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# International Environmental Norms Applicable to Nuclear Activities, with Particular Focus on Decisions of International Tribunals and International Settlements

## Keywords

Settlements, International Law: History, Accidents, Air and Space Law

# INTERNATIONAL ENVIRONMENTAL NORMS APPLICABLE TO NUCLEAR ACTIVITIES, WITH PARTICULAR FOCUS ON DECISIONS OF INTERNATIONAL TRIBUNALS AND INTERNATIONAL SETTLEMENTS

VED P. NANDA

## I. INTRODUCTION

Treaties, customary international law, and general principles of law constitute the primary sources of international environmental law as of international law in general, while judicial decisions and scholarly writings comprise “subsidiary means for the determination of rules of law.”<sup>1</sup> However, the new sources of international law that emerged during the second half of the twenty-first century also include declarations and resolutions adopted by the United Nations organs and other intergovernmental organizations, as well as principles, guidelines, and recommendations produced by International Financial Organizations (IFOs), other UN bodies such as the International Atomic Energy Agency<sup>2</sup> or intergovernmental organizations such as the Organization for Economic Cooperation and Development (OECD),<sup>3</sup> or multilateral conferences such as the 1972 UN

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1. The International Court of Justice applies these sources of international law in deciding disputes submitted to it. Statute of the International Court of Justice art. 38(1), June 26, 1945.

2. The Statute of the International Atomic Energy Agency [hereinafter IAEA Statute] authorizes the organization, the UN specialized agency responsible for regulating the peaceful use of nuclear power for energy production, to establish or adopt “standards of safety for protection of health and minimization of danger to life and property.” IAEA Statute, art. III(A)(6), Oct. 26, 1956, 8 U.S.T. 1095, 276 U.N.T.S. 3. The IAEA has diligently carried out this activity in promulgating dozens of “safety standards,” including safety guidelines, safety practices, and codes of practice. However, since the Agency has no enforcement authority, in practice the safety standards it promulgates are model standards for states to modify and adopt to meet their own needs. See, e.g., IAEA, *Safety Standards for Protecting People and the Environment*, <http://www-ns.iaea.org/standards/> (last visited Sept. 7, 2007); Ann MacLachlan, *Guidance on the Import and Export of Radioactive Sources*, 75 NUCLEAR L. BULL. 131 (2005). For a specific example, see IAEA, *CODE OF CONDUCT ON THE SAFETY AND SECURITY OF RADIOACTIVE SOURCES* (2004), available at [http://www-pub.iaea.org/MTCD/publications/PDF/Code-2004\\_web.pdf](http://www-pub.iaea.org/MTCD/publications/PDF/Code-2004_web.pdf).

3. The Organization for Economic Cooperation and Development is an intergovernmental organization of 30 democratic industrialized countries. Organisation for Economic Co-Operation and Development, *About the OECD*, <http://www.oecd.org> (last visited Sept. 4, 2008).

Stockholm Conference on the Human Environment<sup>4</sup> and the 1992 UN Rio Conference on Environment and Development.<sup>5</sup>

As these new sources come in the form of nonbinding statements, contrasted with binding international law norms established by conventional and customary international law, they are known as “soft law.” But with frequent reiteration of these principles, reflection in state practice, invocation before tribunals and adoption by them, and incorporation by IFOs, they create expectations of similar future conduct by states, and consequently acceptance as customary international law. Through this practice and through the codification of these principles in treaties, the “soft law” they embody may harden into binding legal obligations. Hence, these new sources make valuable contributions to international environmental law. Consequently, the discussion in this paper is confined not only to the already accepted principles of international environmental law, but also to those norms that are currently evolving and emerging through this ongoing process.

All nuclear activities, and not just those confined to nuclear weapons, are cause for serious concern because of their potential threat and harm. The April 1986 Chernobyl accident,<sup>6</sup> the worst industrial disaster ever, has alerted the international community that nuclear power plants pose a grave danger not only to the region in which they are located but to distant lands, as well. In addition to direct casualties of the catastrophe,<sup>7</sup> those affected by it include more than three million victims in Ukraine and Belarus.<sup>8</sup> Chernobyl had taken an \$11 billion toll on Ukraine's economy by the year 1999.<sup>9</sup> The Soviet Union spent billions on Chernobyl rehabilitation,<sup>10</sup> and Ukraine has continued to provide compensation to

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4. See U.N. Stockholm Conference on the Human Environment, June 5-16, 1972, *Report of the United Nations Conference on the Human Environment*, U.N. Doc. A/CONF.48/14/Rev.1 and Corr. 1 (June 16, 1972) [hereinafter Stockholm Declaration].

5. See United Nations Conference on Environment and Development, Rio de Janeiro, Brazil, June 3-14, 1992, *Rio Declaration on Environment and Development*, U.N. Doc A/CONF.151/26 (Vol. I) (Aug. 12, 1992) [hereinafter Rio Declaration].

6. On the Chernobyl accident, see generally Z. MEDVEDEV, *THE LEGACY OF CHERNOBYL* (1990); *CHERNOBYL LAW AND COMMUNICATION* (P. Sands, ed. 1988); G. Handel, *Transboundary Nuclear Accidents: The Post-Chernobyl Multilateral Legislative Agenda*, 15 *ECOLOGICAL L.Q.* 203 (1988); Richard E. Levy, *International Law and the Chernobyl Accident: Reflections on an Important but Imperfect System*, 36 *KAN. L. REV.* 81 (1987); Linda A. Malone, *The Chernobyl Accident: A Case Study in International Law Regulating State Responsibility for Transboundary Nuclear Pollution*, 12 *COLUMB. J. ENV'T'L L.* 203 (1987); Ved P. Nanda & Jeffery C. Lowe, *Nuclear Weapons and the Ecology: Is International Law Helpless to Address the Problem?*, 19 *DENV. J. INT'L L. & POL'Y* 87, 96-101 (1990); David R. Marples & Tatyana E. Cerullo, *Symposium: International Nuclear Safety: The Case of the Chernobyl Nuclear Power Station*, 24 *VT. L. REV.* 1209 (2000); Jon Van Dyke, *Liability and Compensation for Harm Caused by Nuclear Activities*, . . . (published herein).

7. It is difficult to assess the direct casualties of Chernobyl, but it is estimated that direct deaths are more than 4,000. See Marples & Cerullo, *supra* note 6, at 1210.

8. Chernobyl Union numbers the victims at 3.7 million. *Id.*

9. See *Ukraine Says Chernobyl Blast Cost \$11 Bln. So Far*, REUTERS, Apr. 13, 1999, cited in *id.* at 1211 n.11.

10. See GREENPEACE, *CHERNOBYL: TEN YEARS AFTER. CAUSES; CONSEQUENCES; SOLUTIONS* (1996), available at <http://archive.greenpeace.org/comms/nukes/chernob/read25.html> (follow Extended

the victims of the disaster. Environmental damage occurred in many European countries as the cloud of radioactive residue spread all over the northern hemisphere. Thus, Chernobyl has sharpened our awareness of what severe ecological and health impacts an unintentional release of radiation can have on such a vast geographical area.<sup>11</sup>

International efforts primarily under the auspices of the IAEA and the OECD have been ongoing to prescribe environmental norms applicable to nuclear activities<sup>12</sup>—obligating countries to meet nuclear safety requirements, establishing guidelines and a legal framework in the form of conventions on early notification of a nuclear accident and assistance in the case of a nuclear accident or radiological emergency, and developing rules on state responsibility and liability conventions. However, Chernobyl provides a glaring example of the inadequacy of the prevailing legal regime regarding liability and compensation for harm caused by nuclear activities.<sup>13</sup>

After briefly noting in the next part major international environmental norms that are pertinent in the nuclear context, the discussion in subsequent parts will focus on the decisions of international tribunals and international settlements, with a concluding section on recommendations.

## II. MAJOR INTERNATIONAL ENVIRONMENTAL NORMS PERTINENT TO NUCLEAR ACTIVITIES

Although international environmental law is of relatively recent origin, it already has established a core of fundamental legal principles that are pertinent to nuclear activities.<sup>14</sup> The sources of these principles are those mentioned above—treaties incorporating these principles and thus creating binding “hard law,” customary international law generally accepted by states, or still emerging “soft law.”<sup>15</sup> Some of these principles are considered more substantive, that is, focused

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text version of "Causes, Consequences, Solutions." hyperlink).

11. See generally ORGANIZATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD) NUCLEAR ENERGY AGENCY (NEA), CHERNOBYL: ASSESSMENT OF RADIOLOGICAL AND HEALTH IMPACTS, 2002 UPDATE OF CHERNOBYL: TEN YEARS ON (2002), available at <http://www.nea.fr/html/rp/reports/2003/nea3508-chernobyl.pdf>; CHERNOBYL FORUM, IAEA, CHERNOBYL'S LEGACY: HEALTH, ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS AND RECOMMENDATIONS TO THE GOVERNMENTS OF BELARUS, THE RUSSIAN FEDERATION AND UKRAINE (2nd. rev. version 2005), available at <http://www.iaea.org/Publications/Booklets/Chernobyl/chernobyl.pdf>.

12. See IAEA, *International Conventions & Agreements*, <http://www.iaea.org/Publications/Documents/Treaties/>, and OECD NEA, *Legal instruments and documents*, <http://www.nea.fr/html/law/legal-documents.html>.

13. For a thorough study of the pertinent legal developments in the aftermath of Chernobyl, see OECD NEA & IAEA, INTERNATIONAL NUCLEAR LAW IN THE POST-CHERNOBYL PERIOD (2006), available at <http://www.nea.fr/html/law/chernobyl/nea6146-iaea-chernobyl.pdf>.

14. See generally Van Dyke, *supra* note 6; Alexandre Kiss, *State Responsibility and Liability for Nuclear Damage*, . . . (published herein); Duncan E.J. Currie, *Limited Liability, Unlimited Risk: The Problems and Gaps in the Existing Treaties (Vienna & 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).

15. See generally VED P. NANDA & GEORGE E. PRING, INTERNATIONAL ENVIRONMENTAL LAW

on outcomes, as the “no harm” rule, the “polluter-pays” principle, and state responsibility and liability; while others are more procedural, with their focus on means, such as the duty to notify, consult, and negotiate; the principle of effective public participation in decision-making; and the precautionary principle. Still others combine both substantive and procedural aspects, such as “good neighborliness” and the duty to cooperate. Needless to say, however, there is usually no bright line distinguishing substance from procedure.

While the focus of the discussion in this paper is primarily on the decisions of international tribunals and international settlements, it is worth noting that several conventions developed primarily under the auspices of the IAEA and the OECD have established legal principles pertaining to safety and state responsibility and liability. The goal is to ensure the safety of nuclear activities—encompassing several subsidiary principles of protection, prevention, and precaution—and to address the threat of transboundary radioactive pollution. Further elaboration of these principles is likely to result as tribunals are called upon to resolve disputes where these conventions apply.

The pertinent conventions establishing or incorporating these principles include the Convention on Nuclear Safety,<sup>16</sup> under which responsibility for nuclear safety rests on the contracting parties, and which obligates them to establish and maintain effective safety measures in nuclear installations against potential radiological hazards.<sup>17</sup> Major conventions on international liability for nuclear damage are the Vienna Convention of 1963, developed by the IAEA,<sup>18</sup> the 1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy, developed by the OECD,<sup>19</sup> and the subsequent supplementary instruments strengthening the reach of these conventions to include environmental damage and preventive measures and augmenting the liability limits. The main instruments are the 1963 Brussels Supplementary Convention to the Paris Convention,<sup>20</sup> the 1988 Joint Protocol combining the Paris and Vienna Conventions,<sup>21</sup> the 1997 Protocol to

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FOR THE 21ST CENTURY 17-62 (2003).

16. Convention on Nuclear Safety, Sept. 20, 1994, S. TREATY DOC. NO. 104-6 (1995), 1963 U.N.T.S. 293.

17. *Id.* at art. 1(ii). See also *id.* at art. 6 (the obligation to review as soon as possible the safety of existing nuclear installations), art. 7 (the obligation to establish and maintain a legislative and regulatory framework to ensure the safety of the nuclear installations, including a system of licensing and inspection), and art. 11 (the obligation to establish and implement quality assurance programs to satisfy specific requirements for all activities important to nuclear safety throughout the life of the nuclear installations).

18. Vienna Convention on Civil Liability for Nuclear Damage, May 21, 1963, 1063 U.N.T.S. 265 (entered into force Nov. 12, 1977). For the status of the Convention, see IAEA, STATUS OF THE VIENNA CONVENTION ON CIVIL LIABILITY FOR NUCLEAR DAMAGE, [http://www.iaea.org/Publications/Documents/Conventions/liability\\_status.pdf](http://www.iaea.org/Publications/Documents/Conventions/liability_status.pdf).

19. Convention on Third Party Liability in the Field of Nuclear Energy of July 29, 1960, 956 U.N.T.S. 251, as amended by the Additional Protocol of January 28, 1964, 956 U.N.T.S. 335, and by the Protocol of November 16, 1982, 1650 U.N.T.S. 444.

20. Convention Supplementary to the 1960 Convention on Third Party Liability in the Field of Nuclear Energy, Jan. 31, 1963, 1041 U.N.T.S. 358.

21. Joint Protocol relating to the application of the Vienna Convention on civil liability for nuclear

the Vienna Convention,<sup>22</sup> the 1997 Supplementary Convention,<sup>23</sup> and the two 2004 Protocols,<sup>24</sup> one amending the Paris Convention and the other the 1963 Brussels Supplementary Convention.

The principle of strict responsibility applies to nuclear activities and the primary responsibility lies on the operator of the nuclear plant. However, under the instruments mentioned above, states parties are required under their national laws to provide a minimum amount, as well, and the 1997 Supplementary Convention, not yet in force, provides for the creation of a supplementary fund to be created through collective contributions by states parties. Nuclear transportation issues are addressed by the 1971 Brussels Convention Relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material.<sup>25</sup> This Convention was developed by the International Maritime Organization (IMO), which also has other conventions applicable to nuclear activities, such as on dumping and radioactive wastes.<sup>26</sup> The Convention holds the operator of a nuclear installation liable for damage, while exonerating a person otherwise liable if the operator is liable for such damage under either the Paris or Vienna convention.

Among the major weaknesses of the prevailing liability regime are: 1) liability is limited; 2) liability is primarily imposed on the operator, exempting the manufacturer, supplier, or carrier of the material or equipment; 3) the limitation period to bring a claim is very short in most cases of damage caused by nuclear activities, although long-term effects of radiation may not be known for a much longer period; and 4) only a few states are parties to these supplementary instruments.

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damage and the Paris Convention on third party liability in the field of nuclear energy, Sept. 21, 1988, 1672 U.N.T.S. 302.

22. Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage, Sept. 12, 1997, 36 I.L.M. 1454, 1462 (1997) (entered into force Oct. 4, 2003).

23. Convention on Supplementary Compensation for Nuclear Damage, Sept. 12, 1997, 36 I.L.M. 1454, 1473 (1997) (not in force).

24. Protocol to amend the Paris Convention on Third Party Liability in the Field of Nuclear Energy, Feb. 12, 2004, *available at* [http://www.nea.fr/html/law/paris\\_convention.pdf](http://www.nea.fr/html/law/paris_convention.pdf); Protocol to amend the Brussels Convention Supplementary to the Paris Convention on Third Party Liability in the Field of Nuclear Energy, Feb. 12, 2004, *available at* [http://www.nea.fr/html/law/brussels\\_supplementary\\_convention.pdf](http://www.nea.fr/html/law/brussels_supplementary_convention.pdf).

25. Convention Relating to civil liability in the field of maritime carriage of nuclear material, Dec. 17, 1971, 974 U.N.T.S. 255 (entered into force July 15, 1975).

26. *See, e.g.*, International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, May 3, 1996, 35 I.L.M. 1406, 1415 (1996); International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, Dec. 8, 1971, 1110 U.N.T.S. 57, as amended by the 1992 IMO Protocol to Amend the International Convention on Civil Liability for Oil Pollution Damage, Nov. 27, 1992, 23 I.L.M. 148, 177 (1984). For the IAEA recommendation regarding the movement of radioactive waste, see IAEA, General Conference Resolution on Code of Practice on the International Transboundary Movement of Radioactive Waste, Sept. 21, 1990, 30 I.L.M. 556, 563 (1991). *See also* Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment, Lugano, 1993, 32 I.L.M. 1228, 1230 (1993) (a Council of Europe Convention).

Following the Chernobyl tragedy, the IAEA prepared the texts of two more conventions that were adopted within six months of the accident. One convention is on early notification of a nuclear accident<sup>27</sup> and the other is on assistance in the case of a nuclear accident or radiological emergency.<sup>28</sup> Under the Notification Convention, parties are obligated to notify without delay of any nuclear accident and to promptly provide pertinent available information in order to limit the radioactive consequences in other countries.<sup>29</sup> The Assistance Convention creates a framework for cooperation among the States Parties and with IAEA.

The Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters<sup>30</sup> also applies among other activities to “[n]uclear power stations and other nuclear reactors including the dismantling or decommissioning of such power stations or reactors...; [i]nstallations for the reprocessing of irradiated nuclear fuel.” It obligates the contracting parties to take the necessary legislative, regulatory, and other measures to achieve its objectives. The Convention’s principles applicable to nuclear activities include the public’s right to know and hence the state’s obligation to inform the public about the use of nuclear energy, and the public’s participation in the preparation of nuclear regulations.

The 1991 Convention on Environmental Impact Assessment in a Transboundary Context<sup>31</sup> obligates States Parties to take appropriate and effective measures to prevent, reduce, and control significant adverse transboundary environmental impact from proposed activities, which include nuclear power stations and other nuclear reactors.<sup>32</sup> Under a 2003 Protocol to the Convention,<sup>33</sup> the Contracting Parties’ obligations are expanded and a new procedure is established for carrying out public participation and consultations in preparation of an environmental report and plan or program.<sup>34</sup>

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27. Convention on Early Notification of a Nuclear Accident, Sept. 26, 1986, S. TREATY DOC. NO. 100-4(A) (1987), 1439 U.N.T.S. 275 [hereinafter Notification Convention].

28. Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, Sept. 26, 1986, S. TREATY DOC. NO. 100-4(B) (1987), 1457 U.N.T.S. 133.

29. Notification Convention, *supra* note 27, at art. 2.

30. UN Economic Commission for Europe (UN/ECE) Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, annex I, para. 1, June 25, 1998, 2161 U.N.T.S. 447 (entered into force Oct. 30, 2001).

31. Convention on Environmental Impact Assessment in a Transboundary Context, Feb. 25, 1991, 1989 U.N.T.S. 309 (1991).

32. *Id.* at art.2(1).

33. Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context, May 21, 2003, *available at* <http://www.unece.org/env/eia/documents/protocolenglish.pdf> [herein after Kiev Protocol] (adopted by an Extraordinary Meeting of the Parties to the Espoo Convention).

34. *Id.* at art. 2(6).



### III. DECISIONS OF INTERNATIONAL TRIBUNALS AND INTERNATIONAL SETTLEMENTS

#### A. *Tribunals*

The starting point for discussing international environmental law principles is the seminal *Trail Smelter* arbitral decision.<sup>35</sup> This will be followed by the International Court of Justice's 1973, 1974, and 1994 decisions on nuclear testing, its 1996 advisory opinion on the *Legality of the Threat or Use of Nuclear Weapons*, and its 1997 judgment on the *Gabcekovo-Nagyymaros Dam* dispute. Next I will briefly discuss the work of two other tribunals before the concluding section.

##### 1. *The Trail Smelter Arbitration*

The United States had alleged that sulphur dioxide emissions from a smelter located in Trail, British Columbia, were causing substantial damage to a number of farms across the border in the state of Washington. An arbitral tribunal was established under a convention between the United States and Canada<sup>36</sup> to resolve questions regarding damage, provide remedies, and prescribe measures to be "adopted or maintained by the Trail Smelter."<sup>37</sup> The tribunal was to apply the "law and practice followed... in the United States of America as well as international law and practice."<sup>38</sup>

After examining available precedents under both international law and United States law, the tribunal awarded monetary damages to the US. In doing so, it announced two fundamental principles of international environmental law. First, it concluded that a state has the duty not to harm the environment of another state or persons or property in that state by activities within its own territory. This "no-harm" (*sic utere tuo ut alienum non laedas*) rule has become a cornerstone of modern environmental law. Second, nearly as significant, the tribunal held that if a state does cause damage to the environment of another state, the polluter should pay.<sup>39</sup>

This affirmation of the no-harm and good neighborliness principles set the stage for the subsequent development by the international community of the norms of state responsibility regarding transboundary pollution. To illustrate, Principle 21 of the Declaration adopted by the 1972 UN Stockholm Conference on the Human Environment stated that

States have, in accordance with the Charter of the United Nations and the principles of international law ... the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the

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35. *Trail Smelter (U.S. v. Can.)*, 3 R. Int'l Arb. Awards 1905 (1938 & 1941) [hereinafter *Trail Smelter decision*].

36. *Id.* at 1907.

37. *Id.* at 1908.

38. *Id.*

39. *Id.* at 1965-66, 1974-78.

environment of other States or of areas beyond the limits of national jurisdiction.<sup>40</sup>

The same language was included 20 years later in Principle 2 of the Rio Declaration on Environment and Development,<sup>41</sup> adopted at the 1992 UN Rio Conference. Several other international conventions addressing environmental issues, including the 1982 UN Convention on the Law of the Sea<sup>42</sup> and the UN Framework Convention on Climate Change,<sup>43</sup> have incorporated the same principle. Finally, the International Court of Justice recognized in its 1996 advisory opinion on the *Legality of the Threat or Use of Nuclear Weapons* that this principle, “the general obligation on states to ensure that activities within their jurisdiction and control” respect the environment of other states or of areas beyond national control had by then become “part of the corpus of international law relating to the environment.”<sup>44</sup>

It should be noted that in the *Trail Smelter* Arbitration, the arbitral tribunal imputed to Canada responsibility and liability for transboundary pollution on the basis of an act that was not unlawful, the operation of a smelter on its territory. That a lawful act may be considered an internationally wrongful act was determined by the International Law Commission as it defined an “internationally wrongful act” of a state in its 2001 Draft Articles on Responsibility of States for Intentionally Wrongful Acts in these words: it consists of an action or omission attributable to the state and constituting “a breach of an international obligation of the State.”<sup>45</sup> Thus some otherwise lawful nuclear activities may constitute a breach of international obligations.

This principle, it may be noted, was recognized by the International Court of Justice in its 1949 decision in the *Corfu Channel Case*,<sup>46</sup> where it held that every state is obligated “not to allow knowingly its territory to be used for acts contrary to the rights of other States.”<sup>47</sup> Reaffirming the *sic utere* principle, the Court stated the rule that a state must warn others of imminent danger and imposing liability on it for failure to disclose information that might have a harmful effect on

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40. Stockholm Declaration, *supra* note 4, at Principal 21.

41. Rio Declaration, *supra* note 5, at art. 2.

42. United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 396; 21 I.L.M. 1261 (1982), art. 194(2).

43. United Nations Framework Convention on Climate Change, preamble, May 9, 1992, S. Treaty Doc. No. 102-38 (1992), 1771 U.N.T.S. 165.

44. *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, 1996 I.C.J. 226, 241-42 (July 8) [hereinafter *Nuclear Weapons Opinion*]. See generally VED P. NANDA & DAVID KRIEGER, *NUCLEAR WEAPONS AND THE WORLD COURT* (1998).

45. *Report of the International Law Commission to the General Assembly, Draft Articles on Responsibility of States for Internationally Wrongful Acts*, ¶ 76, U.N. GAOR Supp. (No. 10), U.N. Doc. A/56/10, (2001). See also *Report of the International Law Commission to the General Assembly, Draft Articles on Prevention of Transboundary Harm from Hazardous Activities*, ¶ 97, U.N. GAOR Supp. (No. 10), U.N. Doc. A/56/10 (2001) (reflecting the customary international law principle requiring states to take all appropriate measures to minimize the risk of transboundary harm).

46. *Corfu Channel (U.K. v. Alb.)*, 1949 I.C.J. 4 (April 9).

47. *Id.* at 22.

other states.<sup>48</sup> This was not a case involving environmental harm, but the *Restatement (Third), Foreign Relations Law of the United States* has expanded this rule by analogy to include transboundary environmental dangers or risks.<sup>49</sup>

## 2. The International Court of Justice

### a. *The 1973, 1974 and 1995 Nuclear Tests Cases*

New Zealand filed an application with the ICJ on May 9, 1973, requesting provisional (interim) measures of protection regarding the French government's atmospheric nuclear testing in the South Pacific region, on the basis that these tests violated rules and principles of international law.<sup>50</sup> New Zealand argued that nuclear testing by France violated the rights of all members of the international community, including New Zealand, as nuclear tests give rise to radioactive fallout of the territorial, maritime, and aerial environment, and especially of that region's environment, and caused harm, including "apprehension, anxiety and concern."<sup>51</sup> It further contended that the testing violated New Zealand's right to "freedom of the high seas, including freedom of navigation and overflight and the freedom to explore and exploit the resources of the sea and seabed, without interference or detriment resulting from nuclear testing."<sup>52</sup>

New Zealand further claimed that as "any exposure to radiation may have irreparable, and harmful, somatic and genetic effects," radioactive fallout which reaches New Zealand is inherently harmful and that there is no compensating benefit to justify New Zealand's exposure to such harm.<sup>53</sup> It contended that "there could be no possibility that the rights eroded by the holding of further tests could be fully restored in the event of a judgment in New Zealand's favour in these proceedings."<sup>54</sup>

48. The Court stated:

The obligations incumbent upon the Albanian authorities consisted in notifying, for the benefit of shipping in general, the existence of a minefield in Albanian territorial waters and in warning the approaching British warships of the imminent danger to which the minefield exposed them. Such obligations are based . . . on certain general and well-recognized principles, namely: . . . every State's obligation not to allow knowingly its territory to be used for acts contrary to the rights of other States. *Id.*

The Court concluded that:

Albania is responsible under international law for the explosions which occurred on October 22nd, 1946, in Albanian waters, and for the damage and loss of human life which resulted from them, and that there is a duty upon Albania to pay compensation to the United Kingdom. *Id.* at 23.

49. RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW OF THE UNITED STATES §601 cmt. e (1987).

50. Nuclear Tests (N.Z. v. F.), 1973 I.C.J. 135, 135-36 (Interim Protection Order of June 22).

51. *Id.* at 139.

52. *Id.* at 139-40.

53. *Id.* at 140.

54. *Id.* at 141.

In response, France emphasized that it would take every precaution to ensure "the safety and the harmlessness of the French nuclear tests."<sup>55</sup> However, the Court ordered France to cease all nuclear testing.<sup>56</sup> The rationale for the Court's order was its determination that the information provided to it "does not exclude the possibility that damage to New Zealand might be shown to be caused by the deposit on New Zealand territory of radio-active fall-out resulting from such tests and to be irreparable."<sup>57</sup>

The following year, the Court gave its judgment.<sup>58</sup> As it determined that France's public statements that it intended to cease all atmospheric nuclear testing in the South Pacific region rendered the controversy with New Zealand and a similar controversy with Australia moot, the Court declined to decide directly whether to declare that France's nuclear testing violated New Zealand's environmental rights. However, Paragraph 63 of the decision left open the possibility that the Court might reconsider the case against France if it ever decided to resume testing, stating that "if the basis of this Judgment were to be affected, the Applicant could request an examination of the situation in accordance with the provisions of the Statute."<sup>59</sup>

In 1995, the New Zealand government requested an "examination of the situation" because of France's statements regarding its underground nuclear testing, and the Court determined that the ground for this reconsideration was limited to France's atmospheric nuclear testing and thus would not serve as a basis to prevent any of France's nuclear actions outside of atmospheric testing.<sup>60</sup>

Although the Court did not pass judgment directly on New Zealand's claim, two positive developments must be acknowledged: 1) the court imposed interim protections, and 2) it determined that public statements by a state's officials may legally bind a state.<sup>61</sup>

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55. *Id.*

56. *Id.* at 141-42.

57. *Id.* at 141.

58. Nuclear Tests (N.Z. v. Fr.), 1974 I.C.J. 457 (Dec. 20). The Court concluded that "the dispute having disappeared, the claim advanced by New Zealand no longer has any object. It follows that any further finding would have no *raison d'être*." *Id.* at 476.

59. *Id.* at 477.

60. Nuclear Tests (N.Z. v. F.) 1995 I.C.J. 288 (Examination Order of 22 Sept.). The Court found by twelve votes to three that New Zealand's request "does not fall within the provisions of the said paragraph 63 and must consequently be dismissed." *Id.* at 307. It stated that its order was "without prejudice to the obligations of States to respect and protect the natural environment, obligations to which both New Zealand and France have in the present instance reaffirmed their commitment." *Id.* at 306.

61. The I.C.J. in its 1974 judgment did find that France's statement of intention to cease atmospheric testing "may create commitments in international law." Nuclear Tests (N. Z. v. F.), 1974 I.C.J. 457, 473, *citing* Temple of Preah Vihear (Cambodia v. Thail.) 1961 I.C.J. 17, 31, 32 (May 26): "Where . . . as is generally the case in international law, which places the principal emphasis on the intention of the parties, the law prescribes no particular form, parties are free to choose what form they please provided their intention clearly results from it. . . . [T]he sole relevant question is whether the language employed in any given declaration does reveal a clear intention . . . ."

*b. The I.C.J.'s Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons*

The UN General Assembly requested the I.C.J. for an advisory opinion on the question "Is the threat or use of nuclear weapons in any circumstance permitted under international law?"<sup>62</sup> The Court determined that international law neither specifically authorizes nor prohibits the threat or use of nuclear weapons.<sup>63</sup> But its opinion contained a positive message for those interested in international environmental law: it affirmed the status of the "no-harm" rule as customary international law, and stated that the basic principles of international humanitarian law for the protection of civilians and civilian objects similarly apply to protect the environment.

Some states had asserted that any use of nuclear weapons would be unlawful because of the existing norms relating to the safeguarding and protection of the environment, coupled with widespread long-term and severe damage to the environment such use would cause. Other states questioned the binding legal quality of the pertinent environmental norms. Two conventions and two soft law instruments were specifically cited. The two conventions are the Additional Protocol I to the Geneva Conventions of 1949,<sup>64</sup> article 35, paragraph 3, which prohibits the employment of "methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment,"<sup>65</sup> and the 1997 Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD), which prohibits under article 1(1) the use of weapons that have "widespread, long-lasting or severe effects" on the environment.<sup>66</sup> The two soft-law instruments cited were Principle 21 of the 1972 Stockholm Declaration and Principle 2 of the 1992 Rio Declaration, both mentioned above, which obligate the states "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

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62. G.A. Res 49/75 K, U.N. Doc. A/Res/49/75 K (Dec. 15, 1994), cited in Nuclear Weapons Opinion, *supra* note 44, at 227-28.

63. *Id.* at 265-66.

64. Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts, Aug. 15, 1977, U.N. Doc. A/32/144 (1977), reprinted in 16 I.L.M. 1391, 1409 (1977).

65. Article 55 of the Protocol states:

1. Care shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage. This protection includes a prohibition of the use of methods or means of warfare which are intended or may be expected to cause such damage to the natural environment and thereby to prejudice the health or survival of the population.

2. Attacks against the natural environment by way of reprisals are prohibited. *Id.* at 1415.

Article 56 prohibits attacks on non-military dams, dykes, and nuclear power plants if the attack might release dangerous forces causing severe civilian losses. *Id.*

66. Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques, May 18, 1977, 1108 U.N.T.S. 151, 153, T.I.A.S. 9614 (1977).

jurisdiction.”<sup>67</sup> Some states questioned the binding authority of the declarations and argued that: 1) the cited treaties did not mention warfare in general and nuclear warfare in particular; 2) certain states were not parties to the treaties or had made reservations to them; and 3) these treaties and declarations applied only during peacetime and their application to nuclear weapons would be “destabilizing to the rule of law and to confidence in international negotiations.”<sup>68</sup>

The Court responded to these comments by initially recognizing that “the environment is under daily threat and that the use of nuclear weapons could constitute a catastrophe for the environment.”<sup>69</sup> After further recognizing that “the environment is not an abstraction but represents the living space, the quality of life and the very health of human beings, including generations unborn,” the Court explicitly stated: “The existence of 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 part of the corpus of international law relating to the environment.”<sup>70</sup>

In response to some states’ claims that the norms did not apply in wartime, the Court stated that, while states exercise their right of self-defense, they

... must take environmental considerations into account when assessing what is necessary and proportionate in the pursuit of legitimate military objectives. Respect for the environment is one of the elements that go to assessing whether an action is in conformity with the principles of necessity and proportionality.<sup>71</sup>

Thus the Court stated unambiguously that two basic principles of international humanitarian law—necessity and proportionality—which apply to protect civilians and civilian objects, apply in a similar fashion to protect the environment against widespread, long-term and severe environmental damage and that armed attacks that may damage the natural environment must comply with the principle of proportionality.

*c. The I.C.J. 1977 Judgment on the Gabcikovo-Nagymaros Dam Dispute*

This dispute involved the Gabcikovo-Nagymaros Dam Project between Hungary and Slovakia to dam the Danube River and was the first dispute heard by the Court which primarily addressed environmental issues.<sup>72</sup> The Project’s impact on the environment was a major consideration in both sides’ arguments. The basis for Hungary’s abandonment of the Project and unilateral termination of its treaty

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67. Stockholm Declaration, *supra* note 4, at Principal 21; Rio Declaration, *supra* note 5, at art. 2.

68. Nuclear Weapons Opinion, *supra* note 44, at 241.

69. *Id.*

70. *Id.* at 241–42.

71. *Id.* at 242. The Court cited in support of its approach Principle 24 of the Rio Declaration, which provides that “Warfare is inherently destructive of sustainable development. States shall therefore respect international law providing protection for the environment in times of armed conflict and cooperate in its further development, as necessary.” *Id.*

72. Gabcikovo-Nagymaros Project (Hung. v. Slov.), 1997 I.C.J. 7 (Sept. 25) [hereinafter Gabcikovo-Nagymaros Project].

with Czechoslovakia was “the existence of a state of [ecological] necessity; the impossibility of performance of the Treaty; the occurrence of a fundamental change of circumstances; the material breach of the Treaty by Czechoslovakia; and, finally, the development of new norms of international environmental law.”<sup>73</sup>

Hungary asserted that the system would have caused, among other adverse effects, impairment of the water quality, silting up of the riverbed, and the risk of rising eutrophication and the extinction of the fluvial fauna and flora.<sup>74</sup> Hungary’s arguments involving impossibility of performance, fundamental change of circumstances, and new norms of international environmental law all relied primarily on environmental considerations. For example, Hungary contended that the treaty into which it had entered was consistent with environmental protection but was being transformed into “a prescription for environmental disaster.”<sup>75</sup> Similarly, regarding changed circumstances and new norms of international law, it argued that

... subsequently imposed requirements of international law in relation to the protection of the environment precluded performance of the Treaty. The previously existing obligation not to cause substantive damage to the territory of another State had... evolved into an erga omnes obligation of prevention of damage pursuant to the “precautionary principle.” On this basis... its termination was “forced by the other party’s [action].”<sup>76</sup>

In sum, Hungary’s position was that the treaty had become impossible to perform because “the essential object of the Treaty—an economic joint investment which was consistent with environmental protection and which was operated by the two contracting parties jointly—had permanently disappeared.”<sup>77</sup> Furthermore, a number of events had brought about a fundamental change of circumstances, including new norms and prescriptions of international environmental law, which had become obligatory.<sup>78</sup>

The Court did not accept Hungary’s arguments, but on the environmental issues it first acknowledged that “the concerns expressed by Hungary for its natural environment in the region affected by the Gabčíkovo-Nagymaros Project related to an ‘essential interest’ of that State, within the meaning given to that expression in Article 33 of the Draft of the International Law Commission.”<sup>79</sup> The Court then referred to the Commission’s commentary regarding state practice that “it is primarily in the last two decades that safeguarding the ecological balance has come to be considered an ‘essential interest’ of all States.”<sup>80</sup> It further referred to the

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73. *Id.* at 58.

74. *Id.* at 35. For the Court’s discussion of “ecological necessity,” see *id.* at 36-46.

75. *Id.* at 60.

76. *Id.* at 62.

77. *Id.* at 63.

78. *Id.* at 64.

79. *Id.* at 41.

80. *Id.*, citing *Report of the International Law Commission to the General Assembly*, 35 U.N. Doc. A/35/10 (1980), reprinted in [1980] 2 Y.B. INT’L L. COMM’N 39, U.N. Doc.

Court's having already stressed "the great significance that it attaches to respect for the environment, not only for States but also for the whole of mankind," citing from its 1996 Advisory Opinion, *Legality of the Threat or Use of Nuclear Weapons*.<sup>81</sup>

In specific response to Hungary's arguments, the Court explicitly stated that "newly developed norms of environmental law are relevant for the implementation of the Treaty and that the parties could, by agreement, incorporate them through the application of Articles 15, 19 and 20 of the Treaty."<sup>82</sup> As these articles lay down general obligations regarding the environment, "the potential necessity to adapt" the Project had been recognized.<sup>83</sup>

The Court held by thirteen votes to two that "Hungary and Slovakia must negotiate in good faith in the light of the prevailing situation, and must take all necessary measures to ensure the achievement of the objectives of the Treaty... in accordance with such modalities as they may agree upon."<sup>84</sup>

In a separate opinion, the Vice President of the Court, Judge Weeramantry,<sup>85</sup> extensively discussed the principle of sustainable development, which, he said, enables the Court to "hold the balance even between the environmental considerations and the developmental considerations raised by the respective Parties."<sup>86</sup> He also elaborated on the principle of continuing environmental impact assessment.<sup>87</sup>

### 3. International Tribunal for the Law of the Sea

#### a. *The MOX Plant Case*

In November 2001, the International Tribunal for the Law of the Sea (ITLOS) considered a provisional measures application brought by Ireland against the United Kingdom<sup>88</sup> to prevent the UK from commencing operations at a nuclear power plant until a specially constituted tribunal for the dispute under the Convention on the Law of the Sea (UNCLOS) could complete a proper hearing and decide the case. The Tribunal affirmed the duty to cooperate as a fundamental principle in the prevention of pollution of the marine environment under part XII of UNCLOS and general international law,<sup>89</sup> and prescribed specific measures for the parties to implement that duty.

Ireland's request was for provisional measures, under which the UK would immediately suspend the authorization of the MOX Plant or alternatively to take

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A/CN.4/SER.A/1980/Add.1(Part 2).

81. Gabcikovo-Nagymaros Project, *supra* note 72, at 41. For the language cited, see text, *supra* note 70.

82. *Id.* at 67.

83. *Id.*

84. *Id.* at 83.

85. *Id.* at 88.

86. *Id.*

87. *Id.* at 91-97.

88. MOX Plant (Ir. v. U.K.), Order, 41 I.L.M. 405, 406 (Int'l Trib. L. of the Sea 2001).

89. *Id.* at 415.



the necessary measures to prevent its operation, and to “immediately ensure” that no radioactive substances or materials or wastes associated with the operation of or activities related to the operation of the MOX Plant would occur over the waters under its sovereignty.<sup>90</sup>

The Tribunal ordered Ireland and the UK to

cooperate and... for this purpose, enter into consultations forthwith in order to:

- (a) exchange further information with regard to possible consequences for the Irish Sea arising out of the commissioning of the MOX plant;
- (b) monitor risks or the effects of the operation of the MOX plant for the Irish Sea;
- (c) devise, as appropriate, measures to prevent pollution of the marine environment which might result from the operation of the MOX plant.<sup>91</sup>

*b. The Case Concerning Land Reclamation by Singapore in and around the Straits of Johar*

Two years after announcing the *MOX Plant* decision on October 8, 2003, the ITLOS again ruled that disputing parties had the duty to cooperate. It prescribed provisional measures, directing the two states, Malaysia and Singapore, to cooperate and used similar language as in the *MOX Plant* case, that “Malaysia and Singapore shall cooperate and shall, for this purpose, enter into consultations forthwith....”<sup>92</sup> The object, it said, was to:

- a. establish promptly a group of independent experts with the mandate
  - 1. to conduct a study... to determine... 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....<sup>93</sup>

It also called upon 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.”<sup>94</sup>

90. *Id.* at 410.

91. *Id.* at 416.

92. Case Concerning Land Reclamation by Singapore in and around the Straits of Johar (Malay. v. Sing.), Order, ¶106(1) (Int’l Trib. L. of the Sea 2003), available at [http://www.itlos.org/start2\\_en.html](http://www.itlos.org/start2_en.html).

93. *Id.*

94. *Id.* at ¶106(2). See also *M/V Saiga* (No. 2) (St. Vincent v. Guinea), Order, ¶170 (Int’l Trib. L. of the Sea 1999), cited in Van Dyke, *supra* note 6, at 106, in which the ITLOS reiterated the international law rule that a state committing an intentionally wrongful act owes compensation to the state suffering the damage.

#### 4. International Criminal Court

The infliction of environmental damage during war is a criminal act under the statute of the International Criminal Court,<sup>95</sup> as article 8(2)(b)(iv) states:

For the purpose of this Statute, "war crimes" means "... intentionally launching an attack in the knowledge that such attack will cause... widespread, long-term and severe damage to the natural environment which would be clearly excessive in relation to the concrete and direct overall military advantage anticipated."

The language describing the elements of the environmental crime in this article essentially tracks the language from articles 35(3) Protocol I of the Geneva Convention and article 1(1) of the ENMOD Convention, which the International Court of Justice had cited in its advisory opinion, *Legality of the Threat or Use of Nuclear Weapons*. The requirements here are "widespread, long-term and severe damage to the environment,"<sup>96</sup> which has to be intentional and which does not meet the proportionality test of the possible military advantage. It should, however, be noted that the ICC's jurisdiction is limited to natural persons and hence there is no room for state responsibility or liability or corporate liability. Thus, for all practical purposes the reach of the ICC regarding environmental crimes will be rather limited.

#### B. International Settlements

##### 1. Compensation by the Soviet Union for Harm Caused by Nuclear Activities

On January 24, 1978, a Soviet Union's Cosmos 954 Satellite carrying a nuclear reactor containing highly enriched uranium, disintegrated over Canada after reentering the Earth's atmosphere and deposited radioactive debris over a large area in the north of the country.<sup>97</sup> The Soviet Union had not notified Canada of the satellite's possible reentry over Canadian territory.<sup>98</sup>

Canada determined that most of the fragments it recovered of the space object were radioactive, some lethally so.<sup>99</sup> It claimed that the operations it undertook for "locating, recovering, removing and testing the debris and cleaning up the effected areas" cost it nearly \$14 million, and it sought payment of \$6 million from the Soviets.<sup>100</sup> The Canadian claim was based on Article II of the Convention on International Liability for Damage Caused by Space Objects,<sup>101</sup> which imposes

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95. Rome Statute of the International Criminal Court, July 17, 1998, 2187 U.N.T.S. 90, 94 [hereinafter Rome Statute]. The Rome Statute for the International Criminal Court was adopted in 1998 and the ICC entered into force July 1, 2002.

96. Nuclear Weapons Opinion, *supra* note 44, at 241.

97. Canada: Claim against the Union of Soviet Socialist Republics for Damage Caused by Soviet Cosmos 954, 18 I.L.M. 899,902 (1979) [hereinafter Canada: Claim].

98. *Id.*

99. *Id.* at 904.

100. *Id.*

101. Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187 (entered into force Sept. 1, 1972).

absolute liability on a launching state to compensate for damage caused by its space object on the surface of the Earth.

Canada sought damages for the deposit of hazardous radioactive debris from the satellite over Canadian territory and the presence of that debris in the environment, "rendering part of Canada's territory unfit for use."<sup>102</sup> It asserted that the absolute liability standard "for space activities, in particular activities involving the use of nuclear energy, is considered to have become a general principle of international law," and calculated the claimed compensation according to general principles of international law.<sup>103</sup>

The parties eventually settled for the payment by the Soviet Union of \$3 million "without [its] admitting any liability."<sup>104</sup> The settlement was reached through negotiations and was paid *ex gratia*. Thus although it is not clear what the basis for the settlement was and what law was applied, the principles implicated are, as Canada claimed, that a state is obligated not to cause harm to another state's environment and that absolute liability is imposed for activities involving the use of nuclear energy and causing harm.

## 2. Compensation by the United States for Harm Caused by Nuclear Activities

### a. *The Fukuryu Maru (Lucky Dragon) Claim*<sup>105</sup>

On March 1, 1954, eight years after nuclear testing by the United States in the Marshall Islands began, the United States detonated a thermonuclear bomb codenamed "Bravo" on Bikini Island, part of the Marshall Islands, a UN trust territory administered by the US. Although the US had earlier issued a general warning defining a danger zone around Bikini, there was no specific warning regarding the timing or location of the various tests. A Japanese tuna fishing boat, the Lucky Dragon, took on a large amount of Bravo's fallout. Fish were contaminated in the area, and several crew members fell sick, while one died.<sup>106</sup> The US did not accept liability but it made a payment to Japan, *ex gratia*, 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..." caused by the test.<sup>107</sup>

### b. *Marshall Islanders' Claim*

Between 1946 and 1958 the US conducted 67 such nuclear tests in the Marshall Islands.<sup>108</sup> Radioactive fallout from the Bravo test drifted in the wrong

102. Canada: Claim, *supra* note 97, at 905.

103. *Id.* at 907.

104. *Id.*

105. See generally RALPH E. LAPP, *THE VOYAGE OF THE LUCKY DRAGON* (1958), referenced in *Lucky Dragon Incident*, [www.american.edu/TED/lucky.htm](http://www.american.edu/TED/lucky.htm). The description here is based on this work.

106. See Myres S. McDougal & Norbert A. Schlei, *The Hydrogen Bomb Tests in Perspective: Lawful Measures for Security*, 64 *YALE L.J.* 648, 652 (1955).

107. Agreement relating to compensation for personal and property damage as a result of nuclear tests in the Marshall (Bikini) Islands, U.S.-Japan, Jan. 4, 1955, 6 *U.S.T.* 1.

108. See Davor Pevec, *The Marshall Islands Nuclear Claims Tribunal: The Claims of the Enewetak*

direction and several inhabitants of Rangeley and Turk Atolls were irradiated. The Eniwetok people claimed that they had suffered property damage from the nuclear testing program. The United States and the Republic of the Marshall Islands governments entered into a treaty, known as the Compact of Free Association, under which a \$150 million nuclear fund was established and a nuclear claims tribunal with jurisdiction over the Marshall Islanders' claims was established. Eventually, the Enewetak people were awarded \$386 million for their damages,<sup>109</sup> which was an implicit acknowledgement that compensation is required for any harm caused by nuclear activities.

*c. Payment Regarding the B-52 Accident at Palomares, Spain*

On January 17, 1966, a US B-52 carrying four thermonuclear bombs collided with a KC-135 tanker while refueling over Palomares, Spain.<sup>110</sup> The US and Spanish governments were informed of the nuclear accident and dispatched nuclear safety teams. Although three of the bombs that had landed on the shore were located, the fourth could not be found for several days. Two of the bombs had detonated on impact and spread plutonium dust over hundreds of acres of land.<sup>111</sup> The United States paid compensation and assumed responsibility for disposing of the radioactive materials in Spanish waters.<sup>112</sup>

#### IV. CONCLUSION

This survey shows that several international environmental norms, including state responsibility and liability, the *sic utere tuo ut alienum non laedas* (no harm) rule, and the polluter-pays principle, are also especially pertinent to nuclear activities.

This survey also shows that the current international civil liability regimes are inadequate.<sup>113</sup> For example, many applicable treaties have not been widely ratified, do not cover the issue of irreparable harm, as they limit compensation primarily for personal injury and economic (including property) damage, and do not provide for the remedy of cessation of harmful activity. Perhaps those involved in updating nuclear law should study the creation of a new norm, such as ecocide or geocide, that may be helpful.

On an especially urgent related topic, the International Convention for the Suppression of Acts of Nuclear Terrorism, which was adopted by the United

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*People* (published herein).

109. *See generally id.*

110. National Atomic Museum, *Historical Perspective: Broken Arrow*, <http://www.atomicmuseum.com/tour/cw4.cfm> (last visited September 9, 2007).

111. *Id.*

112. *See* BRIAN D. SMITH, STATE RESPONSIBILITY AND THE MARINE ENVIRONMENT: THE RULES OF DECISION 77, 117 (1988).

113. *See generally* Anne Daniel, *Civil Liability Regimes as a Complement to Multilateral Environmental Agreements: Sound International Policy or False Comfort?*, 12 REV. OF EUR. COMMUNITY AND INT'L ENVTL L. 225 (2003).

Nations General Assembly on April 15, 2005,<sup>114</sup> will upon its ratification fill a huge gap that presently exists in the pertinent treaties as they do not provide coverage for terrorist attacks.

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114. G. A. Res. 59/290, U.N. Doc. A/Res/59/290 (April 15, 2005). *See generally* Odette Jankowitsch-Prevor, *International Convention for the Suppression of Acts of Nuclear Terrorism*, 76 NUCLEAR L. BULL. 7 (2005).

