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# The International Fallout From Chernobyl

“The odds of a meltdown are one in 10,000 years.”<sup>1</sup>

## I. Introduction

On April 26, 1986,<sup>2</sup> one of the worst nuclear reactor meltdowns and explosions in history occurred at the Chernobyl nuclear plant in the Soviet Union.<sup>3</sup> The explosion caused a nuclear reactor fire that burned for twelve days.<sup>4</sup> The fire released into the atmosphere lethal forms of iodine and cesium, as well as other highly dangerous radioactive emissions.<sup>5</sup>

The explosion occurred during a test conducted by plant employees to determine how long the reactor's turbines would run once the generators are cut off. As part of this test, plant operators stripped the reactor of all safety mechanisms. This rendered the reactor powerless to check or restrain its own progress, as it would have done if the safety features were operational.<sup>6</sup> Xenon gas and steam pressure quickly accumulated inside the reactor after the

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1. *The Nuclear Power Industry in the Ukraine*, SOVIET LIFE, Feb. 1986, at 8 (statement of Vitali Sklyarov, Minister of Power and Electrification for the Soviet Ukraine, concerning the safety of the Chernobyl nuclear power plant) [hereinafter *Nuclear Power Industry*]. A shift superintendent at Chernobyl added that “working at the plant is safer than driving a car.” *Id.* at 12.

2. Serrill, *Anatomy of a Catastrophe*, TIME, Sept. 1, 1986, at 26, 27. Workers at the Forsmark nuclear power plant in Sweden were the first to discover concentrations of radiation greater than normal when they tested clothing and found amounts of radiation far above contamination levels. Greenwald, *Deadly Meltdown*, TIME, May 12, 1986, at 38, 39 [hereinafter *Deadly Meltdown*]. See generally *Radiation: How Much Is Too Much?*, REDBOOK, Oct. 1986, at 30 (discussion of “acceptable” doses of radiation) [hereinafter *Radiation*].

3. The Chernobyl plant, built in 1977, was the first nuclear power station in the Ukraine. *Nuclear Power Industry*, *supra* note 1, at 12.

4. Serrill, *supra* note 2, at 27. In addition to dumping sand, lead, boron and water on the blaze, Soviet workers tunneled beneath the reactor in an attempt to seal off the damaged unit from below with concrete. This measure was an effort to protect the ground and underlying water table. Greenwald, *More Fallout From Chernobyl*, TIME, May 19, 1986, at 44, 46 [hereinafter *More Fallout*].

5. *Deadly Meltdown*, *supra* note 2, at 41. Iodine 131, among the deadliest of the emissions, rapidly collects and remains in the human thyroid gland. *Radiation*, *supra* note 2, at 30.

6. In order to complete the test, operators turned off the emergency cooling system. Realizing that the reactor power had been inadvertently lowered too much, they attempted to increase it by activating all the water circulation pumps. This made the reactor more difficult to control. The automatic shut-off signal was blocked in order to insure the system's continued operation once the turbines stopped. Before completion of the final tragic step of removing all but six or eight of the thirty control rods, the workers eliminated the safety devices which halted the reactor if steam pressure or water levels became abnormal. Serrill, *supra* note 2, at 26-27.

shutdown of the generators.<sup>7</sup> Ultimately, the pressure tore a hole in the roof of the building that housed the reactor. Oxygen rushed in from outside and kindled a graphite fire. The fire spewed radioactive particles into the wind and, consequently, to areas beyond the borders of the Soviet Union.<sup>8</sup>

The town of Pripyat, which surrounds Chernobyl, felt the immediate effects of the blast most strongly<sup>9</sup> and remained too radioactive for habitation for at least several weeks thereafter.<sup>10</sup> Reservoirs near the plant were also significantly contaminated. The Soviet Union suffered at least thirty-one fatalities linked directly to the mishap.<sup>11</sup> This number only begins to state the extent of health damage, however, since other countries felt the effects of the blast as well.

Poland sustained heavy fallout. The Polish Government advised mothers to have all their children below age sixteen injected with shots of iodine solution.<sup>12</sup> Milk was banned because the cows had been grazing on irradiated grass.<sup>13</sup> In Rumania, government officials declared a state of alert, advising people to stay inside and to avoid drinking rainwater.<sup>14</sup> Sweden suffered at least \$144 million in damages due to the ruination of food.<sup>15</sup> The livelihood of 15,000 Lapp nomads in central Sweden continues to be threatened because radiation has contaminated the reindeer they raise and the berries and fish they eat.<sup>16</sup> Sheep farmers in Great Britain were unable to bring their animals to slaughter because the sheep had ingested contaminated grass.<sup>17</sup>

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7. Marbach, *Anatomy of a Catastrophe*, NEWSWEEK, Sept. 1, 1986, at 26, 27.

8. *Deadly Meltdown*, *supra* note 2, at 49.

9. Serrill, *supra* note 2, at 29.

10. At distances of three to four miles from the plant, residents stood a 50% chance of surviving. Damage to bone marrow and to the gastrointestinal tract could be expected. Though unlikely that they would die, residents within seven miles might experience nausea and similar symptoms. An increase in deaths in the next thirty years from cancer is likely among those persons within a range of sixty miles from the reactor site. Even those living over 200 miles from Chernobyl will have an increased likelihood of getting cancer due to the accident. *Deadly Meltdown*, *supra* note 2, at 42.

11. Serrill, *supra* note 2, at 26. This report conflicts with a pronouncement from the Soviet Union that only two people were killed during the explosion and that, of the 299 people hospitalized, only seven had died. *Mikhail Gorbachev's Television Address Concerning Chernobyl Accident*, SOVIET LIFE, July 1986, at 38.

12. Marbach, *supra* note 7, at 26. The purpose of the solution was to keep the children's bodies from absorbing the element in radioactive form. *Deadly Meltdown*, *supra* note 2, at 44.

13. Marbach, *supra* note 7, at 26. Polish officials stated that a sharp increase in cancer rates in the next two to three decades could be expected as a result of the mishap. *Deadly Meltdown*, *supra* note 2, at 43.

14. *Deadly Meltdown*, *supra* note 2, at 44.

15. Serrill, *supra* note 2, at 28. In addition, 2.2 pounds of radioactive cesium fell upon Sweden's neighbor, Norway. This figure represents 6% of the total discharge from the damaged reactor. Phila. Inquirer, Jan. 31, 1987, at 1-A, col. 1.

16. Serrill, *supra* note 2, at 28.

17. The Foreign Office in Great Britain contemplated bringing international legal action against the Soviet Union to recover the losses sustained by these farmers. *Id.* at 29.

Chernobyl's effects were not confined to Europe. The world's farmers and grocers were forced to check their produce with geiger counters and to spray everything with water to remove any possible contaminants.<sup>18</sup> Italy denied entrance into her country of thirty-two freight cars loaded with cattle from Poland and Austria upon finding that over 900 of the animals contained abnormally-high radiation levels.<sup>19</sup> Due to the essentially unknown long-term effects of radiation contamination on both people and the environment, "[i]t will be decades before all the effects of the world's worst nuclear reactor accident are known."<sup>20</sup>

This Comment will examine the nuclear reactor accident at Chernobyl and its legal consequences in the international arena. In examining these consequences, several important doctrines of international law will be discussed. Foremost among these is the doctrine of territorial sovereignty. That is, while the Soviet Union may claim the right to produce nuclear energy without interference from other states, those other states have a reciprocal right to be free from injury at the hands of the Soviet Union.

A state injured by radiation will first have to prove that the Soviet Union was responsible for the accident. According to the doctrine of state responsibility, there is a concomitant duty of reparation. An injured state must then prove the Soviet Union liable under international law for the damage sustained.

Proving liability may be difficult, depending upon which of the many theories a victim state chooses to assert. The arsenal of theories includes negligence, enterprise liability, strict liability, trespass, and nuisance. A theory must be chosen in light of the type of remedy it affords. Traditional remedies include compensation and injunction.

The above-outlined procedure is complex and difficult to administer. One impediment to the implementation of this procedure is that injured nations rarely agree to submit their claims to an international tribunal for adjudication. Furthermore, the few decisions in the environmental protection area have been made on an ad hoc basis, and provide relatively little guidance for members of the international community. In an effort to eliminate these impediments, several nations are executing bilateral or multilateral agreements.

This Comment proposes that a multinational treaty dealing with environmental pollution is the optimum solution to the problem. Such a document would set standards which would be acceptable to

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18. *More Fallout*, *supra* note 4, at 44-45.

19. *Id.* at 44. In Tokyo, radiation was discovered in both rainwater and fresh milk. In the United States, "[m]inute amounts of radiation were detected from the Pacific northwest to upstate New York." *Id.* at 45.

20. Serrill, *supra* note 2, at 29.

the general international community. In this way, both offending and victim states would be aware of their rights and obligations under international law.

## II. State Sovereignty

Professor Philip C. Jessup has stated that “[s]overeignty, in its meaning of an absolute, uncontrolled state will, . . . is the quicksand upon which the foundations of traditional international law are built.”<sup>21</sup> According to the doctrine of territorial sovereignty, states exercise supreme and total jurisdiction over their territory.<sup>22</sup> This includes the power to develop all branches of state government without external interference.<sup>23</sup> Thus, no state may interfere with the Soviet Union’s power to regulate and control its own nuclear energy industry.

The Permanent Court of International Arbitration (PCIA) considered the doctrine of territorial sovereignty to be a basic tenet of international law in the *North Atlantic Coast Fisheries* case.<sup>24</sup> The Court concluded that sovereignty is essentially territorial and that the exercise of sovereignty, consequently, is limited to a state’s boundaries.<sup>25</sup> While this may appear restrictive, it should be noted that this concept carries with it the corresponding right of noninterference within a state’s territorial limits.<sup>26</sup>

The International Court of Justice (ICJ) reached the same conclusion as the PCIA in the *Corfu Channel Case*.<sup>27</sup> The ICJ rejected Great Britain’s argument that the Allies’ minesweeping operation

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21. P. JESSUP, *A MODERN LAW OF NATIONS* 2 (1948). Sovereignty has been given many different meanings. Hobbes viewed sovereignty as an absolutely unlimited legal power — not only over all persons and things within the sovereign’s territory but also over the state’s relation with other states or their nationals. The sole restraint was that imposed by a state’s own will. A. LAWSON, *SOVEREIGNTY WITHIN THE LAW* 375 (1965).

22. *MANUAL OF PUBLIC INTERNATIONAL LAW* 316 (M. Sorensen ed. 1968) [hereinafter *MANUAL*]. See B. JANKOVIC, *PUBLIC INTERNATIONAL LAW* 117 (1984).

23. *MANUAL*, *supra* note 22, at 316. See also UN Declaration on Principles of International Law Concerning Friendly Relations and Co-Operation Among States in Accordance with the Charter of the United Nations, U.N. Doc. A/RES/2625, reprinted in 14 *I.L.M.* 251, reprinted in *BASIC DOCUMENTS IN INTERNATIONAL LAW* 35, 43 (I. Brownlie ed. 1983) (stating that the territorial integrity and political independence of the state are inviolable) [hereinafter *BASIC DOCUMENTS*].

24. *North Atlantic Coast Fisheries (Gr. Brit. v. U.S.)* Permanent Court of Arbitration, 11 *R. Int’l Arb. Awards* 167, 180 (1910) (in dispute over fishing rights in waters near Newfoundland, held that an interpretation of the 1783 Treaty of Peace between the two nations favored the rights of the United States to fish in those waters).

25. *Id.*

26. A. LAWSON, *supra* note 21, at 376.

27. *Corfu Channel Case (U.K. v. Alb.)* 1949 *I.C.J.* 4 (Merits) [hereinafter *Corfu Channel Case*]. British warships attempted to make an innocent passage through the Corfu Channel. Before doing so, however, the Allied forces conducted a minesweeping operation. When the ships finally passed through, mines exploded, severely injuring crewmen and damaging the ships. The Court held Albania liable for damages.

constituted self-protection.<sup>28</sup> The Court stated that, between independent states, respect for territorial sovereignty is an essential foundation of international relations.<sup>29</sup>

Article 1 of the UN Charter of Economic Rights and Duties of States<sup>30</sup> crystallized this principle of international law. This resolution provides that "[e]very State has the sovereign and inalienable right to choose its economic system as well as its political, social and cultural systems in accordance with the will of its people, without outside interference, coercion or threat in any form whatsoever."<sup>31</sup> Thus, it follows that a nation's right to choose nuclear power as a source of energy falls within the breadth of the resolution.

The scope of the doctrine of territorial sovereignty is an issue which has been adjudicated by several tribunals. In the *Case of the S.S. Lotus*,<sup>32</sup> the Permanent Court of International Justice (PCIJ) concluded that restrictions upon the independence of states cannot be presumed.<sup>33</sup> The Tribunal de Paris, in the *Lake Lanoux Arbitration*<sup>34</sup> supported a decision made by France to divert river waters and to compensate Spain for any damage sustained. Only France could determine the utility of public works to be used on French territory, according to the Tribunal de Paris.<sup>35</sup> This was an affirmation of France's right to territorial sovereignty.

The doctrine of territorial sovereignty applies to the situation under current discussion. The Soviet Union was in the process of developing its domestic nuclear energy industry when the accident occurred at Chernobyl. Though international law authorizes the Soviet Union to exercise sovereignty over its territory, it is clear that territorial supremacy does not give a boundless liberty of action.<sup>36</sup> According to the doctrine of limited territorial sovereignty, it is the right of every nation to be free from outside interference, in making and enforcing rules respecting all activity within its territory, *but it is also the obligation of every state to respect the rights of its neigh-*

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28. *Id.*

29. *Id.*, cited in A. LAWSON, *supra* note 21, at 376.

30. U.N. Doc. A/RES/3281, *reprinted in* 14 I.L.M. 251 (1975).

31. *Id.* at \_\_\_\_.

32. *Case of the S.S. Lotus*, (Turk. v. Fr.) 1927 P.C.I.J. (ser. A) No. 10, *reprinted in* TRANSNATIONAL LEGAL PROBLEMS 293 (H. Steiner & D. Vagts eds. 1986). In 1926, a collision occurred between the French steamer *Lotus* and a Turkish collier. The accident occurred about five nautical miles off the coast of Turkey. Consequently, it was considered to have taken place on the high seas rather than within Turkey's territorial waters. The Turkish ship sank and eight Turkish nationals perished.

33. *Id.* at 294.

34. *France v. Spain*, 24 I.L.R. 101 (Trib. de Paris 1957).

35. *Id.* at \_\_\_\_.

36. I. BROWNIE, PRINCIPLES OF PUBLIC INTERNATIONAL LAW 353 (1966) [hereinafter PRINCIPLES]. Professor Brownlie notes that the law may prescribe the payment of compensation for the consequences of legal or "excusable" acts, and it is proper to consider this aspect in connection with responsibility in general. *Id.* at 354.

*bors*.<sup>37</sup> Accordingly, a state must not act in a manner detrimental to another state but rather in good faith compliance with its international obligations.<sup>38</sup>

One of the international obligations of a state is that it must refrain from altering the natural conditions of its territory to the disadvantage of the natural conditions in the territory of a neighboring state.<sup>39</sup> Another obligation is set forth in Article 1 of the Nuclear Test Ban Treaty.<sup>40</sup> This multilateral agreement provides that

each party renounces the right to explode nuclear devices not only 'at any place under its jurisdiction or control' . . . but also . . . in any other environment if such explosion causes radioactive debris to be present outside the territorial limits of the State under whose jurisdiction or control such explosion is conducted.<sup>41</sup>

The doctrine of limited territorial sovereignty encompasses some of the elements of the theory of state responsibility.

### III. State Responsibility

#### A. Background

Responsibility is a general principle of international law.<sup>42</sup> Professor Ian Brownlie has defined it as "a concomitant of substantive rules and of the supposition that acts and omissions may be categorized as illegal by reference to the rules establishing rights and duties."<sup>43</sup> International law applies an objective test to determine responsibility.<sup>44</sup>

37. Pickering, Swets, *Who'll Stop The Rain: Resolution Mechanisms for U.S.-Canadian Transboundary Pollution Disputes*, 12 DEN. J. INT'L L. 51, 52 (1982). The Corfu Channel Case also supports the application of limited territorial sovereignty in an environmental context: "It is every state's obligation not to knowingly allow its territory to be used for acts contrary to other states." *Id.* at 53. See *supra* note 27 and accompanying text.

38. MANUAL, *supra* note 22, at 316.

39. Comment, *Our Neighbor's Keeper? The U.S. and Canada: Coping With Transboundary Pollution*, 9 FORDHAM INT'L L.J. 159, 176 (1985-86) [hereinafter *Our Neighbor's Keeper?*].

40. Nuclear Test Ban Treaty, Aug. 5, 1963, United States-United Kingdom-Soviet Union, \_\_\_\_ U.S.T. \_\_\_\_, T.I.A.S. No. 5433.

41. *Id.* at art. 1.

42. MANUAL, *supra* note 22, at 316-17. "State responsibility" embraces the concept that "the authority of a state over its subjects is not confined to its territory, but extends beyond it, provided its exercise does not infringe the territorial sovereignty of another state." *Id.* at 317.

43. PRINCIPLES, *supra* note 36, at 353-54. Brownlie further notes a distinction between "original" and "vicarious" responsibility. "Original" responsibility flows from acts committed by, or with the authorization of, the government of a state. "Vicarious" responsibility flows from unauthorized acts committed by either the agents of a state or its nationals. *Id.* at 357-58.

44. *Id.* at 357. It is important to distinguish between liability and responsibility. A state may not necessarily be liable for an act even if it is held to be responsible for that act. The term "liability" carries with it a certain immediacy or directness of legal obligation. It conveys the idea of actual subjection of one person to a power recognized by law in another person. The term "responsibility," on the other hand, refers to a pre-existing state of events not neces-

Objective responsibility rests on the voluntariness of the act.<sup>46</sup> Once agency and a causal link are established, a breach of duty occurs by result alone.<sup>46</sup> Responsibility can flow from a state's execution of lawful measures.<sup>47</sup> The state may be at fault, therefore, based upon either reasonable foreseeability or foresight without regard to the consequences.<sup>48</sup>

The doctrine of state responsibility traditionally has been used as a vehicle by injured nations to justify their claims in international environmental disputes.<sup>49</sup> This doctrine was crystallized in Principle 21 of the 1972 UN Declaration on the Human Environment:

States have, in accordance with the charter of the UN and the principles of international law . . . 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.<sup>50</sup>

Furthermore, there has been general recognition of the rule that a state may not permit the use of its territory for purposes injurious to the interests of other states in a manner contrary to international law.<sup>51</sup> Professor Lassa Oppenheim even suggested that international law imposes a duty upon every state, as far as possible, to prevent its own subjects from committing injurious acts against other states.<sup>52</sup> In addition, the Helsinki Final Act<sup>53</sup> noted that states have the duty to ensure that their internal activities have no external environmental repercussions.<sup>54</sup>

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sarily connected with the conduct causing harm, and at a stage removed from liability. A person who is "responsible" by reason of such pre-existing condition *could also be made "liable."* A person could not be made "liable" if he or she were not "responsible." Pinto, *Reflections on International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by International Law*, 16 NETH. Y.B. INT'L L. 16, 26 (1985).

45. Principles, *supra* note 36, at 357.

46. *Id.*, at 357-58. Defenses may be available, but the injuring state has the burden of exonerating itself. *Id.* at 358.

47. *Id.* at 362.

48. The latter reason is often referred to as recklessness, or *culpa lata*. *Id.* at 361.

49. MANUAL, *supra* note 22, at 316. See B. JANKOVIC, *supra* note 22, at 117.

50. U.N. Doc. A/C48/14 (1974), reprinted in 11 I.L.M. 1416 (1972). This statement is repeated in paragraph 30 of the UN Charter of Economic Rights and Duties of States. See BASIC PRINCIPLES, *supra* note 23, at 251.

51. Williams, *Public International Law and Water Quality Management in a Common Drainage Basin: The Great Lakes*, 18 CASE W. RES. J. INT'L L. 155, 170 (1986). This recognition may be due to the acceptance of the maxim *sic utere tuo ut alienum non laedas* (use your land in a manner so as not to harm another) as a general principle of international law. *Id.* at 170. The United Nations has approved of this principle. See U.N. Doc. A/CN.4/Rev. 1 (1949). See also Rosencranz, *The International Law and Politics of Acid Rain*, 10 DEN. J. INT'L L. & POL'Y. 511, 513 (1981).

52. L. OPPENHEIM, INTERNATIONAL LAW 330 (1948).

53. Reprinted in 11 I.L.M. 1292, 1307 (1972).

54. The official text states that ". . . each of the participating States, in accordance with the principles of international law, ought to ensure . . . that activities carried out on its territory do not cause degradation of the environment of another State or in areas beyond the limits of national jurisdiction." *Id.*



### B. *The Corfu Channel Rule*

In the *Corfu Channel Case*, the ICJ specifically held that Albania had an obligation to warn the British fleet of the existence of a mine field in the channel.<sup>55</sup> In its decision, the Court announced the following rule: “[E]very state has an obligation to not knowingly allow its territory to be used for acts contrary to the rights of other states [.]”<sup>56</sup> This principle can be applied to the Chernobyl incident.

Under the rule announced in the *Corfu Channel Case*, a country that wants to hold the Soviet Union responsible for the radiation damages caused by the fallout from the Chernobyl blast must prove two elements. First, the nation must show that the nuclear accident was an act that was contrary to the rights of other states. Second, it must be shown that the Soviet Union knowingly allowed its territory to be used in such a manner.

In order to determine whether the Chernobyl accident satisfies the first criterion — the use of territory contrary to the rights of other states — it is helpful to examine previous cases and documents that have dealt with the subject of pollution. In the seminal *Trail Smelter Arbitration*,<sup>57</sup> the tribunal relied on principles of international law and the law of the United States.<sup>58</sup> It concluded that no state has a right to use or permit the use of its territory in a manner that would cause injury by fumes to another territory.<sup>59</sup> The arbitrators held that Canada was responsible under international law for the actions of the smelter, even though the smelter was owned and operated by a private corporation.<sup>60</sup>

In the French *Nuclear Tests Case*,<sup>61</sup> the ICJ applied the doc-

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55. *Corfu Channel Case*, *supra* note 27, at 22.

56. *Id.*

57. *Trail Smelter Arbitration* (U.S. v. Can.), Hague Ct. Rep., 3 R. Int'l Arb. Awards 1905 (1941), reprinted in 35 AM. J. INT'L L. 684 (1941) [hereinafter *Trail Smelter Arbitration*]. In this case, fumes and smoke from a copper smelter located in Trail, British Columbia, drifted into the state of Washington, causing extensive damage.

58. *Id.* at 716. The tribunal also stressed that an “injured” state’s claim that its rights are being invaded must be of a serious magnitude and must be established by clear and convincing evidence before the tribunal would exercise its extraordinary power to control the conduct of one state at the request of the injured state. *Id.* at 715 (quoting *New York v. New Jersey*, 256 U.S. 296, 309 (1921)). Article 38 of the Statute of the International Court of Justice permits an international adjudicatory body to apply the municipal law of civilized nations to determine the outcome of international disputes.

59. *Trail Smelter Arbitration*, *supra* note 57, at 716.

60. *Id.* at 717. This follows from the premise that certain conditions exist in the territory of a state which guarantee the safety of both persons and property. States are obligated, therefore, not to pollute or cause serious damage to the air of an adjoining state. Williams, *supra* note 51, at 158. Damage to other states from Chernobyl affected not only the air but also the physical territory. See *supra* notes 4-20 and accompanying text.

61. *Nuclear Tests Case* (Austl. v. Fr.) (Judgment), 1974 I.C.J. 253 (where France had ceased conducting unauthorized nuclear tests which were causing fallout to appear in Australian airspace, held that Australia no longer had a claim because it was no longer being harmed) [hereinafter *Nuclear Tests Case*].

trines of territorial sovereignty and international responsibility.<sup>62</sup> Implicit in the Court's decision was the finding that a state has an obligation to repair the damage caused by an offense committed within its jurisdiction.<sup>63</sup> The Court also noted that this responsibility could be based upon either treaty or custom.<sup>64</sup>

One such custom has been illustrated by the Stockholm Declaration.<sup>65</sup> The Sixth Principle of the Declaration is applicable to the current situation insofar as it recognizes that the discharge of toxic substances and the release of heat in large quantities is detrimental to the environment and must be halted.<sup>66</sup> This is consistent with the generally-accepted principle that each state is responsible for confronting the environmental problem of air pollution.<sup>67</sup>

The *Trail Smelter Arbitration* and the *Nuclear Tests Case* support the proposition that pollution which causes damage in another country is contrary to the rights of that country. In addition, the Sixth Principle of the Stockholm Declaration can be cited as authority, since radioactive material certainly must qualify as a "toxic substance," the dispersion of which is detrimental to the environment. An injured state in the Chernobyl situation, therefore, would be able to satisfy the first requirement of the *Corfu Channel* test. The second requirement to be proven is "knowledge."

Since the decision in the *Corfu Channel Case*, international scholars have concluded that either actual or implied knowledge<sup>68</sup> is sufficient to satisfy the second prong of the *Corfu Channel* test. In that case, the basis for the finding of responsibility was Albania's knowledge of the laying of the mines. The court relied on circumstantial evidence to establish this knowledge.<sup>69</sup>

The fact that circumstantial evidence was used does not alter the requirement that knowledge is a necessary predicate to responsibility.<sup>70</sup> In the situation under current discussion, circumstantial evi-

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62. *Id.* at 256. See *Our Neighbor's Keeper?*, *supra* note 39, at 173.

63. *Nuclear Tests Case*, *supra* note 61, at 256.

64. *Id.*

65. Report of the U.N. Conference on the Human Environment, U.N. Doc. A/Conf. 48/14; 111 I.L.M. 1416 (1972).

66. *Id.* at 1418.

67. Comment, *Acid Rain*, 6 HOUS. J. INT'L L. 197, 209 (1983-84) [hereinafter *Acid Rain*].

68. The doctrine of international responsibility includes responsibility for conditions of which a state may have only imputed knowledge. *Our Neighbor's Keeper?*, *supra* note 39, at 175.

69. The Court considered whether it had been established by means of indirect evidence that Albania had knowledge of the mine-laying expedition in its territorial waters. It concluded that the laying of the minefield could not have been accomplished without the knowledge of the Albanian Government. PRINCIPLES, *supra* note 36, at 360.

70. *Id.* It is true that a state on whose territory an act contrary to international law has occurred may be called upon to give an explanation. That state may not claim ignorance of the action. It is not to be concluded from the mere fact of a state's control over its territory, however, that the state necessarily knew, or ought to have known, of the act of its authors.

dence may be used to demonstrate the Soviet Union's knowledge. The test that was conducted on the reactor on April 25, 1986 was not the first of such experiments.<sup>71</sup> The Soviet Government was aware of the frequent use of such tests and approved of them.<sup>72</sup>

Thus, a state injured by radioactive fallout from Chernobyl will be able to prove both the use of Soviet territory in a manner contrary to the rights of other states and the Soviet Union's knowledge of such use. Consequently, such a state can claim that the Soviet Union should be held responsible for the accident at Chernobyl. Even if a nation does not allege the criteria enumerated under the preceding test, international law provides other ways in which responsibility may be proven.

### C. *Culpable Negligence*

A second test which has developed in the international law of state responsibility is comprised of three elements. First, there must be an act or omission that violates an obligation established by a rule of international law in force between the state responsible for the act or omission and the injured state. Second, the unlawful act must be imputable to the injuring nation. Finally, the injured country must have suffered loss or damage due to that unlawful act.<sup>73</sup> Furthermore, Professor Oppenheim has stated that "an act of a state injurious to another state is . . . not an international delinquency if committed neither willfully and maliciously nor with culpable negligence."<sup>74</sup>

The mishap at Chernobyl was clearly an accident; it was com-

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DECISIONS OF THE I.C.J.: A DIGEST 24 (J. Syatauw ed. 1969).

71. The test was devised by an electro-technical institute and was directed by electrical engineers. A similar test had been performed successfully on two other Chernobyl reactors. One year prior to this test, the same test did not prove successful on Unit 4 because the generator failed to provide enough power. Wash. Post, Oct. 26, 1986, at A34, col. 1.

72. *Id.*

73. MANUAL, *supra* note 22, at 534. See also B. JANKOVIC, *supra* note 22, at 151. Article 3 of the draft articles provisionally adopted by the International Law Commission states this test in a similar manner: "There is an internationally wrongful act of a State when: (a) Conduct consisting of an action or an omission is attributable to the State under international law; and (b) That conduct constitutes a breach of an international obligation of the State." 2 Y.B. INT'L L. COMM'N 179 (1973), reprinted in I. BROWNLIE, SYSTEM OF THE LAW OF NATIONS: STATE RESPONSIBILITY 30 (1983) [hereinafter STATE RESPONSIBILITY]. The International Law Commission is a body of 34 international lawyers elected by the United Nations General Assembly. The function of the Commission is to codify and progressively develop international law. M. AKEHURST, A MODERN INTRODUCTION TO INTERNATIONAL LAW 33 (1984).

74. A. SPRINGER, THE INTERNATIONAL LAW OF POLLUTION 131 (1983). This view has considerable support in the environmental field. For example, the 1948 frontier treaty between Poland and the USSR requires compensation only if material damage is caused to one party through the fault of the other party. Fault was defined as the failure of one state to take steps to prevent deliberate destruction on the banks of frontier rivers and lakes. See THE PROTECTION OF THE HUMAN ENVIRONMENT: TREATIES AND RELATED DOCUMENTS 4475 (B. Ruster & B. Simma eds. 1958).

mitted with neither willfulness nor malice. This determination, however, does not dispose of the issue, since the accident may have been the result of culpable negligence. Indeed, Soviet officials blamed the accident primarily on "gross violations of operating regulations by the workers."<sup>75</sup> In addition, both the international community and the Soviet Union itself have criticized several design and structural defects of the reactor model.<sup>76</sup>

The Chernobyl unit lacked the type of protective containment building common to most American reactors.<sup>77</sup> It also contained design features dating back as far as 1942.<sup>78</sup> Even Soviet writers criticized the shoddy building practices and workmanship of nuclear reactors in their country generally as well as deficiencies in the quality of construction of the Chernobyl plant in particular.<sup>79</sup> Indeed, if these criticisms are well-founded, then the Soviet Union undoubtedly committed an act of culpable negligence by not correcting the situation. Culpable negligence also may be found in the Soviet Union's failure to upgrade the reactor unit. Since modern nuclear reactors begin to lose power when their coolant fluids overheat,<sup>80</sup> the Chernobyl unit needed upgrading because it did not contain such a feature.<sup>81</sup> Furthermore, the 1700 tubes carrying radioactive materials away from the core of the reactor were not enclosed within the customary reinforced safety structure in the unit.<sup>82</sup> This created a hazardous situation because, if any pipe ruptured, the radioactive contents would be released into the atmosphere immediately.<sup>83</sup> Clearly, the Chernobyl unit did not contain appropriate safety features.

Assuming that the various acts and omissions by the Soviet authorities constituted international delinquencies on grounds of culpable negligence, an injured country next must prove that these acts

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75. Serrill, *supra* note 2, at 26. One report related that the staff at the Chernobyl plant was determined to go ahead with the test "at all costs," despite increasingly apparent risks. Wash. Post, Oct. 26, 1986, at A34, col. 1.

76. The Soviet Government admitted that reactor design flaws, as well as human error, contributed to the disaster. Wash. Post, Oct. 27, 1986, at A20, col. 1.

77. *Deadly Meltdown*, *supra* note 2, at 40.

78. *Id.* at 49. The Chernobyl reactor's model, the RBMK-1000, was outdated and had not been changed in over thirty years. *Id.* See also *Gauging the Fallout from Chernobyl*, 117 PUB. UTIL. FORT. 44, 45 (1986) (stating that the reactor's design was "obsolete").

79. *Deadly Meltdown*, *supra* note 2, at 50.

80. Raloff, *More Details on Chernobyl*, SCIENCE NEWS, May 24, 1986, at 326. The article does not mention whether this is an automatic response or is one that may be blocked, as in the case of Chernobyl.

81. The Chernobyl unit incorporated what is known as "positive void coefficient." This means that any loss of water or overheating of the water could spark a surge in the fission action, causing reactor power to increase. Raloff, *A Meltdown But No Melt-through*, SCIENCE NEWS, May 17, 1986, at 308 [hereinafter *A Meltdown But No Melt-through*].

82. *Id.*

83. *Id.* For a general discussion of proposed modifications to other reactors of the same type, see Wash. Post, Oct. 26, 1986, at A34, col. 4.

and omissions were imputable to the Soviet Union. There are several ways in which international delinquencies may be attributed to a specific state. In general, a state cannot be held responsible for the actions of private individuals over whom it has no control.<sup>84</sup> Professor Brownlie has stated that "responsibility can only be based upon some ultimate default by the organs of a state, the activities of private persons merely constituting the objective conditions which give rise to a breach of a principle, or standard, of general international law . . . on the part of that state."<sup>85</sup>

Judge Hersch Lauterpacht has enunciated the same principle.<sup>86</sup> He contends that a state bears full responsibility for breaches of international law committed by any of its servants — officials, courts, and armed forces<sup>87</sup> — but not by private parties. Thus, before an injured country may prove that the actions which caused the accident at Chernobyl are imputable to the Soviet Union, it must demonstrate that a breach of international law was committed by an organ of that state.<sup>88</sup>

Several government agencies regulate the safety, construction, and operation of nuclear power plants in the Soviet Union.<sup>89</sup> These agencies played an important role in the Chernobyl accident.<sup>90</sup> The test that led to the meltdown should have been supervised, or at least authorized, by an official from one of the regulatory agencies.

Reports have stated, however, that the test plan had not been studied by the plant's safety review group and that the test was conducted without proper authorization.<sup>91</sup> The agencies responsible for review and supervision did not fulfill their duties. Since these agen-

84. Williams, *supra* note 51, at 158. ". . . [M]uch of the human activity that gives rise to detrimental environmental effects of concern to the international community is carried on by private persons for whose actions the state is not normally directly responsible." A. SPRINGER, *supra* note 74, at 128. See also STATE RESPONSIBILITY, *supra* note 73, at 159.

85. STATE RESPONSIBILITY, *supra* note 73, at 159.

86. H. LAUTERPACHT, INTERNATIONAL LAW, VOLUME I 399 (1970).

87. *Id.* at 400. This principle is further demonstrated by the Draft Articles on State Responsibility. The International Law Commission concluded that acts or omissions imputable to the state would include those of state organs belonging either to the legislative, executive, judicial, or other branch of the government, provided that the organ was acting in that capacity in the case in question. Williams, *supra* note 51, at 159.

88. A state which substantially affects other states by emanations from within its borders, such as nuclear tests, fumes, air or water pollution, or diversion of waters, is interfering with the rights of the other, for it is the integrity and inviolability of the territory of the injured state that is infringed. The acting state is in breach of the duty of noninterference established by customary international law, generally stated in the maxim: *sic utere tuo ut alienum non laedas*. MANUAL, *supra* note 22, at 540. See also *supra* note 51.

89. For a general discussion of the USSR's nuclear energy industry, see Semenov, *Nuclear Power in the Soviet Union*, 25 IAEA BULL. 47 (1986).

90. The "Gosortekhnadza of the USSR" supervises compliance with regulations and standards of engineering safety in design, construction and operation of nuclear power plants. The "Gosatmnadzor of the USSR" supervises compliance with rules and standards of nuclear safety in design, construction and operation of the plants. *Id.* at 53.

91. Wash. Post, Oct. 26, 1986, at A34, col. 1.

cies are organs of the state, their inaction is imputable to the Soviet Union. This conclusion is supported by the highly-accepted view that "a state will be responsible where its officials have failed to act diligently and have not prevented the acts of private individuals which have caused environmental damage abroad."<sup>92</sup>

#### D. *Unwillingness to Punish*

Responsibility may arise in international law in yet another manner. For example, suppose an accident that occurs in Country *A* causes damage to property in Country *B*. Assume further that the accident was caused by private individuals in Country *A* over whom the government of Country *A* exerted no direct control. The accident was not foreseeable and no organ of the state was involved. Furthermore, the incident involved no culpable negligence on the part of Country *A*. If Country *A* failed to prosecute those persons responsible for causing the accident, that state would become responsible under international law. This is so even where Country *A* could not be held liable<sup>93</sup> for the actual injury.<sup>94</sup>

In the Chernobyl situation, the Soviet Union initiated criminal proceedings against the persons involved in the accident and expelled the plant's former director.<sup>95</sup> Top Soviet nuclear power officials were fired and twenty-seven Communist Party members were expelled from the Party.<sup>96</sup> Thus, an injured state probably would not be successful in arguing that the USSR exhibited an unwillingness to punish those nationals who contributed to the causing of the accident. Though such punitive measures may have provided a deterrent effect, they cannot serve to exonerate the Soviet Union from liability.

#### IV. Liability

"Liability" in international law is distinguishable from "responsibility."<sup>97</sup> The International Law Commission has suggested that the term "responsibility" should be used only in connection with internationally wrongful acts.<sup>98</sup> The term "liability," on the other hand, should be used when referring to the possible injurious consequences arising out of the performance of certain lawful activities.<sup>99</sup> The practical effect, however, is that liability attaches only to per-

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92. Williams, *supra* note 51, at 159.

93. See *supra* note 44 and accompanying text for a discussion of the difference between liability and responsibility.

94. Williams, *supra* note 51, at 159.

95. *Chernobyl's Goats*, NEWSWEEK, July 28, 1986, at 33.

96. Wash. Post, Oct. 27, 1986, at A1, col. 1.

97. See *supra* note 44 and accompanying text.

98. Preliminary Report, A/CN.4/334, par. 10, 1 Y.B. INT'L L. COMM'N 211 (1973).

99. *Id.*

sons who are legally responsible.<sup>100</sup>

In international law, the principle of liability functions to subject an individual or a state to either bear or contribute to the costs of the consequences arising from existing harm.<sup>101</sup> Liability is assessed to achieve the following goals: (i) internalization of the cost of harm in one or more states; (ii) transfer of adequate compensation, or other acts of reparation, from these states to the victim; (iii) preventing repetition of the harm-causing conduct; and (iv) the maintenance of safe conduct for the future.<sup>102</sup>

The PCIJ applied the principle of liability in the *Chorzow Factory Case*.<sup>103</sup> The Court there noted that the effect of a finding of state responsibility in international law is that the offending state must make reparation to the injured state.<sup>104</sup> This rule is consistent with Principle 22 of the 1972 Declaration on the Human Environment, which provides that "[s]tates shall cooperate to develop further the international law regarding liability and compensation for victims of pollution and other environmental damage caused by activities within the jurisdiction or control of such states to areas beyond their jurisdiction."<sup>105</sup> The form of reparation to which an injured nation is entitled may vary, and will depend on the theory of liability applicable under the circumstances.

#### A. Negligence (*Liability Based on Fault*)

A negligence theory<sup>106</sup> has been proposed as "the most plausible and promising route to substantial redress of injury."<sup>107</sup> The decision

100. *Id.* For an example of a document in international law which encompasses both the theory of liability and the theory of responsibility, see the UN Convention on the Law of the Sea, G.A. Res. 2749.

101. Pinto, *supra* note 44, at 31.

102. *Id.*

103. *Chorzow Factory Case (Indemnity) (Ger. v. Pol.)*, 1926 P.C.I.J. (ser. A) No. 17 (held, that reparations should be paid by the Polish Government to the German Government for damage done to property in Germany's possession) [hereinafter *Chorzow Factory Case*].

104. The Court stated the general rule: "It is a principle of international law, and even a general conception of law, that any breach of an engagement involves an obligation to make reparation." *Id.* at 29.

105. I.L.M., *supra* note 50, at 1420.

106. Negligence, or fault, is the usual basis of liability under common law for tortious conduct or for wrongful conduct that causes an injury and gives rise to a claim for damages. A plaintiff suing on account of pollution damage on a negligence theory would have to show that the alleged polluter had fallen short of the "reasonable man" standard of conduct, and that the offender could have foreseen that his conduct might result in damage like that which has occurred. J. BARROS & D. JOHNSTON, *THE INTERNATIONAL LAW OF POLLUTION*, 19 (1974).

107. Mingst, *Evaluating Public and Private Approaches to International Solutions to Acid Rain Pollution*, 22 NAT. RESOURCES J. 5, 18 (1982). This is in contrast to the view that such a theory would prove insufficient in an international context because an industry need only prove compliance with applicable government regulations to avoid liability for pollution injury. Comment, *Compensating Private Parties for Transnational Pollution Injury*, 58 ST. JOHN'S L. REV. 528, 552 (1984) [hereinafter *Compensating Private Parties*]. It has also been argued that liability standards for governing state conduct in the control of pollution activities are either nonexistent or expressed only in general terms. A. SPRINGER, *supra* note 74, at 131.

in the *Corfu Channel Case* also reflects this negligence standard of liability. The ICJ noted, however, that the mere accidental invasion of another state's rights does not render the acting state liable.<sup>108</sup>

In order for an injured country to recover under a negligence theory, it must establish negligence before proving injury.<sup>109</sup> The victim state must demonstrate the following elements: (i) the acting state failed to carry out a legally recognized duty, the breach of which resulted in damage to the claimant state, (ii) the acting state carelessly impinged on the claimant state's unalterable rights, and (iii) a causal link exists between the offending state's action and the injury sustained by the claimant state.<sup>110</sup> It follows, then, that a state injured by the radioactive fallout from Chernobyl has a viable claim in negligence.

First, the Soviet Union breached the duty of noninterference with the rights of other nations as established by the maxim of customary international law *sic utere tuo ut alienum non laedas*.<sup>111</sup> Second, it is clear that the USSR *carelessly* impinged on the rights of the countries sustaining damage from the fallout. As has been noted earlier, the Soviet Union failed to inspect the test plan, workers at the plant violated operating and safety standards, and design and structural defects contributed to the accident.<sup>112</sup> Finally, there is little doubt that the radiation contamination in several states was caused by the Chernobyl accident. An injured country, however, will be confronted with the traditional proof problems associated with causation when bringing an action against the USSR for compensation because any increase in cancer or other health concerns probably will go unnoticed for many years.<sup>113</sup> The contamination of milk, water, vegetables, and animals, on the other hand, can be readily tested and measured, making immediate compensation possible for these damages.

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In the case of Chernobyl, however, this would not be a barrier to recovery because workers violated protocols and, therefore, were not in compliance with government regulations. Serrill, *supra* note 2, at 26. It has also been suggested that the burden of proof regarding negligence should be shifted to the alleged polluter, requiring a demonstration of due diligence. A. SPRINGER, *supra* note 74, at 131. See also *Corfu Channel Case*, *supra* note 27, at 46 (individual opinion of Alvarez, J.).

108. *Corfu Channel Case*, *supra* note 27, at 18. A state's liability for accidental damage will depend on proof that the state's lack of due care or due diligence brought about the transnationally injurious event. Handl, *International Liability of States for Marine Pollution*, 21 CAN. Y.B. INT'L L. 85, 95 (1983) [hereinafter *International Liability*].

109. Mingst, *supra* note 107, at 18.

110. *Id.*

111. MANUAL, *supra* note 22, at 540.

112. See *supra* text accompanying notes 104, 88, and 89, respectively.

113. See *supra* text accompanying note 20.



### B. Enterprise Liability

It has been suggested that a rule of enterprise liability should be implemented to redress injury caused by geographically diffused pollution.<sup>114</sup> Enterprise liability is applicable to in those situations where multiple offenders have engaged in some type of industry-wide cooperation<sup>115</sup> by which they can be considered to have "jointly controlled the risk."<sup>116</sup> Under this theory, each member of the industry would be held liable if any damage resulting from its operations occurs.<sup>117</sup> Although this theory may be inappropriate under the present circumstances, it may become more useful as nuclear power plants proliferate.

The mechanics of this theory were demonstrated in *Sindell v. Abbott Laboratories*.<sup>118</sup> In *Sindell*, the plaintiff was unable to prove which one of five pharmaceutical companies produced the drug that was responsible for causing her injuries.<sup>119</sup> She was permitted, nevertheless, to recover from those companies that were unable to prove that they did not manufacture that particular drug.<sup>120</sup> The court noted that the unavailability of proof was not the fault of the plaintiff, but rather it was due to the fact that the defendants produced a drug whose effects were not visible for many years.<sup>121</sup>

The facts of the *Sindell* case may be altered slightly to demonstrate how the theory of enterprise liability applies to the current situation. Suppose another nuclear reactor accident occurred within the five years after the accident at Chernobyl. A plaintiff who then exhibits signs of cancer due to overexposure to radiation would be unable to prove the source of contamination. That person, then, would be in the same position as the plaintiff in *Sindell*.

In *Sindell*, the burden of proof was shifted to the defendants to exonerate themselves. The court ruled that the manufacturers should be held jointly and severally liable for the whole of the plaintiff's injuries if unable to exonerate themselves because manufacturers are

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114. *Compensating Private Parties*, *supra* note 107, at 553.

115. The term "industry-wide" liability is also used to express this theory. See *Sindell v. Abbott Laboratories*, 26 Cal.3d 588, 598, 607 P.2d 924, 928, 163 Cal. Rptr. 132, 136 (1980).

116. *Id.* at 608, 607 P.2d at 934, 163 Cal. Rptr. at 142.

117. *Id.*

118. 26 Cal.3d 588, 607 P.2d 924, 163 Cal. Rptr. 132 (1980). Article 38 of the Statute of the International Court of Justice permits the "municipal law of civilised nations" to be applied to resolve international disputes.

119. *Sindell*, 26 Cal.3d at 598, 607 P.2d at 928, 163 Cal. Rptr. at 136. When a party cannot identify which of two or more defendants caused an injury, the "alternative liability" theory provides that the burden of proof shifts to the defendants to show that they were not responsible for the harm. *Id.* See also PROSSER AND KEETON ON THE LAW OF TORTS § 103 (Keeton 5th ed. 1984) [hereinafter PROSSER & KEETON].

120. *Sindell*, 26 Cal.3d at 598, 607 P.2d at 928, 163 Cal. Rptr. at 136.

121. *Id.* at 611, 607 P.2d at 936, 163 Cal. Rptr. at 144.

better able to discover and prevent defects.<sup>122</sup> This ruling was designed to send a signal to manufacturers and producers to install or develop adequate safeguards for their particular operations.<sup>123</sup>

Applying this reasoning to the nuclear power industry, an enterprise liability theory would encourage those states manufacturing nuclear power to maintain or install safety mechanisms. If such a theory were currently practicable, the Soviet Union would have the burden of proving that it did not cause the injuries sustained by other states as a result of the accident.

### C. *Strict Liability*

The trend in international law is away from a fault, or negligence, standard and toward a standard of strict liability.<sup>124</sup> The rulings in the *Trail Smelter Arbitration*,<sup>125</sup> the *Corfu Channel Case*,<sup>126</sup> and the *Lake Lanoux Arbitration*<sup>127</sup> point to the emergence of strict liability as a principle of public international law.<sup>128</sup> These cases support the basic principle that a state is responsible for all activities taking place within its territory and may be held liable if damage to the interests of other states reaches a pollution threshold, even if the state has done all it could to prevent the damage.<sup>129</sup>

Under the doctrine of strict liability, the offending state is obligated to compensate the injured state for all damage that is the natural result of its activity, regardless of a finding that the offending state exercised due care.<sup>130</sup> International law scholars and practition-

122. *Id.*

123. PROSSER & KEETON, *supra* note 119, at 681-710. This theory especially would be applicable as well to the chemical spills into the Rhine River in November 1986. See Kiss, *The Protection of the Rhine Against Pollution*, 28 NAT. RESOURCES J. 613 (1985).

124. A. SPRINGER, *supra* note 74, at 132. This is demonstrated by such works as the International Law Association's rules governing international waterways, and the Helsinki Rules of 1966. Strict liability has been the relevant standard in some international agreements dating back to the 1920s. For example, a 1922 treaty between Germany and Denmark requires any persons suffering prejudice to be compensated for their loss. Also, Article V of the 1964 frontier agreement between Finland and the Soviet Union mandates reparation for any damage resulting from measures taken by either of the parties. This agreement focuses on the harmful consequences, and not on the illegality, of the action. *Id.* Another author postulates that strict liability may soon become the accepted norm with regard to liability. Williams, *supra* note 51, at 161.

125. See *supra* notes 57-60 and accompanying text.

126. See *supra* notes 27-29 and accompanying text.

127. See *supra* notes 34-35 and accompanying text.

128. These cases contain judicial recognition of the applicability in international law of such related common-law principles as *sic utere tuo ut alienum non laedas* and good neighborliness. A. SPRINGER, *supra* note 74, at 133-34.

129. *Id.* at 134. Where a state fails to comply with specific international pollutant emission or discharge standards, there can be no doubt about state responsibility. Handl, *Liability as an Obligation Established by a Primary Rule of International Law*, 16 NETH. Y.B. INT'L L. 49, 57 (1985) [hereinafter *Liability as an Obligation*].

130. J. BARROS & D. JOHNSTON, *supra* note 106, at 19-20. Under this theory, the offending state would have the burden of exculpation. See STATE RESPONSIBILITY, *supra* note 73, at 1.

ers distinguish two "types" of strict liability: strict liability without regard to fault, and strict liability based on abnormally dangerous activities.<sup>131</sup> Under either of these types, the Soviet Union would be obligated to compensate the injured countries for the damage they sustained as a result of the Chernobyl accident.<sup>132</sup>

1. *Strict Liability without regard to fault.*—A fundamental distinguishing feature of the class of cases of this type is the "accidental" nature of the harm inflicted.<sup>133</sup> The doctrine of strict liability pertains to accidents because the injury is most often the result of an activity which "is not wrongful, but gives rise to liability even in the absence of an allegation of negligence or fault."<sup>134</sup>

The 1969 Brussels Resolution on Establishment of an International Compensation Fund for Oil Pollution Damage<sup>135</sup> applies this type of strict liability. The Brussels Resolution provides for strict liability as the basis for determining compensation when a state has been injured by an oil pollution incident.<sup>136</sup>

Strict liability is the cornerstone of any international legal standard where the protection of the environment is concerned, especially with regard to accidental pollution.<sup>137</sup> This standard provides a very effective spur to accident prevention.<sup>138</sup> For example, the Soviet Union after being criticized sharply for defects in the design of its Chernobyl reactor, proposed several modifications.<sup>139</sup>

## 2. *Strict liability based on abnormally dangerous activi-*

131. Regardless of this distinction, decisions and documents in international law reveal uniformity as to what must be regarded as the critical parameters engaging liability. A (significant) accidental transnational harm must be: (1) due to the miscarriage of an activity that carries a presumptively recognizable significant risk of transnational harm; (2) typical of the risk associated with the activity; and (3) the result of a risk that is deemed significant, not in the sense of the probability of its realization, but of the consequences foreseeably associated with its realizations. *Liability as an Obligation*, *supra* note 129, at 69.

132. The Chernobyl incident demonstrates components of both types of strict liability. It was an accident, which would seem to place it in the category of "strict liability without regard to fault;" however, it was a nuclear reactor explosion, which usually falls under the category of ultrahazardous activities.

133. *Liability as an Obligation*, *supra* note 129, at 64.

134. J. BARROS & D. JOHNSTON, *supra* note 106, at 19.

135. *Id.* at 228.

136. The actual text states, "Victims should be fully and adequately compensated under a system based upon the principle of strict liability." *Id.* at 229.

137. *International Liability*, *supra* note 108, at 87.

138. Goldie, *Concepts of Strict and Absolute Liability in Terms of Relative Exposure to Risk*, 16 NETH. Y.B. INT'L L. 175, 188 (1985). See also *International Liability*, *supra* note 108, at 98. A strict liability standard will allow industries and nations to weigh the benefit of a polluting activity against the injury caused by such pollution. *Compensating Private Parties*, *supra* note 107, at 553. One author proposes, however, that such a standard for transnational accidents is plausible only when the magnitude of potential damage associated with a given accident renders the risk-bearing activity a matter of international concern. *International Liability*, *supra* note 108, at 99.

139. See Wash. Post, Oct. 26, 1986, at A34, col. 4.

ties.—“Of greater significance in the development of doctrines of strict liability are international agreements covering such particularly hazardous activities as the maritime transport of large volumes of oil, space exploration, and the production and use of nuclear energy.”<sup>140</sup> The thrust of these agreements is to prevent a state which creates a risk on its territory from passing that risk onto the public.<sup>141</sup>

Several treaties already provide that a party which engages in certain hazardous activities<sup>142</sup> will be strictly liable for any accidents that cause another party to sustain damage.<sup>143</sup> The 1969 Brussels Convention on the Liability of Operators of Nuclear Ships<sup>144</sup> demonstrates an application of this type of liability. This Convention states that “[t]he operator of a nuclear ship shall be absolutely liable for any nuclear damage[.]”<sup>145</sup> Likewise, under the Convention on International Liability for Damage Caused by Space Objects,<sup>146</sup> the launching state is absolutely liable to pay compensation for damage caused by its space object.<sup>147</sup>

The Soviet Union’s nuclear power industry is clearly within the class of ultrahazardous or abnormally dangerous activities. The theory of strict liability, thus, is applicable to the Chernobyl incident. According to such documents as the 1969 Brussels Convention and the Vienna Convention on Civil Liability for Nuclear Damage,<sup>148</sup> the liability of the Soviet Union for the nuclear damage from Chernobyl should be absolute.

140. A. SPRINGER, *supra* note 74, at 133. In addition to its inclusion in international agreements, the creation of unlimited liability has been passed as law in West Germany. *Unlimited Liability for Nuclear Power Plants?* INT’L BUS. LAW 386 (1985).

141. A. SPRINGER, *supra* note 74, at 133. The approach normally taken is to “channel” liability back to the party engaged in the risk-creating activity, “no matter how long the chain of causation, nor how novel the intervening factors.” *Id.* This idea has burgeoned into the principle of liability for “the created risk.” It implies that one who, for his pleasure or profit, introduces a dangerous thing into society becomes liable for any accident arising from it. Since this could paralyze initiative, it is important that this theory be implemented with a compulsory insurance program, or with a ceiling of liability. There is also some question as to whether the placement of nuclear activity is a created risk or a lawful act triggering state responsibility principles. MANUAL, *supra* note 22, at 538-40.

142. An example of special importance in international law is the application of the doctrine of strict liability to operators or agencies responsible for the manufacture, transportation, or use of radioactive materials, and to activities that may result in injuries in the form of pollution by radiation. J. BARROS & D. JOHNSTON, *supra* note 106, at 20.

143. In this situation, the offending state must compensate the injured state for all damage which is the natural result of the activity, regardless of a finding of due care. *Id.*

144. Brussels Convention on the Liability of Operators of Nuclear Ships, May 25, 1962, reprinted in 57 AM. J. INT’L L. 268 (1968).

145. *Id.* at 269.

146. Convention on International Liability for Damage Caused by Space Objects, Sept. 1, 1972, 10 I.L.M. 965 (1971).

147. *Id.* at 966.

148. Vienna Convention on Civil Liability for Nuclear Damage, opened for signature May 21, 1963, 2 I.L.M. 727.

#### D. Trespass

Under a trespass theory of liability, the victim state is not required to demonstrate actual injury. Instead, it need only prove that there has been an intrusion upon protected interests by either visible or invisible "pieces of matter or by energy."<sup>149</sup> States are attracted to this theory due to the insubstantial burden of proof required.

A state which has suffered injury due to radiation contamination would have few problems stating a claim under trespass because there are only two elements necessary to make out a claim. First, it is indisputable that radioactive particles are "invisible pieces of matter." Second, the fact that exposure to radiation causes injury to people and to the environment demonstrates an intrusion upon another state's protected interests.

For all its attraction, however, there is a drawback to the use of the trespass theory: the available remedies are unappealing. Though an injunction may issue to prevent the acting nation from repeating the harmful action,<sup>150</sup> this does little to compensate an injured country and its citizens for their losses. The Chernobyl incident is illustrative because the USSR shut down all reactors of the RBMK-1000 type.<sup>151</sup> Hence, such an ex post facto remedy, in actuality, is no remedy at all.

#### E. Nuisance

A nation injured by the radioactive fallout from Chernobyl could choose to apply either the private or public nuisance theory. The doctrine of "private nuisance" prohibits the unreasonable use of one's property in such a way as to cause substantial interference with the use and enjoyment by another of his own property.<sup>152</sup> A requisite element of this cause of action is proof of a wrongful act or omission by the defendant which causes or permits the escape of a deleterious substance onto the land of another.<sup>153</sup> A "deleterious substance" is defined as gas, smoke, fumes, or germs.<sup>154</sup> The radioactive emissions from Chernobyl clearly would fall within the scope of this definition.

The applicability of a private nuisance theory depends, first, upon the injured state's ability to pinpoint the source of the injury.<sup>155</sup>

149. Mingst, *supra* note 107, at 18.

150. Compensation or redress cannot be obtained under trespass. *Id.* Remedies are discussed in greater detail below. See *infra* section V.

151. *Deadly Meltdown*, *supra* note 2, at 50.

152. J. BARROS & D. JOHNSTON, *supra* note 106, at 20. "The plaintiff must show not only that the defendant's conduct was the proximate cause of the interference but also that the defendant's conduct was either intentional or actionable under the rules governing liability for negligent, reckless or ultrahazardous conduct." *Id.*

153. *Acid Rain*, *supra* note 67, at 206.

154. *Id.*

155. *Id.* Two further conditions are that an interference "must be substantial and con-

This theory has been rejected as inapplicable or ineffective because the source of pollution in environmental cases is often disputed. However, it is clear in the present situation that the pollution was the direct result of the nuclear reactor fire and meltdown in the Soviet Union. Therefore, proving the source of injury would not be a barrier for a state damaged by fallout from Chernobyl.

To establish the liability of the USSR under private nuisance, an injured nation must next prove that the Soviet Union's use of its property to produce domestic nuclear energy was "unreasonable." The satisfaction of this second element will be rather difficult. If an injured state can prove that the production of nuclear energy was undertaken in an unreasonable manner, or without proper regard for safety features, it may be able to sustain its burden of proof with regard to this element of the theory.<sup>156</sup> As in trespass, even if a victim state proves all of the necessary elements, only injunctive relief is available.<sup>157</sup>

A public nuisance is different from its private counterpart in that it is an interference with the right of the public at large.<sup>158</sup> The state of Washington effectively utilized the public nuisance theory in the *Trail Smelter Arbitration*.<sup>159</sup> Recovery was limited, however, to "proven damage."<sup>160</sup> For this reason, states often choose not to proceed under a nuisance theory. A claimant nation must show that the injury is different in both kind and degree from that suffered by the rest of the world.<sup>161</sup> A country located close to Chernobyl, therefore, may be able to prove it was injured by radiation contamination to a greater extent than was a state situated further away but may not include any claims for health-related injuries that cannot be "proven."

As has been shown, an injured country may choose from among several theories of liability. Having examined the requisite elements and applicability of each theory, it is also important to consider the effects of a finding of liability under international law. This finding should entitle an injured state to an appropriate remedy.

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tinuing as affecting a person of ordinary sensibilities," and that only land rights are protected. Mingst, *supra* note 107, at 17.

156. *Acid Rain*, *supra* note 67, at 206.

157. *Id.* It is important to note that the activity has interfered in the use or enjoyment of property. This criterion was clearly met in the current situation. An injured state, however, will not be able to recover for any health-related injuries under this theory. *Id.*

158. J. BARROS & D. JOHNSTON, *supra* note 106, at 20.

159. The specific language is: "As between the two countries involved, each has an equal interest that if a nuisance be proved, the indemnity to damaged parties for proven damage shall be just and adequate and each has also an equal interest that unproven or unwarranted claims shall not be allowed." *Trail Smelter Arbitration*, *supra* note 57, at 685.

160. *Id.*

161. J. BARROS & D. JOHNSTON, *supra* note 106, at 21. Since few nations may be capable of meeting this burden of proof, it has been suggested that this theory would not further the interests of pollution victims. *Compensating Private Parties*, *supra* note 107, at 533.

## V. Remedies

Professor Brownlie has listed several remedies available when a state is found to have violated an obligation of international law.<sup>162</sup> Among these are the payment of compensation,<sup>163</sup> the taking of steps to prevent a recurrence of the breach, the punishment of responsible individuals, apology, and any other forms of satisfaction.<sup>164</sup>

### A. Compensation

In the *Chorzow Factory Case*,<sup>165</sup> the PCIJ stated the general rule to be applied with respect to compensation:

[R]eparation must, so 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. Restitution in kind, or, if that is not possible, payment of a sum corresponding to the value which a restitution in kind would bear; the award . . . of damages for loss sustained which would not be covered by restitution in kind or payment in place of it — such are the principles which should serve to determine the amount of compensation due . . . .<sup>166</sup>

In the case under present discussion, the consequences of the Chernobyl accident could never be “wiped out.”<sup>167</sup> An injured state has been permanently altered. Its environment has been contaminated. Its citizens have an increased risk of suffering from cancer. Restitution in kind, therefore, is impossible in such a case since no redress can be provided to make the victim state whole.

When restitution in kind is impossible, damages, in the form of an indemnity, may then be awarded.<sup>168</sup> This alternative was applied in the *Trail Smelter Arbitration*<sup>169</sup> and in the *Corfu Channel Case*.<sup>170</sup> There appears to be no reason why damages should not be available in the immediate case to compensate the injured states for

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162. STATE RESPONSIBILITY, *supra* note 73, at 199.

163. Theoretically, tort law provides the remedies of damages and injunctions to those injured as a result of pollution which can be traced to another's wrongful act or omission. *Acid Rain*, *supra* note 67, at 206.

164. STATE RESPONSIBILITY, *supra* note 73, at 199. This Comment will discuss only the first two remedies listed.

165. *Chorzow Factory Case*, *supra* note 103.

166. *Id.* at 47. Restitution in kind is designed to re-establish the situation which would have existed if the wrongful act or omission had not taken place by: (1) performance of the obligation which the state failed to discharge; (2) revocation of the unlawful act; or (3) abstention from further wrongful conduct. MANUAL, *supra* note 22, at 565.

167. Williams, *supra* note 51, at 161.

168. MANUAL, *supra* note 22, at 565-66. One author proposes that the *usual* type of reparation for a wrongful act or omission is an indemnity that corresponds to the damage suffered. Williams, *supra* note 51, at 161.

169. *Trail Smelter Arbitration*, *supra* note 57, at 687.

170. *Corfu Channel Case (U.K. v. Alb.) (Compensation) 1949 I.C.J. 244.*

irreparable injuries.

### B. Injunction

Compensation in the form of damages is the best alternative afforded to a state injured by radiation contamination from Chernobyl. An injunction, however, would be an invaluable remedy if the reactor were reactivated without modification.<sup>171</sup> An injunction is a means to prohibit a party from undertaking a particular activity.<sup>172</sup> This remedy has been applied in international disputes.

The tribunal in the *Trail Smelter Arbitration* ordered the smelter to stop polluting the state of Washington.<sup>173</sup> This was ordered in addition to an award of damages.<sup>174</sup> A state injured by fallout from Chernobyl, therefore, should seek both compensation for the damage already sustained and an injunction against future harm.<sup>175</sup>

## VI. Conclusion

A state injured by radiation contamination from the Chernobyl accident will have an arduous task in attempting to gain reparation from the Soviet Union. The victim state first must prove that its rights have been violated. It must further prove that the USSR was responsible for that violation. A state must demonstrate that the Soviet Union should be held liable for the damage sustained. In order to accomplish this result, a country should choose to proceed under the theory of liability which would afford it the greatest relief. The injured state then must prove all of the elements under the appropriate theory.

In addition to the choice of an appropriate theory, another impediment is the difficulty of administering the international legal process. This has been made cumbersome because relatively few disputes have been voluntarily submitted to international tribunals for adjudication. Under this ad hoc approach, no clear substantive or procedural standards have developed, leaving countries to rely solely on the decisions in the *Corfu Channel Case* and the *Trail Smelter Arbitration* for guidance. Such inadequacy has prompted one writer to make the following remarks in the aftermath of the Chernobyl

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171. See Williams, *supra* note 51, at 161. This remedy is appropriate where the pollution is continuous, as in ocean dumping or the leaching of chemicals from factories. *Id.* One author has proposed, however, that reparation for transnationally injurious conduct will be granted, but an order for cessation of this conduct is not available. *Liability as an Obligation*, *supra* note 129, at 67.

172. BLACK'S LAW DICTIONARY 705 (5th ed. 1979).

173. *Trail Smelter Arbitration*, *supra* note 57, at 687.

174. *Id.*

175. Both Sweden and West Germany have demanded that all Soviet nuclear reactors of the Chernobyl type be eliminated. *Deadly Meltdown*, *supra* note 2, at 43.



accident:

The accident at the Chernobyl nuclear power plant in the Soviet Union on 25-26 April 1986 revealed a number of serious gaps in the rules of international law . . . as regards the international responsibility of a State, where such an accident occurs, to compensate neighbouring States for the damage and harm suffered as a consequence of the accident . . . . It remains to mention that so far as concerns the definition and identification of international responsibility for nuclear accidents, international law is noticeably weak.<sup>176</sup>

Several nations have attempted to solve this dilemma by forming agreements on environmental issues. One example is the bilateral "Agreement on Cooperation in the Field of Environmental Protection Between the U.S. and the U.S.S.R."<sup>177</sup> While such agreements are a step in the right direction, they are limited to research, exploration, communication, and sharing information.<sup>178</sup> Consequently, they are often too broad to be helpful.

Another way in which states have dealt with the problem has been to enact agreements on specific issues. One such example is the Paris Convention on Third Party Liability in the Field of Nuclear Energy.<sup>179</sup> This Convention is somewhat instructive, for it provides that the operator of a nuclear installation shall be liable for damage.<sup>180</sup> The type or standard of liability to be implemented, however, is conspicuously absent. Furthermore, the Convention covers only nuclear energy.

Writing in 1948, Professor Jessup recognized the need for a general clarification on certain issues in international law. He stated:

It should be one of the tasks in the codification of international law to catalogue the types of direct injuries to states for which the state would be privileged to require another state to pay

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176. *The Chernobyl Nuclear Plant Accident and International Law*, 60 AUSTL. L.J. 586, 586-87 (1986) [hereinafter *Chernobyl Nuclear Plant Accident*]. This article also contains information concerning the general discussions on international regulatory standards to prevent future meltdowns.

177. Agreement on Cooperation in the Field of Environmental Protection, May 23, 1972, United States-Soviet Union, \_\_\_\_ U.S.T. \_\_\_\_, T.I.A.S. No. \_\_\_\_, reprinted in 11 I.L.M. 761 (1962).

178. J. BARROS & D. JOHNSTON, *supra* note 106, at 332.

179. Paris Convention on Third Party Liability in the Field of Nuclear Energy, July 29, 1960, U.N. Doc. C/60/93, reprinted in 55 AM. J. INT'L L. 1082 (1961). The signatories, all European nations, consist of West Germany, Austria, Belgium, Denmark, Spain, France, Greece, Italy, Luxembourg, Norway, the Netherlands, Portugal, the United Kingdom, Sweden, Switzerland, and Turkey.

180. *Id.* at 1084. In addition to these documents, other suggestions as to how to deal with this problem include the creation of an international body to specify precautions to be taken both before and after a nuclear accident. Two draft international agreements have been adopted by the International Atomic Energy Association. The topics are early notification and mutual assistance. *Chernobyl Nuclear Plant Accident*, *supra* note 176, at 587.

such indemnity as might be determined by an international tribunal to be appropriate to the case.<sup>181</sup>

This goal can best be accomplished perhaps by a multinational treaty on transnational environmental pollution. Such a document should set out definitions of the important terms, such as "pollution." It also should include the doctrine of strict liability for both accidents and ultrahazardous activities, since this doctrine appears to be gaining acceptance by the international community. In addition, it should provide for compensation where restitution in kind is impossible, and should not preclude the remedy of injunction.

A multinational treaty is the appropriate vehicle to apply and delineate standards of conduct which would be acceptable to the general international community. The creation of such a treaty would inform both offending and victim states of their rights and obligations under international law.

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181. P. JESSUP, *supra* note 21, at 120.

