the limits of an exclusive economic zone, were one to be established, jurisdiction over actions concerning nuclear damage from that nuclear incident shall, for the purposes of this Convention, lie only with the courts of that Party.

This will only help if the shipping nations ratify the 1997 Protocol and if the country in which the incident occurs has also ratified the 1997 Protocol. It will also not apply if the accident occurs outside the EEZ but the damage is suffered within the EEZ. Installation States can exclude liability for damage in a non-Party nuclear State or its EEZ where that State does not offer reciprocal benefits.[151]

This means that non-nuclear States need not necessarily join the revised Convention to share in at least some of its benefits, though only the courts of a Contracting Party expressly have jurisdiction over an incident occurring within an EEZ.[152] The Installation State may exclude damage suffered in the territory or EEZ of a non-Contracting State for non-nuclear States which do not afford equivalent reciprocal benefits.[153]

The Protocol for the first time excludes military installations, despite silence in the 1963 Vienna Convention on the application of the Convention to military installations,[154] even though many delegates during the negotiations reportedly felt that victims of all nuclear incidents should be compensated[155] rather than taking the opportunity to clarify its application to all nuclear installations. A new article provides that the Convention shall not apply to nuclear installations used for non-peaceful purposes. However, this provision did not define 'non-peaceful purposes' and, as defined, any 'non-peaceful purpose' could exclude the application of the revised Convention. It is unfortunate that States were not required to notify non-peaceful installations in order to gain an exemption. A nuclear installation that produces weapons-grade plutonium as part of its civil reprocessing functions may well be excluded from coverage.

A. Definition of Nuclear Incident

The 1997 Protocol defines 'nuclear incident' to mean "any occurrence or series of occurrences having the same origin which causes nuclear damage or, but only with respect to preventive measures, creates a grave and imminent threat of

151. Revised Vienna Convention, *supra* note 56, art. 1A(2).

152. *Id.* at art. XI.

153. *Id.* at art. IA.

154. The Vienna Convention Preamble does state that the Parties recognize the desirability of establishing some minimum standards to provide financial protection against damage resulting from certain peaceful uses of nuclear energy, but otherwise is silent on military installations. Vienna Convention, *supra* note 2, at Preamble.

155. IAEA Explanatory Texts, *supra* note 25, at 29.

causing such damage."[156] The latter phrase is an addition to the 1963 Convention. There is no definition of 'grave and imminent threat', but it seems clear that it must both be a grave and an imminent threat of causing 'nuclear damage.' Being imminent would not then suffice. Nor is it clear who must determine whether a threat is 'grave and imminent'. A grave threat in the view of a coastal State may not be viewed as grave by another State or its courts, and the 'grave' may be determined under the *lex fori*, although 'reasonable measures' were taken. However, preventive measures are subject to the approval of competent authorities where the measures were taken,[157] which may give rise to an argument that the law of that state should decide what preventive measures constitute a grave and imminent threat. This, however, is countered by the definition of 'reasonable measures' which are to be found as such by the 'law of the competent court,'[158] which is to mean the law of the court having jurisdiction under the Convention, including any rules of such law relating to conflict of laws.

This could have been addressed by the 1997 Protocol but was not: 'preventive measures' are defined to mean reasonable measures taken after a nuclear incident has occurred, subject to the approval of competent authorities by the law of the State where the measures were taken.[159] 'Reasonable measures' are defined to mean measures which are found under the law of the competent court to be appropriate and proportionate, having regard to all the circumstances.[160]

So the revised Convention is in the curious position where 'nuclear incident' is to include occurrences which create a threat of causing nuclear damage, with respect to preventive measures, but where preventive measures are defined in terms of measures taken "after a nuclear incident has occurred." While a commonsense interpretation may be that a 'nuclear incident' includes a series of occurrences which create a grave and imminent threat which preventive measures are aimed at preventing, this seems to be a potential 'catch-22' where a State faced with a threat will have to decide to take measures without any certainty of compensation, in a case where the only nuclear damage is the damage that is threatened.

Likewise, whether a threat is 'grave and imminent' may give rise to dispute. Whether a drifting radioactive cloud drifts a particular direction or distance could give rise to such a dispute as to whether an incident is likely to give rise to radioactive release at all. Whether a radioactive transport which is encountering difficulties such as a collision, fire or terrorist attack constitutes a 'grave and imminent threat' is another area where conflicts may well arise. An operator may argue a threat was not imminent, or if it was, that it was not grave in the sense of threatening great harm.

156. Revised Vienna Convention, *supra* note 56, art. I(1)(l).
157. *Id.* at art. I(1)(n).
158. *Id.* at art. I(1)(e).
159. *Id.* at art. 1(n).
160. *Id.* at art.1(o).

The Paris 2004 Protocol uses the 1963 wording,[161] whereas the Paris Convention qualifies it by adding

> provided that such occurrence or succession of occurrences, or any of the damage caused, arises out of or results either from the radioactive properties, or a combination of radioactive properties with toxic, explosive, or other hazardous properties of nuclear fuel or radioactive products or waste or with any of them, or from ionizing radiations emitted by any source of radiation inside a nuclear installation.[162]

The Revised Vienna Convention is thus the most advanced in terms of definition. With the above caveats in mind, the definition of nuclear damage will now be examined.

B. Definition of Nuclear Damage

The definition of nuclear damage in the 1963 Convention is simply "(i) loss of life, (ii) any personal injury or any loss of, or damage to, property" to the extent that the loss or damage arises out of or results from ionizing radiation emitted by any source of radiation inside a nuclear installation, as well as any other loss or damage so arising or resulting if and to the extent that the law of the competent court so provides.[163] Economic loss and environmental damage is not specifically defined, except to the extent national legislation so provides. The Protocol now includes a far more extensive definition, but each head of damage is conditioned and, more significantly, each new type of damage is allowable only 'to the extent determined by the law of the competent court.'

> (iii) economic loss arising from loss or damage referred to in sub-paragraph (i) or (ii), insofar as not included in those sub-paragraphs, if incurred by a person entitled to claim in respect of such loss or damage;
>
> (iv) the costs of measures of reinstatement of impaired environment, unless such impairment is insignificant, if such measures are actually taken or to be taken, and insofar as not included in sub-paragraph (ii);
>
> (v) loss of income deriving from an economic interest in any use or enjoyment of the environment, incurred as a result of a significant impairment of that environment, and insofar as not included in sub-paragraph (ii);
>
> (vi) the costs of preventive measures, and further loss or damage caused by such measures;
>
> (vii) any other economic loss, other than any caused by the impairment of the environment, if permitted by the general law on civil liability of the competent court [164]

161. Paris Convention, *supra* note 3, art. 1(a)(i).

162. *Id.*

163. Vienna Convention, *supra* note 2, art. II(k)(i)&(ii).

164. Revised Vienna Convention, *supra* note 56, art. 2(k)(iii – vii).

This means that those types of damage are compensable only if the law of the nuclear Installation State permits it. This then is largely an illusory advance. A victim in another State will only be able to recover damage if the law of the nuclear State allows it.[165] This proviso was added after considerable wrangling within the Drafting Committee, and developed from a proposal by Germany, which is phasing out nuclear energy, to condition entitlement to 'pure economic loss' related to environmental impairment to this proviso. This suggestion was progressively widened until a proposal by France, a major nuclear energy State, to subject all except the original three heads to this proviso.[166] While these claims are in theory admissible, obviously if the Installation State allows zero recovery, then the claim would be academic. The head of other economic loss in (vii) is further conditioned: "(vii) any other economic loss, other than any caused by the impairment of the environment, if permitted by the general law on civil liability of the competent court." So the very admissibility of that head is conditioned on 'the general law.' The much–touted aim of harmonization of nuclear liability laws is entirely missed by this formulation.

The limitation of compensation to measures actually taken omits any value of the impairment of the environment as such where reinstatement or remediation is not possible, taking into account any impact on biodiversity and the non-economic value of the environment, including value to future generations.

The difficulties of the victim do not stop there. Article II.6 of the Protocol provides that:

> No person shall be liable for any loss or damage which is not nuclear damage pursuant to sub- paragraph (k) of paragraph 1 of Article I but

---

165. *See id.* at art. 2(k)(i – vii). "Nuclear damage" means - (i) loss of life, any personal injury; (ii) loss of or damage to property; and each of the following to the extent determined by the law of the competent court –

(iii) economic loss arising from loss or damage referred to in sub-paragraph (i) or (ii), insofar as not included in those sub-paragraphs, if incurred by a person entitled to claim in respect of such loss or damage;

(iv) the costs of measures of reinstatement of impaired environment, unless such impairment is insignificant, if such measures are actually taken or to be taken, and insofar as not included in sub-paragraph (ii);

(v) loss of income deriving from an economic interest in any use or enjoyment of the environment, incurred as a result of a significant impairment of that environment, and insofar as not included in sub-paragraph (ii);

(vi) the costs of preventive measures, and further loss or damage caused by such measures;

(vii) any other economic loss, other than any caused by the impairment of the environment, if permitted by the general law on civil liability of the competent court,

in the case of sub-paragraphs (i) to (v) and (vii) above, to the extent that the loss or damage arises out of or results from ionizing radiation emitted by any source of radiation inside a nuclear installation, or emitted from nuclear fuel or radioactive products or waste in, or of nuclear material coming from, originating in, or sent to, a nuclear installation, whether so arising from the radioactive properties of such matter, or from a combination of radioactive properties with toxic, explosive or other hazardous properties of such matter.

166. *See* IAEA Explanatory Texts, *supra* note 25, at 36 – 37, n.101.

> which could have been determined as such pursuant to the provisions of that sub-paragraph.

This rather oddly worded provision, added at the suggestion of Sweden,[167] is apparently intended to absolve any person other than the operator of liability under the channeling principle. It is presumably intended to mean that if damage could (in theory) have been determined to be damage by an applicable law, but was not, then there is no liability for any other person.

There must in any case be an "emission of ionizing radiation"[168] for all except preventive measures,[169] and the damage will be compensable 'to the extent that" the loss or damage arises out of or results from ionizing radiation emitted by any source of radiation inside a nuclear installation. The qualifying words clearly restrict the ambit of compensation: 'to the extent that' implies a restriction.

C. Individual Categories of Damage

1. Economic Loss

(iii) economic loss arising from loss or damage referred to in sub-paragraph (i) or (ii), insofar as not included in those sub-paragraphs, if incurred by a person entitled to claim in respect of such loss or damage;

This is economic loss arising from loss of life, any personal injury or any loss of, or damage to, property – and to the extent that the loss or damage arises out of or results from ionizing radiation emitted by any source of radiation inside a nuclear installation. Loss of income arising from personal injury or death, or lost income from damaged property would be covered, provided it is not already included in the main categories of damage.

This is important, as the economic loss is predicated on the injury, death or damage to property. Economic loss arising in other ways, such as loss to businesses such as tourism or fisheries, where the area or product is not directly damaged, would not be compensable. This is an ongoing issue with coastal States, who are very concerned that if an incident occurred in or near their waters, then tourists would stop coming or fish would not be purchased due to fear of contamination, actual or real. The very real economic loss would not be arising from actual damage to property. Conceivably, one resort may receive compensation where there are measurable increased radiation levels but a nearby one may not, where there are no measurable increased levels.

The group of Small Island States, comprising over forty-two States in the Caribbean, the Pacific, and the AIMS (Atlantic, Indian Ocean, and Mediterranean

---

167. *Id.*

168. Revised Vienna Convention, *supra* note 56, art. I.1(k)

169. *Id.* This extended the 1963 Convention, which requires in article I(1)(k) nuclear damage to arise out of or result from the radioactive properties of nuclear fuel or radioactive products or waste in a nuclear installation, or of nuclear material. In other words, damage from, "other ionizing radiation emitted by any other source of radiation inside a nuclear installation" is now covered. This was already the case in the 1960 Paris Convention under article 1(a)(i).

and South China Seas) regions adopted a Mauritius and strategy[170] to implement the Barbados Programme of Action[171] for their sustainable development. That statement noted that their concerns with nuclear transports include the further development and strengthening, within the appropriate fora, of international regulatory regimes to enhance safety, disclosure, liability, security and compensation in relation to such transport.

The Pacific Island Forum 2004 Communiqué[172] stated that:

> 30. Leaders reiterated their concerns about possible economic loss in a non- release situation and sought an assurance from shipping States that where there is a demonstrable link between the incident and economic loss Forum countries would not be left to carry such a loss unsupported by the shipping States. Leaders agreed that further work be undertaken on the case for a region-specific Environment Impact Assessment including the extent to which the IAEA and shipping States' EIAs adequately take account of region-specific dimensions and on any examples of claims being made for rumour-type damage.

This year the Secretary-General of the Pacific Island Forum, Mr Greg Erwin, during the passage of a shipment of High Level Waste through the Pacific, stated that the Forum remains concerned that present international arrangements for liability and compensation do not adequately address the risks posed by shipments through the region. He said:

> We have a real worry about possible economic loss in the event of an incident involving a nuclear shipment, whether or not that incident results in a radioactive release. The fragile economies of Forum Island Countries depend heavily on industries involving our ocean, such as fisheries and tourism. We continue to seek assurances from the shipping states that where there is a demonstrable link between an incident and economic loss, Forum members will not be left to carry such a loss unsupported.[173]

---

170. International Meeting to Review the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States, , Jan. 10 – 14, 2005, *Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island States* , U.N. Doc A/CONF.207/CRP.7 (Jan. 13, 2005), *available at* http://www.un.org/smallislands2005/pdf/sids_strategy.pdf.

171. Global Conference on the Sustainable Development of Small Island Developing States, Bridgetown, Barbados, Apr. 25 – May 6, 1994, *Programme of Action for the Sustainable Development of Small Island Developing States*, U.N. Doc A/CONF.167/9 (Oct. 1994)

172. The Forum Communiqué, Thirty Fourth Pacific Islands Forum, (Aug. 14 – 16, 2003) stated that "34. *Leaders reiterated their continuing concerns over the shipment of radioactive materials through the region. It welcomed the recent assurance by shipping States to take all practicable action to assist in the management of an incident, whether or not such an incident involved the release of radioactivity, and to cooperate effectively with any state concerned, particularly states close to where any accident had taken place. Leaders called on shipping States to continue the dialogue with Forum members and in particular, to progress the proposals that Forum members had developed for innovative arrangements and assurances.*"

173. Press Statement, Thirty Fourth Pacific Islands Forum, "Forum Expresses Concern on Nuclear

Clearly coastal States are most concerned at the possibility of economic loss from an incident which may occur without direct physical damage or loss.

2. Environmental Impairment

(iv) the costs of measures of reinstatement of impaired environment, unless such impairment is insignificant, if such measures are actually taken or to be taken, and insofar as not included in sub- paragraph (ii);

This is a clear advance from the 1963 Convention. However, it is limited to costs of reinstatement. The subparagraph is silent as to compensation where reinstatement is not practicable or possible, as may well be the case with widespread contamination, particularly of the marine environment. Some measures could be envisaged, such as replacement of soil, replanting and reintroduction of species, although these measures may substantially exceed the limitations of 300 million SDRs.

The European Directive on Liability Directive 2004/35/EC[174] excludes damage covered by specific nuclear liability Conventions; but, by way of comparison, it requires Operators to take restorative measures where environmental damage has occurred[175] and to take preventive measures where environmental damage has not yet occurred but there is an imminent threat of such damage occurring,[176] failing which, Authorities are to take preventative or restorative measures.[177] Environmental damage means damage to protected species and natural habitats, water damage and land damage creating a risk to human health.[178]

This is clearly wider than the requirement to pay for reinstatement where measures are actually taken unless such impairment is insignificant, and requires operators to take steps concerned – the costs of which could exceed the applicable limits.

(v) loss of income deriving from an economic interest in any use or enjoyment of the environment, incurred as a result of a significant impairment of that environment, and insofar as not included in sub-paragraph (ii)

Again, this head is predicated on actual damage to the environment. It is an advance as it does not require property damage by the person affected, so a fisherman without property interest in the fish can still claim damages. However, the IAEA Explanatory Text suggests that a tourist operator may have a claim because tourists stay away for fear that the beach may be contaminated.[179] The

---

Shipments," *available at* http://www.forumsec.org.fj/news/2005/April/01.htm.

174. Directive of the European Parliament and of the Council 2004/35/EC, on environmental liability with regard to the prevention and remedying of environmental damage, art. 4, 2004 O.J. (L 143/56), *available at* http://europa.eu.int/eur-lex/pri/en/oj/dat/2004/l_143/l_14320040430en00560075.pdf.

175. *Id.* at art. 6.

176. *Id.* at art. 5.

177. *Id.* at arts. 5(3) & 6(2).

178. *Id.* at art. 2(1)(a)(b)(c).

179. IAEA Explanatory Texts, *supra* note 25, at 38. The Text does go on to observe that if a ship with nuclear substances sinks, but there is no emission, there is no coverage for economic loss suffered

Text does not condition that statement on an assumption that there was some sort of radioactive contamination somewhere causing the public fear, as opposed to an incident which did not result in the release of radiation. Even if the premise is added that there is some sort of contamination somewhere from the incident, this is still unlikely to be correct as it seems likely that the beach must actually be contaminated—'*a significant impairment of that environment*'—to the extent that the loss or damage arises out of or results from ionizing radiation emitted by any source of radiation inside a nuclear installation. Thus, if a nuclear carrier sinks causing localized contamination in the marine environment, but that contamination does not reach the beach, it is likely the Operator would claim that the loss or damage did not arise out of or resulting from ionizing radiation and that there is not a significant impairment of 'that' environment.

Additionally, there is no definition of 'significant'. In the context of ionizing radiation this is a 'significant' omission. As there is always a certain of level of background radiation, Operators are likely to argue that a very small level of increase in background radiation is not 'significant', even to the extent of requiring actual or potential damage from that increase, as opposed to an increase in concern by potential tourists, for instance.

3. Preventive Measures

(vi) the costs of preventive measures, and further loss or damage caused by such measures;

It is clear from the definition of 'preventive measures' that that the preventive measures need to have been taken;[180] the definition requires that the preventive measures must be taken after an 'incident' has occurred,[181] but can be taken before the damage has occurred. However, since 'nuclear damage' is part of the definition of 'nuclear incident', this could be argued to be a catch-22, where the only 'nuclear damage' is that being prevented.[182] The converse argument is that a grave and imminent threat can form part of the definition of nuclear incident, but thus does run into the difficulty that preventive measures can only be taken after the nuclear incident has occurred.[183]

A difficult question may arise where the preventive measure caused, for instance, loss of tourism or fisheries markets, and there was no actual contamination, whether because the preventive measure prevented contamination or because no contamination eventuated. Ironically, if the loss or damage was caused by the preventive measure[184] rather than the incident itself, the loss or damage may be recoverable, but only to the extent determined by the law of the competent court.

---

by public fear of contamination.

180. Revised Vienna Convention, *supra* note 56, art. 2(4)(n).

181. *Id.*

182. *See* IAEA Explanatory Texts, *supra* note 25, at 42, n. 118.

183. Revised Vienna Convention, *supra* note 56, at art. 2(4)(n).

184. *Id.* at art. (2)(k)(vi). This section includes further loss or damage caused by preventive measures.

Another question which may arise is whether measures taken must be taken within the jurisdiction. Where a radioactive shipment threatens an EEZ, for instance, even if it is outside the EEZ, can preventive measures be taken in or outside the EEZ? The HNS Convention[185] and the 1969 Oil Liability Convention, as amended,[186] applies to preventive measures 'wherever taken.'

(vii) any other economic loss, other than any caused by the impairment of the environment, if permitted by the general law on civil liability of the competent court,

This residual head is potentially applicable to pure economic loss, as it is not predicated on actual damage or injury. However, it is only 'if permitted' by the 'general law on civil liability of the competent court' in which the nuclear installation is operated. "Law of the competent court" is defined in article I(1)(a) to mean the law of the court having jurisdiction under the Convention, including any rules of such law relating to conflict of laws. However, it seems that 'general law on civil liability' is intended to be different and to refer to the substantive law of the forum Court, rather than the substantive law applied under the conflict of laws.[187] If so, this would be inequitable as it would subject the claim of a victim in another State to the laws of the Installation State which caused the damage. This residual head of damage does not appear in the 2004 Paris Protocol.

VII. A COMPARISON OF THE REVISED PARIS AND VIENNA CONVENTIONS

The revised Vienna Convention is of wider territorial application. It applies to nuclear damage wherever it is suffered,[188] whereas the revised Paris convention applies mainly to nuclear damage occurring on the territory of contracting Parties as well as on the territory of revised Vienna Convention Parties, which are also parties to the Joint Protocol.[189] It also applies to damage suffered in the territory of non-nuclear States and other non-Contracting States which have in force reciprocal nuclear liability legislation.[190] The Paris Convention, therefore, excludes damage caused on the high seas or otherwise beyond areas of national jurisdiction, other than EEZs. As one commentator has noted, "[f]rom an environmental point of view this is an important difference with the Amended Vienna Convention as it leaves the natural resources of the high seas and the international seabed area uncovered, which cannot but be deplored."[191]

---

185. HNS Convention, *supra* note 59, at art. 3(d).

186. Oil Pollution Convention, *supra* note 60, at art. 4(b).

187. *See* IAEA Explanatory Texts, *supra* note 25, at 38 – 39 n.106. (quoting *Report of the Standing Committee,* Annex III, SCNL/17/INF.4, pp. 16 – 18, and explaining that this wording was inserted at the request of the United Kingdom).

188. Revised Vienna Convention, *supra* note 56, at art. I A

189. Paris Convention, *supra* note 3, at art. 2. This is provided that the Paris Contracting Party is also a contracting Party to the Joint Protocol.

190. Revised Paris Convention, *supra* note 57, at art. 2(a)(iv).

191. *See* Johan G. Lammers, *International Responsibility and Liability for Damage Caused by Environmental Interferences*, ENVTL. POL'Y & LAW (2001), at 99 *available at* http://iospress.metapress.com/media/2gurmhtuxn0jtcj2cb9q/contributions/q/5/6/p/q56pjg9bw6qy6pq7.pdf.

Secondly, the new definition of nuclear damage in the two Conventions is very similar, although the definition of nuclear damage in the revised Paris Convention does not include catch-all 'any other economic loss'.[192]

Thirdly, the liability amounts differ. The revised Paris Convention provides for minimum liability to €700 million, with various exceptions.[193] The revised Vienna Convention provides for 300 million SDRs (about €357 million).[194] The revised Paris Convention provides for maximum liability of €700 million, whereas the Vienna Convention does not set a maximum.[195]

The revised Paris Convention[196] permits a Contracting Party to subject the transit of nuclear substances through its territory on the condition that the maximum amount of liability of the foreign operator concerned be increased if it considers that such amount does not adequately cover the risks of a nuclear incident in the course of the transit, provided that the maximum amount thus increased does not exceed the maximum amount of liability of operators of nuclear installations situated in its territory. This may provide a mechanism for transit States to protect themselves by increasing required liability considerably. There is no comparable provision in the Vienna Convention.

A. Jurisdiction

As is noted below, both the revised Paris Convention[197] and the revised Vienna Convention grant exclusive jurisdiction to the Party in whose EEZ a nuclear incident has occurred.[198] However, if the incident occurs outside the EEZ but the damage is within the EEZ, jurisdiction is with the Installation State.[199]

The Brussels Supplementary Protocol applies to damage suffered in an EEZ or on the continental shelf of a Contracting Party, but only in connection with the exploitation or the exploration of the natural resources of the EEZ or continental shelf, and where the operator is liable under the Paris Convention.[200] This means

192. Revised Paris Convention, *supra* note 57, at art. 1(vii). Revised Vienna Convention, *supra* note 56, at art. 2(2)(k)(vii).

193. *See* Revised Paris Convention, *supra* note 57, at art. 7.

194. Revised Vienna Convention, *supra* note 56, at art. 7(1)(a).

195. *See* Revised Paris Convention, *supra* note 57, at art. 7(e). *See* Revised Vienna Convention, *supra* note 56, at art. 7(1)(a).

196. Revised Paris Convention, *supra* note 57, at art.7(e).

197. Revised Paris Convention, *supra* note 57, art. 13(b). The coastal State must have notified the Secretary-General of the EEZ.

198. Revised Vienna Convention, *supra* note 56, at art. XI(1bis).

199. Revised Paris Convention, *supra* note 57, at art. 13(c)

200. The Brussels Supplementary Protocol applies to nuclear damage for which an operator of a nuclear installation used for peaceful purposes situated in the territory of a Contracting Party to the Convention is liable under the Paris Convention, and which is suffered either (i) in the territory of a Contracting Party or (ii) in or above maritime areas beyond the territorial sea of a contracting Party and (1) on board or by a ship flying the flag of a Contracting party, or on board or by an aircraft registered in the territory of a Contracting Party, or on or by an artificial island, installation or structure under the jurisdiction of a Contracting Party, or by a national of a Contracting Party, excluding damage suffered in or above the territorial sea of a State not Party to the Convention; or in and above the EEZ of a Contracting Party or on the continental shelf of a Contracting Party in connection with the exploitation or

that if an incident occurs in an EEZ, reinstatement of the environment or preventive measures may be compensable under the BSP if it is in connection with the exploitation or exploration of natural resources or continental shelf. Clearly, this is intended to be narrower than protection of the marine environment *per se*.

B. Limitation in Time

The Vienna Convention[201] imposes a ten-year time limitation from the date of the nuclear incident on the filing of claims. The 1997 Protocol would extend this limit to 30 years, but only "with respect to loss of life and personal injury."[202] Such short limits are unacceptable because it may take many more years for the true nature of the risks to be determined. The provision should include a period following discovery of the injury, even if is more than 30 years from the incident. Genetic damage, for instance, may take more than 30 years to manifest itself in future generations.

The IAEA Explanatory Text explained the Vienna Convention's ten year period after the incident (or even three years of knowledge of the damage[203]) limitation period – in contrast with the more common 30 years – in terms of "the need not to put a prohibitive burden on persons engaged in nuclear activities; it was felt that operators and their guarantors should not be obliged to maintain over long periods commitments that might prove to be merely theoretical."[204] This is despite the fact that radioactive contamination may last for hundreds of years, and consequent genetic damage may be passed down through generations.[205] Subsequent generations are likely, thus, to be excluded.

The 1960 Paris Convention has a limitation period of ten years.[206] However, the period is increased to twenty years in the case of date of the theft, loss, jettison or abandonment.[207] A two year period may be established from the date at which the person suffering damage has knowledge or from the date at which he ought reasonably to have knowledge.[208]

The 2004 Protocol increases the period to thirty years from the nuclear incident with respect to loss of life and personal injury, or ten years with respect to other nuclear damage.[209]

---

the exploration of the natural resources of that EEZ or continental shelf, provided that the courts of a Contracting Party have jurisdiction pursuant to the Paris Convention. 2004 Brussels Supplementary Protocol, *supra* note 128, at art. 2.

201. Vienna Convention, *supra* note 2, at art. VI(1)(a).

202. Protocol, *supra* note 7, art. VI(1)(a).

203. Vienna Convention, *supra* note 2, art. VI.3. Provides for three years from the date on which the person suffering damage had knowledge or ought reasonably to have had knowledge of the damage and of the operator liable for the damage.

204. IAEA Explanatory Texts, *supra* note 25, at 14.

205. A longer period is possible if the operator's liability is covered by a financial security or State funds for a longer period. Vienna Convention, *supra* note 2, art. VI(4).

206. Revised Paris Convention, *supra* note 3, art. 8.

207. *Id.* at art. 8 (b).

208. *Id.* at art. 8(c).

209. 2004 Protocol, *supra* note 120, art. I.

The CSC Convention provides for a ten year limitation period,[210] or twenty years from the date of the theft, loss, jettison or abandonment.[211]

C. Standing

The revised Vienna Convention has very limited provisions on standing, providing only that the State of jurisdiction shall ensure that a State may bring an action on behalf of persons who have suffered nuclear damage.[212] This would assist victims in access to foreign courts, but does not go far enough. It is only a small mitigation of the disadvantage of having to seek compensation from other courts and does not, on the face of it, extend to environmental damage.

Economic loss may be claimed only if incurred by a person entitled to claim in respect of such loss or damage.[213] Thus, there is a significant question mark on whether environmental groups could sue for the costs of measures of reinstatement of impaired environment, of income deriving from an economic interest in any use or enjoyment of the environment incurred as a result of a significant impairment of that environment, or the cost of preventive measures.[214]

The revised Paris Convention has similar provisions,[215] also limiting economic loss to a person 'entitled to claim', without defining what constitutes such entitlement, thus leaving it to the *lex fori*. However, it does provide[216] that the legislation of the State where the nuclear damage is suffered shall determine who is entitled to take reinstatement measures and that preventive measures are taken subject to the approval of competent authorities in the law of the State where the measures were taken.[217]

D. Exceptions

Under the Vienna Convention,[218] damages resulting from "an act of armed conflict, hostilities, civil war or insurrection" or from "a grave natural disaster of an exceptional character" are exempt from any liability or recovery. The latter exception has been removed from the 1997 Protocol, which is an advance, but the other exceptions remain in the Revised Convention. The 1997 Vienna Protocol provides that "No liability under this Convention shall attach to an operator if he proves that the nuclear damage is directly due to an act of armed conflict, hostilities, civil war or insurrection."[219] Thus, the burden of proof is on the operator.

---

210. CSC, *supra* note 8, art. 9. "The law of the competent court may establish a period of extinction or prescription of not less than three years from the date on which the person suffering nuclear damage had knowledge or should have had knowledge of the damage and of the operator liable for the damage, provided that the period established pursuant to paragraphs 1 and 2 shall not be exceeded."

211. *Id.* at art. 9.

212. Revised Vienna Convention, *supra* note 56, art. XIA.

213. *Id.* at art. 1(k)

214. *Id.*

215. *Id.* at art. 1(a)(vii)(iii)

216. *Id.* at art. 1(a)(viii)

217. Revised Paris Convention, *supra* note 57, art. 1(a)(xi).

218. Vienna Convention, *supra* note 2, art. IV(3).

219. Protocol, *supra* note 7, art. 6.

This means that under either Convention, in case of a threat of a terrorist attack on an installation or vessel, the burden is borne by peoples and nations other than the nuclear industry or nuclear State. The 2004 Paris Protocol provides that "the operator shall not be liable for nuclear damage caused by a nuclear incident directly due to an act of armed conflict, hostilities, civil war, or insurrection."[220] So in both treaty systems, damage caused by an attack or terrorism may well be borne by the victim.

VIII. SOME NATIONAL LEGISLATION ON NUCLEAR LIABILITY

A. United States

The United States is not party to any nuclear liability convention. The Price Anderson Act, which was recently extended for 20 years,[221] instead provides a nuclear liability regime. The Act requires individual operators to be responsible for two layers of insurance cover: each operator is required to purchase USD 300 million cover from private insurers, and a second layer is funded through payments of up to USD 96 million per reactor, collected in annual installments of USD 15 million per reactor.[222] The total provision comes to over USD 10 billion paid for by the utilities. If funds are depleted by accidents, Congress is required to consider covering excess claims.[223] USD 70 million was paid out after the Three Mile Island incident.[224] As with international conventions, Price-Anderson, with its limitations of liability and channeling provisions,[225] amounts to a subsidy to the nuclear industry, estimated from USD 366 million 3 billion per year nationwide.[226]

B. Canada

The 1976 Nuclear Liability Act[227] establishes the operator's liability to a limit of C$75 million per nuclear installation and requires insurance to that level.[228]

---

220. 2004 Protocol, *supra* note 120, art. J.

221. The Price Anderson Act was signed into law in 1957 as an amendment to the Atomic Energy Act of 1955. 42 U.S.C. § 2210 et seq. (1994), *available at* http://www.gc.doe.gov/price-anderson/public-comments/Nuclear%20Energy%20Agency/paa-appb.pdf [hereinafter Price Anderson Act]. It was renewed on Aug. 8, 2005 in the Energy Policy Act 2005, to cover licensed nuclear power plants and other facilities through Dec. 31 2005.

222. Price-Anderson Amendments Act of 1988, Pub. L. No. 100-408, § 2(b) (1988).

223. Price Anderson Act, *supra* note 221, § (e)(2).

224. Jason Zorn, *Note: Compensation in the Event of a Terrorist Attack on a Nuclear Power Plant: Will Victims Be Adequately Protected?*, 38 NEW ENG. L. REV. 1087, 1128 n.310 (2003).

225. Anyone liable is covered: 42 U.S.C. § 2014(t).

226. *See* testimony by Anna Aurilio of the U.S. Public Interest Group to the Committee on Energy and Commerce *available at* http://energycommerce.house.gov/107/hearings/06272001Hearing305/Aurilio492print.htm. *See also* Renewable Energy Policy Project, July 2000, "Federal Energy Subsidies: Not all technologies are created equal," *available at* http://www.crest.org/repp_pubs/pdf/subsidies.pdf.

227. Nuclear Liability Act, 1985, c. N-85, *available at* http:////lois.justice.gc.ca/en/N-28 [hereinafter Nuclear Liability Act].

228. *Id.* at § 15. "Damage" is defined to mean any loss of or damage to property, whether real or personal, and, for the purposes of any other provision of this Act, includes any damage arising out of or attributable to any loss of or damage to that property.

Liability is strict,[229] and there is an exemption for an act of armed conflict in the course of war, invasion or insurrection.[230]

C. Japan

Japan is not party to any liability convention. Its Law on Compensation for Nuclear Damage[231] provides for strict, exclusive and unlimited liability for operators, and operators must provide financial security such as 12 billion yen for the Tokai-mura uranium conversion plant.[232] An Indemnity Law provides for indemnification by the government in exchange for an indemnity fee.[233]

Following the 1999 Tokai-mura plant accident, insurance covered 1 billion yen.[234] Sumitomo, the parent company, paid the balance of over 12 billion yen,[235] of which 3.86 billion was to foodstuffs manufacturers, 2.86 billion to tourist operators, 1.76 to food retailers and 1.26 billion to agriculture interests.[236]

D. Russia

Russia, which operates 29 nuclear reactors, this year ratified the Vienna Convention and has bilateral agreements to cover entities working under safety assistance programs. Russia signed the Vienna Convention in May 1996, more than 10 years after the Chernobyl accident.[237] However, whether any Ukrainian victims of the Chernobyl accident will be able to claim remains to be seen.[238] The limitation period for loss of life or personal injury under the 1997 Protocol is thirty years following the date of the nuclear incident,[239] but neither Russia nor Ukraine has ratified it to date. Processing of plutonium from decommissioned Russian weapons has been delayed due to disputes between the United States and Russia on

229. *Id.* at § 4.

230. *Id.* at § 7.

231. Law on Compensation for Nuclear Damage, Law No. 147 of 17 June 1961, as amended. *See* Nuclear Energy Agency [NEA], *Tokai-Mura Accident, Japan: Third Party Liability and Compensation Aspects*, at 7, Nuclear Law Bulletin No. 66 (Dec. 2000), *available at* http://www.nea.fr/html/law/nlb/Nlb-66/013-022.pdf [hereinafter Tokai-Mura Accident Article]. *See also* Omer F. Brown, Nuclear Liability: A Continuing Impediment To Nuclear Commerce, 1999, *available at* http://www.world-nuclear.org/sym/1999/brown.htm.

232. Tokai-Mura Accident Article, *supra* note 231, at 7.

233. Law on the Indemnity Agreement for Compensation for Nuclear Damage, Law No. 148 of 17 June 1961, as amended.

234. Tokai-Mura Accident Article, *supra* note 231, at 7.

235. Some €87 million at today's rates. Barkley's EURO Conversion Calculator *at* http://www.oasismanagement.com/eurodesk/eurocalc.html (last visited Oct. 16, 2006).

236. OECD, *op. cit.*, 4 and Annex II.

237. NTI, Russia: International Organization Membership *available at* http://www.nti.org/db/nisprofs/russia/intorgs/intorgs.htm. (last visited Oct. 17, 2006).

238. Ukraine is a party to the Vienna Convention. International Atomic Energy Agency, (1998), *available at* http://www.iaea.org/Publications/Documents/Infcircs/1998/infcirc566-567a1.shtml.

239. Protocol, *supra* note 7, art. 8.

liability provisions.[240] There are some bilateral agreements in place,[241] such as the 2000 France-Russian agreement on third party liability for nuclear damage.[242]

E. Ukraine

Ukraine is Party to the Vienna Convention and the Joint Protocol, and has signed the CSC. Its 1995 Nuclear Liability Law, revised in 1997 following its accession to the Vienna Convention,[243] has been followed by a Law on Civil Liability for Nuclear Damage and its Financial Security in 2001.[244] The Chernobyl Shelter Implementation Plan (SIP)[245] covered participants in the Plan.

F. China

China is not party to any international liability convention.[246] China to date has only a 1986 interim domestic law on nuclear liability, devised for the Daya Bay nuclear power plant.[247] The law provides for exclusive jurisdiction of Chinese courts and liability limited to 30 million RMB, or about USD 36 million.[248] It excludes massive natural disasters, hostilities, armed conflict or riot, and has a ten-year limitation period, and a three-year limitation period from the date the victim knew or should have known of the nuclear damage.[249]

G. Austria

Austria in 1999 passed an Act on Civil Liability for Damages Caused by Radioactivity.[250] The Act covers environmental impairment, defined as any interference with the environment, which lastingly alters the latter in such a way that it differs noticeably from natural processes either in quantity, in quality or in the temporal respect, and the cost of preventive measures.[251] No sudden incident is required, and damage in the ordinary course of operation is covered.[252] Liability is

240. *See* NTI, Reducing Excess Stockpiles: Russian Plutonium Disposition at http://www.nti.org/e_research/cnwm/reducing/rpdispose.asp (last visited Oct. 17, 2006).

241. *See* Mark Hibbs, Safety of Civil Nuclear Installations, Part I: Safety of Civil Nuclear Installations, Apr. 10, 2003, *available at* http://sung7.univ-lyon2.fr/article.php3?id_article=126.

242. *See* NEA Nuclear Law Bulletin No. 66, Dec. 2000, *available at* http://www.nea.fr/html/law/nlb/Nlb-66/welcome.html.

243. *See* NTI, Ukraine Profile: Nuclear Safety Related Treaties *available at* http://www.nti.org/e_research/profiles/Ukraine/index_4986.html (last visited Oct. 17, 2006).

244. NEA, Law on Civil Liability for Nuclear Damage and its Financial Security, Dec. 13, 2001, *available at* http://www.nea.fr/html/law/nlb/nlb-69/Ukraine.pdf.

245. *See* IAEA, Shelter Implementation Plan: Chernobyl Shelter Fund, at http://www.iaea.org/NewsCenter/Features/Chernobyl-15/shelter-fund.pdf (last visited Oct. 17, 2006).

246. NEA, Julie A. Schwartz, *International Nuclear Law in the Post-Chernobyl Period*, *available at* http://www.nea.fr/html/law/chernobyl/SCHWARTZ.pdf.

247. *See* Brown, *supra* note 231.

248. *Id.*

249. *See* IIAS, *Environmental Law of the People's Republic of China*, Nov. 29, 2002, *available at* http://www.iias.or.jp/old/research/research_e_top.html.

250. NEA, Federal Act on Civil Liability for Damage Caused by Radioactivity (Atomic Liability Act 1999 – Atom HG 1999), Oct. 7, 1998, *available at* http://www.nea.fr/html/law/nlb/NLB-63/austria.pdf.

251. *Id.* at § II.3 and IV.11(2).

252. *Id. at* § II.7.

strict and unlimited; there are no maximum liability amounts. There is no channeling of liability, so suppliers and contractors can be liable. Insurance is required to be carried by nuclear carriers and any operators in Austria.[253] Claimants can require the application of Austrian law to claims for damage caused in Austria,[254] regardless of where the damaging event occurred.

H. Chile

Chile's Law for Nuclear Safety is an interesting law applicable to the transport of nuclear substances and radioactive materials through Chile's EEZ.[255] The Law provides[256] that any transporter of nuclear substances or radioactive material who uses the territorial sea, surrounding sea and the Chilean exclusive economic zone will be considered as an operator, which must put up insurance or guarantees.[257] The maximum liability is set at USD 75 million.[258] On the issue of causation, if together with nuclear damage, damage occurs due to another different or concurrent cause or resulting from a nuclear accident without it being possible to make a distinction, all is deemed to be nuclear damage.[259] There is an exemption for external armed hostilities, insurrection or civil war, but not for force majeure or unforeseeable circumstances.[260] There is a ten-year limitation period.[261]

I. International Liability Discussions Under Way

The International Expert Group on Nuclear Liability (INLEX) was established following the International Conference on the Safety of Transport of Radioactive Material in Vienna in 2003.[262] Instead of exploring ways to progress the international liability regime, consensus for which was blocked by some nuclear States, the IAEA established INLEX to prepare an explanatory text to develop a common understanding of the legal issues and thereby promote adherence to the liability instruments. The text on the Vienna Convention[263] runs to some 107 pages.

Negotiations are under way to develop rules and procedures on liability in redress under the Biosafety Protocol. The first meeting of the Ad Hoc Group on Liability and Redress took place in May 2005 in Montreal, Canada, following a meeting of Technical Group of Experts on Liability and Redress, which took place from 18 to 20 October 2004 in Montreal.[264]

---

253. *Id. at* § II.4, .5, .6(1), .7(1).

254. *Id. at* § V.23.

255. BCN, Law for Nuclear Safety, 18.302, Apr. 16, 1984, (amended Oct. 1 2002) *available at* http://www.bcn.cl/portada.html.

256. *Id.* at art. 54.

257. *Id.* at art. 62.

258. *Id.* at art. 60.

259. *Id.* at art. 55.

260. *Id.* at art. 56.

261. *Id.* at art. 66.

262. *See* IAEA, *Civil Liability for Nuclear Damage*, GOV/INF/2004/9-GC (48)/INF/5, (Sept. 2, 2004) at http://www.iaea.org/About/Policy/GC/GC48/Documents/gc48inf-5.pdf.

263. IAEA Explanatory Texts, *supra* note 25.

264. *See* description of the process at http://www.biodiv.org/biosafety/issues/liability2.aspx. *See also*

IX. CASE STUDIES

Some possible scenarios are postulated to provide examples of how the liability system may work in practice.

A. The French company Cogema sends a shipment of nuclear waste to a nuclear operator in Japan onboard PNTL vessel Pacific Pintail, which flies a UK flag. A nuclear incident occurs on the high seas near Federated States of Micronesia, releasing radiation in areas, which results in a collapse of the FSM fishing and tourist industries and which also causes loss to Japanese, Marshall Islands and Palau tuna fishing fleets who hold licenses to fish in FSM's EEZ. There is no direct evidence that any tuna have been contaminated, but fish caught in or near FSM's EEZ can't be sold. Tourists stay away even though there are no increased levels of radioactivity on nearby beaches.

Both the UK and France are Paris and Brussels Supplementary Convention parties. FSM, Palau, Marshall Islands and Japan are not party to any liability treaty.

Fishing operators will have three options: either they can sue in the United Kingdom or in France or in their own countries. If they sue in their own countries, they will want to be sure they can enforce any judgment, either through a multilateral agreement,[265] bilateral reciprocal judgment enforcement treaty or otherwise. The prospect of success is not good, since the damage is arguably pure economic loss because there is no evidence that fish that cannot be sold are contaminated.

It is questionable whether fishing industries in any of those countries improve their chances if States joined any of the liability Conventions. Since neither France nor the UK a party to the Joint Protocol, the only option is to join the Paris Convention. Since the Paris Convention Protocol is not in force, the only applicable Convention will be the Paris Convention. There would most likely be no recovery since the claim is not for damage to property caused by a nuclear incident involving nuclear substances in the course of carriage. If there was recovery, claims would be limited to the £140 million provided under the Nuclear Installations Act 1965, beyond which the Paris/Brussels system applies. Recovery under the Brussels Convention is limited to damage suffered in an EEZ or on the continental shelf of a Contracting Party, in connection with the exploitation or the exploration of the natural resources of the EEZ or continental shelf, and where the

---

Report of the Open-Ended Ad Hoc Working Group of Legal and Technical Experts on Liability and Redress under the Cartagena Protocol on Biosafety *available at* http://www.biodiv.org/doc/meeting.aspx?mtg=BSWGLR-01.

265. *See* Brussels Convention on Jurisdiction, *supra* note 55. *See also* Lugano Convention (Sept. 16, 1988),at http://www.jura.uni-sb.de/convention-bruxelles/en/c-textes/_lug-textes.htm.

operator is liable under the Paris Convention.[266] There would be no compensation for restoration of the marine environment.

B. A terrorist cell crashes an airliner onto Cogema's reprocessing plant at La Hague, causing a radioactive releases of Cs-137 from a cask storage facility and causing the release of radioactivity across northern Europe and across the English Channel. Damage and economic loss are measured in the hundreds of millions or billions of dollars. Hundreds die and thousands suffer from radiation poisoning.

France is a Paris and Brussels Supplementary Convention party, as is the United Kingdom, Denmark, Italy, the Netherlands, Norway, Spain and Belgium. Claimants in those countries would lodge claims in French courts. They would be subject to claims by the operator or its insurers that the exception in Article 9, being 'armed conflict, hostilities, civil war, insurrection' applied. Claims would be subject to a maximum of about €357 million under the BSC.

Claimants in States which are not Paris Convention or Joint Protocol countries, including Austria, could file claims in their own Courts. They would not be faced with exemption arguments and would be free of limitations. Russia and Serbia and Montenegro, which are Vienna Convention but not Joint Protocol countries, would be in the same position.

Claimants in Portugal, which is a Paris Convention but not Brussels Supplementary Protocol party, would be subject to the Paris Convention limits of €17.85 million. Claimants in the Czech Republic, Lithuania, and Slovakia and Ukraine which are Vienna Convention and Joint Protocol countries, would also be subject to the Paris Convention limits.

C. An accident at a nuclear power station in Germany causes low, but elevated levels of radiation to be detected in Austria, the Czech Republic, Switzerland and Italy. Dairy producers and other farmers find they cannot sell their produce.

Germany is a Paris Convention country and party to the Brussels Supplementary Convention as well as the Joint Protocol. The narrow definition of recoverable damage would apply, so compensation would be restricted to damage

266. NEA, Convention of 31st January 1963 Supplementary to the Paris Convention of 29th July 1960, as amended by the additional Protocol of 28th January 1964 and by the Protocol of 16th November 1982, art. 2 (explaining that the system of this Convention applies to nuclear damage for which an operator of a nuclear installation used for peaceful purposes situated in the territory of a Contracting Party to the Convention is liable under the Paris Convention, and which is suffered either (i) in the territory of a Contracting Party or (ii) in or above maritime areas beyond the territorial sea of a contracting Party and (1) on board or by a ship flying the flag of a Contracting party, or on board or by an aircraft registered in the territory of a Contracting Party, or on or by an artificial island, installation or structure under the jurisdiction of a Contracting Party, or by a national of a Contracting Party, excluding damage suffered in or above the territorial sea of a State not Party to the Convention; or in and above the EEZ of a Contracting Party or on the continental shelf of a Contracting Party in connection with the exploitation or the exploration of the natural resources of that EEZ or continental shelf, provided that the courts of a Contracting Party have jurisdiction pursuant to the Paris Convention).

to or loss of life of any person and damage to or loss of property. Farmers would have to prove actual damage to their property in order to establish liability.

X. CONCLUSIONS AND RECOMMENDATIONS

While the minimum limits have been increased by the 1997 and 2004 Protocols, non-nuclear States may wish to consider whether agreeing to limitation of liability is in their best interests. While it clearly benefits nuclear operators and nuclear States, it is less clear that it benefits potential victims. Where those victims are required by the respective Conventions in most cases to commence litigation in the courts of the Operator State, the quantum and very availability of categories of damage is restricted by the law applied by those courts; and even where it is available, will be limited by the applicable limitations. In the case where claims are in the billions of Euros, they would be at a clear disadvantage.

The revised Vienna Convention applies to damage wherever suffered. Non-nuclear States should consider carefully whether they join the revised Vienna Convention. Particularly if the limitation of claims in time and amount concerns non-nuclear States, they may wish to think carefully about joining the revised Vienna Convention. Joining the CSC seems to provide little improvement, since it is not in force, and, even so, still provides for jurisdiction in the Installation State. Non-nuclear States at least may find the requirements of compliant national legislation, such as exempting installations from terrorist attacks or grave natural disaster of an exceptional character, objectionable.

The CSC does not require a minimum liability be established,[267] but must provide that the maximum amount of liability of the operator shall be governed by the national law of the Installation State.[268] It does require that the nature, form, extent and equitable distribution of compensation for nuclear damage caused by a nuclear incident be governed by the law of the competent court.[269]

If a State does join the revised Vienna Convention, it must *upon ratification or accession* make a declaration under article 19 of the Protocol stating its intention not to be bound with respect to States that are party only to the unamended Vienna Convention, since they risk limiting their rights to compensation to the lower levels in the unamended Vienna Convention. The omission of coverage for terrorist attacks is a significant omission as this is an oft-cited concern by States.

A regime should clearly cover all nuclear installations; all nuclear incidents wherever they should apply, and their effects anywhere in the world; damage to the environment *per se*; should not carry exemptions, particularly for terrorist attacks; should provide for an international tribunal; should provide for a backup fund for providing compensation where a liability regime fails; should not limit liability to an operator and should not provide for limits on liability amounts.

A fund which ensures compensation for damage, rather than one which provides backup funding but still predicates compensation on rigid criteria, would

267. CSC Annex, *supra* note 136, art. 4.
268. *Id.* at art. 6.
269. *Id.* at art. 11.

go some distance towards providing some certainty of compensation. The HNS Convention[270] provides for a fund which shall pay compensation to any person suffering damage if such person has been unable to obtain full and adequate compensation for the damage because no liability exists for damage under other provisions of the Convention, as well as because the owner liable for the damage is financially incapable of meeting the obligations under this Convention in full, financial security has failed, or because the damage exceeds the owner's liability. 'Expenses reasonably incurred' or 'sacrifices reasonably made by the owner voluntarily to prevent or minimize damage' are compensable under the Fund.[271] The Fund, for instance, specifically covers excluded cover for damage resulting from a 'natural phenomenon of an exceptional, inevitable and irresistible character' to a specified limit.[272] Contributions to the Fund are made according to a formula which calculates, for example, the amount of oil or gas received in a given year.[273]

States considering joining the Paris or Vienna Conventions should measure the provisions against the criteria discussed, including the importance of a backup fund; that absolute liability should govern; that limitation should be unlimited in amount; that there should be a just time limit of liability; that all responsible parties should bear liability; that claimants should be able to bring claims in a neutral tribunal; that the applicable law should be that of the claimant; that there should a broad definition of recoverable damage; and that there should be just rules on standing, access to justice, and burden of proof and causation.

270. HNS Convention, *supra* note 59, art. 14.
271. *Id.* at art. 14(2).
272. *Id.* at art. 14(5)(b).
273. *Id.* at arts. 18, 19.