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Legal Protection Against Transboundary Radiation Pollution: A Treaty Proposal

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LEGAL PROTECTION AGAINST TRANSBOUNDARY RADIATION POLLUTION: A TREATY PROPOSAL

*HELMUT J. HEISS**

INTRODUCTION

OVER the last several decades, environmental protection has increasingly become an international legal concern.[1] However, as far as transnational pollution is concerned, today's international legal system still has important shortcomings which present major obstacles for legal protection and victim compensation. In the narrower area of transnational radiation pollution, the accident at the nuclear power plant at Chernobyl in 1986 emphasized those shortcomings, as well as the inherent consequences.

It is the goal of this Article to develop a proposal for an international agreement which will ensure effective legal protection of victims in cases of nuclear accidents causing transboundary radiation pollution. Part I of this Article will describe the accident at the Chernobyl Nuclear Power Plant in the Ukraine in 1986 and its international consequences. In particular, it will address the lack of effective legal protection for victims of that accident. In Part II, the Article examines problems with the legal remedies currently available. Insofar as it is necessary to refer to national law within this section, the laws of Germany and the United States are highlighted. There are several reasons for this. Germany and the United States are highly industrialized countries and rely on nuclear energy Germany as a civil law country and the United States as a common law country are each important representatives of different legal systems. In addition, West Germany was one of the states which was actually affected by the Chernobyl accident. Thus, it is very helpful to look at the way the German government addressed the subsequent problems. Part III of the Article contains a proposal for an international agreement with the goal of effectuating legal protection for private victims of transboundary radiation pollution.[2] Particular attention is paid to providing effective legal protection in an efficient and politically practicable

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1. *See* Amedeo Postiglione, *A More Efficient International Law on the Environment and Setting Up an International Court for the Environment Within the United Nations*, 20 ENVTL. L. 321 (1990); Daniel B. Magraw, *Transboundary Harm: The International Law Commission's Study of "International Liability,"* 80 AM. J. INT'L L. 305 (1986).

2. Ann V Billingsley, *Private Party Protection Against Transnational Radiation Pollution Through Compulsory Arbitration: A Proposal*, 14 CASE W RES. J. INT'L L. 339, 354 (1982).

manner.[3]

I. CHERNOBYL - THE "MODEL CASE"

> An accident at a nuclear power plant could release highly radioactive materials into the environment. Since radioactive pollution can travel through the air, infiltrate waterways, or disperse into the sea, opportunities abound for persons of one State to suffer radiation damage caused by the activities of persons of another State.[4]

The accuracy of such a prediction was dramatically borne out by the Chernobyl disaster.[5] On April 26, 1986 at 1:23 a.m., an explosion at the nuclear power plant at Chernobyl created a radioactive cloud.[6] Because of the winds at the time of the release, the cloud quickly moved to the west. Only two days later the cloud had reached West Germany.[7] Therefore, besides all the damage to the former Soviet Union, radioactive contamination also occurred in several other states.

While very good estimates were made as to the immediate damage, the exact amount of long-term damage is hard to estimate.[8] However, some numbers referring to the situation in West Germany provide an idea of the serious consequences of this accident. Until recently, the German government indemnified its own citizens for a total amount of about DM 400 million (U.S. $260 million). Most of these payments (about DM 376 million or U.S. $245 million) were made immediately after the accident. Additional payments were made by state governments, and those indemnification payments did not cover all the losses which occurred. For example, subsequent susceptibility to and contraction of disease, long-term consequences of the accident, are not reflected in those numbers.[9]

In spite of such enormous damage, none of the affected states brought an action based on public international law for recovery.[10] For instance, the Swedish government expressly waived all rights to recovery [11] This

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3. *Id.*

4. *Id.* at 340-41.

5. *Id.*

6. Hans-Josef Schneider & Jutta Stoll, *Ersatz von Vermogensschaden in der Bundesrepublik Deutschland aufgrund des Unfalls in Tschernobyl*, 19 BETRIEBS BERATER [BB] 1233 (1986); Victoria R. Hartke, *The International Fallout from Chernobyl*, 5 DICK. J. INT'L L. 319 (1987).

7. Judgment of Sept. 29, 1987, Amtsgericht Bonn [AG Bonn] [local trial court], 22 Neue Juristische Wochenschrift [NJW] 1393 (1988), 6 Praxis des Internationalen Private und Verfahrensrechts [IPRAX] 351 (1988), *aff'd*, Landgericht Bonn [LG Bonn] [district trial court], 6 IPRAX 354 (1988).

8. James K. Asselstine, *The Future Of Nuclear Power after Chernobyl*, 6 VA. J. NAT. RES. L. 239, 240 (1987).

9. Bundesminister fur Umwelt, Naturschutz und Reaktorsicherheit [German Ministry for Environment, Nature Preservation and Reactor Safety] [hereinafter B.U.N.R.], Tschernobyl, Ein Jahr danach 16-23.

10. Billingsley, *supra* note 2, at 343. *See also* Lothar Gundling, *Rechtsschutz nach Tschernobyl*, 6 IPRAX 338, 338-39 (1988) (commenting on Chernobyl litigation).

11. Alfred Rest, *Tschernobyl und die internationale Haftung*, 25 Versicherungsrecht [VersR] 609, 609-10 n.4 (1986).

left the citizens of the polluted states virtually without any legal recourse.[12] In addition, individual victims saw themselves in too weak a position to bring an action for recovery on their own.[13]

Individual victims faced several problems in enforcing their rights. These included the uncertainty of their legal situation,[14] pessimism that any judgment would be enforced by the former Soviet Union and potentially high litigation costs.[15] As a result, only one Chernobyl-related action was brought in Germany [16] However, the action was not successful.

In that suit, the plaintiff was the owner of a house with a backyard vegetable garden. As a result of the radiation pollution, he had to throw away the vegetables he had grown, which he valued at DM 45 (U.S. $2.90). In addition, he alleged damages in the amount of DM 705 (or U.S. $45.50) for loss of the use of his backyard in the future. Thus, he sought a total recovery of DM 750 (U.S. $48.40). In order to enforce his rights, the plaintiff first applied for the financial support necessary to initiate the suit. Such financial support (covering litigation costs as well as attorney fees) is given to plaintiffs in Germany who otherwise could not afford to bring an action. One of the eligibility requirements for financial support is that there has to be a reasonable expectation of winning the lawsuit. The court determined, however, that there was no expectation of success for the plaintiff in this case and denied financial support.[17] The plaintiff then brought suit against the former Soviet Union. For several reasons, especially those relating to questions of personal jurisdiction and service of process, this lawsuit was not successful.[18]

The curious result was that although substantial damages, of at least DM 400 million (U.S. $260 million), occurred in West Germany, the costs were never recovered simply because the West German government and other states did not attempt to bring any suits for damages resulting from Chernobyl. This precluded any remedy because individual victims were unable to enforce their rights on their own. Individuals in particular faced certain problems in executing their right to recovery, including:

- determining the identity of the operator of the nuclear plant;
- resolving personal jurisdiction issues;
- overcoming defenses of immunity;
- serving process abroad;

12. *Id.* The indemnification payments of the federal government of Germany only transferred the losses from the individual victim to the tax payer. The economic loss for West Germany and its citizens remained.

13. Linda A. Malone, *The Chernobyl Accident: A Case Study in International Law Regulating State Responsibility For Transboundary Nuclear Pollution*, 12 COLUM. J. ENVTL. L. 203, 207 (1987).

14. Jillian Barron, Note, *After Chernobyl: Liability for Nuclear Accidents Under International Law*, 25 COLUM. J. TRANSNAT'L L. 647, 647-48 (1987).

15. *See* discussion *infra* part III.

16. 22 NJW 1393, 6 IPRAX 351.

17. *Id.*

18. Judgment of Feb. 11, 1987, LG Bonn, 4 IPRAX 231 (1987), *aff'd*, Oberlandesgericht Koln [OLG Koln] [Court of Appeals], 4 IPRAX 233 (1987).

- overcoming unusually disparate economic positions;
- confronting a lack of globally-unified liability rules;
- proving causation, and
- enforcing judgments.

These problems demonstrate the tremendous need for the development of legal protection for victims of transboundary radiation pollution. Immediately after the accident occurred, discussion was initiated to determine how such disasters could be prevented in the future, and when they did occur, how to ensure legal protection for the victims.[19]

Diplomatic communications, especially between the affected countries and the former Soviet Union, took place.[20] Mikhail Gorbachev declared, in accordance with suggestions of politicians of western countries, that international cooperation should be intensified in order to prevent such accidents.[21] This willingness to cooperate resulted in the adoption of two international treaties on information and assistance in cases of nuclear accidents within the organizational framework of the International Atomic Energy Agency (IAEA). The treaty concerning information came into force on October 27, 1986, and the treaty concerning mutual assistance on February 26, 1987.[22]

During a special session of the General Conference of the IAEA on September 24, 1986, West Germany mentioned the need for global nuclear liability rules.[23] In 1990, the IAEA established a Standing Committee on Liability for Nuclear Damage, which was asked to work on several liability issues. Furthermore, several participants expressed hope that the disaster would strengthen international efforts to solve the legal problems created by transboundary environmental pollution, notably in cases of accidents in nuclear power plants.[24] The ongoing discussions within the IAEA offer hope for better legal protection for victims in the future.

II. THE PRACTICAL LEGAL PROBLEMS OF THE CHERNOBYL CASE

According to the reports about the Chernobyl accident, the problems

19. Hans Blix, General Director of the International Atomic Energy Agency [hereinafter IAEA], visited the former Soviet Union on April 30, 1986, initiating diplomatic relations on this issue. As a result, the Ambassador of the former Soviet Union contacted the West German government. *See* Schneider & Stoll, *supra* note 6, at 1233.

20. *Id.*

21. Alexander Uschakow, *Tschernobyl und das sowjetische Recht - Volkerrechtliche Aspekte*, 29 VersR 721 (1986).

22. Michael A. Heller, *Chernobyl Fallout: Recent IAEA Conventions Expand Transboundary Nuclear Pollution Law*, 23 STAN. J. INT'L L. 651, 651 n.3 (1987).

23. B.U.N.R., *supra* note 9, § 2.2.

24. Alfred Rest, *supra* note 11, at 609, 620. *See* Gunther Kuhne, *Haftung bei grenzuberschreitenden Schaden aus Kernreaktor-unfallen*, 35 NJW 2139, 2146 (1986); Hartke, *supra* note 6, at 321; Richard E. Levy, *International Law and the Chernobyl Accident: Reflections on an Important but Imperfect System*, 36 KAN. L. REV. 81, 81-82, 123 (1987); Gunther Handl, *Transboundary Nuclear Accidents: The Post-Chernobyl Multilateral Legislative Agenda*, 15 ECOLOGY L.Q. 203 (1988).

noted below were the most challenging. With the help of references to the U.S. legal system, it shall be shown that the same or very similar problems would arise for U.S. citizens bringing a similar suit.

A. *Whom to Sue? The Question of the Identity of the Defendant*

According to German law, the operator of a nuclear plant is liable in case of accidents, but in the Chernobyl accident, the identity of the operator was difficult to determine. Therefore, the plaintiff sued the former Soviet Union.[25] The court, however, stated that the nuclear plant was operated by a separate entity called "AES Chernobyl" or *Cernobyl'skaja Atomnaja Elektrostancija*.[26] The question of whether AES Chernobyl was a separate entity depended on the degree of influence the administration of the former Soviet Union had on the management of that entity [27] This question would have to be answered in accordance with the actual structure of the Soviet Administration. Thus, extensive research of the Soviet legal system had to be done to determine the identity of the operator.

The difficulty of this task was illustrated by the failure of investigators to learn basic facts about the accident. At a July 10, 1986 symposium in Munich concerning legal protection after Chernobyl, it was noted that the identity of potential defendants was still unclear.[28]

The problem of identifying liable parties is not due to the lack of established rules governing liability issues but the complexities of determining who is an operator, a question which must be answered in accordance with the internal law of the state where an accident occurs. Plaintiffs also must determine whether the state itself or a separate entity is an operator. In the case of a separate entity, the name and address must be determined. This, as the Chernobyl case shows, can be troublesome.

B. *Personal Jurisdiction*[29]

It is common in such accidents that the operator of the nuclear plant had no other contacts in the forum state other than the harmful effect of the disaster. This situation immediately raises the question of whether a plaintiff may file a suit in his home country, i.e., the question of personal jurisdiction of the state where the harm occurred.

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25. 22 NJW 1393, 6 IPRAX 351.

26. *Id. See* Georg Brunner & Carmen Schmidt, *Tschernobyl und die internationale Haftung*, 33(a) VersR 833-34 (1986).

27. 22 NJW 1393, 6 IPRAX 351. Heintz-Peter Mansel, *Zivilrechtliche Schadensersatzklagen gegen auslandische Kernkraftwerksbetreiber - Ein Vortragsbericht*, 6 IPRAX 392, 393 (1986). *See also* Gundling, *supra* note 10, at 340.

28. Mansel, *supra* note 27, at 393. *See also*, Gundling, *supra* note 10, at 340 (explaining that the situation was so complicated that even experts in the law of eastern countries had tremendous difficulties providing precise answers).

29. *See generally*, Gary B. Born, *Reflections on Judicial Jurisdiction in International Cases*, 17 GA. J. INT'L & COMP. L. 1 (1987).

Under German law,[30] this question is easy to answer. According to Section 32 ZPO, the plaintiff may bring an action in the court having geographical jurisdiction over the place where the harm occurred. As a general rule under the German legal system, whenever the ZPO gives the plaintiff a forum, this forum has personal jurisdiction.[31]

In the Chernobyl case the court decided to the contrary However, the court confused personal jurisdiction with local jurisdiction. There was certainly personal jurisdiction within German courts; the plaintiff, however, brought his action at a locally incompetent court.[32]

The question may create problems under United States law American courts have granted due process guarantees to foreigners.[33] This means that courts can assert personal jurisdiction only when the defendant has sufficient minimum contacts in the United States.[34]

Under American law, sufficient minimum contacts can establish either general jurisdiction or specific jurisdiction.[35] General jurisdiction is based on continuous relationships of the defendant to the United States (e.g. domicile or continuous activities within the United States). A causal relation between the contacts of the defendant and the actual occurrence is not necessary

Specific jurisdiction is based on a single contact of the defendant with the United States, which bears a causal relationship to the actual case in issue. This means that the plaintiff can bring an action "arising out of" or "related to" the defendant's activities within the United States (as the forum state). According to the United States Supreme Court decisions, this requires a two part test: 1) the defendant must have "purposefully availed itself of the forum's law," and 2) the assertion of jurisdiction must be "reasonable."[36] According to *Asahi Metal Indus. Co. v. Superior Court of California*, these requirements are only fulfilled in the case of an "action of the defendant purposefully directed at the forum State."[37] The mere awareness of the defendant that one of the products manufactured by him might end up in the forum state and cause harm there is not sufficient. This opinion of the Court, however, was not unanimous. Furthermore, as both parties in this case were foreigners, the Court was cor-

30. Zivilprozessordnung (German Code of Civil Procedure) [hereinafter ZPO] § 32. This provision reads: "[f]or actions in tort, the court at the place where the tort has been committed is competent." (Translation by the author).

31. Heintz-Peter Mansel, *Zustellung einer Klage in Sachen "Tschernobyl,"* 4 IPRAX 210, 210-13 (1987).

32. *Id.* at 213.

33. *See, e.g.*, Helicopteros Nacionales de Colombia, S.A. v. Hall, 466 U.S. 408 (1984); Securities Investor Protection Corp. v. Vigman, 764 F.2d 1309 (9th Cir. 1985); Afram Export Corp. v. Metallurgiki Halyps, S.A., 772 F.2d 1358 (7th Cir. 1985).

34. National contacts are sufficient. *See, e.g.*, Cyromedics, Inc. v. Spembly, Ltd., 397 F Supp. 287 (D. Conn. 1975).

35. *See generally* GARY BORN & DAVID WESTIN, INTERNATIONAL CIVIL LITIGATION IN UNITED STATES COURTS (1989).

36. BORN & WESTIN, *supra* note 35, at 43.

37. 480 U.S. 102, 110, (1987) (O'Connor, J., concurring).

rect in stating that the interest of the plaintiff to have a forum within the United States was only limited. Thus, it is unclear which concrete conclusions should be drawn from *Asahi*.

For cases of transboundary nuclear accidents, this means that American courts normally will not have general jurisdiction (if the United States is the victims' state). There are usually no contacts of the operators of nuclear plants with foreign states other than the fact of causation of harm in cases of accidents.[38] The question of whether there would be specific jurisdiction is unclear. Whatever the outcome would be, potential plaintiffs would face severe problems in convincing the court to assert specific jurisdiction.

C. *Use of the Immunity Defense for Operators*

When it is possible to convince a United States court that it has jurisdiction, the plaintiff may face an even greater hurdle, defendant's immunity defense. For this discussion it is necessary to distinguish cases where the state itself is the operator and cases where a separate entity is the operator.

1. State Operates the Nuclear Power Plant Itself

Since it was believed that the state was the operator, the suit in the Chernobyl case was brought against the Soviet Union. Nevertheless, the state maintained absolute immunity While the German court could easily deny immunity, it chose not to do so in this case. In accordance with public international law, it distinguished between acts *iure imperii* (for which immunity is granted) and acts *iure gestionis* (for which immunity is denied). The characterization in the Chernobyl suit, however, was made solely according to rules of German law. Therefore, as production and supply of energy is left to private enterprises in Germany, no immunity could be granted to the former Soviet Union. This characterization would be necessary to make sure that foreign states cannot gain the advantage of immunity by voluntarily choosing a public way of conducting activities which are privately organized in West Germany [39] Describing a state's act as *iure imperii* or *iure gestionis* solely according to the law of the forum state oversimplifies the problem. Since each state has its own system, the scope of immunity would vary, being always dependent on where the action was brought. Moreover, this contradicts the fact that immunity is granted by public international law and therefore cannot be defined by each state in its own way

It is quite easy for a state to allege and prove that an act *iure imperii* was the cause of the accident. With the Chernobyl accident, the former Soviet Union could have pleaded that the accident occurred as a result of

38. BORN & WESTIN, *supra* note 35, at 25.

39. 22 NJW 1393, 6 IPRAX 351. *See also* European Convention on State Immunity, May 16, 1972, 11 I.L.M. 470.

producing plutonium for military purposes or a military experiment executed in this plant.[40]

United States courts also distinguish between acts *iure imperii* and acts *iure gestionis*.[41] The characterization is made in accordance with the American system but in a more functional way. This means that activities of foreign states which are executed in a private way in the U.S. might still be characterized as acts *iure imperii*. A case in point is *In re SEDCO, Inc.*,[42] which dealt with activities that are probably characterized initially as "private" However, the court held the fact that "drilling an exculpatory oil well in its patrimonial waters" was an act *iure imperii* because it was "integral to the Mexican government's long range planning and policy making process concerning the production and utilization of state-owned minerals."[43] Very similar arguments can be made in cases of accidents at nuclear plants, giving states a rather easy opportunity to escape liability

2. Separate Entity Operates Nuclear Power Plant

When the plant is operated by a separate entity (as was the case with the nuclear power plant at Chernobyl),[44] the question of the immunity of such entities arises. Since the action in the Chernobyl case was brought against the Soviet Union, the court did not deal with this question. Nevertheless, there is a clear legal rule in Germany that separate entities, even if they are owned and controlled by the state, are never entitled to immunity.[45] In other words, immunity is only granted to states not to state-owned enterprises.[46] This stands in contrast to the legal situation in the United States, where the Foreign Sovereign Immunities Act grants immunity not only to the state itself but also to its "agencies" and "instrumentalities."[47] Thus, the argument of German lawyers that immunity may not be granted to state-owned enterprises does not work. Again, a case in point is *In re SEDCO, Inc.*,[48] which dealt with a "separate entity," this is comparable to the "AES Chernobyl."[49]

D. *Service of Process*

A third obstacle in the plaintiff's path is that of performing an adequate service of process. One of the most basic notions of the laws of civilized countries is that there can be no judgment against the defendant

40. Mansel, *supra* note 27, at 393 n.3; Mansel, *supra* note 31, at 213 n.40.
41. BORN & WESTIN, *supra* note 35, at 336.
42. 543 F Supp. 561 (S.D. Tex. 1982).
43. *Id.* at 566.
44. *See supra* Part II.1.
45. Mansel, *supra* note 31, at 213 n.40.
46. *Id.* at 213.
47. Foreign Sovereign Immunities Act of 1976, 28 U.S.C. § 1603(a) (1988) [hereinafter FSIA]. *See also* Levy, *supra* note 24, at 121-22.
48. 543 F Supp. 561 (S.D. Tex. 1982).
49. *See supra* Part II.A.

without notification of the action brought against him. However, in international litigation this creates the problem of "service of process abroad."[50] In the absence of international treaties, the plaintiff is dependent on the good will of the foreign state to execute a request for service of process. But even if there is an international treaty regulating this question, it is probable that the foreign state will not execute a request for service of process. Such international treaties usually contain clauses allowing states not to follow a request if this would infringe on their sovereignty or would be contrary to the public policy of the foreign state.[51] As nuclear plants are usually run by the state itself or by state owned "private" enterprises, it may be easy to allege an infringement of sovereignty or a public policy concern. The fact that the question of an infringement of the sovereignty or a public policy concern is only decided by the foreign state itself, combined with the huge amounts of money which are at stake in international tort cases arising out of accidents in nuclear power plants, increases the incentive to reject requests for service of process.[52]

The possibility remains that the victims' state can create substitutes for actual service of process (e.g., "public service" under section 203 II, III ZPO of Germany).[53] This provision allows "service of process" by announcing the claim in daily newspapers when actual service of process proves impossible or at least unreasonable. However, section 203 II ZPO has been interpreted very restrictively (in order not to undermine due process guarantees) and was therefore not applied in the Chernobyl case[54] (notwithstanding the fact that the German administration had previously declared that it would not transmit requests for service of process to the former Soviet Union).[55]

An American plaintiff would face the same problem. The United States is a party to the Hague Convention on the Service Abroad of Judicial and Extrajudicial Documents in Civil or Commercial Matters of 1965 and the Inter-American Convention on Letters Rogatory [56] The Hague Convention contains a sovereignty clause; the Inter-American Convention contains a public policy clause.[57] Thus, even if the source state of the radiation pollution is a member of either of the two Conventions, its courts will probably deny service of process by alleging an infringement of sovereignty or public policy Whenever the source state is

50. *See generally* BORN & WESTIN, *supra* note 35, at 119.

51. Mansel, *supra* note 31, at 211.

52. *Id.*

53. *See supra* Part II.B.

54. 4 IPRAX 231.

55. Mansel, *supra* note 31, at 213.

56. Hague Convention on the Service Abroad of Judicial and Extrajudicial Documents in Civil or Commercial Matters, 16 I.L.M. 1339 (1977); Inter-American Convention on Letters Rogatory, art. I, 24 I.L.M. 472 (1985). *See* BORN & WESTIN, *supra* note 35, at 136-37 and apps. C, D and E.

57. *Id.*

not a member of either Convention, courts can deny the execution of the letter rogatory without any reason.

E. *Difficulty in Litigation: Inequality of Litigants*

The sheer number of potential plaintiffs and their inversely proportionate strength accentuates the other obstacles inherent in transboundary radiation pollution suits. A disaster like the Chernobyl accident affects all inhabitants of a polluted state. Generally, injured persons see themselves in a comparatively weak position. Without the help of well-educated international lawyers, potential plaintiffs cannot determine their legal position. The problems created by the confluence of public international law, the law of the source state and the law of the victims' state, demand the experience of specialists in international environmental law. Thus, victims are not likely to take any steps because they may face significant expenses without great hope of recovery. The risk of wasting money is too high. Even worse, injured persons may be unaware of these sizable legal costs. Moreover, the defendant is likely to increase costs by prolonging trials as much as possible. In addition, there is often a language barrier and, more importantly, a lack of access to evidence.[58] Since the plaintiff has to prove the facts on which his claim is based, he needs information about the nuclear power plant itself, which is usually kept secret. The defendant, in contrast, is either the source state or a large enterprise. It typically has full access to evidence, sufficiently sophisticated employees and enough assets to pay attorneys who are specialists in the field.

The need for "equality in legal representation" between potential plaintiffs and defendants was recognized after the Chernobyl accident.[59] *De lege ferenda* was suggested as a means of obliging operators of nuclear power plants to take legal expenses insurance at their own cost to provide for compensation to potential victims. This would allow victims seeking recovery to have litigation costs refunded out of an insurance contract procured by the operator of the nuclear power plant. The imbalance in power between plaintiff and defendant would be equalized, creating additional economic incentives for operators of nuclear plants to prevent accidents. Under present law in Germany, only the operators of nuclear plants must possess liability insurance;[60] a plaintiff cannot even obtain legal expense insurance because the general terms for legal expense insurance exclude actions based on nuclear injuries from its coverage.[61]

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58. The international treaties' rulings on taking evidence abroad pose the same problems as the treaties concerning service of process abroad.

59. Fritz Reichert-Facilides, *Versicherungsrechtliche Uberlegungen nach dem Tschernobyl Unfall*, 75 Die Versicherungs Praxis [VP] 159 (1986).

60. Gesetz uber die friedliche Verwendung der Kernenergie und den Schutz gegen ihre Gefahren (Deuches Atomgesetz und Strahlenschutzrecht) [AtG] § 13.

61. Teil A. Text, *Allgemeine Bedingungen fur die Rechtsschutzversicherung*, [ARB] (General Terms for Legal Expenses Insurance) art. 4.

F. *Problem of Differences in Applicable Substantive Law*

Besides the procedural difficulties, the international nature of transboundary radiation pollution suits creates substantive questions. Depending on the particular rules of private international law of the forum state, a court can apply, for example, the domestic tort law of the source state (*lex loci delicti commissi*) or of the victims' state. The laws of each sovereign may differ significantly. Differences in liability rules for nuclear accidents create problems for both the operator of the plant as well as for the victim.

1. Position of the Victim

In the absence of more advantageous liability rules of a source state, victims are usually protected by their own state law For example, in the Chernobyl case, the plaintiff, according to German rules of private international law, could have chosen between the law of the Soviet Union or Germany Thus, victims were at least protected by the law of their country.[62]

However, from a practical point of view, the differences in substantive law are disadvantageous for the plaintiff. Here again the problem of enforceability of a judgment arises. Considering the vast liability costs at stake after accidents like the one at Chernobyl, source states have strong incentives not to enforce judgments of the victims' state which are based on conflicting foreign law Judgments which are not enforced in the source state are usually worthless, unless the operator has sufficient assets in the victims' state or third party states, which are willing to enforce the judgment.

2. Position of the Operator

Due to the differences in private international law and the substantial laws of the potentially affected states, the operator rarely will be able to calculate *ex ante* the probable amount of liability. The calculation of "expected losses," however, is necessary in order to be able to determine the degree of reasonable care as well as the appropriate amount of financial resources. The operator will also argue that victims' states are biased in favor of potential plaintiffs and it is unable to limit the consequences of nuclear accidents to states with, from their perspective, reasonable liability rules.

3. International Treaties which Unify Liability Rules

There are two international treaties which try to unify the liability rules applicable to accidents at nuclear power plants; they are the Paris

62. *See* Malone, *supra* note 13, at 206 (discussing the inadequacy of domestic law to protect the global environment); *see also* RESTATEMENT (THIRD) OF FOREIGN REL. LAW § 602 (1987) (discussing the availability of private remedies under state law).

Convention of 1960[63] and the Vienna Convention of 1963.[64] Both agreements provide for private remedies for victims bringing actions against the operator of a nuclear power plant. However, the agreements contain shortcomings.

In light of the fact that providing a legal remedy for radiation pollution is a global concern, the small degree of participation is alarming.[65] The Paris Convention is based only on European activities. The European Nuclear Energy Agency, which was established within the framework of the EEC, oversees the goals of that Convention. The Vienna Convention is currently in force only in fourteen states (the most important users of atomic energy failing to join). Four other states have signed but not yet ratified the Convention. With the help of the Joint Protocol of 1988, the IAEA tried to merge the two Conventions. The benefits of each Convention are extended to the member states of the other. This Joint Protocol has been signed by twenty-two countries and came into force in 1992.

Both Conventions limit the damages compensable. Indemnification is limited to personal injury, death or loss of property [66] For example, evacuation costs or damages to the general environment are not recoverable. For mere economic losses, the situation is unclear.[67]

The Paris Convention interferes with public international law because it limits the scope of the source state's liability For example, the source state has all the defenses of the operator, especially *force majeure* and amounts of liability.[68] Obviously, a rethinking of the limits of liability of operators is needed.[69] As a result, the IAEA has already drafted a proposal for a Convention on Supplementary Funding.

4. Insufficiency of Customary Public International Law for Private Parties' Protection

The solution that customary public international law provides for the problems arising in transboundary radiation suits is illusory It is well recognized in customary public international law that source states can be liable in cases of transboundary radiation pollution.[70] Liability can

63. Convention on Third Party Liability in the Field of Nuclear Energy, July 29, 1960, 956 U.N.T.S. 251 [hereinafter Paris Convention].

64. Convention on Civil Liability for Nuclear Damage May 21, 1963, 2 I.L.M. 727 (1963) [hereinafter Vienna Convention].

65. 22 NJW 1393, 6 IPRAX 351 (Soviet Union was not a party to either Convention).

66. Handl, *supra* note 24, at 234.

67. Kuhne, *supra* note 24, at 2144.

68. Handl, *supra* note 24, at 232.

69. Handl, *supra* note 24, at 204 ("prompt and full compensation"). *See also* Optional Protocol to the Vienna Convention on Diplomatic Relations Concerning the Compulsory Settlement of Disputes, Apr. 18, 1961, 23 U.S.T. 3227, 3374, T.I.A.S. 7502.

70. Barron, *supra* note 14; JAMES BARROS & DOUGLAS M. JOHNSTON, THE INTERNATIONAL LAW OF POLLUTION (1974); Gunther Handl, *The Environment: International Rights and Responsibilities*, 74 PROC. AM. SOC'Y INT'L L. 223 (1980); ALEXANDER CHARLES KISS, SURVEY OF CURRENT DEVELOPMENTS IN INTERNATIONAL ENVIRON-

result from state responsibility for the accident, or because international duties to prevent such accidents were violated, such as a duty to immediately inform neighbor states about accidents or provide standards of safety.[71] However, as private parties are not subject to rights arising under the law of nations, they cannot base their action on a source state's liability under public international law.[72] Victims therefore would have to convince their state to bring an action against the source state. The political implications of such an action are obvious and as mentioned above, none of the states affected by the Chernobyl accident actually brought an action.

This philosophy was also followed by the court in the Chernobyl case in West Germany. Only the affected state, not individuals themselves, could enforce rights under public international law.[73]

The United States Restatement of Foreign Relations Law takes a more progressive approach in that it holds a state obliged to "accord to the person injured (or exposed to such risk) access to the same judicial or administrative remedies as are available in similar circumstances to persons within the state."[74] However, this only gives foreigners the same rights as citizens of the sovereign, it does not give foreigners substantive rights under public international law

G. *Special Problems Concerning Causation*[75]

In addition to the more exotic encumbrances to transboundary suits, the plaintiff faces the ordinary challenge of proving causation. International opinions differ greatly on issues of causation, particularly with regard to requiring greater regulation of the nuclear power industry and providing proof as to actual damages.

1. Regulatory Action of the Victims' State

In order to prevent further harm and to mitigate already existing damages, regulatory steps were taken after the Chernobyl accident by several states. Especially regarding contaminated food, prohibitions to import or sell were enacted. For example, the EEC Council enacted a regulation which defined the maximum contamination of agricultural products

MENTAL LAW (1976); Levy, *supra* note 24; JAN SCHNEIDER, WORLD PUBLIC ORDER OF THE ENVIRONMENT: TOWARDS AN INTERNATIONAL ECOLOGICAL LAW AND ORGANIZATION (1979); ALLEN SPRINGER, THE INTERNATIONAL LAW OF POLLUTION (1983); Magraw, *supra* note 1, at 305; Lothar Gundling, *Verantwortlichkeit der Staaten fur grenzuberschreitende Umweltbeeintrachtigungen*, 45 Zeitschrift fur Auslandisches Offentliches Recht und Volkerrecht [ZaoeRV] 265 (1985).

71. In the Chernobyl case, such violations committed by the former Soviet Union were alleged. Gundling, *supra* note 10, at 339.

72. Gundling, *supra* note 10; Kuhne, *supra* note 24, at 2145.

73. 22 NJW 1393, 6 IPRAx 351.

74. RESTATEMENT (THIRD) FOREIGN REL. LAW § 602(2) (1987).

75. Handl, *supra* note 24, at 242.

from other countries.[76] However, in different countries, different limits of contamination were applied. The sale of milk between states is a good illustration;[77] the limit for iodine-131 in milk differed from twenty becquerel (in Hessen, Germany) to 2000 becquerel (in the United Kingdom and Sweden).

Those differing international standards raise the question of the reasonableness of the regulatory steps of some victims' states and support an argument for "interruption of the chain of causation" for the operator.[78] For example, it could have been argued that prohibitions of the sale of certain types of food were unreasonable because the food was, though contaminated, not yet dangerous.[79] In other words, the operator could have argued that the unreasonable prohibitions of the victims' state and not the accident were the real cause of the harm (especially loss of profits because of the prohibition against selling the food).

2. Damages Provable Only On an "Aggregate Basis"

Another problem is the fact that radiation pollution causes damages which are provable on an aggregate basis but not on an individual basis,[80] such as an increase in certain diseases like cancer.[81] Moreover, a certain number of these diseases would have occurred anyway

Two possible situations could arise. The increase of diseases might be small (e.g., 10%), in which case an individual plaintiff could not prove that his disease was actually caused by the accident. Even under a 'preponderance of the evidence' rule, the fact that the incidence of disease was increased by only 10% would make causation more unlikely than likely, meaning that none of the injured could recover.[82]

On the other hand, if the incidence of disease is increased by slightly more than 10%, each plaintiff could recover (even those whose disease was not caused by the accident).[83] The preponderance of the evidence rule would favor all persons suffering from the disease.

H. *Enforceability of the Right to Recover*

As mentioned above, judgments are valuable only if they are enforceable. In the case of transboundary radiation pollution, a source state has an incentive not to enforce a foreign judgment, and the high cost at stake makes a source state likely to create reasons not to enforce the

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76. *Id.*
77. *Id.*
78. Mansel, *supra* note 27, at 394.
79. Brunner & Schmidt, *supra* note 26, at 839.
80. WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF TORT LAW 260-61 (1987).
81. Barron, *supra* note 14, at 647 n.3.
82. LANDES & POSNER, *supra* note 80, at 262 (noting the "underdeterrence" problem).
83. *Id.* (noting the "overdeterrence" problem).

judgment.[84]

Furthermore, it must be expected that operators of nuclear power plants will not be able to pay all the damages themselves. Consequently, the Paris Convention and the Vienna Convention contain provisions ensuring the liquidity of the operator up to the amount of liability set forth in those treaties.[85] This forces the operator to maintain insurance or other financial security. However, besides the general problem of low participation rates among the two treaties, there is also no right of the victim to sue the liability insurer directly. This question is left to national legislation.[86]

III. A SOLUTION: THE PROPOSAL OF AN INTERNATIONAL TREATY

In order to provide legal protection to victims of transboundary radiation pollution, cooperation among all states is required. With the help of an international treaty, current problems could be surmounted. The formation of a liability agreement is also recommended.[87] The following discussion reviews the essential aspects of such an international treaty. As stated in the introduction, the goal is to ensure effective legal protection of victims of transboundary radiation pollution in an efficient, politically practicable and legally manageable way.

A. *Liability Effectuated by Private Remedies as the Right Approach*[88]

There are different approaches to solving the problem of indemnification of victims. One is to establish liability rules which protect potential victims. The other alternatives are to have each state bear the burden of its own damages through insurance or funds solutions.[89]

Nevertheless, if every state bore the costs of its own damages, real indemnification would still not be afforded to the victims. Even if an affected state indemnifies its own citizens, this only translates to a shifting of losses from individuals to the public, thus placing the burden on the taxpayer. Furthermore, countries which do not use nuclear energy would be discriminated against. The only justification, if any, for this system, is that users of nuclear energy should also contribute to the losses which their use causes. By definition, this justification would not apply to countries which do not use nuclear energy [90]

84. Malone, *supra* note 13, at 239.

85. Paris Convention, *supra* note 63, art. X, 956 U.N.T.S. at 270; Vienna Convention, *supra* note 64, art. VII, 2 I.L.M. at 737.

86. Paris Convention, *supra* note 63, art. VI, U.N.T.S. at 267; Vienna Convention, *supra* note 64, art. II, 2 I.L.M. at 730.

87. *See* Heller, *supra* note 22, at 663 (explaining that there would be "substantial constituency backing negotiations for a liability convention"); Barron, *supra* note 14, at 668.

88. Barron, *supra* note 14, at 665; Postiglione, *supra* note 1, at 322.

89. Handl, *supra* note 24, at 224.

90. *Id.* at 227.

Finally, there is an underdeterrence problem. The fact that there would be no liability for operators for transboundary harm would make the operators deduct those damages from the calculated expected losses resulting from accidents. The amount of expected losses, however, is decisive for the efficient standard of care. A decrease in the expected losses leads to a decrease in care by the operator.[91]

Other solutions would be insurance or fund constructions not under the auspices of individual states. By insuring potential victims or giving them a right for recovery against international funds, indemnification could be guaranteed. These systems are similar to the no fault systems which are used partly for automobile accidents. However, the same underdeterrence problem, as explained above, would arise.[92]

Liability rules are the preferable solution. First, the use of liability rules provides indemnification for the victims, a desirable result. Furthermore, effective liability rules have a deterrence effect and thus give the correct incentives to the parties. It is the best way to make operators of nuclear installations take reasonable precautions.[93] However, the operator of a nuclear installation is likely to calculate the gravity of injury by considering only those damages for which he can effectively be held liable. As long as transboundary damages are not effectively recoverable, he has an incentive to take less precaution than actually required.[94] It follows that the most effective liability rules would give private victims of nuclear accidents an enforceable right to recovery

It is sometimes said that private law is not an appropriate means to solve problems of transboundary pollution. The reason for this is not based on the nature of private law but rather on the fact that public international law sometimes blocks private remedies.[95] Following this reasoning however, the conclusion should be that public international law should provide appropriate conditions to effectuate private remedies. The two bodies of law should complement one another.

This does not mean that regulations are not helpful or desirable. Safety standards, licensing requirements for operators, as well as criminal sanctions are important for an effective system of international environmental protection. In international cases, public regulation and private remedies should work together as they do in domestic laws.

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91. *Compare* the reasonable care standard under the Judge Learned Hand Formula *infra* note 93.

92. *See* KENNETH S. ABRAHAM, DISTRIBUTING RISK 53-57 (1986).

93. According to U.S. tort doctrine, precautions are reasonable if the burden of precaution is less than the probability of harm times the gravity of the injury; (B>PxL). LANDES & POSNER, *supra* note 80, at 85; W PAGE KEETON ET AL., PROSSER AND KEETON ON THE LAW OF TORTS sec. 17 (5th ed. 1984).

94. Joseph P Tomain & Constance D. Burton, *Nuclear Transition: From Three Mile Island to Chernobyl*, 28 WM. & MARY L. REV 363, 369 (1987).

95. Malone, *supra* note 13, at 237.

B. *International Registration of Operators of Nuclear Power Plants*

Problems of determining the identity of the defendant are not unique to the context of nuclear accidents. In several countries, similar problems have led to a registration requirement, such as with motor vehicles. The same requirement, on an international basis, would avoid all the difficulties in researching the name, address and other statistics of the defendant. A registration requirement would be easy to administer and extremely helpful for potential victims.

Each state should have an obligation to name the operator of the nuclear installations in its country. Failure to notify would make the particular state liable.

A step in this direction was already taken at the Paris Convention.[96] Each contracting state is obliged to submit a conclusive listing of all nuclear installations used for peaceful purposes and situated in its territory.[97] However, a registration of the installation operator is not required.

C. *Procedural Problems*

There are key principles of procedural law which must be addressed in ensuring equitable legal protection. These include the use of mandatory arbitration, the class action device where there are multiple potential litigants and general procedural rules that may require redefinition.

1. Basic Principle: Mandatory Arbitration

In order to ensure private party protection against transnational radiation pollution, a general proposal has been made for mandatory arbitration and is among similar proposals currently being discussed within the IAEA.[98] Indeed, it is the best way to effectuate legal protection.[99] Many of the problems with ensuring the protection of the victims are well known in other contexts, especially in international commerce. The most effective existing solution for these problems is international arbitration. Many of the reasons for the development of international arbitration in general are of special importance in the context of protection of private parties against injuries resulting from nuclear accidents.[100] Most importantly, arbitration provides a neutral forum for both parties. In contrast,

96. Paris Convention, *supra* note 63, art. XIII, §§ (a)-(c), 956 U.N.T.S. at 270-71.

97. *Id.*

98. Billingsley, *supra* note 2, at 355. *See also* Levy, *supra* note 24, at 106-07; *Report of the Standing Committee on Liability for Nuclear Damage*, IAEA Doc. SCNL/4/INF.6 (Dec. 12, 1991); *Liability for Nuclear Damage*, Draft Resolution recommended by the Committee of the Whole, 36th Regular Session of the General Conference of the IAEC, IAEA Doc. GC(XXXVI)/RES/1047 (Sept. 24, 1992).

99. Although arbitration is no panacea, it gives good results in many cases. *See, e.g.*, Heller, *supra* note 22, at 653; Sharon McBrayer, *Recent Developments: Chernobyl's Legal Fallout - The Convention on Early Notification of a Nuclear Accident*, 17 GA. J. INT'L & COMP. L. 303 (1986).

100. BORN & WESTIN, *supra* note 35, at 609.

litigation at courts of one state always contains the possibility of bias and, as a result, non-recognition of the judgment by the other state.

The consensual basis of arbitration also prevents multiple litigation of the same case in different states. The problem of multiple litigation is well known in international cases which are brought at national courts. One result was the development of so called anti-suit injunctions.[101] If, however, states would agree to arbitrate the liability question in cases of transboundary nuclear accidents, jurisdiction would be transferred to the arbitral body and no conflict between courts of different states could arise.

Furthermore, arbitration can be adjusted to different legal systems. This should diminish the reluctance of states to recognize proceedings conducted out of their own control. One main reason for this is that arbitration proceedings are usually less formal and rigid than proceedings at state courts.

International courts, such as the International Court of Justice, present a problem for private parties since they cannot bring actions there. Individual victims must rely on their own government to bring an action for them. The Chernobyl accident showed that states, for whatever reasons, are reluctant to do so. Furthermore, international courts only determine rights under public international law. The liability of operators, which is based on private law, can only be enforced in national courts. The problems with such attempts, however, have already been demonstrated.

Arbitration would open the possibility of determining rights under both bodies of law (source state's liability under public international law as well as operator's liability under private law) without confusing the two and without any need to change the basic principles of either. Public international law and private law should be reconciled in this area.[102]

In cases of nuclear power plant accidents that have international effects, considerable political and diplomatic implications make the general arguments favoring arbitration even stronger. For many countries, use of nuclear energy is of essential macroeconomic importance. These countries do not want to jeopardize their use of this energy source because of heavy burdens of liability. To provide countries with an incentive to expose their own energy producing enterprises to international liability they must be offered a flexible system based on mutual consent, such as arbitration. Arbitration has already proved to be a desirable way to resolve international disputes concerning environmental pollution.[103]

101. *Id.* at 242.

102. Handl, *supra* note 24, at 248. "An entirely new convention - one that essentially embodies a private law approach, yet also incorporates elements of source states' international liability - clearly is the preferable solution." *Id.*

103. Billingsley, *supra* note 2, at 342 n.12; Hartke, *supra* note 6, at 326.

2. Forms of Arbitration

One important argument made in favor of arbitration is its low cost.[104] Because different types of arbitration can vary in expense, this argument is generally not true and requires further examination.

There are two types of arbitration: institutional arbitration and ad hoc arbitration.[105] Institutional arbitration is provided by international organizations or agencies. Their administrative costs may be very high and must be borne by the arbitrating parties in full amount.[106] Considering that nuclear accidents are comparatively rare, administrative costs should be kept as low as possible. Therefore, the creation of a new arbitration organization should be avoided.[107]

On the other hand, ad hoc arbitration does not meet all the needs involved here. Ad hoc arbitration *per definitionem* only refers to single disputes and can be agreed on in tort cases typically only after the accident has occurred.

Thus, there must be some "institutionalized" arbitral proceeding, and a mixture of institutional and ad hoc arbitration may be the right approach. The proposed treaty should provide for mandatory arbitration for all future disputes. The necessary functions should be served by already existing organizations (e.g., IAEA).[108] The rules of procedure should be predefined. The arbitral tribunal itself, however, would be created on a case by case basis.[109] This would keep costs low but at the same time guarantee all of the benefits of institutional arbitration.[110] The relatively small number of accidents makes this approach manageable.

3. Rules of Procedure

As mentioned above, the rules of procedure must be defined beforehand. However, there is no need to create new and special rules, [111] because already several bodies of rules formulated in other contexts have proven successful.[112]

Considering the sovereignty concerns and the political implications of arbitration of transnational nuclear accident cases,[113] the most appropri-

104. Billingsley, *supra* note 2, at 357.

105. BORN & WESTIN, *supra* note 35, at 607.

106. Francis J. Higgins et al., *Pitfalls in International Commercial Arbitration*, 35 BUS. LAW. 1035, 1041 (1980).

107. Note the expensive proceedings where arbitration is conducted under the Convention on the Settlement of Investment Disputes Between States and Nationals of Other States, arts. VI, VII, 2 B.D.I.E.L. 947 (1991).

108. *See infra* Part III.E.

109. Higgins, *supra* note 106, at 1044.

110. Postiglione, *supra* note 1.

111. *See generally* Billingsley, *supra* note 2.

112. *See, e.g.*, Joseph T. McLaughlin, *Arbitration and Developing Countries*, 13 INT'L LAW. 211 (1979).

113. *See, e.g.*, Texaco-Libya award *in* Hunt v. Mobil Oil Corp., 550 F.2d 68 (1977) (noting that there would be no immunity defense if states would agree to arbitrate).

ate example is the rules of procedure of the International Center for Settlement of Investment Disputes (ICSID).[114] These rules are based on the Convention on the Settlement of Investment Disputes between States and Nationals of Other States.[115] The Administrative Council adopted the rules pursuant to article six of this Convention. The rules are divided into "Institution Rules"[116] and "Arbitration Rules"[117] and govern all questions concerning the request to arbitrate, the establishment of the tribunal, the working of the tribunal, general and special procedures and the award (including interpretation, revision and annulment). These rules could be adopted, *mutatis mutandis*, to the particular needs here.

Changes to the ICSID rules are necessary For example, there is no need to create a special "Center" which only provides arbitration because of the small number of accidents. With these rules of procedure, problems concerning personal jurisdiction and service of process might be resolved.

4. Class Action Brought by the State for its Victims

It has been suggested that each private party should be able to present its own case in front of the arbitration tribunal.[118] A precondition would be to get the approval of a special state organization (which could be established by each signatory state). This would be appropriate in the initial phases of such cases.[119] However, for the following reasons an aggregated claim would be preferable.

First, allowing individual arbitration would lead to a tremendous rise in the number of cases to be resolved. As the Chernobyl accident shows, the whole population of foreign states can be affected by a comparable disaster. This would not only overburden the administrative responsibilities of the arbitrators but would multiply legal costs. Under a class action approach, there would be only one arbitral proceeding for each affected state. Legal costs and aspects of investigative costs (e.g., expert witnesses) would arise only once.

Additionally, whenever a state represents its victims in an arbitration proceeding with the operator of the nuclear installation or the source state, the problem of inequality of representation disappears. Two equally powerful parties would arbitrate the case.[120]

114. *See generally* C.F Amerasinghe, *How to Use the International Centre for Settlement of Investment Disputes by Reference to its Model Clauses*, 13 IND. J. INT'L L. 530 (1973).

115. *International Centre for Settlement of Investment Disputes*, ICSID BASIC DOCUMENTS 15 (1985) [hereinafter ICSID BASIC DOCUMENTS] (text is available in each official language of the Centre).

116. *Id.* at 55-60. Conciliation Rules, part E, are also included but of less importance here.

117. *Id.* at 61-89.

118. Billingsley, *supra* note 2, at 356.

119. *Id.*

120. *See*, Reichert-Facilides, *supra* note 59.

A class action approach would create the necessity for each affected state to investigate the kind and amount of damages suffered by each victim. This is an efficient solution since the affected state is in the best position to investigate. It has access to all data of the victims and can use its administrative body to prove its losses. This would certainly be the cheapest way to investigate damages and the affected state would be a party to the arbitration proceedings anyway Nuclear accidents like the one at Chernobyl harm the public good. Recovery for such harm to the public good could only be claimed by the state itself.

Furthermore, affected states may indemnify their citizens independently of the right of individual victims to recover from a liable operator. Such indemnification, for example, was given to German citizens.[121] By virtue of the principle of subrogation, the state becomes the owner of most rights to indemnification. Subrogation can generally become effective in two ways: either the state which indemnifies its citizens requires assignment of the rights to recover, or the subrogation takes place *ex lege* by virtue of applicable substantive law (internal law or international treaties). A subrogation clause in favor of persons who have indemnified victims can be found in the Vienna Convention, [122] and should be implemented as a general rule in the treaty proposed here.

This construction would encourage all states to provide funds for potential nuclear disasters. As states usually provide quick indemnification, such funds bring great relief to victims. However, the decision to create such funds should be left to each state. If the state indemnifies its citizens, it must then arbitrate in its own name; if not, it represents its citizens. Either way comports with notions of fairness from an international perspective.

Certain kinds of damages can only be proven on an aggregate basis. Such damages could be recovered by the state *in cumulo* when it has a right to bring a class action.[123] Disbursement of damage payments would be left to the discretion of the state, and the defendant would be released from his duty to indemnify the individual victims.

Such damages would include, for instance, losses as a result of increases of certain types of diseases. The increase of diseases (e.g., cases of cancer) can be proven statistically through proof on an aggregate basis. According to the expected increase after a nuclear accident, the amount of losses (especially medical expenses, social security costs, etc.) could be estimated. These costs could be recovered by the state with proceeds used for additional compensation, such as medical equipment and social security payments.

In the same arbitration proceeding, the victims' state could also claim

121. AtG § 38; *see also* Norbert Pelzer, Atomrechtlicher Schadensausgleich bei auslandischen Nuklearunfallen, 27 NJW 1664 (1986).

122. *See, e.g.*, Vienna Convention, *supra* note 64, art. IX § 1, 2 I.L.M. at 738 (referring to subrogation clauses in internal laws of the member states).

123. *See* Handl, *supra* note 24, at 236.

its rights under international law against the source state. The single individual is in general not eligible for such recovery; only the state itself can claim damages.[124]

It has been pointed out that the existing liability agreements, the Paris Convention and the Vienna Convention, place too much emphasis on the liability of the operator and thereby unfavorably lessen the source state's liability under customary public international law to the victims.[125] However, article XVIII of the Vienna Convention expressly states that the Convention does not affect "the rights, if any, of a Contracting Party under the general rules of public international law in respect of nuclear damage."[126] Criticism of existing liability agreements in the Paris Convention is well-founded. Providing legal protection against radiation pollution demands an "entirely new convention — one that essentially embodies a private law approach, yet also incorporates elements of state's international liability . "[127] The arbitration approach combined with class action procedures would meet this requirement perfectly States could invoke arbitration proceedings as preventive measures even before an accident occurs.

The participation of foreigners in administrative proceedings concerning approval of new nuclear power plants has been an issue of concern in recent years.[128] A decision in Germany recognizes the right of foreigners potentially affected by German nuclear power plants to be a party to administrative proceedings.[129] The case concerned a plaintiff from the Netherlands, a citizen of a member state of the European Atomic Community [130] The question arose whether only citizens of member states have a right to be a party to proceedings. This view was rejected in literature on the subject.[131]

One problem with participation of foreigners in administrative proceedings is the potentially large number of people involved. However, citizens of one state could be represented by their government, and multiple proceedings might be avoided if arbitration is used. Each state could collect complaints of its citizens and arbitrate those aggregated complaints with the source state.

In order to make the liability rules enforceable, states would have to agree to three further points:

- to waive all immunity defenses;

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124. 22 NJW 1393, 6 IPRAX 351.
125. Handl, *supra* note 24, at 232.
126. *Id.*
127. *Id.* at 248. Similar proposals are currently discussed within the IAEA. *See, e.g., Report of the Standing Committee on Liability for Nuclear Damage, supra* note 98.
128. Billingsley, *supra* note 2, at 344.
129. Judgment of Dec. 17, 1986, Budnesverwaltungsgericht [BVerwG] [highest administrative court], 12 VersR 322 (1987).
130. *Id.*
131. Andreas Weitbrecht, *Zur Rechtsstellung auslandischer Grenznachbarn im deutschen Umweltrecht*, 35 NJW 2132, 2132-33 (1987).

- to hold the arbitral award conclusive and thus enforce it, and
- to ensure the free transferability of the compensatory payments under the award between the states.

Such provisions can be found in the Vienna Convention and in the rules of procedure of the ICSID.[132] Those provisions could, *mutatis mutandis*, be applied.

D. *Questions of Applicable Substantive Law*

In general, liability rules must be refined and unified among states. Protecting the chain of causation, determining methods for investigating damages and establishing insurance coverage minimums are additional issues that must be considered in constructing an effective international treaty.

1. Liability Rules

As mentioned above, a unification of the liability rules is desirable from the point of view of both parties.[133] Uniformity and predictability are the main arguments in its favor. Such liability agreements already exist (Paris and Vienna Convention). After the Chernobyl accident, the IAEA combined those two treaties into the Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention of 1988.[134] The treaty proposed herein would essentially follow the rules of the Vienna and the Paris Conventions. However, there are problems with the treaties which should first be solved.

The main problem is that not all states have signed and ratified the treaties. The Paris Convention is based on European activities, and the degree of participation is fairly sufficient. However as Chernobyl shows, nuclear accidents and their prevention are a global concern. An efficient system needs support from all countries. The signing and ratification of a Convention by all states should be encouraged. The bridging of the Paris and Vienna Convention by the Joint Protocol of 1988 does not yet fully solve the problem of incomplete support, even though the mutual benefits for all countries have become apparent.

Limitations of liability as contained in the two mentioned conventions should also be rethought.[135] The Chernobyl accident gives an idea about the probable losses resulting from nuclear accidents. This experience

132. Vienna Convention, *supra* note 64, 2 I.L.M. 727; ICSID BASIC DOCUMENTS.

133. *See also* Kenneth M. Murchison, *Interstate Pollution: The Need for Federal Common Law*, 6 VA. J. NAT. RES. L. 1 (1986) (arguing that federal common law is needed in cases of interstate pollution within the United States).

134. Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention, IAEA doc. GOV/2326 Annex I (15 Jan. 1988). *See also* B.U.N.R., *supra* note 9, at 20.

135. *See* Price-Anderson Amendments Act of 1988, 42 U.S.C. § 2210 (1988); Leslie D. Lass, Comment, *The Price-Anderson Act: If a "Chernobyl" Occurs in the United States, Will the Victims Be Adequately Compensated?*, 7 GLENDALE L. REV. 200 (1987). *See supra* note 69.

should be used to check the existing liability limits and determine reasonable amounts. The proposal for a Convention on Supplementary Funding elaborated by the IAEA is designed to overcome this problem.

The liability of the source state should not be limited or excluded.[136] The unification of the rules concerning the liability of the operator should not mean excluding or limiting the source state's liability under customary public international law Instead, both bodies of law should supplement each other.[137]

Source states' liability is also very important to give states incentives to fulfil their duties under public international law. Such duties include ensuring compliance by operators of nuclear power plants with safety standards and the notification of other states in case of an accident.[138]

Public international law should not be the only source of law; "the law of neighborly relations and other basic principles of international law" should also apply [139] This proposal contains three main problems. The law of neighborly relations is mainly customary international law and not as well defined as the liability rules of the named treaties, thereby making the results less predictable.[140] According to German doctrine, there is not yet a principle of strict liability in international law (neither as a rule of customary international law nor as a general principle of the laws of civilized countries).[141] Strict liability, however, is desirable in cases of ultra-hazardous activities like running a nuclear power plant. The named conventions should accordingly establish strict liability [142] Furthermore, international law does not generally give rights or duties to private persons.[143] It would therefore seem necessary to include a provision which explicitly extends application of international laws to private persons.

2. Special Aspects Concerning Causation[144]

The question of whether or not regulations of the state where the injury occurs interrupt the chain of causation should not be subject to special provisions.[145] State regulations should prove reasonable on a case by case basis. Scientific standards at the time of the taking of the measures should be decisive as long as there are no internationally unified standards. Such a unification would be desirable and solve this causation problem.

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136. Handl, *supra* note 24, at 228.
137. *Id.* at 232 (discussing restrictions in the Paris Convention).
138. *See* McBrayer, *supra* note 99, at 307 n.22 (citing the Tokyo Declaration).
139. Billingsley, *supra* note 2, at 356.
140. Malone, *supra* note 13, at 226.
141. Rest, *supra* note 11, at 615; *see also* Hartke, *supra* note 6, at 335-37.
142. Barron, *supra* note 14, at 671.
143. Malone, *supra* note 13, at 224.
144. Laura L. Gonsalves, Note, *Probability of Causation in Radiation Tort Litigation*, 24 TULSA L.J. 479 (1989).
145. *See supra* Part II.G.

In contrast, states should be able to recover damages which actually occurred but are provable only on an aggregate basis. Indemnification payments could be used to cover increased social costs as a result of an increase in diseases. With these payments, states would be able to meet the increased needs for health care. The proposed "class action" is a sufficient way to enforce such damage payments.[146]

3. Deductible Clause

The proposed method of investigating damages by the administrative body of the victims' state might create a danger of bias against the operator. Indeed, a government will be more generous knowing that damages are recoverable from the defendant. The danger, however, would not be that great; the method of investigating would be subject to the arbitration proceeding, and the defendant would have all possible objections available. Nevertheless, there might be a certain 'dark margin.' To avoid endless and inefficient disputes, the treaty could contain a deductible clause. A percentage of the damage (either fixed ex ante in the treaty for all future disputes or fixed by the arbitration tribunal on a case by case basis) would be covered by the victims' state.

4. Compulsory Liability Insurance[147]

Both the Paris and Vienna Conventions contain clauses requiring the operator of a nuclear installation to maintain insurance or other financial security [148] This insurance clause could be improved by requiring that operators have to maintain a certain minimum percentage of their insurance coverage in foreign states. In addition, the arbitral award should be directly enforceable against the insurer who could be a joint defendant in the arbitration proceeding.[149] This would make the arbitral award enforceable even if the defendant's state refuses enforcement.

Requiring operators to maintain foreign insurance has another considerable advantage. The business of insurance is based on the law of large numbers. This means that insurers can cover single risks only because they cover a high number of identical risks. This leads to a distribution of risks which makes the insurer risk neutral.[150] In smaller countries, the number of nuclear installations (i.e., number of identical risks) is very small. Where an insurer is unable to distribute risk, he is not risk neutral and he will prefer not to cover the risk at all. A possible solution for such problems is the development of insurer 'pools' (e.g., all insurers share the losses of single accidents). Requiring operators to provide in-

146. *See supra* Part III.C.

147. Reichert-Facilides, *supra* note 59, at 159.

148. *See* Paris Convention, *supra* note 63, art. X, 956 U.N.T.S. at 270; Vienna Convention, *supra* note 64, art. VII, 2 I.L.M. at 737.

149. *Compare* Paris Convention, *supra* note 63, art. VI(a), 956 U.N.T.S. at 267 (leaving this question open for regulation by the victims' state).

150. RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 11 (1986).

surance coverage abroad would create a network of insurance, making the law of large numbers work. The existence of international insurance and reinsurance companies would guarantee the practicability of this proposal.

The pool system is based on international cooperation. This is due to the fact that even countries with a strong insurance industry like the United States and Japan have had to reinsure part of their risks in pools of foreign countries.[151] The already existing insurance network can be demonstrated by the fact that the German pool, *Deutsche Kernreaktor-Versicherungsgemeinschaft* [DKVG] receives about 75% of its premiums from foreign countries.[152]

The existence of insurance coverage will not decrease the deterrent effect of the liability approach. At first sight, it might be argued that an operator will not take reasonable precautions when he knows that the insurance covers losses out of third party liability in cases of accidents. However, it is well recognized that insurance protection, under certain conditions, does not have negative impacts on the deterrent effect of liability rules. This is due to the fact that private insurance companies will not give coverage to operators of nuclear plants unless they take reasonable precautions. The nuclear plant at Chernobyl would probably not have been given coverage by private insurers because the low standard of safety applied there was well known.[153] Therefore, operators of nuclear plants would have to take reasonable care in order to get coverage and would have to keep up security measures in order to maintain the coverage.

This mechanism of insurance-based incentives to provide security measures only works if certain conditions are met.[154] First, the pricing and risk calculation of the insurer has to be accurate. Second, insurers will only investigate the safety standards of the operators of nuclear plants when the respective investigation costs are not too high.[155] In addition, transparent and internationally unified liability rules must make the financial risk of the insurer predictable.

The compliance with the first two requirements is already demonstrated by the fact that nuclear risks are insured in most parts of the western world.[156] The third requirement, transparency and international unity of the liability rules, would be fulfilled at least by the treaty proposed here.

Insurance can do more than just maintain safety incentives for the op-

151. Otto Saxer, *Kernenergie und Versicherung Risikoanalyse und Risikobewaltigung*, 58 SCHWEIZERISCHE VERSICHERUNGS-ZEITSCHRIFT [SVZ] 175, 175-77 (1990).

152. Gunter Schmidt et al., *Kernreaktor - Versicherer: Klarheit in Grenzwertdiskussionen bringen*, 2 VERSICHERUNG-SWIRTSCHAFT [VW] 152 (1987).

153. Saxer, *supra* note 151, at 175.

154. Jeffrey Kehne, Note, *Encouraging Safety through Insurance-Based Incentives: Financial Responsibility for Hazardous Wastes*, 96 YALE L.J. 403 (1986).

155. *Id.* at 403.

156. Saxer, *supra* note 151, at 177; Abraham, *supra* note 92.

erators.[157] Obtaining insurance can improve plant safety in two respects. First, insurers would be able to obtain detailed information about all accidents at nuclear plants. Thus, they could develop statistics on the likelihood of the occurrence of nuclear accidents. Indeed, this access to information was already used by insurers to inform operators of nuclear power plants of the potential for accidents as well as to develop directives for safety (e.g., a Swiss nuclear risk insurance pool developed directives for security measures against fire in nuclear plants).[158]

Additionally, the fact that the potentially tremendous losses after nuclear accidents can only be paid by operators who maintain insurance will provide a strong incentive to comply with all conditions of the policy in order to have continued coverage. The operator knows that it will go bankrupt in the event of an accident if it loses insurance coverage because of noncompliance with safety standards. The existence of insurance coverage becomes a question of survival for the operator.

E. *IAEA - The Appropriate Body to Carry Out the Proposal*[159]

As already mentioned, the IAEA would be the appropriate body to carry out this proposal.[160] The IAEA carries on worldwide activities. Thus, each state would be encouraged to participate and all states would have an equal opportunity to contribute and introduce their own perspectives. The IAEA is well equipped with offices and administrative staff. In fact, ongoing discussions within the IAEA already deal with similar proposals (e.g., a proposal for an international arbitration tribunal).

Furthermore, IAEA headquarters are situated in Austria. This is a political advantage because Austria is a neutral forum for both parties; 'neutral' not only in a political sense but also by virtue of the fact that Austria does not use nuclear energy. It is one of the very few countries which deliberately decided not to use nuclear plants,[161] when a 1978 plebiscite resulted in a majority vote against use of nuclear energy [162] In fact, all democratically-elected governments should be aware of this and thereby be encouraged to enter into international treaties to protect the environment. Austria could foreseeably play a role in inducing negotiations within the framework of the IAEA in order to enter into the proposed agreement.[163]

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157. Kehne, *supra* note 154, at 420 ("Environmental damage can be deterred effectively by insurance-based incentives.").

158. Saxer, *supra* note 151, at 180.

159. Stuart F Clayton, Jr., *The International Atomic Energy Agency: An Expanding Role in the Post-Chernobyl World*, 12 N.C.J. INT'L L. & COM. REG. 269 (1987).

160. Billingsley, *supra* note 2, at 355.

161. *Id.* (It could only be a party of arbitration when representing its own victims).

162. 50.47% voted against, 49.53% in favor of use of nuclear energy (64.1% of all persons entitled to vote took part). *Id.*

163. Austria was always concerned about legal protection against radiation pollution. The Austrian delegation would like to stress the importance it attaches to the

IV. SUMMARY

Legal protection against transboundary radiation pollution is a global concern. A satisfying solution requires participation of all countries in elaborating a new convention. This convention should govern all legal issues arising out of nuclear accidents. The convention should at minimum contain the following requirements:

- it must give effective legal protection to all parties, which means that all hindrances for full indemnification of victims must be overcome;
- it must be efficient, which means especially that litigation costs should be kept as low as possible;
- it must be politically practicable, which means that the way of effectuating legal protection of victims must be universally acceptable and give mutual benefits, and
- it must be legally manageable, which means that the contents of the proposed treaty must not interfere with the legal system of any State in a way which makes an execution of the treaty impossible.

A liability approach guarantees economic efficiency The operator of a nuclear power plant should be held strictly liable. His identity should be publicly registered. As to the procedural issues, mandatory arbitration would be preferable. States should, after an accident, investigate the damages to the public welfare as well as to their citizens, and then bring an action similar to a class action. The applicable substantive law should be unified in the convention. Special attention should be paid to the amounts of liability, compulsory insurance, and special aspects of causation. The appropriate body to carry out this proposal would be the IAEA, where ongoing discussions already deal with some of the issues raised in this Article.

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broadest possible approach to the problems of long-range transboundary air pollution. While recognizing the need to concentrate immediate efforts on the problems related to sulphur compounds, the Austrian delegation nevertheless believes that due attention should be given to all pollutants relevant in connection with long-range transboundary air pollution, including problems connected with the peaceful use of nuclear energy. Beyond that, the Austrian delegation wants to express its conviction that all problems relating to the protection of the environment need to be studied on the widest possible international scale and that cooperation of all states is needed to combat the negative effects of industrial activities on the environment. In the view of the Austrian delegation such cooperation should also include the study of possible negative effects resulting from the peaceful uses of nuclear energy on the environment of a state or states other than the state within which such activities are carried out.

Draft Report, 5th meeting of the Special Group on Long-range Transboundary Air Pollution, Jan. 18, 1979, ECE Doc. ENV/AC. 9/CRP 5/Add.3, at 2-3.