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Bringing Polluters Before Transnational Courts: Why Industry Should Demand Strict and Unlimited Liability for the Transnational Movements of Hazardous and Radioactive Wastes

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C'est parce qu'on ne le tient jamais jusqu'au bout que rien n'est obtenu. Mais il suffit peut-être de rester logique jusqu'à la fin

-Albert Camus

This article prescribes an international private liability regime for the transnational movements of hazardous and radioactive wastes. Prescription of such a regime is particularly relevant because the Basel Convention for the transfrontier movements of hazardous wastes[1] has entered

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* Ford Foundation Fellow, New York University School of Law. This article was first presented at a dinner meeting organized by Professor Thomas Franck, Director of the Center for International Studies at New York University School of Law. I would like to thank Professor Thomas Franck for organizing this meeting for me from which this article has immensely benefitted. I am grateful to Professor Richard Stewart for his insightful comments on the preliminary drafts of the manuscript, Professor Michael Reisman for valuable suggestions and unremitting support, and Professor Chet Mirsky for his encouragement. Professor Günther Handl and Ms. Christianne Bourloyannis, legal officer at the United Nations, have been most helpful in providing the most recent bibliography. Ms. Senita Birbal, inter-library loan co-ordinator at the N.Y.U. Law Library has been of tremendous assistance in helping accumulate the necessary bibliography.

1. The Basel Convention on the Control on Transboundary Movements of Hazardous Wastes and Their Disposal, Mar. 22, 1989, *reprinted in* 28 I.L.M. 649 (1989) [hereinafter Basel Convention]. The Basel Convention is the first Convention that deals with the problem of transnational movements of hazardous wastes. The Convention establishes prior notification and informed consent as an indispensable prerequisite of international waste transports. The Basel Convention was the international community's response to an accumulation of international incidents in the late 1980's involving waste transfers to developing countries. For example, in June of 1988, drums of mislabeled construction material were dumped in the Nigeria port of Koko. The Nigerian authorities seized the ship and arrested those responsible. In addition, Guinea Bissau was offered three times its GNP in order to accept wastes from the United States and Europe. In Congo the minister for the environment and other top-ranking officials were arrested in two toxic waste dumping deals. *See generally* ELLI LOUKA, THE TRANSNATIONAL MANAGEMENT OF HAZARDOUS AND RADIOACTIVE WASTES 3-6 (Yale Law School, Schell Center Series ed., 1992).

Transfrontier waste movements continue unabated until today. *See infra* notes 280-82. African countries felt that the prior informed consent prescribed by the Basel Convention could not prevent waste exports into Africa and adopted the Bamako Convention that bans waste imports into the African region. *See* Bamako Convention on the Ban of the Import of All Forms of Hazardous Waste Into Africa, Jan 29, 1991, *reprinted in* 30 I.L.M. 773 (1991) [hereinafter Bamako Convention]. For Annexes, *see* 31 I.L.M. 163 (1992). *See generally* LOUKA, *supra* at 9-11.

into force,[2] and a protocol that will deal with liability and compensation issues is under negotiation.[3]

As evidenced by the oil and nuclear liability regimes, strict and limited liability has been the prevailing form of liability in international law. This prevalence is due to the belief that a form of unlimited liability will hamper insurance availability. The purpose of this article is to defeat the myth that strict and unlimited liability is responsible for the lack of insurance for environmental harms. This study demonstrates that strict and unlimited liability cannot be blamed solely for the failure of traditional insurance markets and that the emergence of alternative insurance worldwide will provide waste management and chemical industries with adequate insurance coverage.

The fact that strict and unlimited liability does not hamper insurance is not the only reason why it should be prescribed as the appropriate liability regime for transnational waste movements. Contribution to prevention of accidents caused by waste mismanagement, initiation of direct democratic controls into the international system, and appeasement of social conflicts are additional reasons why the establishment of strict and unlimited liability is imperative.

But strict and unlimited liability, while necessary, is not adequate. When industries are unable to compensate pollution victims, a social insurance mechanism in the form of a fund that would provide immediate relief and residual or full compensation is necessary. Such a fund could be financed by states, industries, or a combination of both. Because of the lack of data of the contribution of each industrial sector to accidents caused by wastes, it would desirable if the fund develops in two stages as analyzed in Section III of this article.

I. INTERNATIONAL LIABILITY REGIMES

A. *The Oil Pollution Regime*

The oil pollution regime is the only comprehensive private liability regime in international law. The oil pollution regime vividly illustrates the preoccupation of the oil industry with limited liability as the type of

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2. *United Nations Officials See Basel Treaty as Limping into Effect with Limited Support*, INT'L ENVTL. DAILY (BNA), May 22, 1992, *available in* LEXIS, Nexis Library, Omni File. The Convention needed twenty ratifications in order to enter into force. At present, the following twenty-two countries have ratified the Convention: Argentina, Australia, China, Czechoslovakia, El Salvador, Finland, France, Hungary, Jordan, Latvia, Liechtenstein, Mexico, Nigeria, Norway, Panama, Poland, Romania, Saudi Arabia, Sweden, Switzerland, Syria, and Uruguay. It is interesting to note that the United States and the member states of the European Community (EC), except for France, have not ratified the Convention. The United States and the European Community countries are the major exporters of hazardous wastes.

3. The current negotiations also involve the creation of an emergency fund. *See* Decisions I/5 and I/14 of the Conference of the Parties to the Basel Convention, UNEP/CHW.1/24, Annex II (Dec. 1992).

liability that will not jeopardize insurance availability. It is essential to mention that the first conventions dealing with oil pollution were conventions on limitations of liability, and that the idea of limiting liability for oil pollution damage preceded the idea of creating a comprehensive regime for oil pollution.[4]

The current international regime of oil pollution is comprised of the 1969 Convention on Civil Liability for Oil Pollution Damage[5] and the 1971 Fund Convention.[6] These Conventions were amended by the 1984 Convention on Civil Liability for Oil Pollution Damage[7] and the 1984 Fund Convention.[8] To be party to a Fund Convention, states must be parties to the respective Liability Convention. The initial Conventions and their amendments co-exist, and states can be parties to one or both of them at the same time.[9]

The oil and tanker industry is anxious to avoid liability under international conventions and has accordingly devised voluntary compensation schemes. One such scheme, the Tanker Owners Voluntary Agreement Concerning Liability for Oil Pollution (TOVALOP), provides for strict and limited liability of shipowners just as the Conventions on Civil Liability do. Another scheme, the Contract Regarding an Interim Supplement to Tanker Liability for Oil Pollution (CRISTAL), provides for a fund similar to those prescribed by the Fund Conventions.[10] By adopting

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4. *See, e.g.*, International Convention for the Unification of Certain Rules Relating to the Limitation of Liability of Owners of Sea Going Vessels, Aug. 25, 1924, *reprinted in* INTERNATIONAL MARITIME CONVENTIONS 1383 (Ignacio Arroyo ed., 1991); International Convention Relating to the Limitation of Liability of Owners of Sea-going Ships, Oct. 10, 1957, *reprinted in* INTERNATIONAL MARITIME CONVENTIONS 1389 (Ignacio Arroyo ed., 1991).

5. Convention on Civil Liability for Oil Pollution Damage, Nov. 29, 1969, 973 U.N.T.S. 3, *reprinted in* 9 I.L.M. 45 (1970) [hereinafter 1969 Convention]. *See also* Protocol to the 1969 International Convention on Civil Liability for Oil Pollution Damage, Nov. 19, 1976, *reprinted in* 16 I.L.M. 617 (1977) (the purpose of this Protocol was to amend the "Unit of Account" in which limits of liability are expressed. The initial unit was the gold franc; the Protocol replaced it with "Special Drawing Rights" (SDRs)).

6. International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, Dec. 18, 1971, *reprinted in* INTERNATIONAL CONVENTIONS ON MARITIME LAW 236 (Comité Maritime International ed., 1987)[hereinafter 1971 Fund Convention]. *See also* Protocol to International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971, Nov. 19, 1976, *reprinted in* 16 I.L.M. 621 (1977).

7. Protocol of 1984 to Amend the International Convention on Civil Liability for Oil Pollution Damage, May 25, 1984, *reprinted in* 2 INTERNATIONAL PROTECTION OF THE ENVIRONMENT 1 (Bernd Rüster & Bruno Simma eds., 1990) [hereinafter Protocol of 1984 to Amend 1969 Convention].

8. Protocol of 1984 to Amend the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, May 25, 1984, *reprinted in* 2 INTERNATIONAL PROTECTION OF THE ENVIRONMENT 21 (Bernd Rüster and Bruno Simma eds., 1990)[hereinafter 1984 Fund Convention].

9. DAVID W. ABECASSIS & RICHARD L. JARASHOW, OIL POLLUTION FROM SHIPS: INTERNATIONAL, UNITED KINGDOM AND UNITED STATES, LAW AND PRACTICE 246-47 (1985).

10. *Id.* at 303.

[T]he two schemes operate together as an integrated whole, but they do not

voluntary compensation schemes, the oil industry has hoped to demonstrate to governments that international treaties are unnecessary or at least to influence the emerging international norms for oil pollution.[11] The industry has failed in both endeavors. The 1969 Convention and the 1971 Fund Convention have entered into force, and the 1984 regime is far more progressive than the one advocated by industry.[12]

The 1969 Convention imposes on shipowners strict and limited liability for oil pollution damage[13] and joint and several liability when two or more ships are involved and the pollution damage is not reasonably separable.[14] Shipowners can limit their liability to a specific amount by creating a limitation fund.[15] However, they are not entitled to limited liability if the incident that caused pollution is the result of their "fault or privity."[16] The concept of "fault or privity" is not further explained in the 1969 Convention. The 1984 Convention clarified it by providing that shipowners are not entitled to limit their liability if it is proved that the pollution damage was the outcome of an intentional act or omission, or from reckless behavior and with knowledge that such damage would probably result.[17] Reckless behavior, however, is a flexible concept providing courts with significant latitude to impose unlimited liability.

The limitation fund established by the owner is distributed among the claimants in proportion to the amount of their claims. The distribution of claims is a smooth procedure when the total amount claimed does not exceed the limitation fund established by the owner, otherwise it may be delayed.[18]

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apply to cases actually covered by their respective international legal counterparts: a claimant cannot recover under both the Fund Convention and CRISTAL, for instance, but he can recover under the Liability Convention and CRISTAL if the Fund Convention does not apply to the case.

Id. See generally CHRISTOPHER HILL, MARITIME LAW 311-16 (1989).

11. ABECASSIS & JARASHOW, *supra* note 9, at 304.

12. *Id.*

13. 1969 Convention, *supra* note 5, art. III(2). According to article III(2), shipowners are exempt from liability in cases of *force majeure*, or when pollution damage is wholly caused by a third party with the intent to cause such damage, or by negligence or a wrongful act of a government or other authority responsible for the maintenance of lights or other navigational aids. The term "navigational aids" is too vague. In an incident involving the oil pollution of Swedish territorial waters by a Soviet tanker, the Soviet tanker was able to prove that the pollution was due to a failure to mark a rock on the navigation chart. *See* HILL, *supra* note 10, at 291.

14. 1969 Convention, *supra* note 5, art. IV.

15. According to article V(1) as amended in 1976, shipowners can limit their liability to an amount of 133 SDRs for each ton of the ship's weight. This amount shall not exceed fourteen million SDRs. *See supra* note 5.

16. 1969 Convention, *supra* note 5, art. V(2).

17. Protocol of 1984 to Amend 1969 Convention, *supra* note 7, art. 6(2).

18. ABECASSIS & JARASHOW, *supra* note 9, at 217. The fund has been involved in sixty cases. In one case, it had not been possible to fully compensate the damage. Another case where claims may exceed the limit is still pending. *See* Günther Doeker & Thomas Gehring, RESEARCH PAPER NO. 32, *in* LIABILITY FOR ENVIRONMENTAL DAMAGE 30 (United Nations Con-

Under the Convention, the plaintiff can bring an action for compensation only in the courts of the contracting state where the damage occurred.[19] Nonetheless, according to conflicts of law rules, a plaintiff can bring an action in the courts of a non-contracting state if the person responsible for the pollution damage is domiciled within that state.[20]

The Convention also provides for compulsory insurance of shipowners registered in a contracting state and carrying more than two thousand tons of oil in bulk.[21] One of the advantages of compulsory insurance is that it drives out of the market those shipowners who do not have adequate assets to cover possible pollution damage. This effect is tempered, however, by the fact that only those shipowners carrying two thousand tons of oil are required to maintain insurance.[22] National governments must enforce the compulsory insurance provision by ensuring that the ships they register maintain insurance and carry an insurance certificate on board.[23] Ships registered in contracting states with no insurance certificate are not allowed to engage in the business of carrying oil.[24] Ships registered in non-contracting states are also required to hold such a certificate whenever they enter or leave ports or off-shore terminals of contracting states.[25] This prevents those shipowners from acquiring a competitive advantage over ships of contracting states.[26] The 1984 Convention further clarifies that contracting states should mutually recognize the certificates they issue and that a ship registered in a non-contracting state can obtain such a certificate from the authorities of any contracting state.[27]

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ference on the Environment and Development ed., 1992) [hereinafter UNCED].

19. 1969 Convention, *supra* note 5, art. IX. Article VIII also provides that the plaintiff has no right to compensation if she brings an action after three years from the date the damage occurred. No action can be brought after six years from the date of the incident that caused the damage.

20. ABECASSIS & JARASHOW, *supra* note 9, at 220-21.

> [T]his has been dramatically illustrated in the *Amoco Cadiz* case off France (a contracting state) in 1978, where French plaintiffs, including the French government, instituted actions in the United States (which was not a contracting state) where the managers of the ship were domiciled. The other defendants included the owner, registered in Liberia (a contracting state) and the ship builder, registered in Spain (also a contracting state). The United States Court of Appeals rejected the plea of *forum non conveniens* made by the ship builder, and the District Court for the Northern District of Illinois proceeded to enter judgment against the owners, the managers, and their parent company.(citations omitted).

Id. *See also* Tullio Scovazzi, *Industrial Accidents and the Veil of Transnational Corporations*, *in* INTERNATIONAL RESPONSIBILITY FOR ENVIRONMENTAL HARM 395, 413-21 (Francesco Francioni & Tullio Scovazzi eds., 1991) [hereinafter ENVIRONMENTAL HARM].

21. 1969 Convention, *supra* note 5, art. VII(1).

22. ABECASSIS & JARASHOW, *supra* note 9, at 224.

23. 1969 Convention, *supra* note 5, art. VII(2), (4).

24. *Id.* art. VII (10).

25. *Id.* art. VII(11).

26. ABECASSIS & JARASHOW, *supra* note 9, at 225.

27. Protocol of 1984 to Amend 1969 Convention, *supra* note 7, art. 7.

The 1969 Convention applies exclusively to pollution damage caused within the territory or the territorial sea of contracting states.[28] Pollution damage is defined as loss or damage caused from the escape or discharge of oil from a ship carrying oil.[29] The loss or damage also includes "the costs of preventive measures and further loss or damage caused by preventive measures."[30] Preventive measures, in turn, are defined as reasonable measures taken *after* the oil spill has occurred for the prevention or minimization of pollution damage.[31] The definition of oil pollution damage has been criticized as vague because only personal injuries are covered under the Convention, while there is no specification for the type and scope of other damages.[32]

To some extent the 1984 Convention has remedied the shortcomings of the 1969 Convention's definition of oil pollution damage. The 1984 Convention establishes that compensation should cover not only personal injuries, but also include property damages and loss of profit.[33] Claims for compensation for impairment of the environment are limited to the cost of reasonable measures actually undertaken or measures to be undertaken for reinstatement of the environment.[34] The Convention does not provide details on causation, which damages are considered remote, or information on how to quantify damages such as loss of future earnings.[35] Instead, the Convention leaves this task to national courts. Yet, lack of details on causation and quantification should not be conceived as a shortcoming of the Convention.[36] Until sufficient national legislation is passed, case-by-case adjudication can address these details better than general treaty provisions. International conventions have to maintain a certain level of flexibility in order to accommodate future developments.

Another innovation of the 1984 Convention is that it establishes liability not only for occurrences resulting in pollution damage but also occurrences creating "a grave and imminent threat of causing such damage."[37] Plaintiffs can now be compensated not only for preventive measures after pollution has occurred but also for measures taken to avert threats of pollution.

The geographical scope of the 1984 Convention includes the exclusive economic zone as well as the territory and the territorial sea of the con-

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28. 1969 Convention, *supra* note 5, art. 2.

29. *Id.* art. I(6).

30. *Id.*

31. *Id.* art. I(7).

32. ABECASSIS & JARASHOW, *supra* note 9, at 209.

33. Protocol of 1984 to Amend 1969 Convention, *supra* note 7, art. 2(3). *See also* ABECASSIS & JARASHOW, *supra* note 9, at 237-38.

34. ABECASSIS & JARASHOW, *supra* note 9, at 237-38.

35. *Id.*

36. *But see id.* at 209, 239.

37. *Compare* 1969 Convention, *supra* note 5, art. I(8) *with* Protocol of 1984 to Amend 1969 Convention, *supra* note 7, art. 2(4).

tracting states.[38] Liability is channelled to the owner, but other people that perform services for the ship such as the manager, charterer, or operator of the ship[39] can be held liable if the damage resulted from a reckless or intentional act or omission and with knowledge that such damage would probably result. As mentioned above, the term "recklessly" provides courts with ample discretion to hold these persons liable. The Convention does not provide for liability of the builder or the repairer of the ship, but the builder or repairer may be held liable under domestic law.[40]

One of the priorities of 1984 Convention was to raise the liability limits of the 1969 Convention. The liability ceilings adopted were considered too high by some states and therefore the final draft of the Convention was adopted with many abstentions.[41] The procedure for revising the liability ceilings adopted in the 1984 Convention does not require a Conference, as did the 1969 Convention.[42] The 1984 Convention merely requires an amendment adopted by the Legal Committee of the International Maritime Organization (IMO). The amendment is considered accepted within eighteen months after notification to all state parties, unless a quarter of the state parties object.[43] Industry's preoccupation with the repercussions of liability on insurance is evident: state parties will consider the potential increase in insurance costs when contemplating any revision of the liability ceiling.[44]

The 1971 Fund Convention supplements the 1969 Liability Convention and provides for compensation of victims of pollution[45] and for indemnification of the owner held liable under the Liability Convention.[46] Indemnification of the shipowner was excessively debated during the drafting of the Convention because of the conflict of interests between states with shipping industry and oil receiving states that finance the Fund.[47] Finally, the indemnification provision was abolished in the 1984

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38. *Compare* 1969 Convention, *supra* note 5, art. II *with* Protocol of 1984 to Amend 1969 Convention, *supra* note 7, art. 3.

39. According to article 4(2) of the Protocol of 1984 to Amend 1969 Convention, *supra* note 7, these people include the following: the servants or agents of the owner or the members of the crew; the pilot or any other person who, without being a member of the crew, performs services for the ship; any person performing salvage operations with the consent of the owner or on the instructions of a competent public authority; any person taking preventive measures; and all servants or agents of persons mentioned above.

40. ABECASSIS & JARASHOW, *supra* note 9, at 233.

41. *Id.* at 240. According to article 4 of the Protocol of 1984 to Amend 1969 Convention, *supra* note 7, shipowners can limit their liability to the three million SDRs for a ship that does not exceed five thousand units of tonnage; for a ship with additional tonnage, an additional 420 million SDRs are required. In any case the amount can not exceed 59.7 million SDRs.

42. Protocol of 1984 to Amend 1969 Convention, *supra* note 7, art. 15.

43. *Id.* art. 15(7).

44. *Id.* art. 15(5).

45. 1971 Fund Convention, *supra* note 6, art. 4(6). The amount of compensation can in no case exceed 900 million francs or be lower than 450 million francs.

46. *Id.* art. 5(1).

47. ABECASSIS & JARASHOW, *supra* note 9, at 261.

Fund Convention.[48]

Compensation is provided for pollution damage[49] only if the claimant is unable to obtain full and adequate compensation under the Liability Convention.[50] The claimant can also recover preventive costs as defined by the Liability Convention.[51] Preventive costs are those costs incurred from measures undertaken *after* the oil spill occurred. The 1984 Fund Convention further improved this definition by providing that the claimant is entitled to compensation for preventive measures taken *before* the occurrence of the oil spill.[52]

Under the 1971 Fund Convention, the amount of damages to which the victims are entitled is unrelated to the amount of indemnification paid to the owner. The provision relating to distribution of Fund resources among claimants is ambiguous.[53] The 1984 Fund Convention[54] clarified this provision by providing that claims against the Fund should be treated as a separate group and distributed *pro rata* disregarding the extent to which they have been satisfied by the limitation fund of the Liability Convention.[55] According to Fund practice, the claims covered under its provisions are restoration of the environment, loss of livelihood, loss of income, and environmental damage.[56] But claims to recover costs for environmental damage can be raised only if economic interests are affected.[57]

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48. 1984 Fund Convention, *supra* note 8, art. 7.

49. Both the 1969 Liability Convention and the 1971 Fund Convention define pollution damage in the same terms. *See* 1971 Fund Convention, *supra* note 6, art. 1(2).

50. The claimant is unable to obtain full and adequate compensation when no liability for damage arises under the Liability Convention, or when the owner liable under the Liability Convention is financially incapable of meeting her obligations, or when the damage exceeds the owner's limitation fund. 1971 Fund Convention, *supra* note 6, art. 4(1).

51. *See* 1971 Fund Convention, *supra* note 6, art. 1(9).

52. 1984 Fund Convention, *supra* note 8, art. 2(3). The 1984 Fund Convention defines preventive measures as the 1984 Liability Convention does. *See id.* art. 2(2).

53. 1971 Fund Convention, *supra* note 6, art. 4(5):

> Where the amount of established claims against the Fund exceeds the aggregate amount of compensation payable under paragraph 4, the amount available shall be distributed in such manner that the proportion between any established claim and the amount of compensation actually recovered by the claimant under the Liability Convention shall be the same for all claimants.

See also ABECASSIS & JARASHOW, *supra* note 9, at 270.

54. The 1984 Fund Convention has also raised the liability limits to 135 million SDRs. *See also* 1984 Fund Convention, *supra* note 8, art. 6(4)(c), which calls for liability limits to be raised to 200 million SDRs in case state parties to the Convention receive oil equal to 600 million tons. This is because oil-receiving states contribute to the Fund. *See infra* at 71. Thus, in practice the limit will be raised only if the United States together with Japan, or with Italy and France, or with Italy and the Netherlands, participate in the Fund. *See* UNCED, *supra* note 18, at 34.

55. ABECASSIS & JARASHOW, *supra* note 9, at 269-70, 295.

56. *See generally id.* at 274-77.

57. It is difficult to quantify harm to the environment when tangible economic loss or personal injury is not involved. *See* Note by the Director General on Claims Relating to Damage to the Marine Environment, IOPC Fund, Exec. Comm., 30th Sess., Agenda Item 3,

The Fund's settlement procedure is quite remarkable. The Fund has developed a Claims Manual that provides a simple procedure for claim settlement.[58] The Fund has a good working relationship with the Protection and Indemnity Clubs (P&I Clubs) of shipowners, and claimants can bring their claims just once to either of these two bodies in order to obtain compensation.[59] Subsequently, the Club and the Fund divide the amount paid to the claimant.[60] P&I Clubs are composed of shipowners who organize to mutually indemnify each other against lawsuits in case of damage to cargo or injuries to third parties. The Clubs started to operate in the nineteenth century when underwriters at Lloyd's of London would cover only three quarters of hull damage.[61] Today P&I Clubs cover ninety percent of the world shipping industry. They provide unlimited coverage in most cases, except for oil pollution and nuclear incidents.[62] P&I Clubs, while considered a traditional form of insurance, are one of the oldest forms of alternative insurance.[63]

The Fund also provides for prepayment of damages after verifying that the shipowner is entitled to liability limits under the Liability Convention. To receive prepayment, one must also demonstrate undue financial hardship on the part of the shipowner.[64] The Fund additionally provides for credit facilities to contracting states "in imminent danger of substantial pollution damage."[65] The 1984 Fund Convention enhanced these provisions by providing for compensation even if the shipowner has not yet established a limitation fund.[66]

The Fund is financed by entities of states that have received in the relevant calendar year more than 150,000 metric tons of oil.[67] Therefore, states with modest oil imports can become parties to the Fund Convention, enjoying its full protection, without imposing on the industry to contribute to the Fund.[68] Enforcement is left to states, which should make sure that industry's financial obligation to the Fund are fulfilled and which should impose sanctions when necessary.[69] The 1984 Fund Convention additionally provides that states can be held liable if their failure to police the contributors results in financial loss to the Fund.[70]

FUND/EXC.30/2 (Nov. 29, 1991); *see also* IOCP Fund Resolution No. 3—Pollution Damage, Annex, FUND/EXC.30/2 (Oct. 1980).

58. ABECASSIS & JARASHOW, *supra* note 9, at 272.

59. *Id.* at 272-73 (mentioning the Fund's internal regulations).

60. *Id.* at 273.

61. BRUCE FARTHING, INTERNATIONAL SHIPPING 49 (1987).

62. *Id.*

63. J. Brady Young, *High Stakes in the Alternative Market: Non-Traditional Risk-Financing Techniques*, BEST'S REV., Jan. 1992, at 47.

64. ABECASSIS & JARASHOW, *supra* note 9, at 273.

65. *Id.*

66. 1984 Fund Convention, *supra* note 8, art. 6(5).

67. 1971 Fund Convention, *supra* note 6, art. 10(1).

68. ABECASSIS & JARASHOW, *supra* note 9, at 278.

69. 1971 Fund Convention, *supra* note 6, art. 13(2).

70. 1984 Fund Convention, *supra* note 8, art. 16(2).

In general, the oil pollution regime is very comprehensive, but it has one important shortcoming: the prescription of limited liability. The inadequacy of liability limits is evidenced by their repeated increases after environmental disasters.[71] After the *Amoco Cadiz* disaster, France, a state party to the 1974 Convention, refused to collect the money deposited in the limitation fund because of limited liability restraints. Instead, France brought an action in the United States, the domicile of the ship's builder and operator.[72]

Except for the prescription of limited liability, the oil pollution regime provides a model private liability system for environmental accidents with international implications.[73] The 1984 Civil Liability and Fund Conventions clarified many of the provisions of the Conventions they have amended. They provide explicitly for compensation for economic loss, and for recovery of expenditures for restoration of the environment. They also provide for compensation even when the shipowner has not established a limitation fund. Because of these progressive provisions, the Conventions have yet to enter into force. The United States Congress refused to ratify the Conventions, and therefore the prospects of the Conventions ever entering into force are slim.[74] For this reason the IMO decided to amend the Conventions in order to ease their ratification.[75]

After the *Exxon Valdez* disaster, the United States enacted legislation[76] that not only increased the liability limits for oil pollution[77] but also provided for unlimited liability in many more instances than do the 1971 and 1984 Conventions on Civil Liability.[78] Even before the Oil Pollution Act, United States courts interpreted the Limitation Liability Act of 1851[79] broadly. According to the Act, shipowners are not entitled to limit their liability if the damage occurred due to their privity or knowl-

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71. UNCED, *supra* note 18, at 37-38 (For example, liability limits were increased by fifty percent after the *Amoco Cadiz* incident).

72. *See* In re Oil Spill by the Amoco Cadiz off the Coast of France on March 16, 1978, 954 F.2d 1279 (7th Cir. 1992).

73. The success of the Conventions is evidenced by the fact that many countries have ratified them. For example, since their entry into force, 71 countries have ratified the 1971 Civil Liability Convention, and 47 countries have ratified the 1971 Fund Convention.

74. *See supra* note 54.

75. Consideration of Draft Protocols with Amendments to the Intergovernmental Oil Pollution Liability and Compensation System Based on the 1969 Civil Liability Convention and the 1971 Fund Convention and Related Issues, IMO Leg. Comm., 66th Sess., Agenda Item 9, at 21-24, IMO Doc. LEG 66/9 (Mar. 26, 1992).

76. Oil Pollution Act, 33 U.S.C. §§ 2701-2761 (1990).

77. 33 U.S.C. § 2704(a).

78. *Compare* 1969 Convention, *supra* note 5, art. V(2) and Protocol of 1984 to Amend 1969 Convention, *supra* note 7, art 6(2) *with* 33 U.S.C. § 2704(c), which provides that polluters are not entitled to limited liability in case of gross negligence, willful misconduct or "*violation of an applicable Federal safety, construction, or operating regulation*" (emphasis added). In addition, according to the Oil Pollution Act, polluters are not accorded as many defenses as under the Civil Liability Convention. *Compare* 1969 Convention, *supra* note 5, art. III(2) *with* 33 U.S.C. § 2703.

79. 46 U.S.C. §§ 181-89 (1982).

edge.[80] Courts initially supported Congress' purpose for the Act — to enhance the competitiveness of the United States shipping industry, which was at that time comprised of small shipowners. But during the 1950's and 1960's, the courts refused to provide the same protection to multinational oil corporations. The courts instead interpreted the statute in favor of pollution victims. More specifically, the courts started imposing unlimited liability not only when shipowners had actual knowledge of an imminent threat of an accident but also when they should have had knowledge of such a threat, such as knowledge of the lack of seaworthiness or faulty condition of the ship.[81] Perhaps the different national courts that will interpret the Liability Convention will follow the same path. As emphasized, the explicit provision for unlimited liability when shipowners recklessly cause damage opens the door for such an interpretation.

In practice, the 1971 regime has functioned smoothly with an amicable resolution of most disputes. This is largely due to the fact that oil spills do not directly affect population centers by causing injuries and deaths. Oil spills have a more subtle effect on the surrounding marine environment. A liability regime for transnational waste movements can build upon many of the provisions of the oil pollution regime.

B. *International Liability of the Carriers of Dangerous Goods*

The Convention on Civil Liability for Damage Caused During Carriage of Dangerous Goods by Road, Rail and Inland Navigation Vessels (CRTD)[82] was prepared by the United Nations Economic Commission for Europe (ECE), but it is opened for signature to other countries.[83] The Convention places strict and limited liability on operators of railway lines and persons in control of vehicles carrying dangerous goods.[84]

In order to facilitate the identification of the liable person, it is presumed that the person in whose name the vehicle is registered is liable. When such registration does not exist, the owner will be held liable, unless the owner can prove that another person was in control of the vehicle

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80. 46 U.S.C. § 183(a).

81. Linda Rosenthal & Carol Raper, *Amoco Cadiz and Limitation of Liability for Oil Spill Pollution: Domestic and International Solutions*, 5 VA. J. NAT. RESOURCES L. 259, 270-72 (1985).

82. UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE (ECE), CONVENTION ON CIVIL LIABILITY FOR DAMAGE CAUSED DURING CARRIAGE OF DANGEROUS GOODS BY ROAD, RAIL OR INLAND NAVIGATION VESSELS (CRTD), U.N. Doc. ECE/TRANS/84, U.N. Sales No. E.90.II.E.39 (1990) (including Explanatory Report) [hereinafter CRTD Convention]. The Convention has not yet come into force.

83. *Id.* art. 22.

84. *Id.* art. 1(8). When the vehicle on which the dangerous goods are transported is carried on another vehicle the operator of that other vehicle will be considered the carrier. *See* art. 1(8)(a). When damage has resulted from an incident involving two or more vehicles, and the damage is inseparable, both carriers will be held jointly and severally liable. *See* art. 8.

with or without the owner's consent.[85]

The primary concern of the drafters of the treaty was to protect potential victims, while simultaneously minimizing insurance costs. Therefore, the different solutions proposed by the drafters contemplated both of those considerations.[86] The possibility of channeling liability to the owner of goods was excluded because ownership may change many times during transport, making identification of the owner burdensome.[87] Channeling responsibility to the producer of goods was also excluded because the producer has no control over the carriage. Moreover, the carriage may take place many years after production and, consequently, it would be unfair to require the producer to keep insurance just in case of an accident during transportation. Many times dangerous goods are transported together, and it is difficult to distinguish which producer's goods have caused the damage.[88] Imposing liability on the shipper was additionally viewed as impractical. The shipper would have to take out insurance for each and every consignment, and it would be difficult at the time of an accident to decipher which shipper's substance caused the damage.[89]

Placing liability on the carrier seemed the most reasonable solution to most governments since the carrier is in control of the movement of goods, can be easily identified by the victims, and can purchase insurance on an annual basis. Carriers fiercely opposed this proposition. They claimed that accidents occur due to the inherent danger of the goods carried and that imposing liability on the carrier will only increase the cost of insurance, distort competition, and drive many carriers out of business. The carriers proposed joint responsibility of carriers and shippers. However, joint responsibility was rejected because it was considered impractical to place responsibility on the shipper, and because most governments considered joint and several liability too complex. Yet recognizing the inequities of placing responsibility on the carrier when other persons are also responsible, the Convention renders the consignor or consignee liable for accidents caused during loading or unloading without the participation of the carrier. Joint liability is additionally established when both the carrier and another person are involved in loading and unloading.[90] Except for the reasons mentioned above, persons other than the carrier are not required to take out insurance.[91]

The issue of whether liability should be limited or unlimited was a source of contention during the drafting of the treaty. It is interesting to note that a large number of governments favored unlimited liability, arguing that the adoption of unlimited liability in domestic systems has not

85. *Id.* art. 1(8).
86. *Id.* at 6, Explanatory Report.
87. *Id.*
88. *Id.*
89. *Id.* at 7.
90. *Id.* art. 6.
91. *Id.* art. 6(2)(a).

prevented the operation of compulsory insurance.[92] As a compromise, limited liability was adopted,[93] while it was made clear that governments may adopt higher limits or unlimited liability.[94] The Convention also provides that when carriers are entitled to limit their liability, they must establish a limitation fund with the court where an action is brought.[95] Carriers are not entitled to limit their liability when the damage is caused by their intentional or reckless act or omission or by an intentional or reckless act of their servants and agents.[96]

The defenses provided in this Convention are broader than those of the Oil Pollution Convention.[97] Except for *force majeure*, carriers cannot be held liable if they can prove that consignors or other persons did not fulfill their obligation to inform them about the dangerous nature of goods. The carriers must also prove that they did not know, or were not required to know, that the goods carried were dangerous.[98] The carrier is also exonerated from liability if the damage resulted from an intentional or negligent act or omission of the victim.[99] In case the carrier is not liable, other persons may be held liable, but many important provisions of the Convention will not apply to them.[100]

Following the 1969 Oil Pollution Convention, the CRTD Convention provides for compulsory insurance.[101] The insurance covers not only the carrier mentioned in the insurance policy, but it also covers any other person in control of the vehicle at the time of an accident.[102] The participants felt that insurance companies would be able to insure carriers, and

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92. *Id.* at 9, Explanatory Report.

93. For the limits of liability, see *id.* art. 9:

> The liability of the road carrier and of the rail carrier under this Convention for claims arising from any one incident shall be limited as follows: (a) with respect to claims for loss of life or personal injury: eighteen million units of account (b) with respect to any other claim: twelve million units of account. The liability of the carrier by inland navigation vessel under this Convention for claims arising from any one incident shall be limited as follows: (a) with respect to claims for loss of life or personal injury: eight million units of account (b) with respect to any other claim: seven million units of account. *See also id.* art. 37, Explanatory Report. The reason for imposing lower liability limit for inland navigation carriers was the absence of insurance markets for such carriers, and concerns that small such carriers will not be able to insure up to the amounts provided for rail and road carriers.

94. *Id.* art. 24.

95. *Id.* art. 11.

96. *Id.* art. 10.

97. *Compare* 1969 Convention, *supra* note 5, art. III(2) *with* CRTD Convention, *supra* note 82, art. 5(4).

98. *See also* Convention on the Contract for the International Carriage of Goods by Road (CMA), May 19, 1956, art. 22, *reprinted in* 399 U.N.T.S. 189. Servants and agents of a carrier are exonerated from liability as well unless they acted with intent or with knowledge that such damage would probably result. *See* CRTD Convention, *supra* note 82, art. 5(7).

99. CRTD Convention, *supra* note 82, art. 5(5).

100. *Id.* art. 7.

101. *Id.* art. 13.

102. *Id.* art. 13(2).

they believed that, because of the limited amounts of liability, even small carriers would be able to insure. The insurance companies were in favor of such a regime. While they claimed that strict liability may initially lead to an increase in premiums, they maintained that such an increase would be reassessed by taking into account the number and severity of claims.[103] The monitoring of insurance provisions is left to state parties. Each state party must designate competent authorities that will issue or approve certificates verifying that the carriers have obtained insurance.[104] In order to speed the settlement of disputes, claims for compensation may be brought directly against the insurer. No action against the carrier or its insurer may be brought three years after the victim knew or should have known of the damage and the identity of the carrier, or ten years after the incident.[105] Actions may be brought in the courts of the state party where damage occurred, where the incident took place, or where preventive measures were taken. In addition, and contrary to the oil pollution and nuclear liability regimes, an action may be brought where carriers have their habitual residence — the state of registration when the ship entangled in the accident is subject to such registration.[106] Some governments also proposed the establishment of a fund for use when compensation exceeds the liability limits, but the proposal did not gain the support of the majority of governments. It was recognized that the oil importers sponsoring the oil pollution fund were more readily identifiable than industries involved with dangerous goods.[107]

The definition of dangerous goods provided by the Convention is very comprehensive.[108] The Convention refers to the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR),[109] which contains extensive lists of dangerous substances subject to frequent updates. This puts carriers on notice about which substances may entail liability under the Convention. The definition of dangerous goods is broad enough to include hazardous wastes as long as there is no specific liability regime for the transfers of hazardous wastes.[110]

The damages covered under the Convention involve loss of life or personal injury and loss of or damage to property.[111] Recovery for pure economic loss is not explicitly covered by the Convention. It should be

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103. *Id.* at 9, Explanatory Report.

104. *Id.* art. 14.

105. *Id.* art. 18.

106. *Id.* art. 19.

107. *Id.* at 10, Explanatory Report.

108. *Id.* art. 1(9).

109. ECONOMIC COMMISSION FOR EUROPE, EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD, U.N. Doc. ECE/TRANS/80, U.N. Sales No. E.89.VII.2 (including amendments up to January 1990).

110. Basel Convention, *supra* note 1, art. 12, provides that state parties must adopt a liability protocol concerning the transfrontier movements of hazardous wastes. *See also supra* note 3.

111. CRTD Convention, *supra* note 82, art. 1(9).

mentioned, however, that during the drafting, many states resisted explicit exclusion of pure economic loss and maintained that because national laws were still evolving such issues must be covered by domestic legislation.[112] Loss or damage from polluting the environment may also be recovered provided that compensation for impairment of the environment, other than loss of profit, is restricted "to costs of reasonable measures of reinstatement actually undertaken or to be undertaken."[113] The costs of preventive measures and loss or damage caused by preventive measures must also be covered.[114] Preventive measures, however, are defined as measures taken after an incident has occurred.[115]

An advantage of the Convention is that, by subjecting reckless carriers to unlimited liability, it leaves open the possibility for application of unlimited liability. In addition, the Convention justifiably renders consignors liable if they fail to inform carriers about the nature of dangerous goods. But unfortunately, the Convention does not go far enough. Establishing limited liability that could be superseded by expansive judicial interpretations or by national laws imposing increased liability limits or unlimited liability fails to bind states to a uniform liability regime. A fund sponsored by consignors or consignees seems also necessary since the aggravation of many accidents is due to improper packing or the inherent nature of dangerous goods. A fund could provide the mechanism through which persons profiting from the trade in dangerous goods will internalize the costs resulting from the transportation of such goods.

Yet attempts to impose liability on the shippers of dangerous substances within the framework of the Draft Convention Concerning the Carriage of Hazardous and Noxious Substances by Sea[116] have been met with strong resistance from the chemical industry. The chemical industry claims that liability should lie with the shipowner according to the traditional rules of maritime law. Another problem is that because many diverse industries are involved in the transportation of dangerous goods, it is difficult to create an effective international body capable of collecting contributions.

Recent proposals involve the establishment of an "International Dangerous Goods Scheme." Under the initial formulation of the Scheme, each shipper and shipowner had to purchase a dangerous goods certificate stating the amount and nature of the cargo, and in which trip it would be

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112. *Id.* at 17-18, Explanatory Report.

113. *Id.* art.1(9)(c).

114. *Id.* art. 1(9)(d).

115. *Id.* art. 1(11).

116. 1991 Draft Convention on Liability and Compensation in Connection with the Carriage of Hazardous and Noxious Substances by Sea, Jan. 25, 1991, IMO Doc. LEG. 64/4 [hereinafter HNS Convention]. The Convention has been recently amended. *See* 1992 Draft International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, Jan. 5, 1993, IMO Doc. LEG 684 [hereinafter HNS Revision].

transported.[117] Later in the negotiations, it was decided that only shippers should sponsor the Scheme[118] because that was more in line with the established law and practice initiated by the oil pollution regime.[119] The certificates purchased by shippers will be issued by "issuing agents" — governments[120] — on behalf of the Scheme.[121] Many problems, however, emerged in trying to identify the contributions of each industrial sector.[122] These problems would be difficult to resolve because of the lack of statistics identifying the rate of involvement of each industrial sector in accidents.[123] The chemical industry has proposed that only shipowners should participate in the Scheme. According to the chemical industry, shipowners must incorporate the cost of contributing to the Scheme into the freight price, and contribute the charge so collected to the Scheme. If they fail to contribute, they should be refused registration until they pay.[124] The proposal of the chemistry industry has been rejected.[125]

C. *The Nuclear Liability Regime*

The nuclear liability regime is comprised of three conventions: the Paris Convention[126] adopted by the Nuclear Energy Agency (NEA) of the

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117. HNS Convention, *supra* note 116, art. 17.

118. It has been proposed that the term "scheme" should be replaced by the term "fund." Consideration of a Draft International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, IMO Leg. Comm. 66th Sess., Agenda Item 9, at 9, IMO Doc. LEG. 66/9 (Mar. 26, 1992) [hereinafter 66th Session Report].

119. HNS Revision, *supra* note 116, art. 17.

120. Norway has proposed that in addition to issuing agents, voluntary "industry associations" should be able to issue HNS certificates. According to Norway's proposal, an industry association may include a trade sector, or part of a trade sector, world-wide or regional. The members of such associations will have to purchase HNS certificates, but the associations will have to contribute to the Scheme based on transport statistics. Shippers will have to reimburse their industry association according to their membership terms. *See* Consideration of a Draft International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, IMO Leg. Comm. 67th Sess., Agenda Item 9, Annex 2, at 6, IMO Doc. LEG 67/9 (Oct.13, 1992) [hereinafter 67th Session Report].

121. HNS Revision, *supra* note 116, art. 12, 14.

122. 66th Session, *supra* note 118, Annex 2.

123. 67th Session Report, *supra* note 120, at 5, 11.

124. Consideration of a Draft International Convention of Liability and Compensation for Damage in Connection with the Carriage of Dangerous Goods by Sea, Submitted by the European Chemical Industry Council (CEFIC), IMO Legal Comm., 65th Sess., Agenda Item 3, at 2, IMO Doc. LEG. 65/3/8 (Sept. 10, 1991). CEFIC reiterated its position in the 67th Session Report, *supra* note 120, at 7.

125. Report of the Group of Technical Experts on the Consideration of a Draft International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, IMO Leg. Comm. 67th Sess., Agenda Item 3, at 8, IMO Doc. LEG 67/WP.7 (Oct. 1, 1992).

126. Convention on Third Party Liability in the Field of Nuclear Energy, July 29, 1960, 1041 U.N.T.S. 358 [hereinafter Paris Convention].

Organization for Economic Co-operation and Development (OECD),[127] the Vienna Convention[128] adopted by the International Atomic Energy Agency (IAEA),[129] and the Brussels Convention, which supplements the Paris Convention.[130] State parties to the Paris Convention are not parties to the Vienna Convention. For this reason, the Joint Protocol Relating to the Application of the Vienna and Paris Conventions[131] provides that a state party to the Vienna or Paris Conventions and the Protocol can recover damages from the operator of a nuclear facility installed in a state that is party to either Convention.[132]

Both the Paris and the Vienna Conventions impose strict[133] and limited liability on the operator of a nuclear installation[134] and joint and several liability when more than one operator is liable and the damage is not reasonably separable.[135] Limited liability was considered preferable because it was protective of the relatively new nuclear energy industry.[136] Channelling liability exclusively to the operator avoided the excessive administrative and insurance costs related with inquiries into the liability of the other actors such as suppliers and transporters.[137] The Conventions

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127. Seventeen OECD countries have signed the Convention: Belgium, Denmark, Finland, Germany, Greece, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Turkey, and United Kingdom.

128. Vienna Convention on Civil Liability for Nuclear Damage, May 21, 1963, 1063 U.N.T.S. 265 [hereinafter Vienna Convention].

129. The state parties to the Vienna Convention are as follows: Argentina, Bolivia, Cameroon, Chile, Cuba, Egypt, Hungary, Mexico, Niger, Peru, Philippines, Poland, Trinidad & Tobago and Yugoslavia. Only Argentina and Yugoslavia are, however, nuclear power states.

130. Convention Supplementary to the 1960 Convention on Third Party Liability in the Field of Nuclear Energy, Jan. 31, 1963, 956 U.N.T.S. 264 [hereinafter Brussels Convention].

131. Joint Protocol Relating to The Application of the Vienna Convention and the Paris Convention, Sept. 21, 1988, *reprinted in* 42 NUCLEAR LAW 56 (NEA ed., 1988).

132. All these Conventions are concerned with liability issues regarding peaceful uses of nuclear power. The only Convention that touches on the military uses of nuclear power has never entered into force because of the sensitivity of national security issues. *See* Convention on the Liability of Operators of Nuclear Ships, May 25, 1962, *reprinted in* INTERNATIONAL CONVENTIONS ON MARITIME LAW, *supra* note 6, at 138. The Convention provides for strict and limited liability of the operators of nuclear ships (art. 2-3). No other person except for the operator can be held liable (art. 2). Operators of warships are also held liable (art. 1(11)).

133. According to Paris Convention, *supra* note 126, art. 9 and Vienna Convention, *supra* note 128, art. IV(3), operators are not held liable in cases of *force majeure*.

134. Paris Convention, *supra* note 126, art. 3, 6; Vienna Convention, *supra* note 128, art. IV(1), II(5).

135. Paris Convention, *supra* note 126, art. 5(b); Vienna Convention, *supra* note 128, art. II(3).

136. Norbert Pelzer, *Concepts of Nuclear Liability Revisited: A Post-Chernobyl Assessment of the Paris and the Vienna Conventions*, *in* NUCLEAR ENERGY LAW AFTER CHERNOBYL 97, 99 (Peter Cameron et al. eds., 1988).

137. *Id.* at 102. As far as the carriage of nuclear material is concerned both Conventions impose liability on the operator who sends and the operator who receives the material. *See* Paris Convention, *supra* note 126, art. 4; Vienna Convention, *supra* note 128, art. II. *See also* Convention Relating to Civil Liability in the Field of Maritime Carriage of Nuclear

also impose compulsory insurance on the operators of nuclear facilities. The specification of the amount, type, and terms of such insurance is left to each state party.[138]

The Conventions apply in cases that involve, inter alia, transportation and disposal of radioactive wastes.[139] Nuclear damage under the Conventions comprises loss of life, personal injury, and damage to property.[140] It does not include economic loss and loss of future earnings unless the courts of the competent state so provide.[141] The Brussels Convention prescribes a compensation scheme for damages caused by an incident at a nuclear installation whose operator is liable under the Paris Convention: a portion is provided by the operator's insurance, another by the installation state, and the balance by contracting states, according to a special formula based upon the GNP and the nuclear power of the installation state.[142] Victims can bring claims under the Conventions only in the courts of a state where the incident that caused nuclear damage occurred.[143] However, under the general rules of private international law, any state that suffers damage because of a nuclear incident has jurisdiction over such claims, and plaintiffs can engage in forum shopping.[144]

The nuclear liability regime does not address nuclear accidents as comprehensively as the oil pollution regime does with oil spills. The liability prescribed is limited, and the liability ceilings are ridiculously low[145] in light of a disaster such as Chernobyl. In addition, the Conven-

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Material, Dec. 17, 1971, *reprinted in* INTERNATIONAL CONVENTIONS ON MARITIME LAW, *supra* note 6, at 230. The purpose of the Maritime Carriage Convention is to ensure that operators of nuclear installations are exclusively liable for damages caused by a nuclear incident during the transport of nuclear material. More specifically, article 2 of the Convention provides that any person who could be held liable, according to international or national law applicable in maritime transportation, is exonerated from such liability if an operator of a nuclear installation is liable under the Paris or Vienna Convention or national law.

138. Paris Convention, *supra* note 126, art. 10; Vienna Convention, *supra* note 128, art. VII.

139. Paris Convention, *supra* note 126, art. 1(a)(ii), (iv), (v), and art. 8. *See also* Vienna Convention, *supra* note 128, art. I(g), (h), (j), and art. VI(2).

140. Paris Convention, *supra* note 126, art. 3.

141. Vienna Convention, *supra* note 128, art. I(k). *See also id.* art. VIII; Paris Convention, *supra* note 126, art 11.

142. Brussels Convention, *supra* note 130, art. 3.

143. Paris Convention, *supra* note 126, art. 13; Vienna Convention, *supra* note 128, art. XI.

144. Pelzer, *supra* note 136, at 103-04.

145. Under article 7 of the Paris Convention, *supra* note 126, the liability ceiling is fifteen million European Monetary Agreement Units of Account. National laws can set lower liability ceilings after examining the opportunities that operators have to obtain insurance, but in no case can liability limits be less than five million European Monetary Agreement Units of Account. Under article III of the Brussels Convention, *supra* note 130, the liability ceiling was increased to 120 million European Monetary Agreement Units of Account. The 1982 protocols to the Paris and Brussels Conventions that entered into force in 1988 have replaced the unit of account with SDRs. The Vienna Convention, *supra* note 128, does not set upper liability limits. Under article V(1), it just sets a minimum liability ceiling of five million dollars.

tions do not provide mechanisms to update liability limits and to compensate for preventive measures and economic loss as does the 1984 Liability Convention for Oil Pollution. Moreover, the ten year time frame within which the plaintiff can bring an action does not take into account that the effects of exposure to radiation may not appear for decades. Also there is no international fund to provide for immediate or residual relief after a nuclear disaster.[146] In other words, the particular nature of nuclear accidents makes the nuclear liability regime appear disconnected from reality. Only lately have there been efforts to update the conventions and specify their liability limits. The revision process requires close cooperation between OECD and IAEA.[147]

II. DOMESTIC SYSTEMS OF LIABILITY: THE EXPERIENCE OF THE UNITED STATES AND THE EUROPEAN COMMUNITY

A. *CERCLA and the Price-Anderson Act: Evidence of Linkage Between Liability and Insurance?*

This section analyzes United States legislation concerning the liability of generators, transporters and disposers of hazardous wastes, and operators of nuclear plants. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)[148] governs the liability of hazardous waste generators, transporters, and disposers concerning the clean-up of hazardous waste sites. Yet the statute does not deal with personal injuries caused by hazardous waste sites. CERCLA represents a vivid illustration of the tensions surrounding the subject of liability and insurance. The same tensions are apparent in the Price-Anderson Act,[149] the statute governing nuclear liability.

1. CERCLA

While the Resource, Conservation and Recovery Act (RCRA)[150] sets the standards for waste disposal, CERCLA prescribes strict, unlimited, and retroactive[151] liability for actors involved in waste management. CERCLA also creates an 8.5 billion dollar fund, the Hazardous Substance

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146. Paris Convention, *supra* note 126, art. 8; Vienna Convention, *supra* note 128, art. VI(1).

147. UNCED, *supra* note 18, at 17.

148. The Comprehensive Environmental Response, Compensation and Liability Act was amended by the Superfund Amendment and Reauthorization Act in 1986 (SARA). Both these Acts are referred to as CERCLA or as CERCLA as amended by SARA, 42 U.S.C. §§ 9601-9675 (1986).

149. 42 U.S.C. §§ 2210-2214 (1988 & Supp. I 1990).

150. Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901-6991(k) (1982 & Supp. I 1984).

151. Retroactive liability extends liability to past mismanagement of hazardous wastes when no regulations regarding sound disposal were existing. *See, e.g.*, United States v. Northeastern Pharmaceutical & Chem. Inc. Co., 810 F.2d 726 (8th Cir. 1986); New York v. Shore Realty Corp., 759 F.2d 1032 (2d Cir. 1985).

Superfund, to clean up hazardous waste disposal sites.[152] The Superfund is financed by taxes on chemical and oil importing companies and by taxes on general revenues. It is frequently replenished because each time the Environmental Protection Agency (EPA) cleans a hazardous waste site it recovers its expenditures from private responsible parties.[153] Many times, however, the discovery and apportionment of liability among responsible parties entail time-consuming and very expensive settlement[154] and litigation procedures with hundreds of parties involved.[155]

Under CERCLA, four categories of persons are strictly liable for releases or threatened releases of hazardous waste from a disposal facility: the current owner of a disposal facility, the owner or operator of a facility at the time of disposal,[156] the generators of hazardous wastes disposed of at a facility, and the transporters of hazardous wastes.[157] Their liability includes all costs of removal or remedial action at hazardous waste sites[158] incurred by the federal or state government and all other necessary costs of response assumed by any other person. The costs of removal and remedial action must be consistent with the National Contingency Plan (NCP).[159] Liability also includes all damages resulting from the destruc-

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152. 42 U.S.C. § 9611(a).

153. 42 U.S.C. § 9604.

154. 42 U.S.C. § 9622 (this section specifies that the government can enter into a Consent Decree according to which Potential Responsible Parties (PRPs) have to reimburse it for response costs incurred or under which the PRPs agree to undertake response measures themselves. In extraordinary circumstances, these settlement agreements may include a covenant not to sue the PRPs).

155. OFFICE OF TECHNOLOGY ASSESSMENT (OTA), COMING CLEAN: SUPERFUND PROBLEMS CAN BE SOLVED 28-29 (1989).

156. *See* 42 U.S.C. § 9601(20)(A). The term "owner or operator" according to the act does not include "a person, who, without participating in the management of a . . . facility, holds indicia of ownership primarily to protect his security interest in the facility." Despite this provision, courts have held lenders liable under the act. In United States v. Maryland Bank & Trust Co., 632 F.Supp. 573. (D. Md. 1986), the court found a foreclosing lender liable under the act. *But see* United States v. Mirabile, 15 Envtl. L. Rep. (Envtl. L. Inst.) 20994 (E.D. Pa. Sept. 4, 1985), holding lenders that foreclosed not liable because they did not participate in the operation of the facility but only in the financial decisions. *But see* United States v. Fleet Factors Corp., 901 F. 2d 1550, 1557-8 (11th Cir. 1990), holding:

> [I]t is not necessary for the secured creditor actually to involve itself in the day-to-day operations of the facility in order to be liable . . . [n]or is it necessary for the secured creditor to participate in management decisions relating to hazardous waste. Rather, a secured creditor will be liable if its involvement with the management of the facility is sufficiently broad to support the inference that it could affect hazardous waste disposal decisions if it so chose.

See also New York v. Shore Realty Corp., 759 F. 2d 1032 (2d Cir. 1985), holding a stockholder and corporate officer individually liable for the continuing release of hazardous wastes. The security interest exemption was not applicable because the stockholder as a corporate officer had participated in the management of the facility.

157. 42 U.S.C. § 9607(a)(1)-(4).

158. Removal costs cover the short-term responses in cases of emergency at a disposal site. Remedial costs are the long-term clean-up costs. *See* 42 U.S.C. § 9601(D)(23), (24).

159. 42 U.S.C. § 9605. The NCP establishes procedures and standards for responding to releases of hazardous substances. The EPA is required to employ a hazard ranking sys-

tion or injury of national resources.[160] Consequently, liability under CERCLA covers damage to property and to the environment but not personal injuries.[161] Liability under CERCLA can be characterized as absolute due to the fact that the defenses provided are very limited.[162] Furthermore, the courts take an expansive approach interpreting those defenses. According to the interpretation of the courts, the government's burden of proof entails the following: the existence of a "facility;" a release of hazardous wastes from the facility; and a defendant that can be one of the persons — generator, transporter, owner, or disposer — that can be held liable under CERCLA.[163] The courts also have imposed joint and several liability on defendants when the harm caused is indivisible.[164] This is the case in most hazardous waste disposal sites where, because drums are crowded together, it is virtually impossible to identify the extent to which a particular defendant has contributed to the contamination of the surrounding environment and groundwater.

The RCRA provides for compulsory insurance of owners and operators of hazardous waste facilities[165] during the time of operation and thirty years subsequent to the facility closure. The insurance must cover all property damage and personal injury claims resulting from sudden accidental occurrences and non-sudden accidental occurrences.[166] In case insurance is not available, letters of credit, surety bonds, trust funds, corporate guarantees, or self-insurance can be used to demonstrate financial accountability.[167]

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tem in determining the facilities to be added to the National Priority List.

160. 42 U.S.C. § 9607(a)(4).

161. Despite the fact that the statute does not cover personal injuries, certain courts have allowed medical monitoring damages to be recovered as response costs. *See, e.g.*, Brewer v. Ravan, 680 F. Supp. 1176 (M.D. Tenn. 1988). *See also* Keister v. Vertac Chemical Corp., 21 Envtl. L. Rep. (Envtl. L. Inst.) 20,677 (E.D. Ark. 1990).

162. In order not to be held liable, the defendant should establish by preponderance of evidence that the release or threat of release was a result of an act of God, an act of war, or an act or omission of a party with which the defendant had a contractual relationship other than an employee or agent of the defendant. In the latter case, the defendant has to prove that she exercised due care, and that she took precautions against foreseeable acts or omissions of any such third party and the consequences that could foreseeably result from such acts or omissions. *See* 42 U.S.C. § 9607(b).

163. FREDERICK R. ANDERSON, ET AL., ENVIRONMENTAL PROTECTION: LAW AND POLICY 616 (1990).

164. *See, e.g.*, United States v. Chem-Dyne Corp., 572 F.Supp. 802 (S.D. Ohio 1983); Colorado v. ASARCO, Inc., 608 F. Supp. 1484 (D. Colo. 1985).

165. RCRA § 3004(a), 42 U.S.C. § 6924. The RCRA concerns active waste facilities and not abandoned waste sites. However, the RCRA provides for corrective action for releases of hazardous waste constituents from disposal facilities independent of the time wastes were placed at the facility. *See* RCRA § 3004(u), 42 U.S.C. § 6924(u). Also, the EPA is authorized under the RCRA to issue an order or bring an action against past and present waste generators, transporters, and disposers involved in facilities that may present an imminent and substantial endangerment to health and the environment. *See* RCRA § 7003(a), 42 U.S.C. § 6973(a).

166. 40 C.F.R. § 264.147(a)-(b).

167. *Id.* § 264.147(a)-(b), (f), (g).

2. The Causes and Aftermath of the Insurance Crisis

By the mid to late 1980's, the imposition of strict and retroactive liability, and joint and several liability, in combination with an excessive number of environmental claims led many insurance companies to withdraw comprehensive general liability (CGL) policies, covering both accidental and gradual environmental harm.[168] Instead, the insurance companies started providing insurance only for one year, and only for sudden pollution arising out of an incident during that year.[169] In this manner, the insurance companies hoped to evade liability for the past mishaps of their policy holders. In most cases, however, courts interpreted the letter of insurance contracts broadly and held insurers liable for all types of pollution, sudden as well as gradual, as long as the harm was not intentional.[170] The uncertainty created by the broad judicial interpretation of insurance contracts rendered insurance virtually unavailable.[171] However, it was not only insurance availability for hazardous waste that declined. Simultaneously, insurance premiums for medical malpractice and products liability soared.[172] As a result, corporations were forced to self-insure through "industry wide mutuals"[173] or "go bare," that is, operate without any insurance.[174]

The insurance crisis has provoked severe criticism of the tort system, but critics do not attribute the insurance crisis to the doctrine of strict and unlimited liability. Instead, they maintain that the insurance crisis is rooted in the uncertainty created by the broad interpretation of insurance policies by courts.[175] Critics claim that courts have failed to distinguish between liability levels that deter irresponsible corporate behavior by forcing industry to engage in prevention and high liability levels that do

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168. ANDERSON, *supra* note 163, at 610.

169. *Id.* at 611.

170. Kenneth S. Abraham, *Environmental Liability and the Limits of Insurance*, 88 COLUM. L. REV. 942, 963-73 (1988).

171. *See id.* at 944. *See also* UNITED STATES GENERAL ACCOUNTING OFFICE, HAZARDOUS WASTES: THE COST AND AVAILABILITY OF POLLUTION INSURANCE 4 (GAO/PEMD-89-6 1988).

172. Some commentators have attributed the insurance crisis to the alteration of hard and soft markets that are characteristic of the insurance industry. According to this view, limiting liability or caps on awards will not alter insurance availability. *See, e.g.*, Linda Lipsen, *The Evolution of Products Liability as a Federal Policy Issue*, *in* TORT LAW AND THE PUBLIC INTEREST 247 (Peter Schuck ed., 1991) [hereinafter PUBLIC INTEREST].

173. *See* George L. Priest, *The Current Insurance Crisis and Modern Tort Law*, 96 YALE L. J. 1521, 1570, 1577 (1987) (Priest calls the mutuals created because of unavailability of insurance, for example, in the area of hazardous waste and railroad transportation as high-risk mutuals. On the contrary, "low-risk mutuals are formed because their members find being pooled with the high-risk more costly than its worth.").

174. Frank Sommerfield, *Going Bare*, INSTITUTIONAL INVESTOR, Mar. 1990, at 99.

> Uninsured companies are coping with the situation simply by trying to make their internal environmental controls failsafe. Although some say they are self-insuring, they usually mean that they feel their cash flow is strong enough to charge damages to profits, not that they are reserving against potential losses.

175. *See*, e.g., KIP VISCUSI, REFORMING PRODUCTS LIABILITY 28, 50 (1991).

not deter,[176] render insurance unavailable, drive useful companies out of the market, hamper innovation[177] and international competitiveness,[178] and possibly spur illegal practices.[179] In other words, critics do not blame the insurance crisis on the doctrine of unlimitied liability per se. Rather, they blame the interpretation by U.S. courts that awarded large amounts of compensatory and punitive damages, increasing uncertainty in the insurance market.

According to the critics of the tort system, because strict and unlimited liability is not at the source of the insurance crisis, its abolition cannot be the remedy. Therefore, state statutes that attempt to set limits on liability, or reinstate the fault principle are bound to fail to relieve the uncertainty of the insurance market.[180] In addition, liability limits for each type of injury would be extremely inflexible and would make it difficult to consider the particularities of individual cases. Even the most vehement critics of the tort system consider liability ceilings "desperate responses impelled by juridical inflation that has exceeded all bounds that private insurance can accommodate."[181]

In fact, state efforts to stimulate the insurance market in response to the insurance crisis by establishing caps on liability awards have not significantly affected the availability of insurance. For example, empirical studies have demonstrated that measures to limit liability, such as caps on awards or granting immunities to defendants, have reduced insurance costs in medical malpractice cases.[182] But in the case of general liability,

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176. *See* Priest, *supra* note 173, at 1538.

> [T]he economic effects of steadily increasing provider liability thus are quite simple in structure. A liability rule can compel providers of products and services to make investments that reduce the accident rate up to the level of optimal (cost-effective) investments. After providers have invested optimally in prevention, however, any further assignment of liability affects only the provision of insurance.

177. Peter W. Huber & Robert E. Litan, *Overview, in* LIABILITY MAZE 16 (Peter W. Huber & Robert E. Litan eds., 1991)[hereinafter LIABILITY MAZE]:

> [statistical analysis has] found that for industries with relatively low liability costs the liability system appeared, if anything, to enhance innovation. But in industries such as general aviation, in which liability costs rose sharply during the early 1980s and became a significant share of total costs, liability does seem to have dampened innovation.

178. Douglas Besharov, *Forum Shopping and Forum Skipping, and the Problem of International Competitiveness, in* NEW DIRECTIONS IN LIABILITY LAW 139 (Walter K. Olson ed., 1988).

179. PETER HUBER, LIABILITY: THE LEGAL REVOLUTION AND ITS CONSEQUENCES 165 (1988)("[P]roviders who are illegal, anonymous, or too small to bother with also gain a competitive edge over established and reputable providers every time the liability vise is tightened.").

180. Priest, *supra* note 173, at 1532-4. *See also* Abraham, *supra* note 170, at 976.

181. HUBER, *supra* note 179, at 202.

182. Glenn Blackmonn & Richard Zeckhauser, *State Tort Reform Legislation: Assessing Our Control of Risks, in* PUBLIC INTEREST, *supra* note 172, at 272, 279; Michael J. Trebilcock et. al., *Malpractice Liability: A Crosscultural Perspective, in* PUBLIC INTEREST, *supra* note 172, at 207, 217 (caps on awards reduced claims severity by about twenty-three

it is not caps, but restrictions on noneconomic and punitive damages and modifications of the joint and several liability doctrine that have reduced insurance costs.[183] The fact that limits on liability have affected malpractice insurance, but not general insurance, has been attributed to the fact that malpractice insurance crisis was a crisis of price, while the general liability insurance crisis was a crisis of availability.[184]

Moreover, in the empirical studies mentioned above, for both medical malpractice and general liability, reduction of insurance costs does not always result in an actual decrease of insurance premiums. Rather, it results in less dramatic increases of insurance premiums in states where tort reform has been enacted.[185] The inability of statutory tort reform to induce an actual decrease of insurance premiums has been attributed to the insurers' conviction that the success of statutory reforms depends on judicial interpretation.[186]

Additionally, predictions that the tort system would harm innovation and the competitiveness of American industry in international markets have not proven true. The performance of the United States chemical industry in international markets has not been affected by the allegedly excessive liability costs.[187] On the contrary, the American chemical industry is much more innovative[188] than Japanese and Western European chemical industries.[189] Products liability does not appear to preoccupy American corporate executives as much as do the general economic environment, taxation, the stigmatizing effects of punitive damages, and haz-

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percent).

183. Blackmonn & Zeckhauser, *supra* note 182, at 277 (the authors do not make clear what kinds of insurance are included in the broad category "general liability insurance." The study makes it difficult to identify what exact type of reform caused what reduction of insurance costs. This is because it frequently includes similar, but not identical tort reforms under one general category).

184. Patricia Danzon, *Malpractice Liability: Is the Grass on the Other Side Greener*, *in* PUBLIC INTEREST, *supra* note 172, at 176, 180.

185. Blackmonn & Zeckhauser, *supra* note 182, at 287.

186. *See* Roberta Romano, *Corporate Governance in the Aftermath of the Insurance Crisis*, *in* PUBLIC INTEREST, *supra* note 172, at 151, 158.

187. Rollin B. Johnson, *The Impact of Liability on Innovation in the Chemical Industry*, *in* LIABILITY MAZE, *supra* note 177, at 428, 431-34:

> [A]ccording to a recent report, "while the U.S. has posted massive overall trade deficits for many years, this country's chemical trade surplus reflects the technology, research and marketing expertise that give the industry competitive advantage in many high valued products." The report goes on to say that American chemical companies are very attractive to foreign investment . . . and that foreign chemical companies view the American market as the biggest and most promising for chemical products.

188. In other industries like pharmaceuticals and industries that produce small aircrafts, liability has dampened innovation. *See, e.g.*, Louis Lasagna, *The Chilling Effect of Product Liability on New Drug Development*, *in* LIABILITY MAZE, *supra* note 177, at 334; Robert Martin, *General Aviation Manufacturing: An Industry Under Siege*, *in* LIABILITY MAZE, *supra* note 177, at 478.

189. *See* Johnson, *supra* note 187, at 433.

ardous waste regulations.[190] However, even in the area of hazardous wastes, the chemical industry has started to realize that the regulatory and liability rules of hazardous waste management will provide it with a competitive advantage over other industries that have little experience with handling chemical substances.[191] Fluor, for instance, a uranium mining company, uses a modification of its computer program for mining to determine how to excavate underground contaminants, while removing as little soil as possible, and how to extract and treat contaminated groundwater.[192] Betcht is another company that once constructed oil refineries but now assists in cleaning them up. Betcht was hired by Saudi Arabia to clean up the Gulf spill.[193]

It has been determined that the existence of liability or of a particular standard of liability — strict liability or negligence — does not by itself influence deterrence. Concerns about reputation and a mix of liability and regulatory rules often have more effective deterrent effects.[194] Many times strict liability and regulations have forced industry to invest in products that are environmentally benign and have fostered industrial safety and innovation. The efforts of the industry to develop alternatives to chlorofluorocarbons (CFCs) are well known. After the Bhopal disaster, certain chemical companies reduced the amount of hazardous chemicals they store on site or the amounts they use.[195] Other times, stringent legislation has driven polluting industries out of the market and has spurred the development of new industries willing to produce safer products or services.[196]

Despite the chemical industry's increased investment in safety, it has been estimated that the existing liability system grossly underdeters corporations. For immediately manifested injuries due to chemical exposure, the overall liability costs of the chemical industry represent no more than seventy percent of the corresponding social costs.[197] For chronic diseases due to chemical exposure, liability costs represent no more than five percent and often less than one tenth of a percent of the corresponding social costs.[198] The causes of this excessive underdeterrence are, inter alia, the

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190. *Id.* at 435.

191. *Id.* at 444.

192. Sonni Efron & James M. Gomez, *Cleaning-Up on Clean-Ups*, L.A. TIMES, Sept. 15, 1991, at D1.

193. *Id.*

194. LIABILITY MAZE, *supra* note 177, at 12. *See also* Johnson, *supra* note 187, at 449. However, while concerns about reputation can influence transnational corporations and small reputable firms, they cannot influence speculative small enterprises. *See* BRENT FISSE & JOHN BRAITHWAITE, THE IMPACT OF PUBLICITY ON CORPORATE OFFENDERS 242 (1983).

195. Nicholas Ashford & Robert F. Stone, *The Impact of Liability Law on Safety and Innovation*, *in* LIABILITY MAZE, *supra* note 177, at 367, 400 (the authors mention numerous examples where industries changed practices because of public outcry after disasters or more stringent legislation). *See also* Johnson, *supra* note 187, at 444.

196. Ashford & Stone, *supra* note 195, at 417-18.

197. *Id.* at 417.

198. *Id.*

difficulties of identifying chemical exposure and the difficulties of verifying, by preponderance of evidence,[199] the causal linkage between exposure and disease when there is a long latency period between exposure and manifestation of the disease.[200] Even in circumstances where courts have relaxed the causation standard,[201] the amount of compensation awarded is very small.[202] What actually preoccupies courts is that relaxing the causation standard when reliable epidemiological studies do not exist would over-compensate plaintiffs at the expense of the defendants.[203] On the other hand, denying damages because of lack of epidemiological studies may undercompensate accident victims given the current absence of scientific knowledge on many hazardous substances and their effects on humans. Because of the reluctance of courts to relax the causation standard, and the ensuing blatant underdeterrence of the chemical industry, it has been claimed that caps on awards will eventually discourage the creation of safer products and services,[204] and that tort reform should be

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199. In the notorious Agent Orange litigation, the court ruled that the linkage between exposure and disease must be proven by a probability of greater than fifty percent. *See* In re "Agent Orange" Prod. Liab. Litig, 597 F. Supp. 740 (E.D.N.Y. 1984), *aff'd*, 818 F.2d 145 (2nd Cir. 1987). *See also* Parker v. Employers Mutual Liability Ins. Co. of Wisconsin, 440 S.W.2d 43 (Tex. 1969). Courts also have refused to grant awards where other synergistic factors could have contributed to the disease. Gardner v. Hecla Mining Corp., 431 P.2d 794 (Utah 1967). In addition, courts have been reluctant to award damages for increased risk of future injury because of exposure to harmful substances at waste sites. This is because science is not advanced enough to quantify the degree of susceptibility to a future illness due to chemical exposure. *See, e.g.*, Sterling v. Velsicol Chemical Corp., 855 F.2d 1188 (6th Cir. 1988); Wilson v. Johns-Mansville, 684 F.2d 111 (D.C. Cir. 1982); Anderson v. W.R. Grace & Co., 628 F. Supp. 1219 (D.Mass. 1986).

200. Ashford & Stone, *supra* note 195, at 414.

201. For example, courts have been willing to award damages for fear of future illness ("cancerphobia") due to present injury from chemical exposure. *See* Payton v. Abbott Labs, 437 N.E.2d 171 (Mass. 1982). Certain courts have even relaxed the standard of "present injury" and simply demand "present impact" or "reasonable fear" of developing a disease, Stites v. Sundstrand Heat Transfer, 660 F. Supp. 1516 (W.D. Mich. 1987), or serious emotional distress that is both "severe and debilitating," Paugh v. Hanks, 451 N.E.2d 759 (Ohio 1983). Courts also are increasingly willing to grant damages for costs of medical monitoring when there is a relative increase in the chance that the disease will occur and early diagnosis will mitigate its effects. *See* Ayers v. Jackson Township, 525 A.2d 287 (N.J. 1987). *See also* In re Paoli Railroad Yard PCB Litigation, 916 F.2d 829 (3rd Cir. 1990). In awarding damages courts have relied on medical expert testimony, Ferebee v. Chevron Chemical Co., 736 F.2d 1529 (D.C. Cir. 1984), and epidemiological studies, but, for example, courts have rejected medical testimony and epidemiological evidence based on animal studies. *See* In re "Agent Orange", *supra* note 199. *See also* Richardson v. Richardson-Merrell, Inc., 857 F.2d 823 (D.C. Cir. 1988).

202. Sterling v. Velsicol Chemical Corp., 855 F.2d 1188 (6th Cir. 1988). The district court granted damages ranging from $50,000 to $250,000. The court of appeals reduced a $250,000 award to $18,000 and the highest award granted was $72,000.

203. Even commentators supporting probabilistic causation —that courts should rely on statistical analysis based on the facts of the particular and previous similar exposures — concede that such an approach may over-compensate or under-compensate pollution victims. *See* Glen Robinson, *Probabilistic Causation and Compensation for Tortious Risks*, 14 J. LEGAL STUD. 779, 786 (1985).

204. Ashford & Stone, *supra* note 195, at 398.

oriented more towards expanding rather than limiting liability.[205]*

As demonstrated, the insurance crisis has been attributed to the uncertainty created by court decisions that have made damage awards unpredictable rather than to the absence of liability ceilings. Moreover, empirical studies have demonstrated no direct linkage between caps on liability and insurance availability. Furthermore, the claim that the tort system grossly underdeters the chemical industry compels reconsideration of the position that limited liability will boost insurance markets. Today, after the insurance crisis, while traditional insurance for environmental damage is still unavailable, industries have started to participate in alternative forms of insurance. In fact, alternative insurance is on the rise worldwide, and it is believed that it will eventually replace traditional insurance.[206]

The lack of causal linkage between unlimited liability and insurance availability illustrated by the experience of the U.S. should dissipate concern about establishing an unlimited liability regime at the international level. This is especially true because of the development of alternative forms of insurance that may be better suited to cover environmental harm.

3. The Price-Anderson Act

The experience of the nuclear industry underscores the view that liability ceilings cannot guarantee insurance availability and financial viabil-

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205. *Id.* at 419.

> [T]he recent demands for widespread tort reform . . . tend to miss their mark since significant underdeterrence in the system already exists. Thus proposals that damage awards be capped, that limitations be placed on pain and suffering and punitive damages, and that stricter evidence be required for recovery should be rejected. On the contrary, the revisions of the tort system should include relaxing the evidentiary requirements for recovery, shifting the basis of recovery to subclinical effects of chemicals, and establishing clear causes of action where evidence of exposure exists in the absence of manifest disease. Other tort claims may also be entertained, but they must increase the amount of deterrence in the system, not further weaken the signals sent to the firm.

206. *See Alternative Insurance*, ECONOMIST, Sept. 26, 1992, at 94. Lack of traditional insurance has created booming international markets for alternative insurance. Companies increasingly discover that because they know their risks better than insurers, they can better insure for risks giving rise to big claims. Rather than paying premiums to traditional insurance companies, they hire consultants to advise them on how to manage their risks. Many alternatives to traditional insurance are currently available. One is to pay claims as they arise. Another is to create reserves by establishing subsidiary companies, the so-called captives, into which premiums are paid. A third alternative used mostly by small enterprises is to form mutual insurance companies. Commentators believe that by the year 2000, self-insurance in the form of captives or mutuals will be the prevailing form of insurance worldwide. It is estimated that captives all over the world have assets worth twenty-three to twenty-four billion dollars. Premiums paid to mutuals were estimated to be $270 million by the end of 1988 and double that amount by the end of 1991. *See also* Richard M. Page, *The Business of Insurance; Someone Has To Pay; Special Global Report*, FINANCIAL EXECUTIVES INSTITUTE, Jan. 1991.

ity for corporations. The Price-Anderson Act as amended in 1988[207] provides for limited liability of operators of commercial nuclear power plants and completely shields Department of Energy contractors from any form of liability in the event of a "nuclear incident."[208] When first enacted, the act contained a liability ceiling of five hundred million dollars, sixty million dollars contributed by private insurance companies and the remaining by public funds.[209] This unique arrangement was undoubtedly due to the United States' eagerness to explore the peaceful and military uses of nuclear power combined with the reluctance of private insurance companies to undertake the full costs of compensation in the event of a nuclear disaster.[210] The 1988 Amendment of the Act did not eliminate the liability limit. Despite the significant setbacks of the nuclear industry and the termination of the cold war, the liability ceiling remains, although it has been increased significantly to seven billion dollars.[211]

In spite of the liability ceilings prescribed by the Price-Anderson Act, insurance for nuclear power plants in traditional insurance markets remains unavailable. Limited liability has been unable to prevent the decline of the nuclear industry.[212] In the United States, the nuclear industry is in retreat.[213] The fierce public opposition against the construction of nuclear power plants has annulled any possible incentive provided by limited liability. Additionally, insurance industries have suggested that nuclear liability limits discourage demand for liability coverage and that as long as utilities are protected by liability limits, they do not have incentives to purchase more coverage.[214] Despite the absence of traditional

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207. 42 U.S.C. §§ 2210-2214 (1988). The United States Supreme Court has upheld the constitutionality of limits on the liability of nuclear power plants. According to the Court, liability limits

> accompanied by an express statutory commitment to 'take whatever action is deemed necessary and appropriate to protect the public from the consequences of' a nuclear accident [are] fair and reasonable substitute for the uncertain recovery of damages of this magnitude from a utility or component manufacturer, whose resources might well be exhausted at an early stage.

Duke Power Co. v. Carolina Environmental Study Group, Inc., 438 U.S. 59 (1978).

208. Nuclear incident is defined as an occurrence including an extraordinary nuclear occurrence taking place within the United States and causing bodily injury, sickness, disease, or death, or loss of or damage to property, or loss of use of property within or outside the United States. *See* 42 U.S.C. § 2014(q).

209. 42 U.S.C. § 2210(e).

210. Dan Berkovitz, *Price-Anderson Act: Model Compensation Legislation? The Sixty-Three Million Dollar Question*, 13 HARV. ENVT'L L. REV. 1, 6 (1989).

211. *See* 42 U.S.C. § 2210(e); 42 U.S.C. § 2210(b). *See also* Marcie Rosenthal, Note, *How the Price Anderson Act Failed the Nuclear Industry*, 15 COLUM. J. ENVT'L L. 121, 123 (1990).

212. *Nuclear's Fall from Favour*, ECONOMIST, Nov. 21, 1992, at 18.

213. *See, e.g.*, DANIEL BORSON ET AL., A DECADE OF DECLINE (Public Citizen ed. 1989). *See also Nuclear Power: Losing its Charm*, ECONOMIST, Nov. 21, 1992, at 21 ("In the United States, where a quarter of the world's nuclear plants operate, no new plant has been ordered without subsequently being canceled, since 1974.").

214. Dan R. Anderson, *The Dangers of Nuclear Liability Limits*, BEST'S REVIEW 12 (Property-Casualty Insurance ed., Mar. 18, 1987).

insurance for nuclear power plants, the nuclear industry has been able to secure coverage through alternative forms of insurance, such as insurance pools and mutuals.[215] Today nuclear plant operators are able to obtain over two billion dollars per reactor in coverage.[216]

B. *The Draft Waste Liability Directive and the European Insurance Market*

The Commission of the European Community, following in the steps of the United States, has proposed strict and unlimited liability for actors involved in hazardous waste activities.[217] According to the Commission, strict liability for environmental harm is becoming increasingly prevalent in both international[218] and domestic law.[219] The purpose of the Directive is to establish a uniform liability system within the European Community in order to ensure that a product's price reflects the full costs of its production, including the costs of environmental damage.[220] The proposed Directive, however, differs from CERCLA in that it does not explicitly address the problem of abandoned waste sites and covers personal injury cases. In contrast to CERCLA, it explicitly incorporates a cost-benefit analysis for estimating which damages should be recovered for cleaning up the environment.

The Directive imposes strict, unlimited,[221] and joint and several liability[222] on the "producer of wastes."[223] For the purposes of the Directive,

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215. Three insurance pools provide insurance for the nuclear industry: American Nuclear Insurers (ANI) (pool of 90 member insurance companies, insuring one-half of 110 nuclear plants), Mutual Atomic Energy Liability Underwriters (MAELU), and MAELRP Reinsurance Association which reinsures 100% of the MAELU policies. Utility companies have also formed mutuals: Nuclear Mutual Ltd. and Nuclear Electric Insurance Ltd. *See* Christopher Dauer, *ANI Unveils New Nuclear Power Covers*, THE NATIONAL UNDERWRITER COMPANY, May 13, 1991, at 23. *See also* Mercedes M. Perez, *Nuclear Energy Touted as Long-Term Option*, BEST'S REV. 112 (Property-Casualty Insurance ed., May 1989); NUCLEONICS WEEK, April 6, 1990, at 12.

216. This is a significant increase in comparison with $300 million insurance coverage used to be provided in 1979 when the Three Mile accident occurred.

217. Proposal for a Council Directive on Civil Liability for Damage Caused by Waste, COM(89)282 final [hereinafter Proposal]. It was further amended by COM(91)219 final [hereinafter Amendment].

218. *See* Proposal, *supra* note 217, at 2 (the Commission refers to the products liability Directive, the international conventions on nuclear energy and oil pollution, and the draft convention on compensation for damage caused by the carriage of dangerous goods by rail, road or inland waterway).

219. *Id.*

> [T]he same trend is becoming increasingly established in national legislation. Germany and Belgium have already introduced the principle of no-fault liability. In France, it is well established by case law. Case law in the Netherlands is moving in the same direction, and the law is being drafted to introduce the principle in the new Civil Code. In Spain, strict liability has been introduced in the waste management sector.

220. *See* Proposal, *supra* note 217, at 1.

221. Amendment, *supra* note 217, art. 8.

222. *Id.* art. 5.

producers of wastes are considered those persons who import wastes into the European Community from non-Community countries,[224] waste disposers,[225] and persons in control of wastes when they cannot identify the producer.[226] In the latter case, producers are held liable only for a limited amount if the incident that caused the damage falls within the scope of the liability Convention concerning the carriage of dangerous goods.[227] The Directive does not specify whether generators that transport their wastes to a permitted disposal facility are still be held liable.

Damages under the Directive include harm resulting from death or physical injury, and damage to property.[228] Plaintiffs can bring an action against polluters under national law. National law also determines whether lost profits may be recovered and who may bring an action in the event of impairment of the environment.[229] In the latter case, plaintiffs can claim compensation for costs to prevent impairment to the environment, for costs to restore the environment, and for damage caused by preventive measures. The entitlement to compensation, however, is subject to a cost-benefit analysis: there is no entitlement to compensation when the costs of restoration substantially exceed the benefits or if substantially cheaper restoration measures are available.[230] Impairment to the environment is defined as significant physical, chemical, or biological deterioration of the environment.[231]

Despite the claims of the Commission that the purpose of the Directive is to establish a uniform liability system, the precise remedy[232] and the standard of proof[233] are left to national legislation. The Directive also

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223. A producer of wastes is anyone who in the course of commercial or industrial activity produces wastes and anyone who engages in processing, mixing, or other operations resulting in a change of the nature or composition of waste. *Id.* art. 2(1)(a).

224. Importers are not held liable when wastes were previously exported from the Community and their nature or composition were not substantially changed prior to reimportation. *Id.* art. 2(2)(a).

225. *Id.* art. 2(2)(c).

226. *Id.* art. 2(2)(b).

227. *Id.* art. 3(1). *See also supra* Section I(B).

228. *Id.* art. 2(1)(c).

229. *Id.* art. 4(1)(a).

230. *Id.* art. 4(2).

231. *Id.* art. 2(1)(d).

232. *Id.* art. 4(1)(b).

> The national laws of the Member States shall determine . . . the remedies available to [plaintiffs] which shall include: (i) an injunction prohibiting the act or correcting the omission that has caused or may cause the damage and/or compensation for the damage suffered; (ii) an injunction prohibiting the act or correcting the omission that has caused or may cause impairment of the environment; (iii) an injunction ordering the reinstatement of the environment and/or ordering the execution of preventive measures and the reimbursement of costs lawfully incurred in reinstating the environment and in taking preventive measures (including costs of damage caused by preventive measures).

233. *See Id.* art. 4(1)(c). *But see* Proposal, *supra* note 217, art. 4(6). It was provided that a plaintiff should show "overwhelming probability of the causal relationship between

provides that, in addition to pollution victims and public authorities, non-governmental organizations can bring action against polluters under conditions specified by domestic legislation.[234]

Polluters are exempt from liability only when they can prove that the damage or injury to the environment was the result of *force majeure*[235] or the result of an intentional act or omission of a third party.[236] Their liability can also be reduced or totally abolished when the damage is caused in part by the injured party.[237] Finally, waste disposers are exempt from liability if they can prove that they were not negligent and that the producer failed to fully disclose information regarding the nature of the wastes.[238]

The scope of the Directive includes hazardous and non-hazardous wastes[239] but not nuclear wastes.[240] The Directive does not distinguish between recyclable and non-recyclable wastes. The Economic and Social Committee has praised the Commission for including recyclable wastes in the definition of wastes.[241] The Economic and Social Committee has also recommended that carriers should be able to use a distinctive sign to in-

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the producer's wastes and the damage . . . or the injury to the environment suffered."

234. Amendment, *supra* note 217, art. 4(3). The 1989 version of the proposed directive provided that public-interest groups could bring an action only if national law so provided. *See also* Proposal, *supra* note 217, art. 4(4).

235. Amendment, *supra* note 217, art. 6(1)(b).

236. *Id.* art. 6(1)(a).

237. *Id.* art. 7(2).

238. *Id.* art. 7(1).

239. *Id.* art. 2(1)(b).

240. The justification is that there already exist international conventions prescribing liability for activities involving nuclear wastes. Proposal, *supra* note 217, at 2. Most European countries have signed the Paris Convention. However, international regulation of other issues has not prevented the Commission from proposing appropriate legislation. In addition, the Paris Convention has many inadequacies that could be addressed by European Community legislation.

The reluctance of the Commission to regulate radioactive wastes stems from the European Community's support for nuclear energy. This position is reflected in the Euratom Treaty, which is more preoccupied with facilitating the development of nuclear industry than with establishing safeguards for the operation of nuclear power plants or for the disposal of radioactive wastes. As a result, the Commission has adopted a position of non-intervention in domestic nuclear energy programs. *See, e.g.*, Leigh Hancher, *1992 and Accountability Gaps: The Transnuklear Scandal: A Case Study in European Regulation*, 53 MOD. L. REV. 669 (1990). The lack of genuine supervision and the absence of safeguards for the military uses of nuclear power has left radioactive waste management unregulated and has corrupted the nuclear energy industry. The nuclear industry has been frequently involved in illegal transfers of radioactive materials and wastes. After the Transnuklear scandal that involved illegal waste exports to Belgium, Transnuklear, the private company entangled in the scandal was dissolved. It was replaced by a government company that soon started to engage in illegal waste transfers as well. Nuclear Energy: West Germany Confirms Irregularities in Transport of Nuclear Material, European Report, No. 1555, Jan. 15, 1990, *available in* LEXIS, Nexis Library, Omni File.

241. Opinion on the Proposal for a Council Directive on Civil Liability for Damage Caused by Waste, CES(90)215.

dicate whether the wastes they carry are for recycling or final disposal.[242] Finally, the Committee has suggested that waste carriers should be held primarily liable because of the difficulty victims will encounter in identifying the producer before the expiration of the statute of limitations.[243] The Commission has yet to include this recommendation in the amended Directive.[244]

The Directive provides for compulsory insurance of waste generators and disposers[245] and also provides that the Commission will study the feasibility of establishing a "European Fund for Compensation for Damage and Impairment of the Environment Caused by Waste."[246] The imposition of compulsory insurance has intensified the insurance industry's opposition to the Directive.[247] The insurance industry fears that the vague language of the Directive could be interpreted broadly to include liability for past misdeeds and compulsory insurance for both accidental and gradual pollution.[248] In other words, it fears the creation of a type of liability scheme believed to be responsible for the litigation and insurance crises in the United States. Nevertheless, the fear that the United States precedent will be repeated in the European Community is unfounded. This is due to the differences between the legal systems of European Community countries and the United States. The rules of civil procedure of many European countries often compel the losing party to pay the legal costs of the winning party. Most European systems also do not provide for jury trials, broad discovery, and noneconomic and punitive damages. Thus, even if the final formulation of the waste Directive contains language similar to that of the United States tort doctrine, it does not follow that its implementation will spur litigation or that it will affect the availability of insurance.[249] In fact, it has been suggested that precisely because of the legal systems of the Community and aversion to confrontation, Europeans will not resort to litigation to resolve their disputes.[250]

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242. *Id.*

243. *Id.* A plaintiff can bring an action within three years from the date the damage or injury to the environment occurred. *See* Amendment, *supra* note 217, art. 9. The right to compensation expires after thirty years. *See* Amendment, *supra* note 217, art. 10.

244. *See* Amendment, *supra* note 217.

245. Amendment, *supra* note 217, art. 11(1).

246. *Id.* art. 11(2).

247. Gavin Souter, *E.C. Insurers to Scramble to Avoid Clean-Up Liability*, BUSINESS INSURANCE, Oct. 21, 1991, at 30.

248. *Id. See also* Roger Scotton, *European Marketplace Faces Crisis: Insurer*, BUSINESS INSURANCE, June 10, 1991, at 44.

249. Gary T. Schwartz, *Product Liability and Medical Malpractice in Comparative Context*, in LIABILITY MAZE, *supra* note 177, at 28 (the author emphasizes that differences in doctrine cannot explain why significantly more suits are brought in the United States than in Europe, Japan or Canada because these countries have doctrines similar to the United States liability doctrines. He demonstrates that jury trials, liberal rules of discovery, contingency fees, and punitive damages make the United States tort system more unpredictable and costly).

250. R. Patrick Thomas, *"New" Europe is Years Away; Cultural Traditions, Not E.C. Directives, Shape Risk Functions*, BUSINESS INSURANCE, May 27, 1991, at 27.

An additional indication that the European Community is unlikely to experience an insurance crisis is that in Europe insurance contracts providing for sudden and accidental pollution have been interpreted narrowly and have not been the subject of extensive litigation.[251] Despite the narrow interpretation of insurance contracts, British insurers have been reluctant to provide pollution coverage. However, insurance is readily available from Swiss and American insurers who claim to make significant profits from environmental premiums.[252] In other parts of Europe strict liability and environmental regulations have intensified the trend toward alternative types of insurance through captives or mutuals.[253]

III. THE LIABILITY REGIME FOR THE TRANSNATIONAL MOVEMENTS OF HAZARDOUS AND RADIOACTIVE WASTES

Before prescribing the elements of a private liability system for transnational waste movements, it is necessary to examine the potential functions of such a system and whether it can be successfully replaced by more efficient and fairer systems. Such systems could include an international social insurance system that would be in the form of a government-sponsored international fund.

A. *The Theoretical Debate*

In the 1920's and 1930's, workers' compensation statutes gradually replaced the tort system of the United States and Europe.[254] At that time, there was significant debate in academic circles as to whether enterprise liability should replace the fault principle in torts.[255] This debate was reflected in court decisions that began shifting the burden of proof from plaintiffs to defendants. Under the fault principle, the plaintiff must prove that the defendant caused the harm, thus the costs of accidents are more likely to be borne by the plaintiff. Under an enterprise liability system, the defendant carries the burden of proof, and the costs of accidents are more likely to be imposed on the defendant. The movement favoring

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251. *Id.*

252. *Green Insurance: Missing Market*, ECONOMIST, Sept. 19, 1992, at 94.

253. *See, e.g.*, Wilhelm Zeller, *European Solutions to EIL Coverage; Environmental Impairment Liability Insurance*, A.M. BEST COMPANY INC. 14 (Property-Casualty Insurance Edition, March 1991), *available in* LEXIS, Nexis Library, Omni File; *but see also* Carolyn Aldred, *Pollution Crackdown in Europe; EIL Insurance Increasingly Scare*, BUSINESS INSURANCE, Oct. 8, 1990, at 35, *available in* LEXIS, Nexis Library, Omni File (mentioning a French insurance pool that provides insurance for both accidental and gradual pollution damage, German general insurance liability policies that provide coverage for bodily injury resulting from both sudden and accidental as well as gradual pollution, and a Swedish insurance consortium that has created a fund to indemnify third parties for pollution caused by insolvent or unknown polluters).

254. *See generally* Lawrence Friedman & Jack Ladinsky, *Social Change and the Law of Industrial Accidents*, 67 COLUM. L. REV. 50 (1967).

255. GUIDO CALABRESI, THE COSTS OF ACCIDENTS 3, 4 (1970) (citing extensive related literature in the United States and Europe).

enterprise liability, as its name indicates, was inspired by indignation against corporate power and advocated placing liability, irrespective of fault, on those with "deep-pockets."[256] Contemporary proponents of enterprise liability urge adoption of strict liability and view the tort system as a social security mechanism whose primary function is to adequately compensate accident victims.[257]

The theory of enterprise liability has been enriched by what is called the "economic theory" of tort law. The economic theory concludes that "deep-pockets" should bear the cost of accidents, but it bases this conclusion on a different rationale. The primary goal of tort law is not to compensate accident victims but to reduce accident costs. Accident costs can be reduced by deterring tortfeasors from engaging in accident-prone activities.[258] However, harmful activities are only deterred if the costs of accidents exceed the costs of preventing them.[259] This determination is left to the cheapest cost-avoider who is the person in the best position to assess more cheaply the dangers of certain activities.[260] Frequently, the cheapest cost-avoiders are corporate entities or insurance companies that have or can obtain first-hand information on the safety of products and services. The public, on the other hand, cannot be the cheapest cost-avoider because it can easily underestimate the dangers involved.[261] For this reason, advocates of the economic analysis argue that the costs of accidents should not be externalized in the form of general taxes because this would compromise the primary goal of deterrence.[262] Accident costs should be incorporated in the price-system, informing the public on the safety of products and services.[263]

The two goals of tort law as designated by both enterprise liability and economic theories — victim compensation and corporate deterrence — have been criticized as conflicting. Lavish compensation awards may over-deter corporations, deprive society of valuable services, and impede innovation.[264] These predictions, however, have not proven true. As ana-

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256. George L. Priest, *The Invention of Enterprise Liability: A Critical History of the Intellectual Foundations of Modern Tort Law*, 14 J. LEGAL STUD. 461 (1985).

257. RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF TORT LAW 5 (1987).

258. CALABRESI, *supra* note 255, at 16. *But see also* E. Donald Elliott, *Why Punitive Damages Don't Deter Corporate Misconduct Effectively*, 40 ALA. L. REV. 1053 (1989).

259. CALABRESI, *supra* note 255, at 17.

260. *Id.* at 164-65.

261. *Id.* at 55

> [F]irst, individuals choosing between insurance and taking their chances often do not have the data necessary to determine how great the risk is . . . . Second, even if individuals had adequate data for evaluating the risk, they would be psychologically unable to do so . . . people cannot estimate rationally their chances of suffering death or catastrophic injury.

262. *Id.* at 143.

263. *Id.* at 134. However, Calabresi concedes that in real life many decisions are made politically or collectively without the intervention of the market. This is particularly true when a decision made through the market would be considered unfair. *See id.* at 24.

264. For example, in the case of pharmaceuticals and industries that produce small air-

lyzed above, despite the imposition of enterprise liability, chemical industries are still underdeterred because it is difficult to establish the causal link between exposure and disease.[265]

Opponents of the tort system also contend that the tort system cannot deter environmental accidents because such accidents are unforeseeable events, even for the corporations involved.[266] They are "normal accidents," or unpredictable outcomes of interactions of complex systems.[267] The critics claim that adding safety devices to complex systems will not necessarily reduce the likelihood of accidents. On the contrary, in many circumstances, safety devices may stimulate the interactive complexity of a system, ultimately resulting in more accidents.[268] This is particularly evident in nuclear energy production where the potential for unexpected interactions of trivial failures substantially increases the likelihood of accidents.[269] It is also evident in maritime transportation where navigational aids have contributed to an increase rather than a reduction of accidents. Due to high-tech navigational devices, captains feel more in control of their ships and take greater risks than they normally would if the technology had not been available.[270] The nature of certain accidents makes the primary goal of corporate deterrence look futile.[271] The tort system as a compensation mechanism has also been criticized for being too expensive and too ineffective when the advantages of a social security system are considered.[272] The advantages of a social security system involve, inter alia, speedy and less costly dispute resolution.[273]

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crafts. *See supra* note 188; *see also* HUBER, *supra* note 179, at 12-15.

265. *See supra* notes 199-201 and accompanying text.

266. *See generally* RICHARD H. GASKINS, ENVIRONMENTAL ACCIDENTS: PERSONAL INJURY AND PUBLIC RESPONSIBILITY 59-62 (1989).

267. CHARLES PERROW, NORMAL ACCIDENTS: LIVING WITH HIGH-RISK TECHNOLOGIES (1984).

268. *Id.* at 23.

269. *Id.* at 60-61.

270. RICHARD PETROW, IN THE WAKE OF TORRY CANYON 206 (1968).

271. GASKINS, supra note 266, at 94.

272. The advantages of the social security system are as follows: "expert" administrative tribunals that deal with similar cases so they can dispose of them relatively quickly; the lack of adversariness that saves time and money during discovery; and the possibilities of making provisional assessments of the injury and review them when there is future aggravation. One of the disadvantages of the social security system is that it is vulnerable to fraudulent claims. *See generally* PATRICK S. ATIYAH, ACCIDENTS, COMPENSATION AND THE LAW 401-07, 509-11 (1980); *see also* Peter Kerr, *Vast Amount of Fraud Discovered in Workers' Compensation System*, N.Y. TIMES, Dec. 29, 1991, at 1. Even advocates of the economic theory of law have suggested that the tort system is incapable of dealing with cases of catastrophic accidents or excessive pollution and that it should be replaced by a social insurance system. *See* RICHARD A. POSNER, THE PROBLEMS OF JURISPRUDENCE 390 (1991) (Posner suggests that in cases of catastrophic accidents that cannot be attributed to the negligence of another, a social insurance system might be preferable).

273. ATIYAH, *supra* note 272.

B. *An Evaluation of the Debate*

1. Liability and Minimum Standards as an Accident Prevention Mechanism

The first argument of the opponents of the tort system is that environmental accidents are inherent in the systems that generate them, and consequently no one can legitimately be held responsible for the occurrence of an accident. Accidents are bound to happen and will happen, as statistical charts indicate. However, upon closer scrutiny, the picture is not as bleak as the opponents of the tort system indicate. The systems that generate accidents are generally capable of improvement. Even the "normal accident theory" suggests that prevention of accidents depends on factors such as political will, collective action,[274] and a change in corporate attitude.[275] Often a simple change in a decision making procedure can minimize the frequency and seriousness of accidents. For example, in the area of marine transportation, replacing the captain with a team of officers that can check each other's decisions can reduce the likelihood of accidents.[276] Environmental accidents, therefore, are often preventable and, as demonstrated by the domestic systems analyzed above, strict and unlimited liability in combination with appropriate international standards will deter corporate polluters, especially large corporations concerned with their reputation. These standards for the purpose of waste movements should include standards for land disposal.[277]

However, it is highly unlikely that strict and unlimited liability and land disposal standards will deter smaller hauling companies penetrated by organized crime[278] from engaging in illegal waste trafficking.[279] These companies are often involved in international illegal waste shipments such as the illegal waste transfers across the United States-Mexican border.[280] In Europe, organized crime has penetrated waste exports to

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274. PERROW, *supra* note 267, at 172. Perrow attributes the lack of effort to prevent marine accidents to the fact that victims are unidentifiable, "low status, unorganized or poorly organized seamen." The same is true for the victims of toxic spills and pollution.

275. In marine transportation corporate pressure to keep to schedules despite the ship's condition or the weather forecasts is at the source of most accidents. *See id.* at 118. Such pressure could certainly be lessened.

276. *Id.* at 230.

277. It is better to allow waste exports for disposal than prohibit them, and consequently entice industries to engage in illegal dumping. In contrast to oil and other dangerous goods, wastes are considered materials without further use, thus industry is always tempted to illegally dump them. *See* LOUKA, *supra* note 1, at 20.

278. For the involvement of organized crime in the United States transportation industry, see MAURICE D. HINCHEY, REPORT TO THE NEW YORK STATE ASSEMBLY ENVIRONMENTAL PRESERVATION COMMITTEE, ORGANIZED CRIME'S INVOLVEMENT IN THE WASTE TRANSPORTATION INDUSTRY (1984). *See also* MAURICE HINCHEY, REPORT TO THE NEW YORK STATE ASSEMBLY COMMITTEE ON ENVIRONMENTAL CONSERVATION, ILLEGAL DISPOSAL OF WASTES IN THE HUDSON VALLEY (1991).

279. *See* FISSE & BRAITHWAITE, supra note 194.

280. *See Californian Pleads Guilty to Transporting Hazardous Waste to Mexico Ille-*

France[281] and Somalia.[282]

Even if strict and unlimited liability does not affect the behavior of companies penetrated by organized crime, it is likely that, in combination with clear and specific land disposal standards, it will limit the clientele of those companies.[283] Clear and specific international standards will be instrumental in avoiding the confusion and uncertainty of industry about expected behavior concerning waste management and transfers. Developing clear and specific international standards and legal assurances that severe penalties will be imposed if violated will encourage industry's compliance and make waste generators less willing to entrust waste shipments to enterprises infiltrated by organized crime. Levying severe penalties when a violation occurs is particularly crucial due to the difficulties in detecting illegal waste traffickers. Violators must know that once discovered they will endure severe punishment.

2. Liability as a Catharsis and Instrument of Democratic Control

The second argument made by the opponents of the tort system is more compelling. Opponents argue that a social security system would be less time-consuming and less costly. However, the tort system presents an undoubtable advantage: in the domestic arena, suing polluters potentially not only prevents accidents and provides victims with compensation, it also empowers the *individual*[284] to force industry to change its negligent practices. The tort system enables individuals to send a signal to govern-

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gally, DAILY REPORT FOR EXECUTIVES (BNA), May 28, 1991, at 1, *available in* LEXIS, Nexis Library, Current File. *See also* Michael S. Barr et al., *The Labor and Environmental Rights in the Proposed Mexico-United States Free Trade Agreement*, 14 HOUS. J. INT'L L. 1 (1991).

281. The German Environment Minister, after the scandal of illegal waste transfers to France, warned against the dangers of an international network of illegal waste traffickers similar to the one involved in illegal arms and drug deals. *See Criminals "Trading in Toxic Waste,"* THE INDEPENDENT, Aug. 19, 1992, *available in* LEXIS, Nexis Library, Omni File; *Alarming Spread of Illegal Waste Dumping*, AGENCE FRANCE PRESS, Aug. 19, 1992, *available in* LEXIS, Nexis Library, Omni File; Tony Catterall, *Crime in Germany Spreads to Trash*, Aug. 22, 1992, *available in* LEXIS, Nexis Library, Omni File.

282. The Executive Director of UNEP claimed also that organized crime was involved in the waste transfers from Italy and Switzerland to Somalia. The interim government of Somalia participated in the deal hoping to make profits that would be used to buy more weapons. When the deal was uncovered, the directors of the company involved had already disappeared. *See Contract to Dump Toxic Waste in Somalia Linked to Firm in Small Village Outside Geneva*, INT'L ENVTL. DAILY (BNA), Oct. 2, 1992, *available in* LEXIS, Nexis Library, Omni File; *Somalia, European Firms Dumping Wastes, UNEP To Probe*, INTER PRESS SERVICE, Sept. 10, 1992, *available in* LEXIS, Nexis Library, Omni File; Aidan Hartley, *Contract Shows Plan to Dump Toxic Waste in Somalia*, THE REUTER LIBRARY REPORT, Sept. 9, 1992, *available in* LEXIS, Nexis Library, Omni File.

283. For more details on the international system that must govern transnational waste movements, see ELLI LOUKA, OVERCOMING NATIONAL BARRIERS IN INTERNATIONAL WASTE TRADE (forthcoming).

284. *See* ATIYAH, *supra* note 272, at 554.

ments that legislative action is imperative.[285] Certainly, in a democracy, interest groups can always lobby and participate in public hearings. The advantage that the tort system offers, as opposed to a social security system, is that each individual citizen can initiate action and voice concerns in an adversarial setting. This advantage is very critical because only by personally initiating action before an impartial judge can accident victims be persuaded that justice is served. The catharsis of a public trial is especially important in cases of catastrophic accidents when victims demand some sort of vindication.[286] Thus, the tort system serves a dual function. It acts as a tension release mechanism of social passions. It also introduces an element of direct democracy in corporate boardrooms and within government bodies where the decisions that affect people are made. In other words, the tort system instills democratic controls in a society where democracy is limited to periodic elections.[287] In this respect, the tort system is undoubtedly superior to any social insurance system.

The advantages of a tort system over a social insurance system are also evident in international law. The international community, despite patterns of cooperation, is still deeply divided between the privileged and underprivileged, and this division is often the cause of dissention and conflict. A private liability system can assuage confrontations by empowering the citizens of developing countries to sue multinational corporations in national courts. This is especially pertinent when social dichotomies are inflamed by catastrophic accidents of international dimensions, such as the Bhopal incident, that entail not only economic suffering and property damage but physical injuries and death. In such cases, the public often considers a settlement between the state and the corporate entity as unsatisfactory.[288] Only the entitlement to compensation through settlement with the threat of litigation, or through adjudication, can convince victims that justice has been served. It is only through this method that individuals can be relieved from the helplessness they experience when confronted with the unexpected consequences of an environmental accident.

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285. *See* LIABILITY MAZE, *supra* note 177, at 16 (liability may play a role in "helping regulators identify potentially unsafe products and encouraging them to take action.").

286. *See, e.g.*, ATIYAH, *supra* note 272, at 553 (the author emphasizes that the tort system is instrumental in appeasing social divisions after catastrophic accidents, as, for example, in the case of an accident that involved the collapse of coal tip onto a school that caused the deaths of 116 children and 28 adults).

287. *See* JETHRO K. LIEBERMAN, THE LITIGIOUS SOCIETY (1981).

288. *India Seeks to Reopen Bhopal Case*, N.Y. TIMES, Nov. 21, 1990, at D8. *Indian Government Ends Speculation, Announces Support for Bhopal Challenge*, 13 INT'L ENV'T REP. (BNA) 551 (1990). *See also* Wil Lepkowski, *Union Carbide-Bhopal Saga Continues as Criminal Proceedings Begin in India*, CHEMICAL & ENGINEERING NEWS 7, May 16, 1992 (the $470 million settlement between India and Union Carbide mediated in 1989 by the Indian Supreme Court encompassed both civil and criminal charges. "But public outcry was so strong that the court agreed to review its decision. It completed its review last December, upholding the settlement but restoring the criminal charges it had thrown out as part of the 1989 ruling.").

The notion that private liability can work as a tension release mechanism in international fora stems from the domain of human rights. For example, after *Filartiga v. Pena-Irala*,[289] citizens of developing countries started bringing suits against human rights violators in the courts of the United States. The purpose of the suits is vindication as opposed to compensation.[290]

Citizen participation in the international arena achieves something more fundamental. In pursuit of justice in transnational fora, citizens essentially join in the formation and strengthening of international rules. Their cases establish precedents that define acceptable corporate or state behavior. The importance of citizen participation is that it is not effectuated through state representation but through direct citizen involvement in affairs of international dimension. In this fashion, international law is infused by elements of direct democracy and is transformed from an instrument at the disposal of governments to an instrument in the hands of those truly affected by it.

Viewing the tort system as an instrument capable of introducing direct democracy in the international system could be criticized as unrealistic given the fact that citizens in many countries are not that litigious. However, this reality is changing at a rapid pace. Environmental groups in developing countries have started bringing suits against corporate and government polluters. For example, in Korea, the contamination of groundwater supplies resulted in criminal charges brought against top corporate officials.[291] In Malaysia, an environmental group brought an action against a corporation for the alleged harm to pregnant women and children caused by radioactive waste dumping.[292] There also have been suits on behalf of future generations and suits for failing to comply with environmental impact assessments.[293]

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289. 630 F.2d 876 (2nd Cir. 1980) (the case involved a suit of two Paraguayan citizens against Pena, another Paraguayan citizen and former Inspector General of the Police in Paraguay. According to the plaintiffs, Pena had tortured to death their son and brother. The court concluded that it had subject matter jurisdiction based on the Alien Tort Statute, 28 U.S.C. § 1350, which provides: "The district courts shall have original jurisdiction on any civil action by an alien for tort only, committed in violation of the law of nations or a treaty of the United States.").

290. *See* Larry Rohter, *Ex-Ruler of Haiti Faces Human Rights Suit in the US*, N.Y. TIMES, Nov. 15, 1991, at B10 (the objectives of these lawsuits are political and psychological. As a lawyer for six Haitians formulated it: "There is a message here to other military thugs and human rights violators, which is that you're not going to get away with it."). Relying on the Alien Tort Claims Act, human rights groups have filed claims against the Serbian leader in Bosnia, Radovan Karadzic, on behalf of the women raped during the civil war in the former Yugoslavia. Because of the lawsuit, Karadzic asked the United States administration to grant him immunity in order to participate in the peace talks held at the United Nations headquarters in New York. Paul Lewis, *Immunity Sought for Bosnian Serb: Atrocities Suit in a U.S. Court Cited as Barrier to Talks*, N.Y. TIMES, Feb. 23, 1993, at A8.

291. Michele Corash & Robert Falk, *Through a Cleaner Looking Glass*, LEGAL TIMES, May 11, 1992, at 16, *available in* LEXIS, Nexis Library, Omni File.

292. *Id.*

293. *Id.*

The growth of national litigation renders an international tort system for environmental harms extremely relevant. Building such a system would not necessarily be a panacea for all the procedural hurdles of private international law.[294] It could, however, lay the foundation for a more coherent action when the circumstances arise. These circumstances are very likely to develop, given the lack of success of the current international system in controlling the international transfers of hazardous and radioactive wastes. For example, the ban of waste imports into the African region[295] has not stopped illegal waste transfers to that area. In fact, waste exports to impoverished African countries such as Somalia are on the increase.[296] Waste exports to Latin America and Eastern Europe are also on the rise.[297]

C. *A Proposal for a Liability Regime*

1. The Liability Component

Strict liability has been established, nationally and internationally, as the appropriate type of liability for environmental harms—ultra-hazard-

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294. *See* Hans Ulrich Jessurum d'Oliveira, *The Sandoz Blaze: The Damage and the Public and Private Liabilities in Environmental Harm*, *in* ENVIRONMENTAL HARM, *supra* note 20, at 429, 442. *See* Scovazzi, *supra* note 20, at 395-96. These procedural hurdles stem from the fact that different countries adopt different conflict of law rules. For example, in the Sandoz disaster many problems emerged because the countries affected by the disaster — France, Germany, Netherlands, and Switzerland —have different rules of private international law. In addition, corporate subsidiaries not having many assets are often involved in severe accidents. In these cases, plaintiffs have tried to pierce the corporate veil and sue the parent company in the courts of the state where it is located. An example is the Bhopal case. The success of these lawsuits has been mixed and the law on this subject needs further clarification.

In response to the above concerns, certain countries have signed agreements that provide equal access to national remedies. The principle of equal access agreements is that plaintiffs suffering damages in a country other than the country where the environmental accident originated enjoy in the country where the accident originated the same legal treatment as the citizens of that country. However, these agreements are very few and do not solve the problem that the laws of the country of origin of environmental accident may be inadequate to deal with such accidents. *See* Alan E. Boyle, *Making the Polluter Pay? Alternatives to State Responsibility in Allocation of Transboundary Environmental Costs*, *in* ENVIRONMENTAL HARM, *supra* note 20, at 363, 370-73.

295. *See supra* note 1.

296. *See supra* note 281-2.

297. For example, banned German pesticides that were labeled as humanitarian aid were shipped to Romania and Albania without the consent of the governments of these countries. *See Federal, State Environmental Ministers Approve Steps to Curb Illegal Waste Trade*, INT'L ENVTL. DAILY (BNA), Sept. 28, 1992, *available in* LEXIS, Nexis Library, Omni File; *Greenpeace Finds Loopholes in EC Waste Trade Laws*, INTER PRESS SERVICE, Oct. 19, 1992, *available in* LEXIS, Nexis Library, Omni File; *see also* David Clark Scott, *Central American Presidents Seek Regional Solution to Toxic Wastes*, THE CHRISTIAN SCIENCE MONITOR, Mar. 10, 1992, at 5, *available in* LEXIS, Nexis Library, Omni File; *Colombia: Government Bans Ship Loaded with Toxic Waste*, INTER PRESS SERVICE, July 30, 1992, *available in* LEXIS, Nexis Library, Omni File.

ous activities posing non-reciprocal risks to others. The generation, transportation, and disposal of hazardous wastes are such activities. Unlimited liability, although not yet established in international law, has many procedural advantages over limited liability. Unlimited liability makes unnecessary periodic revisions of liability ceilings in order to take into account cost of living adjustments or in case of unexpected environmental disasters. In addition, the lack of adverse effects of this type of liability on insurance, in combination with its function as a tension release mechanism, an instrument of democratic control, and an accident prevention mechanism, renders its adoption imperative. Pollution victims should be able to negotiate a settlement or bring an action free of prearranged limitations on the amount of liability they may demand.

Imposing liability on generators for accidents occurring during transportation and disposal is supported by both domestic and regional legislation as a method that would induce generators to internalize the costs of producing wastes. Disposers must also be held liable for accidents occurring during disposal. Waste disposers must have the facilities and equipment to verify the quantities and categories of wastes they receive in order to ensure that they are suitable for the type of services they provide. Disposers must also be held liable for accidents taking place during transport, except in cases where they can prove that they did not have any control over the transporter or did not participate in her selection.

Imposing liability on transporters is not a common practice. The Conventions on nuclear liability avoid placing liability on transporters of nuclear materials — including wastes. The Draft European Community Directive specifies that waste transporters are liable only for a limited amount and not liable when they can identify the waste producer. Only the Convention on the Carriage of Dangerous Goods holds carriers exclusively liable, but only for a limited amount. Exonerating transporters from liability for accidents during transportation and disposal has yet to be adequately explained. Waste transporters must examine and verify the identity and package of wastes. They should refuse delivery if the wastes are improperly identified in the consignment note or if the package appears faulty. It is important to establish such a duty because otherwise transporters would have an incentive to engage in high-risk transfers. At the same time, waste transporters should be allowed defenses if they can identify the generator and demonstrate that, under the circumstances, further examination of wastes was infeasible or that the generator did not disclose the nature of wastes. However, the negligence of the waste transporter should not be a defense. Other defenses for waste transporters may be appropriate. This is because generators will often force transporters to expedite waste shipments and because there is significant room for fraud when wastes are already packaged and ready for transportation.

In addition, generators, transporters, and disposers must not be held liable when they have complied with the clear and specific national and international standards, or when the damage is the result of *force majeure*, intentional acts, or omissions of a third party or the victim. Lia-

bility must be joint and several when more than one person is liable.[298] All actors involved in waste management must have a right of recourse or subrogation against each other. Such a right will be particularly useful when waste disposal facilities are situated in developing countries and operated by small or state companies, and the deep-pocket generators are multinational corporations from a developed country with stricter environmental legislation. Such rules would provide generators with incentives to select responsible transporters, for transporters to verify the types of wastes they transport, and for disposers to make sure that the wastes they dispose of are actually the wastes mentioned in the manifest. Liability should cover personal injuries, property, loss of profits, costs of preventing environmental harm, and the costs to clean the environment. The costs to be recovered for preventing environmental harm and for cleaning the environment may be subject to a cost-benefit analysis after considering the circumstances of each case. Compulsory insurance must also be imposed, including traditional as well as alternative types of insurance. Moreover, given the particular nature of waste management, the statute of limitations should be extended to twenty or thirty years after the incident occurs. Finally, the geographical scope of an international liability regime must include the territory, the territorial sea, and the exclusive economic zone.[299]

Securing such provisions in an international convention should not be difficult since most national and international tort law contains similar provisions for environmental accidents.[300] It will be difficult, however, to establish an international standard of proof because national legislation is still evolving. This standard, because of the long latency periods between exposure and disease, should allow for reliable epidemiological studies to be considered. On the other hand, the standard should be flexible enough to allow courts to adjudicate cases according to the particularities of each individual case. Claims for emotional distress or for fear of cancer must also be given careful consideration. Finally, plaintiffs must be able to choose between the forum where the damage occurred, the forum where the environmental accident originated, or the place of business of the generators, transporters, and disposers. Existing conventions that limit the fora to the place where the incident or damage occurred only encourage defections from the established liability regimes when accidents actually happen and the forum designated does not serve the plaintiffs'

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298. Joint and several liability has been adopted by the Draft Convention on Liability from Activities Dangerous to the Environment. *See* The Council of Europe, Draft Convention on Civil Liability for Damage Resulting form Activities Dangerous to the Environment, July 31, 1992, DIR/JUR (92) 3, art. 6(2)-(3). After closure of the site it is provided that the last operator shall be liable and then the operator can have recourse against any third party. *See id.* art. 7.

299. The application of strict and unlimited liability cannot be extended to actions that take place in the high seas since there is no national or international jurisdiction over the high seas.

300. *See supra* sections I & II.

interests.

It will be difficult to include in a single international instrument those issues already covered by other international conventions and under the jurisdiction of different international organizations. As emphasized, there exist international conventions that deal with the transportation of toxic and radioactive wastes along with the transportation of dangerous and nuclear material.[301] There is also a fragmentation of international institutions that deal with the transportation of hazardous and radioactive wastes. In the case of maritime transportation of wastes, waste shippers may resist the imposition of liability by invoking the traditional rules of maritime law that place liability on shipowners.[302] Consequently, given the existing international legislation and different modes of waste transportation, it will be useful if the protocol to the Basel Convention is drafted with the cooperation of IMO, IAEA, and NEA.[303] Such cooperation would elucidate many issues.

2. The Social Insurance Component

Additional funding mechanisms should be provided in cases where businesses are not able to shoulder the full amount of compensation, cannot be held liable, do not exist anymore, or the settlement or adjudication procedures take too long because of the nature of the dispute or the overloading of national courts. These concerns can best be addressed by a mixed system comprised of private liability and social insurance components. The social insurance component of such a regime may take the form of a fund. The fund could be modeled after the 1971 and 1984 Fund Conventions and provide for residual compensation and immediate relief. It may also provide full compensation in cases where industries are not liable or do not exist anymore or in cases where national courts rejected compensation claims because there was no apparent linkage between exposure and disease. In the latter case, plaintiffs may be allowed to file claims against the fund at least two times after the initial claim if they can demonstrate with stronger evidence the linkage between exposure and disease. The fund could additionally provide immediate assistance during catastrophic accidents and sponsor international relief efforts in case of environmental disasters in the high-seas.

The Fund could be financed by waste exporting and importing states

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301. In addition, during the discussion of the HNS Revision, there was agreement that the Convention should cover "damage occurring during the carriage of hazardous and noxious substances to the dumping site." *See* 66th Session Report, *supra* note 118, at 13. However, the state parties to the London Dumping Convention have emphasized that the HNS Convention should apply only to "accidental spillages and loss of waste cargo" and not to "deliberate disposal at sea of wastes." The latter should be covered by a liability protocol to the London Dumping Convention. *See* 67th Session Report, *supra* note 120, at 17.

302. *See supra* notes 4-8.

303. It appears that such cooperation already exists. *See* Discussion of the Protocol to the Basel Convention, 67th Session Report, *supra* note 120, at 25.

in proportion to their wealth and the volumes of wastes they import or export.[304] States can, in turn, tax waste generators, transporters, or disposers. Direct industry financing under the supervision of states should not be excluded, but it will be more difficult to establish because industries that generate wastes, unlike industries involved in the oil business, are very diverse. An alternative approach would be to establish a preliminary fund involving mandatory contributions of states and voluntary contributions of industry. After the termination of the preliminary period, the performance of the fund will be evaluated and states will be required to submit proposals concerning industry's direct contributions to the fund. For this purpose, during the first stage of the fund, states will have to accumulate data and sponsor statistical analysis concerning waste production, waste exports, and accidents due to waste mismanagement and transportation for each industrial sector. The advantage of the two-stage approach is that it would entice industry to contribute to the fund under the threat that if voluntary contributions are inadequate, they will become mandatory. As evidenced by CRISTAL and TOVALOP, industry is more willing to contribute to voluntary schemes than to obligatory ones. The fund could be administered temporarily by an existing international organization such as the United Nations Environment Programme, the IAEA, the World Bank, or preferably by an international agency specializing in waste management.[305]

CONCLUSION

It is the conclusion of this article that both justice and efficiency propagate the establishment of an international liability regime for accidents due to waste mismanagement. A strict and unlimited liability system will prevent accidents and simultaneously democratize the international system without causing any adverse effects on insurance.

304. LOUKA, *supra* note 1, at 26.
305. *Id.* at 22-23.