Denver Journal of International Law & Policy

Volume 35
Number 1 *Winter*

Article 3

January 2006

Liability and Compensation for Harm Caused by Nuclear Activities

Jon M. Van Dyke

Liability and Compensation for Harm Caused by Nuclear Activities

Keywords

Compensation, Liability, Environmental Law, Acid Rain, International Law: History, Politics

LIABILITY AND COMPENSATION FOR HARM CAUSED BY NUCLEAR ACTIVITIES

JON M. VAN DYKE[1]

I. INTRODUCTION

The body of customary international environmental law has its foundation in cases such as the *Trail Smelter Arbitration,*[2] which utilized the no-harm rule and the polluter-pays principle, and it is now drawing upon more specific norms that build on these earlier rules, such as the precautionary principle and the principle of sustainable development. The specific obligation to provide restitution and compensation when nuclear activities cause injuries has been recognized repeatedly and is now certainly part of customary international law. But problems remain regarding how to measure damages, how to implement the duty to repair the injuries, and what specific obligations exist to protect neighboring states from transboundary pollution.

II. RESPONSIBILITY FOR TRANSBOUNDARY INJURY TO PERSONS, PROPERTY, AND THE ENVIRONMENT

A. The No-Harm Rule (Sic Utere Tuo Ut Alienum Non Laedas – One Should Use One's Property So As to Avoid Injuring Others)

Customary international law requires states to ensure that activities under their jurisdiction do not cause damage to the resources, people, or environment of other states. This principle was applied in the *Trail Smelter Arbitration*[3] and has been repeatedly embodied in later treaties, conventions, and international decisions. The United States brought an action against Canada for sulfur dioxide emissions produced by a smelter in Trail, British Columbia, which damaged private timber and agricultural property in Washington State. The International Joint Commission, established by the Boundary Waters Treaty of 1909 between the two states, arbitrated the dispute. It held Canada liable for more than $350,000 in damages and ordered Canada to refrain from causing further damages. The Commission examined international decisions as well as disputes between U.S. states, because the arbitration agreement indicated that U.S. law could be

1. The author would like to thank Jamie Tanabe, Svitlana Campbell, and Sechyi Laui, law students at the William S. Richardson School of Law, University of Hawaii at Manoa, classes of 2002, 2006, and 2007 respectively, for their assistance with some of the research in this paper.

2. Trail Smelter Case (U.S. v. Can.), 3 R.I.A.A. 1905 (1938 & 1941) [hereinafter *Trail Smelter Arbitration*] (no-harm rule at 1965; polluter-pays principle at 1980-81).

3. *Id.* at 1965.

considered. Based on these precedents, the Commission concluded that "no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence."[4]

The responsibility of Canada in the *Trail Smelter Arbitration* did not result from any intentional or invidious action taken by Canada, and wrongful intent was not necessary for the activity to become "an internationally wrongful act." Canada's responsibility flowed simply from its breach of a duty it owed to its neighbor, a duty to prevent activities within its jurisdiction from causing harm to persons, property, and the environment of the United States. One commentator explained that the earlier efforts of the International Law Commission to differentiate between lawful and unlawful acts were based on a false dichotomy and led to a *non sequitur*:

> The fact that operating a smelting plant is permitted by international law does not necessarily mean that all acts committed in the course of that activity are permitted by international law: the *activity* of operating a smelting plant is lawful, but the *act* of discharging fumes from that plant is not lawful. The discharge of fumes arises out of an activity which is permitted by international law, but the discharge itself is an act which is not permitted by international law.[5]

In its more recent 2001 Draft Articles on Responsibility of States for Internationally Wrongful Acts, the International Law Commission has recognized that international liability does not require wrongful intent, and it now defines "internationally wrongful act of a State" in the following simple terms: "There is an internationally wrongful act of a State when conduct consisting of an action or omission: (a) is attributable to the State under international law; and (b) constitutes a breach of an international obligation of the State."[6] The Commentary to this article explains that "[c]ases in which the international responsibility of a State has been invoked on the basis of an omission are at least as numerous as those based on positive acts, and no difference in principle exists between the two."[7]

The International Court of Justice (ICJ) recognized state responsibility for damage to one country caused by activities within the jurisdiction of another country in the 1949 *Corfu Channel Case*.[8] The United Kingdom brought a claim against Albania when two of its warships were damaged by mines in the Straits of Corfu within Albania's territorial waters. Albania was aware of the dangers but did not announce the existence of the mines. In holding Albania responsible, the

---

4. *Id.*

5. M.B. Akehurst, *International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by International Law*, 16 NETH. Y.B. INT'L. L. 3, 8 (1985).

6. JAMES CRAWFORD, THE INTERNATIONAL LAW COMMISSION'S ARTICLES ON STATE RESPONSIBILITY: INTRODUCTION, TEXT AND COMMENTARIES 81 (2002) [hereinafter ILC ARTICLES].

7. *Id.* at 82.

8. Corfu Channel Case (U.K. v. Alb.), 1949 I.C.J. 4 (Apr. 9).

ICJ held that it is "every State's *obligation* not to allow knowingly its territory to be used for acts contrary to the rights of other States."[9] This case is particularly significant because it speaks in terms of an "obligation" on the part of Albania to ensure that others are not injured by dangers within its jurisdiction, and because the United Kingdom vessels knew that dangers lurked in the Corfu Channel when they sailed through. The Court ruled that the responsibility of Albania was not in any way reduced because the U.K. ships may have been contributorily negligent in sailing through these waters.[10]

The 1972 U.N. Conference on the Human Environment, also known as the Stockholm Conference, formally adopted the no-harm principle for environmental damage. The purpose of the Stockholm Conference was to "serve as a practical means to encourage, and to provide guidelines for, action by governments and international organizations designed to protect and improve the human environment, and to remedy and prevent its impairment, by means of international co-operation."[11] It confirmed the *Trail Smelter* holding in Principle 21, stating that:

> *States have*, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and *the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.*[12]

Principle 21 has developed into "the cornerstone of international environmental law,"[13] and was confirmed again in Principle 2 of the Rio Declaration, which emerged from the 1992 Conference on Environment and Development.[14] This principle has become important because "as it has been applied in subsequent law-making, [it] requires states to do more than make reparation for environmental damage. *Its main importance is that it recognizes the*

---

9. *Id.* at 22 (emphasis added).

10. *Id.* at 35-36; Military and Paramilitary Activities (Nicar. v. U.S.), 1986 I.C.J. 14 (June 27) (holding that the United States violated international law by failing to warn other states that it had planted mines in Nicaragua's harbors).

11. G.A. Res. 2581, ¶ 2, U.N. GAOR, 24th Sess., Supp. No. 30, U.N. Doc. A/7630 (Dec. 15, 1969).

12. U.N. Conference on the Human Environment, June 5-16, 1972, *Declaration of Principles*, Principle 21, U.N. Doc. A/CONF.48/14 (June 16, 1972) [hereinafter *Stockholm Declaration*] (emphasis added).

13. PHILIPPE SANDS, PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW 236 (2d ed. 2003).

14. U.N. Conference on Environment and Development, June 3-14, 1992, *Rio Declaration on Environment and Development*, Principle 2, U.N. Doc. A/Conf.151/26/Rev.1 (Jan. 1, 1993) [hereinafter *Rio Declaration*] (Stating that, "States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction").

duty of states to take suitable preventive measures to protect the environment."[15] This duty is thus one of exercising both due diligence and harm prevention.[16]

The obligation of due diligence "requires the introduction of legislation and administrative controls applicable to public and private conduct which are capable of effectively protecting other states and the global environment, and it can be expressed as the conduct to be expected of a good government."[17] The due diligence standard has sometimes been criticized as elusive and too flexible, and it necessarily is relative and responsive to the situation requiring "diligence." One scholar has explained that "during the course of legal development," due diligence "has been defined to mean what a responsible government should do under normal conditions in a situation with its best practicable and available means, with a view to fulfilling its international obligation."[18] But, even though the response of a government will vary depending on its abilities to respond, when the government itself is involved in the risk-creating activity, either as initiator or as regulator of it, its responsibility to protect the interests of its neighbors is necessarily at the highest possible level: "When an activity bears a significant risk of transboundary damage the government *must take all necessary measures* to prevent such damage."[19]

The no-harm rule can be found in Article 194(2) of the 1982 U.N. Law of the Sea Convention[20] and in the Preamble of the 1992 U.N. Framework Convention on Climate Change, which says:

> *Recalling* also that States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, *and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.*[21]

The International Court of Justice said explicitly in 1996 that "the general obligation of states to ensure that activities within their jurisdiction and control respect the environment of other states or of areas beyond national control is now

---

15. PATRICIA W. BIRNIE AND ALAN E. BOYLE, INTERNATIONAL LAW & THE ENVIRONMENT 111 (2d ed. 2002) (emphasis added).

16. *Id.* at 112.

17. *Id.*

18. XUE HANQIN, TRANSBOUNDARY DAMAGE IN INTERNATIONAL LAW 163 (2003).

19. *Id.* (emphasis added).

20. United Nations Convention on the Law of the Sea art. 194(2), Dec. 10, 1982, 1833 U.N.T.S. 397 (art. 194(2) states: "States shall take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment, and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights in accordance with this Convention").

21. United Nations Framework Convention on Climate Change Preamble, May 9, 1992, 1771 U.N.T.S. 107 (emphasis added).

part of the corpus of international law relating to the environment."[22] Claims for transboundary harm can be brought based on several distinct theories:

> Nuisance, which refers to excessive and unreasonable hindrance to the private utilization or enjoyment of real property... Trespass,... direct and immediate physical intrusion into the immovable property of another person... Negligence... [T]he doctrine of public trust... and that of riparian rights... [N]eighborhood law (duty of owner of a property or installation, especially one carrying industrial activities, to abstain from any excesses which may be detrimental to the neighbour's property)...[23]

The claim brought by Australia and New Zealand against France in the early 1970s challenging the atmospheric testing in French Polynesia,[24] for instance, was based on a theory of trespass, *i.e.,* that the radionuclides produced by the testing entered into the airspace of Australia and New Zealand thereby causing harm to persons and property.

B. The Duty to Control Sources of Harm

Professor Boyle has usefully explained that governing principles of customary international law require countries "to take adequate steps to control and regulate sources of serious environmental pollution or transboundary harm within their territory or subject to their jurisdiction."[25] This principle is designed to protect not only other states but also "common spaces including the high seas, deep sea-bed and outer space, and also the atmosphere, from pollution."[26]

C. The Polluter-Pays Principle

It is a central principle of international law that when a state violates its international obligations, it has a duty to make reparations for the wrongs committed. This is a logical rule because "the function of any regime of allocation of loss should be to provide an incentive for those concerned with the hazardous operations to take preventive or protective measures in order to avoid damage; to compensate damage caused to any victim; and to serve an economic function, that is, internalize all the costs (externalities)."[27] The Permanent Court of International Justice (PCIJ) in the *Factory at Chorzów Case* stated that "reparation must, as far as possible, wipe out all the consequences of the illegal act and reestablish the situation which would, in all probability, have existed if that act had not been

22. Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226, 241-42, (July 8). *See also* Gabcikovo Nagymaros Project (Hung. v. Slovk.), 1997 I.C.J. 7, ¶ 53 (Sept. 25).

23. International Law Commission, *First Report on the Legal Regime for Allocation of Loss in Case of Transboundary Harm Arising Out of Hazardous Activities,* ¶ 123, U.N. GAOR, 55th Sess., U.N. Doc. A/CN.4/531 (Mar. 21, 2003) (*prepared by* Pemmaraju Sreenivasa Rao, Special Rapporteur) [hereinafter Rao].

24. Nuclear Tests (Austl. v. Fr.), 1973 I.C.J. 99 (Dec. 20, 1974).; Nuclear Tests (N.Z. v. France), 1973 I.C.J. 135 (Dec. 20, 1974).

25. Alan E. Boyle, *Nuclear Energy and International Law: An Environmental Perspective,* 60 BRIT. Y.B. INT'L L. 257, 269 (1990).

26. *Id.* at 271.

27. Rao, *supra* note 23, at ¶ 45.

committed."[28] The ICJ also recognized in the *Gabcikovo Case* that "[i]t is a well-established rule of international law that an injured State is entitled to obtain compensation from the State which has committed an internationally wrongful act for the damage caused by it."[29] This rule was reaffirmed by the International Tribunal for the Law of the Sea in its first full opinion, *The M/V Saiga Case.*[30] When addressing the question of damages, the Tribunal quoted from the venerable *Factory at Chorzów Case*[31] for the proposition that every wrong requires a remedy:

> It is a well-established rule of international law that a State which suffers damage as a result of an internationally wrongful act by another State is entitled to obtain reparation for the damage suffered from the State which committed the wrongful act and that "reparation must, as far as possible, wipe out all the consequences of the illegal act and reestablish the situation which would, in all probability, have existed if that act had not been committed" (Factory at Chorzów, Merits, Judgment No. 13, 1928, P.C.I.J., Series A, No. 17, p. 47).[32]

Pursuant to this standard, the Tribunal awarded $2,123,357 to Saint Vincent and the Grenadines for damages resulting from the detention of the *Saiga*, the damage to the vessel, and the injury to the crewmembers.[33] This principle is also codified as Principle 17 of the 1992 Rio Declaration:

> National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that *the polluter should, in principle, bear the cost of pollution*, with due regard to the public interest and without distorting international trade and investment.[34]

III. OTHER PRINCIPLES GOVERNING HOW COUNTRIES MUST DEAL WITH ACTIVITIES THAT AFFECT THEIR NEIGHBORS

Among the other principles of international law relevant to transboundary environmental conflicts are the duty to cooperate, stewardship, sustainable development, the protection of biological diversity, the precautionary principle or approach, intra-generational (social) equity, inter-generational equity, and indigenous rights. Those particularly relevant to this discussion are addressed in more detail below.

A. Precautionary Principle

The precautionary principle, which has evolved into a customary international law norm, was confirmed in Principle 15 of the Rio Declaration, which states:

---

28. Factory at Chorzów, (F.R.G. v. Pol.), 1928 P.C.I.J. (ser. A) No. 17, at 47 (Sept. 13).

29. Gabcikovo Nagymaros Project, *supra* note 22, at ¶152.

30. M/V Saiga (No. 2) (St. Vincent v. Guinea), 120 I.L.R. 143, ¶ 170 (Int'l Trib. L. of the Sea 1999).

31. Factory at Chorzów, *supra* note 28.

32. M/V Saiga, *supra* note 30, at ¶ 170.

33. *Id.* at ¶ 175.

34. *Rio Declaration*, *supra* note 14, Principle 17 (emphasis added).

> In order to protect the environment, the precautionary approach shall be widely applied *by States* according to their capabilities. Where there are threats of serious or irreversible damage, *lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.*[35]

The precautionary principle continues to develop and is presently seen as an authoritative norm recognized by governments and international organizations as a firm guide to activities affecting the environment.[36] It flows directly from the responsibility of "due diligence" that is a component of the no-harm rule and it constitutes "an obligation of diligent prevention and control."[37] The essential components of the precautionary principle are:

- Developments and initiatives affecting the environment should be thoroughly assessed before action is taken.
- The burden is on the developer or initiator to establish that the new program is safe.
- Alternative technologies should be explored.
- The absence of full scientific certainty should not limit precautionary measures to protect the environment.
- Whenever serious or irreversible damage is anticipated, the action should be postponed or canceled.

The precautionary principle has been somewhat controversial, because some commentators view it as being too vague,[38] and others view it as unrealistic, but it is a major presence at all international negotiations now, and it appears regularly in treaties and documents because it reflects the view that it is necessary to be extra vigilant in our stewardship of resources, especially in light of the many mistakes we have made in recent years.[39] Although the content of the precautionary principle is still the subject of discussion, at a minimum it serves to reverse the burden of proving that a certain activity does not or will not cause damage onto the

---

35. *Id.* at Principle 15 (emphasis added).

36. *See, e.g.*, Jon M. Van Dyke, *The Evolution and International Acceptance of the Precautionary Principle, in* BRINGING NEW LAW TO OCEAN WATERS 357, 357 (David D. Caron and Harry N. Scheiber eds., 2004).

37. BIRNIE & BOYLE, *supra* note 15, at 115.

38. *See, e.g.*, Daniel Bodansky, *Scientific Uncertainty and the Precautionary Principle*, 33 ENV'T 4, 8 (Sept. 1991) ("Although the precautionary principle provides a general approach to environmental issues, it is too vague to serve as a regulatory standard because it does not specify how much caution should be taken."). *But see* Daniel Bodansky, *Remarks: New Developments in International Environmental Law*, 85 AM. SOC'Y INT'L L. PROC. 401, 413 (1991) ("Indeed, so frequent is its invocation that some commentators are even beginning to suggest that the precautionary principle is ripening into a norm of customary international law."). *See generally* James E. Hickey, Jr. & Vern R. Walker, *Refining the Precautionary Principle in International Environmental Law*, 14 VA. ENVTL. L.J. 423 (1995) and Gregory D. Fullem, *The Precautionary Principle: Environmental Protection in the Face of Scientific Uncertainty*, 31 WILLAMETTE L. REV. 495 (1995).

39. *See generally* Jon M. Van Dyke, *Applying the Precautionary Principle to Ocean Shipments of Radioactive Materials*, 27 OCEAN DEV. & INT'L L. 379 (1996).

state seeking to initiate an environmentally sensitive activity. As Judge Wolfrum expressed in his separate opinion in the *MOX Plant Case*:

> There is no general agreement as to the consequences which flow from the implementation of this principle *other than* the fact that the burden of proof concerning the possible impact of a given activity is reversed. A State interested in undertaking or continuing a particular activity has to prove that such activities will not result in any harm, rather than the other side having to prove that it will result in harm."[40]

Certainly the inclusion of the precautionary standard in the 1996 Protocol to the London Dumping Convention[41] and in the 1995 Straddling and Migratory Fish Stocks Agreement[42] provides strong evidence that this approach is here to stay.[43] The principle has been so universally included in recent treaties that it now appears to have been accepted as a norm of customary international law that is formally binding on all nations.[44] Several judges on the ICJ have recognized the precautionary principle as an emerging concept in international law in cases such as the 1995 *Nuclear Tests Case*[45] and the 1996 *Nuclear Weapons Case*.[46]

B. The Duty to Cooperate

Another principle well-established in customary international law is the requirement that states cooperate in making decisions that may substantially affect shared environmental resources. As Professor Boyle has explained in simple and direct terms, "States are required to co-operate with each other in controlling

---

40. MOX Plant Case (No. 10) (Ir. v. U.K.), 41 I.L.M. 405 (Int'l Trib. L. of the Sea 2001) (opinion of Judge Wolfrum) (emphasis added).

41. 1996 Protocol to the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter art. 3, Nov. 7, 1996, 36 I.L.M. 1 (reversing the presumptions established in the original convention, so that the dumping of all wastes is prohibited unless the item to be dumped is explicitly listed in Annex I).

42. Agreement for the Implementation of the Provisions of the U. N. Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks art. 5(c) and 6, Sept. 8, 1995, U.N. Doc. A/CONF.164/37, 34 I.L.M. 1542 (listing the "precautionary approach" among the principles that govern conservation and management of shared fish stocks and elaborating on this requirement in some detail, focusing on data collection and monitoring).

43. *E.g.*, Western Pacific Regional Fishery Management Council, *A 20-Year Report* 26 (1998) (stating proudly that the Council has established "a precautionary management approach to fishery conservation and management" as evidenced by its establishment of a moratorium and then a limited-entry program "in response to the rapid entry of longline vessels into the Hawaii-based fleet").

44. *See generally* Van Dyke, *supra* note 39.

45. Request for Examination of Situation in Accordance with Paragraph 63 of Court's Judgment of 20 December 1974 in the Nuclear Tests (N.Z. v. Fr.), 1995 I.C.J. 288, 342, 412 (Sept. 22) (dissenting opinion of Judge Weeramantry) (stating the precautionary principle is "gaining increasing support as part of the international law of the environment") (dissenting opinion of Judge Palmer) (stating "the norm involved in the precautionary principle has developed rapidly and may now be a principle of customary international law relating to the environment").

46. Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 240, 502 (July 8) (dissenting opinion of Judge Weeramantry) (stating "principles of environmental law, which this Request enables the Court to recognize and use in reaching its conclusions, [include] the precautionary principle").

transboundary pollution and environmental risks."[47] Principle 24 of the Stockholm Declaration states:

> International matters concerning the protection and improvement of the environment *should be handled in a co-operative spirit by all countries*, big and small, on an equal footing. Cooperation through multilateral or bilateral arrangements or other appropriate means is essential *to effectively control, prevent, reduce and eliminate adverse environmental effects* resulting from activities conducted in all spheres, in such a way that due account is taken of the sovereignty and interests of all States.[48]

This principle had earlier been utilized by the arbitral tribunal in the 1957 *Lac Lanoux Arbitration*[49] where it was held that, as a matter of customary international law, a state that is engaging in behavior likely to impact the environment of another state significantly is obliged to involve the affected state in discussions regarding these activities.

The duty to consult includes the duty to notify other affected countries, the duty to exchange information, the duty to listen to the concerns of affected countries, the duty to respond to these concerns, and the duty to negotiate in good faith. In some situations, countries also have the duty to reach an agreement, and a duty to submit the dispute to third-party adjudication if they cannot resolve the matter.

For instance, when an activity may have a significant transboundary affect on ocean and coastal waters the Law of the Sea Convention requires the exchange of information about the proposed activity and the preparation of an environmental impact assessment to disclose the nature of the activity and the attendant risks.[50] The Espoo Convention also requires an environmental impact assessment for activities that are likely to cause a significant transboundary impact.[51] Along these same lines, a state also has a duty to provide prior notification for transboundary shipment of wastes. The Basel Convention[52] and the IAEA Code of Practice on the International Transboundary Movement of Radioactive Waste[53] both require a state to notify and obtain the consent of the sending, receiving and transit states in accordance with their respective laws and regulations.

---

47. Boyle, *supra* note 25, at 278.

48. Stockholm Declaration, *supra* note 12, at Principle 24 (emphasis added).

49. Affaire du Lac Lanoux [Lake Lanoux Arbitration] (Fr. v. Spain), 12 R.I.A.A. 281 (1957).

50. Law of the Sea Convention, *supra* note 20, art. 204-06.

51. Convention on Environmental Impact Assessment in a Transboundary Context art. 2.1, Feb. 25, 1991, 1989 U.N.T.S. 309 [hereinafter Espoo Convention] (requiring contracting parties to take all appropriate measures to prevent, reduce, and control significant adverse transboundary environmental impacts from proposed activities.).

52. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal art. 4, Mar. 22, 1989, 28 I.L.M. 649.

53. Int'l Atomic Energy Agency [IAEA], *Code of Practice on the International Transboundary Movement of Radioactive Waste (IAEA Code)*, IAEA Doc. INFCIRC/386 (Nov. 13, 1990).

The duty to cooperate played a central role in judgment of the International Court of Justice in the *Case Concerning the Gabcikovo-Nagymaros Dam*,[54] which, as described by Professors Birnie and Boyle, had "[t]he effect of...requir[ing] the parties to co-operate in the joint management of the project, and to institute a continuing process of environmental protection and monitoring...."[55] These distinguished commentators have explained that "[t]he Court's environmental jurisprudence is not extensive but its judgments affirm the existence of a legal obligation to prevent transboundary harm, to co-operate in the management of environmental risks, to utilize shared resources equitably and, albeit less certainly, to carry out environmental impact assessment and monitoring."[56]

The International Tribunal for the Law of the Sea confirmed the importance of the duty to cooperate in two recent cases. In the *MOX Plant Case (Ireland v. U.K.)*, the Tribunal ruled on December 3, 2001 that the duty to cooperate required the two countries to exchange information concerning the risks created by the plant, to monitor the effects of the plant on the marine environment, and to work together to reduce those risks.[57] Similarly in the *Case Concerning Land Reclamation by Singapore In and Around the Straits of Johor*, the Tribunal issued a ruling on October 8, 2003, stating:

> [G]iven the possible implications of land reclamation on the marine environment, *prudence and caution require* that Malaysia and Singapore *establish mechanisms for exchanging information and assessing the risks or effects of land reclamation works and devising ways to deal with them in the areas concerned* (emphasis added).[58]

To give teeth to this duty to cooperate, the Tribunal went on to prescribe provisional measures that the parties had to comply with:

> Malaysia and Singapore *shall cooperate* and shall, for this purpose, enter into consultations forthwith in order to:
>
> (a) *establish promptly a group of independent experts* with the mandate
>
> (1) *to conduct a study*, on terms of reference to be agreed by Malaysia and Singapore, to determine, within a period not exceeding *one year* from the date of this Order, the effects of Singapore's land reclamation and to propose, as appropriate, measures to deal with any adverse effects of such land reclamation...
>
> (b) exchange, on a regular basis, information on, *and assess risks or effects of*, Singapore's land reclamation works...(emphasis added).[59]

---

54. Gabcikovo Nagymaros Project, *supra* note 22, at ¶ 147.

55. BIRNIE & BOYLE, *supra* note 15, at 108.

56. *Id.*

57. MOX Plant Case, *supra* note 40.

58. Concerning Land Reclamation by Singapore In and Around the Straits of Johor (No. 12) (Malay. v. Sing.), 126 I.L.R. 487, ¶ 99 (Int'l Trib. L. of the Sea 2003).

59. *Id.* at ¶ 106(1).

Finally, the Tribunal directed "Singapore not to conduct its land reclamation in ways that might cause irreparable prejudice to the rights of Malaysia or serious harm to the marine environment, taking especially into account the reports of the group of independent experts."[60]

C. Principles of Equity

Principles of equity are also deeply rooted in customary international law. The concept of inter-generational equity holds that "each generation is entitled to inherit a robust planet that on balance is at least as good as that of previous generations... As members of the present generation, we hold the earth in trust for future generations. At the same time, we are beneficiaries entitled to use and benefit from it."[61]

IV. DOES INTERNATIONAL LAW IMPOSE STRICT LIABILITY ON HAZARDOUS ACTIVITIES THAT CAUSE HARM TO OTHER COUNTRIES?

For most injuries under most legal systems, the person who caused the injury is liable only if that person acted "negligently," *i.e.,* did not engage in the "due diligence" required by the activity or situation. But for some activities and situations, which by their very nature are risky and raise the possibility of serious injuries, a higher standard of liability is utilized, usually characterized as "strict liability."

Strict liability emerged in Anglo-American jurisprudence from the 1868 case of *Rylands v. Fletcher,*[62] where the House of Lords ruled that a "person who, for his own purposes, brings on his land and collects and keeps there anything likely to do mischief if it escapes, must keep it in at his peril, and, if he does not do so, is *prima facie* answerable for all damage which is the natural consequence of its escape."[63] One commentator has recently explained that "strict liability is not a recent legal development for tortious injury, nor is it uncommon... [S]trict liability in one form or another is imposed in many legal systems for damage caused by [ultrahazardous] activity."[64] Although some commentators seem reluctant to recognize this principle as applicable in international law, it appears increasingly in international treaties,[65] and does seem to govern international decision-making.

---

60. *Id.* at ¶ 106(2).

61. Edith Brown Weiss, *Our Rights and Obligations to Future Generations for the Environment,* 84 AM. J. INT'L L.198, 199-200 (1990).

62. Rylands v. Fletcher, (1868) 3 Eng. Rep. 330 (L.R.-P.C.).

63. *Id* at 339-40.

64. HANQIN, *supra* note 18, at 299-300.

65. *See, e.g.,* Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment, June 21, 1993, 32 I.L.M. 1228; Basel Protocol, *supra* note 53; Convention on International Liability for Damage Caused by Space Objects, March 29, 1972, 24 U.S.T. 2389, T.I.A.S. No. 7762; Convention Relating to Civil Liability in the Field of Maritime Carriage of Nuclear Materials, Dec. 17, 1971, 974 U.N.T.S. 255, 11 I.L.M. 277; International Convention on Civil Liability for Oil Pollution Damages, Nov. 29, 1969, 23 I.L.M. 177; Vienna Convention on Civil Liability for Nuclear Damage, May 21, 1963, 1063 U.N.T.S. 265, 2 I.L.M.727; Convention on the Liability of Operators of Nuclear Ships, May 25, 1962, 973 U.N.T.S. 3; Convention on Third Party Liability in the Field of Nuclear Energy, July 29, 1960, 956 U.N.T.S. 263; Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface, Oct. 7, 1952, 310 U.N.T.S. 181.

One commentator has explained that "strict liability may result even though the activity does not involve a high degree of risk if the risk carries with it the possibility of such widespread harm that it becomes 'abnormally dangerous.'"[66]

Although countries have been reluctant to accept the unlimited range of responsibilities that might flow from a strict-liability regime, nonetheless they have tended to accept their obligations to others when their activities have caused unforeseen harms. As Robert Q. Quentin-Baxter, the first Special Rapporteur to the International Law Commission on this topic, explained, "at the very end of the day, when all the opportunities for regime-building have been set aside – or, alternatively, when a loss or injury has occurred that nobody foresaw – there is a commitment, in the nature of strict liability, to make good the loss."[67] "In the absence of any agreement, the source State, according to Quentin-Baxter, was nevertheless liable to make reparation to the affected State in conformity with the shared expectations entertained by them."[68] His successor, P.S. Rao, has confirmed that "there is general support for the proposition that any regime of liability and compensation should aim at ensuring that the innocent victim is not as far as possible left to bear the loss resulting from transboundary harm arising from hazardous activity."[69] Later in his report, he phrased this in terms of a duty: "States have a duty to ensure that some arrangement exists to guarantee equitable allocation of loss."[70] In his conclusions, he explained that states normally prefer to avoid direct responsibility and that "liability and obligation to compensate should be first placed at the doorstep of the person most in control of the activity at the time the accident or incident occurred."[71] If the liability of the operator is limited in any way, then "[t]he limited liability should be supplemented by additional funding...from the principal beneficiaries of the activity or from the same class of operators or from earmarked State funds."[72] And, perhaps most importantly, "[t]he State should also ensure that recourse is available within its legal system, in accordance with evolving international standards, for equitable and expeditious compensation and relief to victims of transboundary harm."[73]

A. Nuclear Activities in Particular

The operation of a nuclear reactor for the purpose of creating energy is not an inherently "wrongful act," but it can constitute an "internationally wrongful act" if the operation of the plant causes harm to the persons, property, or environment of a neighboring state. If a nuclear accident were to occur, the operator would be strictly liable for the damage that resulted and the state with jurisdiction over the plant would also be responsible for providing restitution and compensation for the

66. John M. Kelson, *State Responsibility and the Abnormally Dangerous Activity*, 13 HARV. INT'L L. J. 197, 205 (1972).

67. Rao, *supra* note 23, at ¶ 18.

68. *Id.* at ¶ 8.

69. *Id.* at ¶ 44.

70. *Id.* at ¶ 151.

71. *Id.* at ¶ 153(d).

72. *Id.* at ¶ 153(g).

73. *Id.* at ¶ 153(i).

resulting harm. Commentators appear to agree that nuclear activities are governed by the strict-liability regime:

> A good example of the special importance in international law is the application of the doctrine of strict or absolute liability to operators or agencies responsible for the manufacture, transportation, or use of radioactive materials, activities that may result in injuries in the form of pollution by radiation.[74]

Professor Boyle has explained why strict liability is the logical standard to govern nuclear activities:

> The arguments for using a standard more demanding than due diligence to shift the burden of unavoidable loss back to the polluting state remain strong, particularly where the source is an ultra-hazardous activity, such as a nuclear power plant. In the absence of reciprocal acceptance of risk, making the victim suffer is not an attractive policy.[75]

Several examples involving payments underscore the recognition that victims who suffer injuries as a result of nuclear activities are entitled to restitution and compensation, and that countries accept that they are strictly liable to provide such remedies.

B. The Fukuryu Maru (Lucky Dragon) Fallout Exposure (1954)

Because of errors in calculating the magnitude of the explosion and the wind direction, the March 1, 1954 hydrogen bomb test conducted by the United States in the Marshall Islands caused injury to islanders and Americans in the region, and also to the 27 Japanese crew members on the fishing vessel *Fukuryu Maru (Lucky Dragon)*. One member of the crew died and the rest sustained serious sickness and injuries because of their exposure to the radiation.[76] A year later, even though the United States defended its nuclear tests as lawful measures of security,[77] it provided Japan with an *ex gratia* payment of $2 million "for purposes of compensation for the injuries or damages sustained... [and] in full settlement of any and all claims against the United States of America or its agents, nationals or juridical entities" caused by the test.[78]

C. Payments to Marshall Islanders

The United States provide $185 million to the Marshall Island victims of the U.S. nuclear testing during the 1950s.[79] Although this amount is inadequate and more compensation is being sought, the payment nonetheless provides further

74. J. BARROS AND DOUGLAS M. JOHNSTON, THE INTERNATIONAL LAW OF POLLUTION 75 (1974).

75. Boyle, *supra* note 25, at 296; *see also* BIRNIE & BOYLE, *supra* note 15, at 188-89.

76. Myres McDougal and Norbert Schlei, *The Hydrogen Bomb Tests in Perspective: Lawful Measures for Security*, 64 YALE L. J. 648, 652 (1955).

77. *Id.* at 682-94.

78. Personal and Property Damage Claims Agreement, U.S.-Japan, Jan. 4, 1955, 6 U.S.T. 1, T.I.A.S. No. 3160.

79. *See generally* Davor Pevec, *The Enewetak People: Nuclear Testing; Displacement; Resettlement: and Land Damage Claims* (published herein).

recognition that restitution and compensation are required for harm caused by nuclear activities.

D. The Palomares Nuclear Bomb Accident

After a U.S. B-52 containing four nuclear bombs collided in mid-air with a refueling tanker and then crashed in the waters near Palomares, Spain on January 17, 1966, spreading plutonium dust over several hundred acres,[80] the United States accepted responsibility to locate, remove, and dispose of the radioactive materials in Spanish waters and pay compensation for the injurious consequences of this act.[81]

E. The Cosmos 954 Incident

Commentators tend to examine the Cosmos 954 incident for guidance regarding the obligations of states for environmental damage, even though that matter was resolved through a negotiated settlement rather than by a third-party tribunal. On January 24, 1978, a Soviet nuclear-powered surveillance satellite called the Cosmos 954 left its orbit and crashed in western Canada, spreading its debris widely over a remote area extending across Alberta, Saskatchewan, and the Northern Territories.[82] All but two parts of the satellite were radioactive, and several pieces contained lethal levels of radioactivity.[83] Canada conducted a massive search across the area to find the pieces, with the help of the United States and with limited assistance from the Soviets.[84] Canada lodged a claim against the Soviet Union based on the 1972 Convention on International Liability for Damages Caused by Space Objects[85] and on general principles of international law,[86] asserting that international law imposed "absolute liability for space activities, in particular activities involving the use of nuclear energy,"[87] and that "[t]he principle of absolute liability applies to fields of activities having in common a high degree of risk."[88] Canada spent Canadian$14 million in the entire clean-up operation,[89] but sought only about Canadian$6 million from the U.S.S.R.[90] for costs "reasonably related to the satellite debris and not including administrative and other types of expense."[91] Canada did not assert any claim for property or environmental damage, apparently because its prompt clean-up

80. National Atomic Museum, *Broken Arrow*, http://www.atomicmuseum.com/tour/cw4.cfm (last visited Oct. 25, 2006).

81. BRIAN D. SMITH, STATE RESPONSIBILITY AND THE MARINE ENVIRONMENT 77, 117 (1988).

82. Claim Against the Union of Soviet Socialist Republics for Damage Caused by Soviet Cosmos 954, Feb. 8, 1978, 18 I.L.M. 899, 902 [hereinafter Canadian Claim].

83. *Id.* at 904.

84. *Id.* at 903.

85. Convention on International Liability for Damage Caused by Space Objects, *supra* note 65 [hereinafter Space Damage Convention].

86. Canadian Claim, *supra* note 82, at 905.

87. *Id.* at 907.

88. *Id.*

89. *Id.* at 904.

90. *Id.*

91. Eilene Galloway, *Nuclear Powered Satellites: The U.S.S.R. Cosmos 904 and the Canadian Claim*, 12 AKRON L. REV. 401, 413 (1979).

operation limited such damage. The U.S.S.R. agreed to pay Canada Canadian$3 million "in full and final settlement of all matters connected with the disintegration of the Soviet satellite 'Cosmos 954,'" without admitting any liability.[92] Some commentators have interpreted this settlement as confirming the obligation to cover clean-up costs in common areas and wilderness areas.[93] The rule that emerges from this situation is a bit ambiguous, however, because the final settlement, reached through negotiations during the height of the Cold War, was for less than the full amount of the damages.[94]

F. The Chernobyl Accident – April 1986

The catastrophic explosion of the Chernobyl nuclear power plant on April 26, 1986 was "one of the gravest technological disasters in history"[95] with consequences "of incomparable scale,"[96] and the impact of this event on the development of customary international law must be examined.[97] For ten days after the explosion, some 50 million Curie (the amount that would have been put into the atmosphere from "the simultaneous explosion of 500 A-bombs") was spewed into the atmosphere.[98] Many millions were affected, and 350,000 were obliged to abandon their homes, which was a "deeply traumatic experience" for most.[99]

Although Chernobyl was built and it exploded during the existence of the Union of Soviet Socialist Republics, its location after the breakup of the Soviet Union—within Ukraine but only 12 kilometers from the border with Belarus[100]—illustrates the inequity of siting dangerous facilities near international borders, where one state derives all the benefits of the operation while the other state bears all the risk. Nearly 70% of the radioactive dust fell on Belarus, and will remain in the ground of Belarus for thousands of years.[101] After the accident, the Soviet government in Moscow withheld information about the explosion for several days

92. Protocol on Settlement of Canada's Claim for Damages Caused by "Cosmos 954," Can.-U.S.S.R., April 2, 1981, 20 I.L.M. 689.

93. BIRNIE & BOYLE, *supra* note 15, at 192-93.

94. *Id.* at 193.

95. HANQIN, *supra* note 18, at 22.

96. *Id.*

97. *See generally* Linda A. Malone, *The Chernobyl Accident: A Case Study in International Law Regulating State Responsibility for Transboundary Nuclear Pollution,* 12 COLUM. J. ENVTL. L. 203 (1987).

98. HANQIN, *supra* note 18, at 22.

99. Press Release 2005/12, Int'l Atomic Energy Agency [IAEA], Chernobyl: The True Scale of the Accident (Sept. 5, 2005) [hereinafter IAEA Press Release], *available at* http://www.iaea.org/NewsCenter/PressReleases/2005/prn200512.html (last visited Oct. 27, 2006).

100. *See* BelarusGuide.com, Chernobyl Trace in Belarus, http://www.belarusguide.com/chernobyl1/ctrace.html [hereinafter Chernobyl Trace] (last visited Oct. 27, 2006) (providing more information on the damages suffered by Belarus as a result of transboundary nuclear pollution from the Chernobyl plant in Ukraine).

101. Ivan A. Kenik, *Belarus: a small country faces 70 percent of the fallout*, DHA NEWS, Sept–Oct. 1995, at 7, 7, *available at* http://chernobyl.undp.org/spanish/otherdoc/fallout.htm (last visited Oct. 27, 2006).

instead of immediately notifying the Belarus government.[102] Today, 23% of Belarus' agricultural land (as compared to 4.8% of Ukraine's and 0.5% of Russia's) and 20% of its forest lands have been taken out of production as a result of Chernobyl; 62% of pregnant women in Belarus currently suffer from nuclear-related diseases; and the increase in the number of diseases among newly born babies in Belarus was 60% over the period of 1986-1994 (after Chernobyl), versus only 8% in 1981-1985 (before Chernobyl).[103]

The effects of radiation may sometimes take years to manifest. Hence, claims may be brought for monitoring future harms to human health, emotional distress, and fear of developing nuclear-related diseases. Exposure to nuclear radiation undoubtedly causes severe emotional distress as a result of the environmental devastation, possible loss of life, and fear of developing life-threatening diseases. The possibility of developing such a disease may cause a victim to spend hundreds on doctor's fees and lab tests to monitor their health and detect the disease early on.

Some commentators suggest that the failure of other nations to bring claims against the Soviet Union is an example of state practice recognizing that international law would not support such claims.[104] Professors Birnie and Boyle suggest, for instance, that this incident leads to the conclusion that the strict liability regime may not apply to damage resulting from nuclear activities:

> Responses to the Chernobyl disaster provide the most telling evidence of state practice so far. This accident caused widespread harm to agricultural produce and livestock in Europe and affected wildlife, in some cases severely. Clean-up costs were incurred and compensation was paid by several governments to their own citizens for produce which was destroyed as a precautionary measure, or which was rendered unusable. Evidence of long-term health risks has yet to emerge, but remains possible.

---

102. *See* Dr. Christine K. Durback, World Information Transfer, Chornobyl, Misinformation and Ethics (Sept. 19-22, 2005), *available at* http://www.worldinfo.org/index.php?id=420 (last visited Oct. 27, 2006) (statement at the 7th Scientific and Practical Conference, Chornobyl Center, Slavutich, Ukraine).

103. *See* Chernobyl Trace, *supra* note 100; Kenik, *supra* note 101.

104. *See, e.g.*, VED P. NANDA, GEORGE PRING, INTERNATIONAL ENVIRONMENTAL LAW & POLICY FOR THE 21ST CENTURY 37, 56 n.177 (2003) (characterizing "the affected European states' failure in turn to make any claims" against the former Soviet Union for the 1986 Chernobyl nuclear plant disaster as a "notable exception to the state practice" contrary to the principles of international environmental law, but later suggesting that "as there are diplomatic reasons why this may have occurred (other nuclear states not wishing to create a precedent that could haunt them), it is not sufficient to deny the general practice and *opinion juris* on this principle"). *See also* Justin Mellor, *Radioactive Waste and Russia's Northern Fleet: Sinking the Principles of International Environmental Law*, 28 DENV. J. INT'L L. & POL'Y 51, 65–66 (1999) (stating that "Chernobyl has resulted in a 'polluter gets paid principle,' in which the polluter becomes the recipient of aid rather than compensating those states that are harmed" and also stating that the Ukraine had secured $2.3 billion from western nations to close the Chernobyl plant and begin a full cleanup).

> Despite this provable loss, no claims were made against the Soviet Union by any affected state, although the possibility was considered by some governments. Uncertainty over the basis for such a claim, reluctance to establish a precedent with possible future implications for states which themselves operate nuclear power plants, and the absence of any appropriate treaty binding on the Soviet Union are the main reasons for this silence. It is also unclear whether liability would extend to damage to the environment, or to the costs of precautionary measures taken by governments. The Soviet Union made no voluntary offer of compensation, and questioned the necessity of precautionary measures taken by its neighbours, maintaining that they suffered little or no damage. The failure to demand, or to offer compensation in this case shows the difficulty of reconciling doctrinal support for any standard of strict or absolute responsibility with the evidence of state practice, limited as it is. It points to the conclusion that responsibility for a failure of due diligence, that is for causing avoidable loss only, provides a more convincing interpretation of the actual practice of states and the present state of customary law in cases of accidental environmental damage.[105]

Professor Sands provided additional detail in his treatise, explaining that Sweden asserted that "customary international law...principles exist which might be invoked to support a claim against the USSR," but concluded that "[t]he issues involved...are complex from the legal as well as the technical point of view" and hence that "the Government has felt that priority should be given...to endeavours of another nature."[106] The United Kingdom reserved its right to present such a claim,[107] but ultimately declined to do so, perhaps in part because:

> The position of the United Kingdom government was complicated by outstanding disputes relating to the problem of acid rain in Scandinavia, contamination of the Irish Sea by nuclear waste from the Windscale/Sellafield nuclear plant, and alleged damage to Australian territory, from the nuclear tests carried out by the United Kingdom in the 1950s.[108]

West Germany and the United Kingdom paid compensation to their own citizens for the losses they incurred after the Chernobyl explosion, and the list of situations covered by the Germans under their own statute provides an interesting model of the range of damages appropriate in such situations. Individuals received payments when:

- Cattle were kept from grazing;
- Milk had to be transformed into cheese, leaving radioactive whey;

---

105. BIRNIE & BOYLE, *supra* note 15, at 474.

106. SANDS, *supra* note 13, at 887-88 (citing Correspondence with the Swedish Embassy in London, Dec. 10, 1987).

107. *Id.* at 888.

108. *Id.*

- Spring vegetables had to be destroyed or were seized;
- Some kinds of fruits were unsaleable, though they were not all contaminated;
- The travel and transport industries specializing in Eastern Europe lost clientele;
- Seasonal farm workers lost their jobs;
- Import restrictions were imposed;
- Sand in playgrounds was replaced;
- Open air meetings were cancelled;
- Recommendations to refrain from eating certain foodstuffs were issued;
- Filters of motor cars and of air-conditioning systems were replaced; and
- The changing conduct of customers led to a decline in turnover.[109]

The international community did not sit idly by after the Chernobyl tragedy and has worked to revamp the civil nuclear liability regime, adopting a host of treaties and domestic legislation.[110] More importantly, in our effort to understand the reactions of the international community to the Chernobyl disaster, it is vital to recognize that the Soviet Union—and the Russian Federation after the Soviet Union broke apart—*did recognize a duty to provide compensation to the victims of this tragedy.* In fact, the Soviet Union spent $18 billion on Chernobyl rehabilitation between 1986 and 1991, when the Union split apart. Of this, 35% went on "social assistance to affected people" and 17% on resettlement. This aid continued after the Soviet Union broke into 16 separate independent states:

> After the Soviet Union broke up in 1991, Chernobyl became a key factor in domestic politics and in relations between the three new states. *Belarus and Ukraine demanded compensation from Russia for the effects of the accident...* Especially in the case of Belarus and Ukraine, Chernobyl benefits came to represent a heavy burden on the national budgets and drained resources away from other areas of public spending. By the late 1990s, however, scaling them down, or exploring alternative strategies had become politically impossible.[111]

109. HANQIN, *supra* note 18, at 92 n.68 (listing the categories of payments made under Section 38 of the 1985 Atomic Energy Act of the Federal Republic of Germany).

110. *See generally* BIRNIE & BOYLE, *supra* note 15, at 452-99.

111. U.N. Dev. Program [UNDP] & U.N. Int'l Children Emergency Fund [UNICEF], *The Human Consequences of the Chernobyl Nuclear Accident: A Strategy for Recovery*, ¶ 2.11, (Jan. 25, 2002) [hereinafter *Human Consequences Report*] (emphasis added) *available at* http://www.undp.org/dpa/publications/chernobyl.pdf.

In 1991, Ukraine enacted The Law on Status and Social Protection of Population Suffered from Chernobyl Catastrophe,[112] which recognized liability to the following groups of people:

1. Immediate victims directly exposed to radiation, *i.e.,* the "liquidators" who worked on the site of the accident or in the exclusion zone in 1986 or 1987.

2. People affected by the accident (divided by three zones of radioactive contamination: exclusion zone, mandatory relocation zone, and voluntary relocation zone):

- Those evacuated from the exclusion zone in 1986
- Those who left a voluntary relocation zone after the accident (were paid to resettle).
- Those who refused to leave and continued to reside in these two zones
- Those who returned and lived in the second zone for two years or in the third zone for three years as of 1993.
- Those working or studying in any of three contaminated zones.
- Those who became ill because of radiation not connected to Chernobyl accident such as improper disposal of radioactive waste where no intent was established (causation had to be medically confirmed)... This statute and other Ukrainian enactments recognized the following types of injuries as being eligible for compensation:
- Harm to health or loss of ability to work, for those with a medically confirmed disability traceable to Chernobyl accident; causation was established upon physical exam after which a person received a disability document; the medical examination had to be repeated every three-to-five years to confirm disability and evaluate treatment results, except for persons with unrecoverable health changes, senior persons, or persons with Group I or II disability.
- Actual monetary losses caused by relocation or loss of property.
- Death of bread-winner.

The Ukrainian government also accepted responsibility for providing and covering the expenses for timely medical examination, radiation tests, and medical treatment of liquidators and other persons affected by the accident. Data on all liquidators and other individuals affected by the accident have been listed in the State Register maintained by the Defense Ministry, Internal Affairs Ministry, and National Security Ministry and are made available to local medical institutions assigned by the place of residence and to each person individually. The coverage

112. The Law of Ukraine, On Status and Social Protection of Population Suffered from Chornobyl Catastrophe, Law No. 796-XII, Feb. 28, 1991, *available at* http://www.welcometo.kiev.ua/ili/ilic.frame_law_result2.show?p_arg_names=law_id&p_arg_values=325 (last visited Oct. 27, 2006).

of these programs has been extensive: "benefits were offered to broad categories of 'Chernobyl victims' that expanded to seven million now receiving or eligible for pensions, special allowances and health benefits, including free holidays and guaranteed allowances."[113] Those eligible included individuals with a variety of links to the disaster, and the types of programs established for them responded to the range of injuries they suffered:

> The system of compensation payments established after the accident reflected a Soviet practice of, in effect, *compensating exposure to risk rather than actual injury*. Belarusian and Russian legislation provides more than seventy, and Ukrainian legislation more than fifty, different privileges and benefits for Chernobyl victims, depending on factors such as the degree of invalidity and the level of contamination.[114]

The pensions provided for Chernobyl disability groups included the following categories:

- Group I disabled person (liquidator) - $2,820/month
- Group II – $2,115/month
- Group III – $1,410/month
- Disabled child – $470/month
- Family that lost a bread-winner – $2,820/month
- Parents of a deceased person – $1,410/month

Compensatory programs also provided the following additional reimbursements and privileges:

- Pensions to compensate harm to health (for persons capable of working)
- Payments in addition to earned wages and harmful-work-condition payments to persons working in contaminated zones
- State housing provided to liquidators and evacuees
- Priority rights to state housing for other affected persons
- Paid medical examinations; mandatory irradiation tests; paid medical treatment and medicines
- Paid social and psychological rehabilitation services
- Paid health holidays
- Priority admission to universities
- Paid public transportation for liquidators

Health holidays are paid health vacations or trips to sanatoria in addition to normal vacation time:

> Health holidays in sanatoria and summer camps are fully financed by the authorities for invalids, liquidators, people who continue to live in highly contaminated areas, children and adolescents... In

113. IAEA Press Release, *supra* note 99.

114. *Human Consequences Report*, *supra* note 111, ¶ 2.16 (emphasis added).

> Belarus...children living in areas with contamination at a level above 5Ci/km2 (five Curies per square kilometer) have the right to two months holiday...In the year 2000, 293,895 Belarussian children and adults were provided with such holidays. A similar situation exists in Ukraine.[115]

The range and variety of these programs establish clearly that the Soviet Union, and the Russian Federation as its successor, did accept the duty to compensate the victims of this tragedy, at least in the (new) countries immediately surrounding the event and those most immediately affected by it. Although no offers of compensation were extended to victims in countries more distant from the explosion, the amount and types of compensatory programs established for those in the surrounding countries do reflect an acceptance of a strict-liability level of responsibility by the Soviet Union and by the Russian Federation.

V. THE INADEQUATE INTERNATIONAL NUCLEAR LIABILITY TREATY REGIME [116]

A patchwork of treaties has been drafted to address injuries resulting from nuclear activities, but they are not widely ratified and they leave many questions unresolved. The liability of the operator of a nuclear installation is well-established by these treaties, but they do not address carrier, supplier or financier liability. The treaty framework also imposes limits on liability and statutes of limitations on claims arising out of nuclear accidents.

The two primary conventions that create a special regime of civil liability for nuclear damage are the 1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy,[117] promulgated by the Organization of Economic Cooperation and Development (OECD) and the 1963 Vienna Convention on Civil Liability for Nuclear Damage,[118] promulgated by the International Atomic Energy Agency (IAEA). The low liability limits in these treaties were increased somewhat in 1963 in the Brussels Supplementary Convention.[119] These conventions were then linked by the Joint Protocol of 1988,[120] which combined the two Conventions into one expanded liability regime. Parties to the Joint Protocol are treated as if they are parties to both the Paris and Vienna Conventions.[121]

---

115. *Id.* ¶ 2.21.

116. Duncan E.J. Currie, *Limited Liability, Unlimited Risk: The Problems and Gaps in the Existing Treaties (Vienna and Paris Treaties) and an Analysis of How an Actual Claim Would Be Brought Under the Current Existing Treaty Regime in the Event of a Nuclear Accident*, published herein (discussing the issues concerning the inadequate international treaty regime).

117. Convention on Third Party Liability in the Field of Nuclear Energy, July 29, 1960, 956 U.N.T.S. 263 [hereinafter 1960 Paris Convention].

118. Vienna Convention on Civil Liability for Nuclear Damage, May 21, 1963, 1063 U.N.T.S. 265, 2 I.L.M.727.

119. Convention Supplementary to the Paris Convention of 29th July 1960 on Third Party Liability in the Field of Nuclear Energy, Jan. 31, 1963, 1041 U.N.T.S. 358, 2 I.L.M. 685.

120. IAEA, *Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention*, IAEA Doc. INFCIRC/402 (Sept. 21, 1988).

121. *Id.* at art. IV.

These Conventions impose strict liability on the operator of the plant for nuclear damage and require it to demonstrate financial security to cover costs brought on by the accident, mainly in the form of insurance. This liability regime has been criticized, however, as essentially immunizing the manufacturer and supplier of the nuclear facility by holding the operator strictly liable.[122] The Conventions have also been condemned for placing a statute of limitations of ten years in most cases for injuries stemming from nuclear damage, which in reality may take many more years to manifest. Another flaw in these early treaties was that they did not cover environmental damage. The Vienna Convention held the operator liable for "nuclear damage," which is defined simply as "loss of life, any personal injury or any loss of, or damage to, property which arises out of or results from... a nuclear installation."[123]

In September 1997, more than 80 countries signed a Protocol to Amend the 1963 Vienna Convention[124] and also adopted a Convention on Supplementary Compensation for Nuclear Damage[125] at the IAEA headquarters to address these concerns, but these new documents have not been widely ratified. The Protocol extended the definition of nuclear damage to include the concepts of environmental damage and preventive measures. Under the Protocol, "nuclear damage" now includes not only loss of life, personal injury, and loss of or damage to property, but also:

> each of the following to the extent determined by the law of the competent court... *the costs of measures of reinstatement of impaired environment*, unless such impairment is insignificant, if such measures are actually taken or to be taken, and insofar as not included in sub-paragraph (ii) [regarding loss of or damage to property]... [and] the costs of preventive measures, and further loss or damage caused by such measures.[126]

Although this language increases the range of compensable damages, one commentator has pointed out that is still less generous than the West German government was in providing compensation to its own citizens after the Chernobyl explosion.[127] The Protocol increased the possible limit of the operator's liability to not less than 300 million Special Drawing Rights (SDRs), which is equal to approximately $400 million, and extended the statute of limitation governing claims of loss of life and personal injury. In 2004, an additional protocol increased

122. 1963 Vienna Convention, *supra* note 118, art. II, ¶ 5 (stating that "no person other than the operator shall be liable for nuclear damage").

123. *Id.* at art. III, ¶ 1(k).

124. IAEA, *Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage*, 36 I.L.M. 1454, Sept. 12, 1997 [hereinafter 1997 IAEA Protocol].

125. IAEA, *Convention on Supplementary Compensation for Nuclear Damage*, IAEA Doc. INFCIRC/567 (Sept. 12, 1997).

126. 1997 IAEA Protocol, *supra* note 124, art. II, ¶ 2 (emphasis added).

127. HANQIN, *supra* note 18, at 92 n.68 (listing compensable categories).

the liability limits further to a total of 1.5 billion euros, which would be provided by governmental funding sources.[128]

This limit is still grossly inadequate, as can be seen by comparison to the estimate of 5,000 billion euros as the total damage of a reactor meltdown in Germany.[129] After the 1986 Chernobyl accident, according to one estimate, Belarus suffered economic damages of US$235 billion.[130] The International Atomic Energy Agency has declined to identify a specific figure for the extent of the Chernobyl damage, but has acknowledged that "[a] variety of estimates from the 1990s placed the costs over two decades at hundreds of billions of dollars."[131] For further comparison, the claims for damages after the breakup of the *Prestige* oil tanker off the cost of Spain in November 2002 came to about 700 million euros in Spain and another 100 million euros in France.[132]

The Paris and Vienna Conventions, as supplemented by the Brussels Convention and linked by the Joint Protocol, hold that the treaties ratified by the country where the nuclear installation is located will govern.[133] These conventions hold that an operator will be liable for damages occurring during the transportation of nuclear material in two situations: (1) for material originating from its plant before liability involving the material has been assumed by another operator, and (2) for material being sent to its plant after it has assumed liability.[134] In the second case, if the material is coming from a state that is not a member of the treaty, the receiving operator will be liable after the material has been loaded on the means of transport by which it is to be carried.[135] The Maritime Liability Convention[136] exonerates anyone liable for damage caused by a nuclear accident if the operator of the installation is held liable under the Paris or Vienna Convention.[137] Many gaps exist in the current treaty framework for transportation of nuclear materials. The definition of damage does not clearly include damage to the environment and consequential losses (such as fisheries and tourism) and the liability of other parties such as carriers, suppliers or financiers is not addressed.

---

128. Protocol to Amend the Convention on Third Party Liability in the Field of Nuclear Energy of 29 July 1960, art. I(H), 2004 O.J. (L 97) 55.

129. H.J. Ewers & K. Rennings, *Economics of Nuclear Risks – a German Study*, *in* SOCIAL COSTS OF ENERGY: PRESENT STATUS AND FUTURE TRENDS 150-66 (O. Hohmeyer and R. Ottinger eds., 1992).

130. Press Release, Embassy of the Republic of Belarus in the United States of America, Chernobyl After 19 Years: Problems of Rehabilitation and Sustainable Development (Apr. 22, 2005), http://www.belarusembassy.org/news/digests/pr042505.htm.

131. IAEA Press Release, *supra* note 99.

132. Louise Angelique de La Fayette, *New Approaches for Addressing Damage to the Marine Environment*, 20 INT'L J. MARINE & COASTAL L. 176 (2005).

133. 1963 Vienna Convention, *supra* note 118, art. II(1)(b); 1960 Paris Convention, *supra* note 118, art. 4(a) & (b); IAEA *Joint Protocol*, *supra* note 120, art. III(3); *see also* Jon M. Van Dyke, *The Legal Regime Governing Sea Transport of Ultrahazardous Radioactive Materials*, 33 OCEAN DEV. & INT'L L. 77, 81-82 (2002).

134. 1963 Vienna Convention, *supra* note 118, art. II(1).

135. *See id.* at art. II(1)(c).

136. Convention Relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material, Dec. 17, 1971, 974 U.N.T.S. 255, 11 I.L.M. 277.

137. *Id.* at art. I.

The failure of the international community to develop a comprehensive and adequate liability and compensation regime is the equivalent of providing an enormous subsidy to support the nuclear industry. It should be obvious that any limits on liability are inconsistent with the polluter-pays principle.

A. What Does a Sound Liability Regime Require?

The patch-work and poorly-ratified treaties governing nuclear liability do not constitute a sound liability regime on this topic. To provide appropriate coverage for those put at risk by this activity, the regime would need to include:

- Strict liability as the governing standard
- No monetary limits on liability
- A broad definition of damages, that includes damages resulting from perceived fears from an incident even if no measurable radioactivity has yet been released
- Access to a neutral tribunal by those bringing claims
- Ability to bring claims against all contributing parties—operators, suppliers, financiers, relevant governments, and, in the case of transport situations, shippers and owners of the cargo
- No statute of limitations
- The establishment of an adequate compensation fund

B. The Challenge of Determining Damages

The acceptance by the international community of the no-harm rule and the polluter-pays principle establishes that a country initiating an activity that causes harm to its neighbors bears the responsibility to provide compensation for the injuries suffered, but disagreements remain regarding how to define the "damage" that requires payment. This question is crucial because a partial or inadequate payment may leave the injured neighbor in a greatly weakened situation. Only if the country where the harm occurred is required to pay for all the damages suffered will the costs of the activity be truly "internalized." If less than complete compensation is provided, the injured neighbors will essentially be subsidizing the state conducting the harm-producing activity. The nuclear industry has historically been subsidized by governments and, as a result of the failure to develop a comprehensive liability and compensation program, by the international community. Allowing the nuclear industry to be responsible for only some of the damage it causes to neighbors who receive no benefit from the nuclear activity is an enormous subsidy to this industry.

The International Law Commission's 2001 Draft Articles on State Responsibility define the duty of the state with jurisdiction over the activity causing the harm in the following language:

> 1. The responsible State is under an obligation to make *full reparation* for the injury caused by the internationally wrongful act.

> 2. Injury includes *any damage, whether material or moral*, caused by the internationally wrongful act of a State.[138]

As explained above, the Permanent Court of International Justice (PCIJ) in the *Chorzow Factory Case* stated that "reparation must, as far as possible, wipe out all the consequences of the illegal act and reestablish the situation which would, in all probability, have existed if that act had not been committed."[139] But the reality has often been that less than full compensation has been provided after injuries have been caused. What about losses of opportunity and lost profits? What about the damages that result from fears, which may or may not be reasonable? What are "moral" damages, and when must they be paid?

The Commentary to the ILC Draft Articles defines the operative terms as follows:

> "Material" damage here refers to damage to property or other interests of the State and its nationals which is assessable in financial terms. "Moral" damage includes such things as individual pain and suffering, loss of loved ones or personal affront associated with an intrusion on one's home or private life.[140]

The Commentary offers the French attack on the Greenpeace vessel *Rainbow Warrior* in Auckland, New Zealand as an example where moral damages had been appropriately awarded because France's intentional and clearly unlawful assault on the vessel "provoked indignation and public outrage in New Zealand and caused a new, additional non-material damage...of a moral, political and legal nature, resulting from the affront to the dignity and prestige not only of New Zealand as such, but of its highest judicial and executive authorities as well."[141]

The preferred form of remedy for an internationally wrongful act is "to re-establish the situation which existed before the wrongful act was committed, provided and to the extent that restitution: (a) is not materially impossible; (b) does not involve a burden out of all proportion to the benefit deriving from restitution instead of compensation."[142] Thus, what is called "specific performance" in Anglo-American law is obligatory, rather than monetary damages, unless reestablishing the previous situation is impossible or unless "there is a grave disproportionality between the burden which restitution would impose on the responsible State and the benefit which would be gained, either by the injured State

---

138. ILC ARTICLES, *supra* note 6, at 201 (emphasis added).

139. Factory at Chorzów, *supra* note 28.

140. ILC ARTICLES, *supra* note 6, at 202.

141. *Id.* at 203 (*quoting* Rainbow Warrior Affair (N.Z. v. Fr.), 20 R.I.A.A. 217, 267 ¶ 109 (1990)). Some tribunals have viewed the award of punitive damages as appropriate under international law. *See, e.g.*, I'm Alone Case (Can. v. U.S.), 3 R.I.A.A. 1609, 1618 (where the Commissioners recommended that, in addition to compensatory damages, the United States be required to pay $25,000 to Canada for intentionally sinking a Canadian ship); Filartiga v. Pena-Irala, 577 F.Supp. 860, 864 (D.N.Y. 1984) (explaining that because Paraguay had failed to prosecute its official for his act of torture "the objective of the international law making torture punishable as a crime can only be vindicated by imposing punitive damages").

142. ILC ARTICLES, *supra* note 6, at 213.

or by any victim of the breach."[143] This language requires only "the situation that existed prior to the occurrence of the wrongful act" be reestablished,[144] but the next article then confirms that if this restitution does not adequately cover all damage, additional compensation must be provided "including loss of profits insofar as it is established."[145] The goal thus must be to ensure that the remedy "should be commensurate with the loss, so that the injured party may be made whole."[146] The ILC Commentary points out that numerous tribunals have awarded compensation for loss of profits.[147]

Especially when injuries to environmental biodiversity and environmental amenities are involved, it will be difficult to value such losses in monetary terms, but "[d]amage to such environmental values...is, as a matter of principle, no less real and compensable than damage to property, though it may be difficult to quantify."[148] In 1993, the Council of Europe negotiated the Lugano Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment,[149] but it has not yet been widely ratified. This treaty says that "compensation for the impairment of the environment, other than for loss of profit from such impairment, shall be limited to the costs of measures of reinstatement actually undertaken or to be undertaken,"[150] and it further says that "measures of reinstatement" are limited to "any reasonable measures aiming to reinstate or restore damaged or destroyed components of the environment, or to introduce, where reasonable, the equivalent of these components into the environment."[151] The irony of this type of formula is that an operator or state that causes damage so devastating that it is beyond repair—such as the vaporization of an island in a nuclear test—would be left in a better position (because no attempt to reinstate the lost island would be undertaken) than an operator or state that has caused damage but has repaired it.

Most commentators appear to believe that "[f]or legal recovery, damage must be quantifiable and certain,"[152] and must thus be:

> [M]easured in economic units as suffered by other States, e.g. loss of tourism or damage to the fishing industry, or in terms of the costs of removal and restoration. Environmental values are considered in each particular context using a criterion based on the nature and extent of

143. *Id.* at 217.

144. *Id.* at 213.

145. *Id.* at 218.

146. *Id.* at 219 (*quoting* Lusitania Cases (U.S. v. F.R.G.), 7 R.I.A.A. 32, 39 (1923)).

147. *Id.* at 228 (*citing, e.g.*, Cape Horn Pigeon Case (U.S. v. Russ.), 9 R.I.A.A. 63 (1902); Sapphire Int'l Petroleums Ltd. v. Nat'l Iranian Oil Co., 35 I.L.R. 136 (1963)); Factory at Chorzów, *supra* note 28, at 47-48, 53; Libyan American Oil Co. v. Libya, 62 I.L.R. 140 (1977).

148. *Id.* at 223.

149. Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment, June 21, 1993, 32 I.L.M. 1228.

150. *Id.* at art. 2(7)(c).

151. *Id.* at art. 2(8).

152. HANQIN, *supra* note 18, at 252.

> human use as well as on the availability of the natural resource to human society with the currently available and feasible technology.[153]

Professor Sands has explained that "[i]n relation to environmental damage... the liability rules are still evolving and in need of further development."[154] This effort is crucial because the goal of the polluter-pays principle—the internalization of the true costs of any endeavor—can only be achieved if the real costs to society are attributed to the activity that causes pollution and environmental degradation. If environmental resources are viewed as "public goods" that can be polluted and degraded without cost (the "free-rider theory"), then the public will be subsidizing the operations destroying the environment. Only when the true costs of environmental degradation are charged to the operator and the state involved will they "tend to cut back on pollution in order to minimize production costs and enjoy greater profits, thus internalizing social costs."[155]

One example of a court trying to address "the extremely difficult substantive issues concerning damages" to the environment is *Commonwealth of Puerto Rico v. SS Zoe Colocotroni*,[156] decided by the U.S. Court of Appeals for the First Circuit in 1980. After carefully analyzing U.S. and Puerto Rican statutes, the court concluded that the measure of damages was not limited "to the loss of market value of the real estate affected,"[157] and explained the proper measure as follows:

> We think the appropriate primary standard for determining damages in a case such as this is the cost reasonably to be incurred by the sovereign or its designated agency to restore or rehabilitate the environment in the affected area to its pre-existing condition, or as close thereto as is feasible without grossly disproportionate expenditures.[158]

This challenge was also faced by the United Nations Compensation Commission, which was established by the Security Council 1991 to evaluate claims against Iraq that arose out of the first Gulf War.[159] This assignment was daunting because "[t]here is hardly any direct international precedent for valuation of similar environmental losses in international law."[160] The Commission received

---

153. *Id.* at 253.

154. SANDS, *supra* note 13, at 869 (for examples of efforts to determine and compensate for environmental harm, *see* 918-22). *See* EDWARD H.P. BRANS, LIABILITY FOR DAMAGE TO PUBLIC NATURAL RESOURCES: STANDING, DAMAGE AND DAMAGE ASSESSMENT (Kluwer Law International 2001) (for a comprehensive overview of this issue). *See also* HANQIN, *supra* note 18, at 93; Alan Boyle, *Reparation for Environmental Damage in International Law: Some Preliminary Problems*, *in* ENVIRONMENTAL DAMAGE IN INTERNATIONAL AND COMPARATIVE LAW: PROBLEMS OF DEFINITION AND VALUATION 17-26 (Michael Bowman and Alan Boyle eds., 2002).

155. HANQIN, *supra* note 18, at 323.

156. Commonwealth of Puerto Rico v. The SS Zoe Colocotroni, 628 F.2d 652, 670 (1st Cir. 1980).

157. *Id.* at 674.

158. *Id.* at 675.

159. S.C. Res. 692, ¶ 3, U.N. Doc. S/RES/692 (May 20, 1991); S.C. Res. 687, ¶ 18, U.N. Doc. S/RES/687 (Apr. 3, 1991); The Secretary-General, *Report of the Secretary-general Pursuant to Paragraph 19 of Security Council resolution 687 (1991)*, ¶ 3-4, U.N. Doc. S/22559 (May 2, 1991).

160. Mojtaba Kazazi, *Environmental Damage in the Practice of the UN Compensation Commission*, *in* ENVIRONMENTAL DAMAGE IN INTERNATIONAL AND COMPARATIVE LAW: PROBLEMS

170 claims for environmental damage and depletion of natural resources, claiming US$64 billion in damages.

Claims regarding nuclear activities generally fall into one of four categories: (1) claims brought before the plant begins operation under equitable theories or for failure to comply with treaties such as the Espoo Convention[161] and the Aarhus Convention,[162] which require nuclear operators to provide information before operation; (2) claims brought after a nuclear accident for physical harm or property damage; (3) claims brought after a nuclear accident for damage caused to the environment and consequential losses, such as a decline in tourism or fisheries; and (4) claims brought after a nuclear accident, but before any physical injury, for emotional distress or fear of developing a disease.

The 1997 Protocol to the Vienna Convention allows claims to be filed for "damages to persons or property," "economic loss arising from the loss of life or any personal injury or loss of or damage to property; the costs of measures of reinstatement of impaired environment; loss of income derived from an economic interest in any use or enjoyment of the environment incurred as a result of a significant impairment of environment; the costs of preventive measures and further loss of damage caused by such measures; and any other economic loss, if permitted by the general law on civil liability of the competent court."[163] P.S. Rao has summarized the law on damages as follows:

> (j) The definition of damage eligible for compensation as we have seen above is not a well-settled matter. Damage to persons and property is generally compensable. Damage to environment or natural resources within the jurisdiction or in areas under the control of a State is now well accepted. However, compensation in such a case is limited to costs actually incurred on account of prevention or response measures as well as measures of restoration... Where actual restoration of damaged environment or natural resources is not possible, costs incurred to introduce equivalent elements could be reimbursed;
>
> (k) Damage to environment per se, not resulting in any direct loss to proprietary or possessory interests of individuals or the State is not considered a fit case for compensation. Similarly, loss of profits and tourism on account of environmental damage are not likely to get compensated.[164]

The costs incurred to restore the environment from the injuries suffered are compensable under the 1997 Supplementary Compensation Convention if they are "reasonable," "have been approved by the competent authorities of the State," and are designed to "reinstate or restore damaged or destroyed components of the

---

OF DEFINITION AND VALUATION 111, 121 (Michael Bowman and Alan Boyle eds. 2002).

161. Espoo Convention, *supra* note 51.

162. Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, June 25, 1998, 38 I.L.M. 517.

163. Rao, *supra* note 23, ¶ 88.

164. *Id.* ¶ 153(j)-(k).

environment, or to introduce, where reasonable, the equivalent of these components in the environment."[165]

VI. CLAIMS FOR ANTICIPATED HEALTH HAZARDS AND FEAR OF ENVIRONMENTAL HARM

Can claims be brought against nuclear operators based on fears presented by a nuclear facility sited close to an international border, or based on fears presented by vessels carrying ultrahazardous nuclear materials near fragile coastal areas, or brought after a nuclear accident based on the fear of developing a nuclear-related disease? Professors Birnie and Boyle have concluded that "states are not debarred by international law from acquiring and using nuclear technology simply because it poses a risk of injury to other states or to the environment, nor are they precluded from siting nuclear installations near borders."[166] They do recognize, however, that "states must notify and consult their neighbours in cases of serious or appreciable transboundary risk, with a view to ensuring reasonable regard for the rights and legitimate interests of other states."[167] And they go on to suggest that the best approach—to balance the right of each state to govern activities within its own territory with the need to protect neighboring states "from unilaterally determined nuclear risks"[168]—would be to establish a requirement "comparable to that which applied certain cases of dumping at sea, requiring prior consultation and approval of the relevant international organization."[169] Other authors have issued stronger opinions, stating that activities carrying the risk of catastrophic damages should be impermissible unless there is "a special relationship between risk-creating and risk-exposed states, such as reciprocity of risk creation or a sharing in the benefits to be derived from the proposed activity."[170]

The Pacific Island countries concerned about the risks created by the shipments of ultrahazardous nuclear cargos through their adjacent waters have complained repeatedly about the inadequate liability regime governing potential accidents. At the October 1999 meeting of the Pacific Island Forum, for instance, the leaders specifically called for a compensation regime to be established that would provide redress for all economic losses, including those that their tourism and fishing industries might suffer as a result of an incident "even if there is no actual environmental damage caused."[171] The islanders are concerned that tourists

---

165. Supplementary Convention, *supra* note 125, ¶ g.; David D. Caron, *Finding Out What the Oceans Claim: The 1991 Gulf War, the Marine Environment, and the United Nations Compensation Commission*, *in* BRINGING NEW LAW TO OCEAN WATERS 393, 399 (David D. Caron & Harry N. Scheiber eds. 2004)(explaining the Commission recommendation that US$243,234,967 be awarded to claimants for monitoring and assessing the impact of Iraq's activities on environmental resources resulting from Iraq's 1990 invasion of Kuwait).

166. BIRNIE & BOYLE, *supra* note 15, at 470.

167. *Id.*

168. *Id.*

169. *Id.*

170. Gunter Handl, *An International Legal Perspective on the Conduct of Abnormally Dangerous Activities in Frontier Areas: The Case of Nuclear Power Plant Siting*, 7 ECOLOGY L.Q. 1, 35-36 (1978).

171. Thirtieth South Pacific Forum, Koror, Palau, Oct. 3-5, 1999, *Forum Communique*, ¶ 31, *available at* http://www.dfat.gov.au/geo/spacific/regional_orgs/spf30_communique.html.

would stop visiting their islands and consumers would stop buying their fish if some event involving a nuclear cargo occurred, because of their fears of contamination, even if no measurable radioactivity had been recorded. In 2004, the Forum Communique repeated this concern:

> Leaders reiterated their concerns about possible economic loss in a non-release situation and sought an assurance from shipping States that where there is a demonstrable link between the incident and economic loss Forum countries would not be left to carry such a loss unsupported by the shipping States.[172]

Courts in the United States have analyzed these "fear of cancer" claims under several theories: emotional distress, enhanced risk of disease claims, and claims for medical monitoring.

A. Emotional Distress

In the United States, a claim can be brought for the negligent infliction of emotional distress (NIED) where a defendant negligently causes one to suffer emotional injuries.[173] Although a majority of courts in the United States hold that a claim for NIED must stem from physical injury, many courts have abolished this strict physical impact rule.[174]

Most courts require proof of four essential elements: (1) the plaintiff must have been exposed to toxic substances, (2) the fear of a certain disease must be a result of a present injury, (3) the fear must be reasonable, and (4) the fear must be causally related to the defendant's negligence.[175] In *Metro-North Commuter Railroad Co. v. Buckley*, a case involving a railroad employee who brought a claim for emotional distress as a result of asbestos exposure, the U.S. Supreme Court identified the main policy consideration for denying recovery based on fear of cancer claims – even if reasonable – absent physical injury. The Court stated that "in a world of limited resources... a rule permitting immediate large-scale recoveries for widespread emotional distress caused by fear of future disease

172. Thirty-Fifth Pacific Islands Forum, Apia, Samoa, Aug. 5-7, 2004, *Forum Communique*, ¶ 30, *available at* http://www.forumsec.org.fj/news/2004/August/Aug_09.htm .

173. J.D. Lee & Barry A. Lindahl, 4 Modern Tort Law § 32.03 (2006) (stating that intentional infliction of emotional distress (IIED) is a recognized cause of action where a plaintiff can prove: (1) intentional or reckless conduct; (2) that is extreme and outrageous; (3) which causes severe emotional distress.

174. *See* Taylor v. Baptist Med. Ctr., Inc., 400 So. 2d 369, 374 (Ala. 1981) (holding that patient would not be precluded from recovering from physician for mental anguish caused by his failure to attend patient's labor and delivery of child, even though no actual physical injury was claimed); Molien v. Kaiser Found. Hosps., 616 P.2d 813, 819 (Cal. 1980) (holding that the unqualified requirement of physical injury is no longer justifiable); Rodrigues v. State of Hawaii, 472 P.2d 509, 520 (Haw. 1970) (holding that serious mental distress may be found where a reasonable man, normally constituted, would be unable to adequately cope with the mental stress engendered by the circumstances of the case).

175. *See* Metro–North Commuter R.R. Co. v. Buckley, 521 U.S. 424, 429-31 (1997); Potter v. Firestone Tire and Rubber Co, 863 P.2d 795, 805-06 (Cal. 1993).

[would] diminish the likelihood of recovery by those who later suffer from the disease."[176]

In those jurisdictions that require a showing of physical harm, however, many courts have allowed recovery for NIED where the plaintiff could prove "an objectively verifiable psychological condition, such as depression or anxiety serious enough to require medical treatment."[177] Thus, many courts adopt the view that the physical impact rule, in the context of toxic torts, is flawed because it ignores the fact that oftentimes the plaintiff's emotional harm is a true injury that does not manifest itself physically.

In line with this trend, some courts now allow recovery for the fear of developing a disease absent a showing of physical injury. In *In re Moorenovich*, the U.S. District Court for the District of Maine held that an asbestos worker's current fear that he would contract cancer in the future was a recoverable element of damages where asbestos was a known carcinogen, the worker had had prolonged exposure to asbestos, and his coworkers were dying at a higher than normal rate from asbestos-related cancer. The court further required "that any anxiety must have been proximately caused by plaintiff's exposure to asbestos. Moreover, the anxiety must be reasonable. Finally, defendants must be legally responsible for the plaintiff's exposure to asbestos."[178]

In *Mauro v. Owens-Corning Fiberglass Corp.*, a New Jersey appellate court similarly allowed a plaintiff to recover for emotional distress from exposure to asbestos absent any physical manifestations, noting that "mental and emotional distress is just as real as physical pain." The court held that bodily injury or sickness is not required to obtain damages for fear of cancer as long as there is a reasonable basis for that fear.[179]

In *Lavelle v. Owens-Corning Fiberglas Corp.*, an Ohio court set forth a three-part test for NIED in toxic tort cases: (1) the plaintiff must be aware that he in fact possesses an increased statistical likelihood of developing a disease; (2) this knowledge creates a reasonable fear; and (3) the apprehension manifests itself in emotional distress.[180] In *Devlin v. Johns-Manville Corp.*, the New Jersey court established four factors that must be present in toxic tort NIED cases: (1) the injured party must be currently suffering from serious fear or emotional distress or

176. Metro–North Commuter R.R. Co., 521 U.S. at 435-36 (holding that an employee could not recover under for negligently inflicted emotional distress unless he manifested symptoms of the disease and a separate cause of action was not available to allow employee to recover lump-sum medical monitoring costs).

177. Jason Yearout, *Fear of Future Harm in Toxic Tort Litigation: The Appropriate Measure of Damages*, 22 AM. J. TRIAL ADVOC. 639, 644 (1999).

178. *In re* Moorenovich, 634 F. Supp. 634, 637 (D. Mc. 1986).

179. Muaro v. Owens-Corning Fiberglass Corp., 542 A.2d 16, 21-22 (N,J, Super. Ct. App. Div. 1988), *aff'd*, 561 A.2d 257 (N.J. 1989).

180. Lavelle v. Owens-Corning Fiberglas Corp., 30 Ohio Misc. 2d 11, 11-14 (Ohio Com. Pl. 1987) (holding that a plaintiff suffering from asbestosis may not recover for the increased risk of cancer, but may be compensated for increased fear of cancer where this knowledge springs a reasonable apprehension which manifests itself in mental distress).

a clinically diagnosed phobia of the future harm; (2) the fear was proximately caused by exposure to the contaminant; (3) the plaintiff's fear of developing the illness is reasonable; and (4) the defendants are legally responsible.[181]

B. Enhanced Risk of Disease Claims

Many courts have resolved these claims under an enhanced risk theory by adhering to the general requirement that the plaintiff must show a physical injury, but adopting the view that the enhanced risk of disease itself is the present injury. The Fifth Circuit has held, for instance, that, under Texas law, the "inhalation of [asbestos] fibers and the invasion of his body by those fibers" caused him physical damage and held that recovery may extend to fear of future conditions that will, in medical probability, develop from presently existing injuries.[182] Similarly, in *Sterling v. Velsicol Chemical Corp.*, the federal district court allowed residents to recover damages for emotional distress that stemmed from their ingestion and contact with chemical wastes, which leached into the local aquifer, and for fear which reasonably and naturally flowed from disclosure of the nature and possible effects of those chemical wastes. [183] In that case, the court recognized that enhanced susceptibility is an existing condition, and not a speculative future injury, and courts have regularly upheld awards for such a claim.[184] Other courts have rejected this approach, however, and have adhered to the majority view that enhanced susceptibility is not a compensable injury.[185]

C. Medical Monitoring Claims

The best chance of recovery in a U.S. court would be a claim for medical monitoring damages. In this line of cases, the plaintiff is allowed to recover "anticipated costs of long-term diagnostic testing necessary to detect latent diseases that may develop as a result of tortious exposure to toxic substances."[186] This compensation is available to plaintiffs who can establish liability based upon a recognized tort, such as negligence, strict liability, trespass, and intentional conduct.

In *Bower v. Westinghouse Electric Corp.*, the Supreme Court of Appeals of West Virginia held Westinghouse liable for medical monitoring costs for

181. Devlin v. Johns-Manville Corp., 495 A.2d 495, 499 (N.J. Super. 1985) (holding that asbestos workers were required to show serious fear, emotional distress or clinically diagnosed phobia, proximate cause, reasonableness of fear, and defendants' responsibility for exposure to recover for emotional harm and that "fear of cancer" and "cancer phobia" are distinct injuries).

182. Gideon v. Johns-Manville Sales Corp., 761 F.2d 1129, 1137 (5th Cir. 1985).

183. Sterling v. Velsicol Chemical Corp., 647 F. Supp. 303, 320-321 (W.D. Tenn. 1986).

184. *Id.* at 322.

185. *See* Friedman v. F.E. Myers, 706 F. Supp. 376, 379 (E.D. Pa. 1989) (stating that "there is generally no cause of action in tort until a plaintiff has suffered identifiable, compensable injury"); Burns v. Jaquays Mining Corp., 752 P.2d 28, 31 (Ariz. Ct. App. 1988) (holding that a claim for fear of contracting an asbestos-related disease in the future without manifestation of bodily injury must fail); In re Hawaii Federal Asbestos Cases, 734 F. Supp. 1563, 1569-70 (D. Haw. 1990) (holding that "[r]ecovery for fear of cancer will not be granted for mere exposure to a known carcinogen (asbestos); rather, a plaintiff must demonstrate a compensable harm").

186. Bower v. Westinghouse Electric Corp., 522 S.E.2d 424, 429 (W. Va. 1999).

negligently exposing plaintiffs to toxic substances contained in a pile of debris from the manufacture of light bulbs. The court recognized that at least six other states have recognized claims for medical monitoring and rejected the contention that a claim for future medical expenses must rest upon the existence of present physical harm.[187] Instead, the court enumerated six elements of a claim for medical monitoring:

> (1) [The plaintiff] has, relative to the general population, been significantly exposed; (2) to a proven hazardous substance; (3) through the tortious conduct of the defendant; (4) as a proximate result of the exposure, plaintiff has suffered an increased risk of contracting a serious latent disease; (5) the increased risk of disease makes it reasonable necessary for the plaintiff to undergo periodic diagnostic medical examinations different from what would be prescribed in the absence of the exposure; and (6) monitoring procedures exist that make the early detection of a disease possible.[188]

In 2006, the West Virginia Supreme Court followed and applied *Bowers* in *West Virginia Rezulin Litigation v. Hutchison,* confirming that a "cause of action exists under West Virginia law for the recovery of medical monitoring costs, where it can be proven that such expenses are necessary and reasonably certain to be incurred as a proximate result of a defendant's tortious conduct."[189] In West Virginia, the court explained, "the 'injury' that underlies a claim for medical monitoring—just as with any other cause of action sounding in tort—is the 'invasion of any legally protected interest.'"[190] Once plaintiffs can show that they have "a significantly increased risk of contracting a particular disease relative to what would be the case in the absence of exposure" and that "medical monitoring is, to a reasonable degree of medical certainty, necessary in order to diagnose properly the warning signs of disease...even if the disease it is intended to diagnose is not reasonably certain to occur," then the plaintiffs are entitled to damages sufficient to cover the medical monitoring costs.[191]

According to a 2000 article in the ENVIRONMENTAL LAW REPORTER, 18 states then recognized a cause of action for medical monitoring,[192] but these courts were split on whether plaintiffs must demonstrate a present physical injury or only that they were exposed to a toxic material. The following year, the Supreme Court of Nevada ruled that Nevada common law did not recognize a cause of action for medical monitoring, but that "[a] remedy of medical monitoring may be available for an underlying cause of action" based in tort and contract.[193] In 2005, a U.S. district court explained that medical monitoring is still "novel" and that some

187. *Id.*

188. *Id.* at 432–33.

189. W. Va. Rezulin Litigation v. Hutchison, 585 S.E.2d 52, 73 (W.Va. 2006).

190. *Id.*

191. *Id.*

192. James M. Garner, et. al., *Medical Monitoring: The Evolution of a Cause of Action*, 30 ENVIRONMENTAL LAW REPORTER 10024, 10032 (Jan. 2000).

193. Badillo v. American Brands, Inc., 16 P.3d 435, 441 (Nev. 2001).

courts treat it as an "independent cause of action," some as "a form of damages for an underlying tort, such as negligence or strict liability," and that "[o]f the states recognizing medical monitoring claims as an independent claim or form of damages, some require a present physical injury."[194]

VII. CONCLUSION

This survey of settled norms and unresolved issues demonstrates that further work is needed to develop a comprehensive and authoritative regime to govern harm from nuclear activities. Although it is clear that both the operators of nuclear facilities and the states that have jurisdiction over them would be responsible to provide restitution and compensation for such harm under a strict liability regime, the types of injuries that must be compensated and the range of damages that must be covered remain subjects of controversy. Although the underlying customary international law principles (the no-harm principle and the polluter-pays principle) are clear, the actual treaties that have been drafted are inadequate and they have not been widely ratified. Victims of damage from nuclear activities would have difficulty finding a neutral tribunal in which to bring their claims and would face procedural obstacles including caps on liabilities and inappropriate statutes of limitations as well as difficulties regarding proof of damages. The failure to develop a proper regime that would ensure full restitution and compensation for harm resulting from nuclear facilities constitutes a continuing subsidy to the nuclear industry and distorts decisions regarding energy choices. The effort to update international nuclear law must, therefore, continue until a proper liability and compensation regime is established.

194. Foster v. St. Jude Med., Inc., 229 F.R.D. 599,602 (D.Minn. 2005).