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Convention on International Liability for Damage Caused by Space Objects: Definition and Determination of Damages After the Cosmos 954 Incident

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Convention on International Liability for Damage Caused by Space Objects: Definition and Determination of Damages After the Cosmos 954 Incident

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Abstract

This Note examines the conflicting provisions of the Liability Convention in the context of the Cosmos 954 incident to determine whether the damages that Canada claimed would be recoverable under the Convention. The analysis will illustrate the need for change in the Liability Convention's definition of the measure of damages. Finally, this Note presents a proposal that would render the provisions more consistent with the spirit and the purpose of the Liability Convention.

CONVENTION ON INTERNATIONAL LIABILITY FOR
DAMAGE CAUSED BY SPACE OBJECTS:
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OF DAMAGES AFTER THE
COSMOS 954 INCIDENT

INTRODUCTION

The United Nations General Assembly endorsed the Convention on International Liability for Damage Caused by Space Objects¹ (Liability Convention or Convention), on November 29, 1971.² The Liability Convention was the result of ten years work³ by the Legal Sub-Committee of the Ad Hoc Committee on the Peaceful Uses of Outer Space⁴ (COPUOS). One of the goals of the Convention is to provide a measure of damages for cases involving injury or damage caused by space objects.⁵

1. Mar. 29, 1972, 24 U.S.T. 2389, T.I.A.S. No. 7762, 10 I.L.M. 965 [hereinafter cited as Liability Convention].

2. G.A. Res. 2777, 26 U.N. GAOR Supp. (No. 29) at 25, U.N. Doc. A/8429 (1971); see Foster, *The Convention on International Liability for Damage Caused by Space Objects*, 10 CAN. Y.B. INT'L L. 137, 137 (1972). The United Nations (UN) Ad Hoc Committee on the Peaceful Uses of Outer Space (COPUOS), created on December 13, 1958, had adopted and submitted to the UN General Assembly the final draft convention on September 10, 1971. *Id.*; see also G. ZHUKOV & Y. KOLOSOV, INTERNATIONAL SPACE LAW 101 (1984). "The convention is actually the first specific international agreement on liability in the area of public law relations." *Id.*

3. The first draft proposal on liability was submitted by the United States on June 4, 1962. USA: Proposal: Liability for Space Vehicle Accidents, U.N. Doc. A/AC.105/C.2/L.4 (1962). The final draft was endorsed on November 29, 1971. See C. CHRISTOL, THE MODERN INTERNATIONAL LAW OF OUTER SPACE 61 (1982); Cheng, *Convention on International Liability for Damage Caused by Space Objects*, 1 MANUAL ON SPACE L. 83, 83 (1979).

4. The first United States proposal, U.N. Doc. A/AC.105/C.2/L.4, *supra* note 3, was submitted to COPUOS' Legal Sub-Committee, which has been the forum for the development of international space law in the United Nations. C. CHRISTOL, *supra* note 3, at 16-17. For a discussion of the birth of COPUOS, see *id.* at 12-20.

5. See *infra* notes 12-19 and accompanying text. The Liability Convention, *supra* note 1, defines the term space object as including "component parts of a space object as well as its launch vehicle and parts thereof." *Id.* art. I(d). "This non-definition was the result of the acceptance by the Legal Sub-Committee of the suggestion that 'space object' had a reasonably understood and clear meaning and that it was only necessary to include in a definition all the component parts and equipment of a space object which could cause damage." Foster, *supra* note 2, at 145. Some problems remain with the definition of the term. *Id.* at 144-49; see C. CHRISTOL, *supra* note 3, at 68, 72-73, 83. It is concluded that "the absence of a specific definition in the Convention of a 'space object' should not be regarded as a meaningful defect of the agreement." *Id.* at 108. A suggested definition is that of a "man-made vehicle designed for launch into orbit and possessing the characteristics and potential neces-

The final draft, however, included two conflicting definitions for this measure.⁶ As a result, it is unclear what damages would be recoverable under the Convention.⁷

The Liability Convention has been invoked only once; in the Cosmos 954 incident.⁸ In 1978, a Soviet satellite crashed in the Canadian Northwest. Later that same year, the Canadian Government presented a claim for damages based in part on the Liability Convention, to the Government of the Soviet Union. The incident was resolved through diplomatic channels, and the majority of the provisions of the Liability Convention were left untested.

This Note examines the conflicting provisions of the Liability Convention in the context of the Cosmos 954 incident to determine whether the damages that Canada claimed would be recoverable under the Convention.⁹ The analysis will illustrate the need for change in the Liability Convention's definition of the measure of damages.¹⁰ Finally, this Note presents a proposal that would render the provisions more consistent with the spirit and the purpose of the Liability Convention.¹¹

I. PURPOSE OF THE LIABILITY CONVENTION

Reentry¹² of space object fragments into the earth's atmosphere has been rare, relative to the number of space ob-

sary for it to achieve at least one orbit." *Id.* at 109; see also Cheng, *supra* note 3, at 116-17 (discussing the definition of "space object").

6. See *infra* notes 45-56 and accompanying text.

7. See Foster, *supra* note 2, at 157. "[N]o indication is given as to whether claims will lie for both direct and indirect damage." *Id.*; see G. ZHUKOV & Y. KOLOSOV, *supra* note 2, at 102; Haanappel, *Some Observations on the Crash of Cosmos 954*, 6 J. SPACE L. 147, 148 (1978).

8. See *infra* notes 75-88 and accompanying text. There have been other incidents where alarm was raised by the reentry of space objects into the earth's atmosphere. Most notable among these are the Skylab incident in which a United States space lab landed in the Australian desert and sea after a fall that carried it over several continents, Lyons, *Skylab Debris Hits Australian Desert; No Harm Reported*, N.Y. Times, July 12, 1979, at A1, col. 5, and the Cosmos 1402 incident, where another Soviet satellite in the Cosmos line fell from orbit and crashed harmlessly into the Indian Ocean. Wilford, *Russian Satellite Falls Harmlessly Over Indian Ocean*, N.Y. Times, Jan. 24, 1983, at A1, col. 6.

9. See *infra* notes 45-74 and accompanying text.

10. See *infra* notes 91-118 and accompanying text.

11. See *infra* notes 119-44 and accompanying text.

12. For a general discussion of reentry, see Doyle, *Reentering Space Objects: Facts and Fiction*, 6 J. SPACE L. 107, 107-10 (1978).

jects presently circling the earth.¹³ There is, however, a very real possibility that future space accidents may result in injury to innocent persons, natural or juridical.¹⁴ The Legal Subcommittee imposed liability on launching states¹⁵ with the intent of inducing those engaged in space activities to take into account the rights of those who might be harmed by such activities.¹⁶ While the advancement of space exploration is important, it must not be pursued at the expense of remediless victims of damage.¹⁷ The members also intended to draft effective rules and procedures to facilitate the prompt payment of compensation to victims.¹⁸ As a result, the Liability Convention is a victim-oriented agreement designed to balance the importance of the advancement of space exploration against the necessity of protecting innocent victims.¹⁹

13. See STAFF OF SENATE COMM. ON AERONAUTICAL AND SPACE SCIENCES, 92D CONG., 2D SESS., STAFF REPORT ON CONVENTION ON INTERNATIONAL LIABILITY FOR DAMAGES CAUSED BY SPACE OBJECTS 74 (Comm. Print 1972) [hereinafter cited as STAFF REPORT]; Christol, *International Liability for Damage Caused by Space Objects*, 74 AM. J. INT'L L. 346, 350 n.14 (1980).

14. Wilkins, *Substantive Bases for Recovery for Injuries Sustained by Private Individuals as a Result of Fallen Space Objects*, 6 J. SPACE L. 161, 169 (1978). "In light of the very real possibility of future [space] accidents . . . attention must be given internationally and domestically to insure that it will not be the innocent injured person that bears the risk of such injuries." *Id.*

By 1972, 44 space object fragments had been recorded as having reentered the earth's atmosphere. See STAFF REPORT, *supra* note 13, at 74-75. They ranged in size from small bits of debris to a four foot square flat steel plate weighing 640 pounds that was recovered in the Southwestern United States. *Id.* The steel plate was identified as part of Soviet Cosmos 316. It and five oblong pieces of steel, 2 to 2.5 feet long with an average weight of 150 pounds, fell in Kansas, Texas and Oklahoma in August 1970. *Id.*

15. The "launching State" is defined in article I of the Liability Convention as being:

- (i) A State which launches or procures the launching of a space object;
- (ii) A State from whose territory or facility a space object is launched.

Liability Convention, *supra* note 1, art. I.

16. C. CHRISTOL, *supra* note 3, at 59.

17. Rajska, *Convention on International Liability for Damages Caused by Space Objects—An Important Step in the Development of the International Space Law*, in PROCEEDINGS ON THE SEVENTEENTH COLLOQUIUM ON THE LAW OF OUTER SPACE 245, 249 (1974); Recent Decisions, *Space Law—International Liability for Space Exploration Activities*, 7 TEX. INT'L L.J. 523, 526 (1972).

18. See Christol, *supra* note 13, at 355.

19. Verbatim Record of the Seventy-Second Meeting, U.N. Doc. A/AC.105/PV.72, at 46 (1969) (statement of Canada). The Convention was intended to be victim-oriented, designed not as a reciprocal agreement between the two prevailing space powers, the United States and the U.S.S.R., but as a safeguard

II. BACKGROUND OF THE LIABILITY CONVENTION

On December 13, 1958, COPUOS was created to establish legal principles and guidelines governing the use of outer space.²⁰ The Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space²¹ soon followed, establishing the application of international law and the Charter of the United Nations to outer space.²²

The subject of liability for damages from space vehicle accidents was first addressed by COPUOS in 1959²³ and was immediately given priority status.²⁴ In June 1962, the United States submitted the first draft proposal on liability,²⁵ thus be-

for each state, perhaps in particular nonspace powers. *Id.*; see N. MATTE, *AEROSPACE LAW: FROM SCIENTIFIC EXPLORATION TO COMMERCIAL UTILIZATION* 169 (1977); Christol, *supra* note 13, at 355; Cocca, *The Principle of "Full Compensation" in the Convention on Liability for Damage Caused by Space Objects Launched into Outer Space*, in *PROCEEDINGS ON THE FIFTEENTH COLLOQUIUM ON THE LAW OF OUTER SPACE* 92, 92 (1972).

Herbert Reis, United States Delegate to the Legal Sub-Committee, remarked that the fundamental American goal of the Convention was to assure the payment of prompt and fair compensation to citizens who might be injured as a result of the reentry of fragments of a foreign manmade space object. Reis, *Some Reflections on the Liability Convention for Outer Space*, 6 *J. SPACE L.* 125, 126 (1978). The Convention itself sets forth its purpose as follows:

Recognizing the need to elaborate effective international rules and procedures concerning liability for damage caused by space objects and to ensure, in particular, the prompt payment under the terms of this Convention of a full and equitable measure of compensation to victims of such damage

Liability Convention, *supra* note 1, preamble.

20. See generally C. CHRISTOL, *supra* note 3, at 12-20 (discussing the birth of COPUOS).

21. G.A. Res. 1962, 18 U.N. GAOR Supp. (No. 15) at 15, U.N. Doc. A/5515 (1964) [hereinafter cited as Declaration of Principles]; see Dembling, *Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*, I *MANUAL ON SPACE L.* 1, 5 (1979).

22. Declaration of Principles, *supra* note 21, at 15. "The activities of States in the exploration and use of outer space shall be carried on in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international cooperation and understanding." *Id.*; see Dembling, *supra* note 21, at 5.

23. C. CHRISTOL, *supra* note 3, at 60; Foster, *supra* note 2, at 138. On July 14, 1959, the Committee reported that "the issue of 'liability for injury or damage caused by space vehicles' would arise in the exploration, use, and exploitation of the space environment." C. CHRISTOL, *supra* note 3, at 60; see Foster, *supra* note 2, at 138.

24. C. CHRISTOL, *supra* note 3, at 60; Cheng, *supra* note 3, at 83.

25. U.N. Doc. A/AC.105/C.2/L.4, *supra* note 3.

ginning a ten year process of negotiation, both formal and informal,²⁶ that ended in the endorsement of the Liability Convention in 1971.²⁷

During that ten year period, the drafting of two other treaties had an impact on the development, and delayed the drafting of the Liability Convention.²⁸ The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies²⁹ (Principles Treaty), was drafted primarily during the Legal Sub-Committee's Fifth Session, held in 1966.³⁰ It was intended to establish basic principles upon which international space law, in the form of agreements and conventions, could be built.³¹ Articles VI and VII of this Treaty pertain to international liability for damages and are the basis upon which the Liability Convention was developed.³²

26. Cheng, *supra* note 3, at 89. As a result, it is impossible to tell how and when agreement was reached on some of the most crucial liability issues. *Id.*

27. G.A. Res. 2777, *supra* note 2, at 25. The Delegations of Canada, Iran, Japan, and Sweden were unable to support the Convention "because they believed it would have been preferable to have had incorporated in the text provisions on measures of compensation and especially on the settlement of claims more in accordance with those that they had earlier proposed in the Legal Sub-Committee." UNCOPUOS Report, 26 U.N. GAOR Supp. (No. 20) at 16, U.N. Doc. A/8420 (1971). These delegations therefore reserved their positions on the substance of the text of the Convention. *Id.*

28. See C. CHRISTOL, *supra* note 3, at 61; *infra* notes 29-38 and accompanying text.

29. Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205 [hereinafter cited as Principles Treaty].

30. Dembling, *supra* note 21, at 1.

31. *Id.* at 35.

32. Principles Treaty, *supra* note 29, arts. VI-VII; see C. CHRISTOL, *supra* note 3, at 61. Article VI provides as follows:

States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty. When activities are carried on in outer space, including the moon and other celestial bodies, by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization.

Principles Treaty, *supra* note 3, art. VI. Article VII provides as follows:

Each State Party to the Treaty that launches or procures the launching of an

Negotiation on the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched Into Outer Space³³ (Return Agreement) lasted almost as long as negotiation on the Liability Convention,³⁴ primarily due to a general lack of interest on the part of the delegates from nations other than those from the Soviet Union and the United States.³⁵ Article 5 of the Return Agreement refers to the obligations of the launching state to bear the expenses of cleanup and recovery when a satellite lands in the territory of a signatory state.³⁶ The article has been read to relieve the launching state of responsibility for such costs where the launching state does not request the return of its space object.³⁷ As long as that state declines to request the return of its space object, the Return Agreement does not apply. The victim state must rely on the Liability Convention for any relief in

object into outer space, including the moon and other celestial bodies, and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the Earth, in air space or in outer space, including the moon and other celestial bodies.

Id. art. VII.

33. Apr. 22, 1968, 19 U.S.T. 7570, T.I.A.S. No. 6599, 672 U.N.T.S. 119 [hereinafter cited as Return Agreement].

34. The Return Agreement, *supra* note 33, took 10 years to draft, from 1959 to 1968. Lee, *Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space*, I MANUAL ON SPACE L. 53, 53 (1979).

35. Lee, *supra* note 34, at 53. The subject of the Return Agreement was not of primary interest to anyone but the space powers who had space objects and astronauts to be concerned about. *Id.* There was some basic disagreement on legal issues and approaches to the issues between the two space powers. *Id.*

36. Return Agreement, *supra* note 33, art. 5(5). Article 5(5) provides that "[e]xpenses incurred in fulfilling obligations to recover and return a space object or its component parts under paragraphs 2 and 3 of this article shall be borne by the launching authority." *Id.* In essence, the provision "provides for payment by the launching authority of expenses incurred by a Contracting Party in recovering and returning a space object or component part, if requested by the launching party." Dembling, *Cosmos 954 and the Space Treaties*, 6 J. SPACE L. 129, 132 (1978).

37. Dembling, *supra* note 36, at 132. The treaty provides that recovery and return expenses "shall be borne" by the launching authority. Return Agreement, *supra* note 33, art. 5(5). "Since the expenses incurred by the Contracting Party must be borne by the launching state, a launching authority's request for such recovery and return is a condition of this obligation." Dembling, *supra* note 36, at 132; see Lee, *supra* note 34, at 72; Address by L.H. Legault & A. Farand, Canada's Claim for Damage Caused by the Soviet Cosmos 954 Satellite, at 16, American Bar Ass'n Forum Committee on Air and Space Law, First Annual Forum (Feb. 23-25, 1984) [hereinafter cited as Legault & Farand].

paying for the removal of the space object.³⁸

The ten year delay in finalizing the Liability Convention was caused by the lack of consensus³⁹ among the Legal Sub-Committee members on such issues as the law applicable to the measurement of damages, the status of international organizations with respect to the Convention, dispute resolution procedures, limitation of liability, and nuclear damage.⁴⁰ The major factor in the delay, frequently complained of by the United Nations General Assembly,⁴¹ was the plurality of views among the members of the Legal Sub-Committee.⁴² The unwillingness of certain members of the Legal Sub-Committee to participate in its proceedings was blamed for some delay.⁴³ It was also apparent that the Principles Treaty would have to be

38. Lee, *supra* note 34, at 72. "Whether the launching authority is responsible for . . . expenses [not connected with its request] is beyond the scope of the . . . [Return] Agreement and may have to be resolved under other applicable rules of international law, such as the Liability Convention." *Id.*

39. C. CHRISTOL, *supra* note 3, at 61-62. Foster, *supra* note 2, at 139-40. The reasons given for this lack of consensus vary. One view is that the complex nature of the problems themselves led to long negotiations and difficult agreements. C. CHRISTOL, *supra* note 3, at 61; Dembling & Arons, *Space Law and the United Nations: The Work of the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space*, 32 J. AIR L. & COM. 329, 350 (1966).

40. C. CHRISTOL, *supra* note 3, at 61.

41. As early as December 14, 1962, the United Nations General Assembly was urging COPUOS' Legal Sub-Committee to increase its efforts in drafting the Liability Convention. G.A. Res. 1802, 17 U.N. GAOR Supp. (No. 17) at 5, U.N. Doc. A/5217 (1963); C. CHRISTOL, *supra* note 3, at 63. In 1970, the General Assembly adopted G.A. Res. 2733B, 25 U.N. GAOR Supp. (No. 28) at 20, U.N. Doc. A/8028 (1970), emphasizing that delay in reaching an agreement on liability left the world in an unsatisfactory state of vulnerability to space object accidents. *Id.* at 20; see Christol, *supra* note 13, at 355.

42. Cheng, *supra* note 3, at 83, 91, 123-25; see C. CHRISTOL, *supra* note 3, at 62; Deleau, *La Convention sur la Responsabilité Internationale pour les Dommages Causés par des Objets Spatiaux*, 1971 ANNUAIRE FRANÇAIS DE DROIT INTERNATIONAL 876, 886 (Centre National de la Recherche Scientifique); Foster, *supra* note 2, at 141.

43. Foster, *supra* note 2, at 140. One commentator attributed the delay in part to "the refusal of certain members of the Committee—notably those from the Soviet bloc—to participate in its work." *Id.*; see Cheng, *supra* note 3, at 91; Deleau, *supra* note 42, at 886. Herbert Reis, United States Delegate to the Legal Sub-Committee, expressed the problem as follows:

We at first found it difficult to engage the serious attention of the Soviet Union, which, indeed, preferred throughout the following eight years of negotiation not to put forward proposals under its own name but instead to rely upon Hungary.

. . . .

Even today there might have been no liability convention but for the efforts of the Government of India which took the initiative of trying to overcome a

completed before a detailed liability agreement could be reached.⁴⁴

III. CONFLICT IN THE PROVISIONS OF THE LIABILITY CONVENTION

Articles I, II, and XII of the Liability Convention outline the process of defining and determining damages in space object accidents.⁴⁵ However, these articles suffer from inconsistencies that make that process confusing.⁴⁶ Article I defines the term "damage" for the purpose of the Convention and limits that term to physical, psychological, or property damage⁴⁷ and loss of life.⁴⁸ Article II provides for payment of compensa-

critical impasse by hosting informal discussion in New Delhi in March 1969 with the United States, Belgium, the Soviet Union and Hungary
 Reis, *supra* note 19, at 126. "With views so widely differing it is hardly surprising that it took considerable time to reach agreement." P. van Fenema, *The 1972 Convention on International Liability for Damage Caused by Space Objects* 179 (August 1973) (unpublished manuscript available in McGill University Law Library).

44. Foster, *supra* note 2, at 140-41. "[I]ntensive work on . . . [the liability] question had to await the completion of a declaration of basic principle." *Id.* at 141.

45. Liability Convention, *supra* note 1, arts. I, II, XII. These articles provide, in pertinent part:

For the purposes of this Convention:

(a) The term "damage" means the loss of life, personal injury or other impairment of health; or loss of or damage to property of States or of persons, natural or juridical, or property of international intergovernmental organizations;

Id. art. I;

A launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft in flight.

Id. art. II;

The compensation which the launching State shall be liable to pay for damage under this Convention shall be determined in accordance with international law and the principles of justice and equity, in order to provide such reparation in respect of the damage as will restore the person, natural or juridical, State or international organization on whose behalf the claim is presented to the condition which would have existed if the damage had not occurred.

Id. art. XII.

46. See *infra* notes 52-56 and accompanying text.

47. "[L]oss of or damage to property" has been described as "an interference with the property resulting in the destruction or damage of the property or in its being in any way . . . rendered unfit for the use for which it was intended." Foster, *supra* note 2, at 156-57.

48. Liability Convention, *supra* note 1, art. I. The limitation of the term to these concepts "reflects the idea of sharing the burden of damage caused in operating sources of special danger between the operator of the technology and the parties that

tion for "damage," presumably as defined in article I.⁴⁹ Under article XII, compensation for damage is to be "determined in accordance with international law and the principles of justice and equity," so that the claimant will be restored to the condition that would have existed had no damage occurred.⁵⁰ Articles XIV through XX establish and set out the guidelines for a Claims Commission, which handles disputes between nations unable to resolve such disputes through diplomatic procedures.⁵¹

The restoration proposed by article XII is beyond the scope of the limited definition of "damage" in article I. For

sustained the damage." G. ZHUKOV & Y. KOLOSOV, *supra* note 2, at 105. It is argued that the risk of damage from space activities should be borne by the international community as a whole, and not solely by the launching state. *Id.* at 104-05.

"No other larger definition of damage exists in any international instrument. This definition, comprehensive as it is, was reached as a result of extending the concept in all possible ways." Cocca, *supra* note 19, at 93. *But see* STAFF REPORT, *supra* note 13, at 23. When the United States Senate examined the Liability Convention in 1972, it predicted that the article I definition of damage would become "one of the major problem areas of the Convention." *Id.*

49. Liability Convention, *supra* note 1, art. II. This is consistent with the view that "[o]ther types of damage are not eligible for reparation under the convention." G. ZHUKOV & Y. KOLOSOV, *supra* note 2, at 105.

50. Liability Convention, *supra* note 1, art. XII. This measure of compensation was decided on by the Legal Sub-Committee when no agreement could be reached on the applicability of the law of any particular state. P. van Fenema, *supra* note 43, at 179-87; *see* STAFF REPORT, *supra* note 13, at 33-34; Szilagyi, *Protection of Outer Space Environment—Questions of Liability*, in PROCEEDINGS OF THE TWENTY-FIFTH COLLOQUIUM ON THE LAW OF OUTER SPACE 53, 53 (1982). The deadlock was caused by disagreement on two issues: the settlement of claims and the question of applicable law. P. van Fenema, *supra* note 43, at 184; *see infra* note 57.

The final text of article XII, adopted pursuant to a compromise between factions of the Legal Sub-Committee, was designed primarily to provide full compensation to victims and restore them to the status quo ante. *See infra* notes 57-69 and accompanying text. *See generally* P. van Fenema, *supra* note 43, at 185-92 (discussing the presentation and debate on the language which ultimately became article XII).

51. Liability Convention, *supra* note 1, arts. XIV-XX; *see* C. CHRISTOL, *supra* note 3, at 82-83; Foster, *supra* note 2, at 173-77. If diplomatic negotiations are unsuccessful after one year following submission of a claim, a Claims Commission can be called by either party. *See* Liability Convention, *supra* note 1, art. XIV. The Commission has three members. One member is to be nominated by the claimants, one member will be nominated by the respondents, and one member will be nominated by the parties jointly. *Id.* art. XV. The purpose of the Claims Commission is to provide a forum for the settlement of disputes where the parties cannot agree through diplomacy. *See id.* art. XIV.

Decisions of the Commission are not binding but are subject to immediate publication. *Id.* art. XIX. This is an odd result which created much debate in the Legal Sub-Committee. Foster, *supra* note 2, at 175.

example, the drafters were aware, as article XXI attests,⁵² that the reentry of a space vehicle might present large-scale danger to human life and might seriously threaten vital population centers.⁵³ Article XII, with its reference to international law and the principles of justice and equity,⁵⁴ seems to compensate for damages incurred by a state in taking reasonable measures to prevent the threatened danger.⁵⁵ Nevertheless, article I precludes such recovery by limiting damage to the items listed.⁵⁶

52. Liability Convention, *supra* note 1, art. XXI. Article XXI provides as follows: If the damage caused by a space object presents a large-scale danger to human life or seriously interferes with the living conditions of the population or the functioning of vital centers, the States Parties, and in particular the launching State, shall examine the possibility of rendering appropriate and rapid assistance to the State which has suffered the damage, when it so requests. However, nothing in this article shall affect the rights or obligations of the States Parties under this Convention.

Id.

53. Article XXI recognizes the danger but does very little about it. It imposes on the launching state the obligation, in the event of such danger, to "examine the possibility" of giving some sort of help and then only if the damaged state requests it. *Id.* It does not affect the rights and obligations of the parties in the other articles of the Convention. Rajski, *supra* note 17, at 256; *see also* STAFF REPORT, *supra* note 13, at 38 ("Use of the word 'examine' appears to indicate that a state is not obligated under the Convention to actually render such assistance."). *See generally* Cheng, *supra* note 3, at 132-33 (discussing article XXI of the Liability Convention).

54. Liability Convention, *supra* note 1, art. XII.

55. "National courts generally take these factors [preventive measures] into account when granting compensation, considering that the victim should take steps to mitigate damage and that costs incurred in doing so should be recoverable." Legault & Farand, *supra* note 37, at 13. This is especially true if the term "equity" in article XII is used in its popular sense to signify moral justice and not in the Anglo-American legal sense. *See* Alexander, *Measuring Damages Under the Convention on International Liability for Damage Caused by Space Objects*, 6 J. SPACE L. 151, 153 (1978). "Pursuant to such a formulation, it would be possible to avoid the rigors of strictly legal approaches to the measurement of damages and adapt relief to the circumstances of any given case." Christol, *supra* note 13, at 358. If the measure of compensation is to be determined by international law and the principles of justice and equity, and if the tribunal has "the power to meet the moral standards of justice in a particular case . . . so as to adapt the relief to the circumstances of the particular case," H.L. McCINTOCK, *HANDBOOK OF THE LAW OF EQUITY* 1 (1948), it is inconsistent to argue that article XII does not require the launching state to compensate the victim state for preventive measure damages when the victim state was in no way responsible for the landing of the space object.

56. G. ZHUKOV & Y. KOLOSOV, *supra* note 2, at 105; *see supra* note 48 and accompanying text.

IV. LEGAL SUB-COMMITTEE'S DEBATE ON COMPENSATION FOR DAMAGE

The Legal Sub-Committee's treatment of the measures of compensation in article XII consisted largely of a debate over whether the measure should be determined by reference to general international law or to the law of a particular state.⁵⁷

57. See Dembling & Arons, *supra* note 39, at 366; Diederiks-Verschuur, *Convention on International Liability Caused by Space Objects*, in PROCEEDINGS OF THE FIFTEENTH COLLOQUIUM ON THE LAW OF OUTER SPACE 96, 101 (1972).

On April 29, 1963, during the second session of the Legal Sub-Committee, Belgium submitted a proposal entitled Working Paper Submitted by the Belgian Delegation on the Unification of Certain Rules Governing Liability for Damage Caused by Space Devices. U.N. Doc. A/AC.105/C.2/L.7 (1963) [hereinafter cited as Belgian Proposal]; see C. CHRISTOL, *supra* note 3, at 63; Dembling & Arons, *supra* note 39, at 349. This paper opened debate on one of the most difficult issues that was to come before the Legal Sub-Committee: the identification of the law to be applied to the determination of compensation. C. CHRISTOL, *supra* note 3, at 64; see also Dembling & Arons, *supra* note 39, at 366-69 (discussing the debate on applicable law). The Belgian Proposal, in defining damage, proposed that the national law of the injured person should govern the classification of compensable losses. U.N. Doc. A/AC.105/C.2/L.7, at 1 (1963); see C. CHRISTOL, *supra* note 3, at 64; Dembling & Arons, *supra* note 39, at 355; P. van Fenema, *supra* note 43, at 176-77.

A later United States proposal sought to base determination of the measure of compensation on international law and the principles of justice and equity. United States Proposal, Convention Concerning Liability for Damage Caused by the Launching of Objects into Outer Space, U.N. Doc. A/AC.105/C.2/L.8 (1964) [hereinafter cited as United States Proposal]; see C. CHRISTOL, *supra* note 3, at 62; Dembling & Arons, *supra* note 39, at 355; P. van Fenema, *supra* note 43, at 176.

The Hungarian Proposal, Hungary: Revised Draft Convention Concerning Liability for Damage Caused by the Launching of Objects into Outer Space, U.N. Doc. A/AC.105/C.2/L.10 (1964) [hereinafter cited as Hungarian Proposal], while not exactly applying a particular national law, provided that "loss of profits and moral damage" might be recovered "whenever compensation for such damage is provided for by the law of the State liable for damage in general." U.N. Doc. A/AC.105/C.2/L.10/Rev.1, at 2; see C. CHRISTOL, *supra* note 3, at 67; Dembling & Arons, *supra* note 39, at 355; P. van Fenema, *supra* note 43, at 176.

For a table comparing these three proposals, see Liability for Damage Caused by Objects Launched into Outer Space, U.N. Doc. A/AC.105/C.2/W.2/Rev.3 (1965). Of the three proposals, only the Belgian Proposal, *supra*, made any connection between the definition of damage and the law applicable to compensation. Specifically, it proposed that "[d]amage' shall be understood to mean any loss for which compensation may be claimed under the law of the place where the loss is caused." U.N. Doc. A/AC.105/C.2/L.7/Rev.2, art. 2, at 2; see Dembling & Arons, *supra* note 39, at 378.

The debate over applicable law shaped up between those nations who thought that the law of the launching state should govern and those who thought that the law of the state of the injured party or of the state of the occurrence of the harm was the appropriate choice. See P. van Fenema, *supra* note 43, at 179; *infra* notes 64-66 and accompanying text. See generally Cheng, *supra* note 3, at 122-31 (discussing the Legal

The Soviet bloc nations⁵⁸ backed a proposal calling for application of the law of the launching state.⁵⁹ These nations

Sub-Committee's treatment of applicable law); Dembling & Arons, *supra* note 39, at 366-68 (report on the debate on applicable law).

The scope of this debate, as perceived by the United States delegate to the Legal Sub-Committee, was as follows: "As we understand it, applicable law involves the legal context which the liability convention will provide to serve as a guide in determining what elements of that particular claim are to be treated as compensable under the treaty regime." U.N. Doc. A/AC.105/PV.73, at 63 (1969) (statement of the United States).

This statement embodies the Legal Sub-Committee's approach to the definition of compensable harms. The Sub-Committee, unable to agree upon the inclusion of the term "indirect damage" or any similar term in the article I definition of damage, abandoned its discussion of the definition without ever reaching an agreement on whether any damage other than the items listed in article I would be compensable. P. van Fenema, *supra* note 43, at 33. It later addressed the issue of indirect damage in the context of applicable law. *Id.* It finally resolved that the question of indirect damages would be left to be "fought out, in each separate case, by the parties involved according to international law, and the principles of justice and equity, with the purpose of restoring the victim to the condition which would have existed if the damages had not occurred." *Id.*

This development essentially deferred the whole question of the compensability of damages to the parties to resolve in whatever manner they may choose. *Cf.* Summary Record of the Fifty-Fourth Meeting, U.N. Doc. A/AC.105/C.2/SR.54, at 11 (1966) (statement of Romania) ("[t]hus, to invoke international law was simply to defer the whole question."); Dembling & Arons, *supra* note 39, at 367 (discussing statement of Romanian delegate); *see also* N. MATTE, *supra* note 19, at 157 ("in each case, this question will have to be decided upon the basis of international law and the principles of justice and equity . . ."). As a result, the limited definition of damage in article I precludes the application of international law to the issue of which damages are compensable. *See* Gorove, *Cosmos 954: Issues of Law and Policy*, 6 J. SPACE L. 136, 142 (1978).

58. The Soviet bloc nations included the Soviet Union, Bulgaria and Hungary. *See* Cheng, *supra* note 3, at 123 n.246. "[T]he other members of the Legal Sub-Committee, including Romania" were opposed to the "Soviet Block" view on applicable law. *Id.* at 123. There seems to be no simple way to discern which states joined which bloc, Soviet or non-Soviet, in the debate on applicable law. The ambiguous nature of these labels in the first place increases the difficulty of determining which nations joined which in the Legal Sub-Committee. It is certain, however, that Hungary and Bulgaria joined the Soviet Union in the debate, while the non-Soviet bloc included at least the United Kingdom, Austria, Canada, Sweden, and Italy. *Id.*; *see also* II MANUAL ON SPACE L. 461 (list of United Nations Documents emanating from COPUOS and its Legal Sub-Committee between July 14, 1959 and November 29, 1971, when G.A. Res. 2777, *supra* note 2, the Resolution accepting the Liability Convention, was adopted, all dealing with the question of liability).

59. Cheng, *supra* note 3, at 123-24; Deleau, *supra* note 42, at 882; Dembling & Arons, *supra* note 39, at 367. It was the Hungarian Proposal, *supra* note 57, which first presented the idea of applying the law of the launching state to the determination of compensation for the purposes of the Convention. U.N. Doc. A/AC.105/C.2/L.10/Rev.1, at 2-3. The Hungarian Proposal provided that states which did not recognize immaterial damage would not have to pay for such damage.

wished to spread the "burden of damage"⁶⁰ that resulted from the advancement of space technology and use, and to retain some degree of control over those damages for which they might become liable.⁶¹

The non-Soviet bloc nations⁶² countered that such a provision would make it too easy for launching states to fashion special statutes limiting their own responsibility.⁶³ Provisions calling for the application of the law of the state of the victim⁶⁴ or of the state where the damage occurred⁶⁵ drew support

Id. at 2; see P. van Fenema, *supra* note 43, at 178. The Soviet Union argued in this vein that that imposition of "moral damages," which it perceived as a form of punishment, was a violation of sovereignty because states cannot punish each other through international law. Summary Record of the One Hundredth Meeting, U.N. Doc. A/AC.105/C.2/SR.100, at 138 (1968) (statement of U.S.S.R.); P. van Fenema, *supra* note 43, at 178. The Soviet Union therefore supported the Hungarian Proposal. *Id.*

60. See G. ZHUKOV & Y. KOLOSOV, *supra* note 2, at 105. The argument was based upon the notion that since all mankind benefits from the advancement of space technology, victim states should share with launching states in compensation for damage. *Id.* at 104.

61. For example, the Soviet bloc states wished to avoid paying compensation for "moral and immaterial damage," which is not compensable in those states. Cheng, *supra* note 3, at 124.

62. See *supra* note 58.

63. U.N. Doc. A/AC.105/C.2/SR.100, at 136-37 (statement of Italy); Dembling & Arons, *supra* note 39, at 367. "This was precisely what all the other [i.e. non-Soviet bloc] states were afraid of; for it would mean, for most of them, that their own nationals, if injured, would be grossly under compensated." Cheng, *supra* note 3, at 125; see also Deleau, *supra* note 42, at 882 (the Soviet proposal would only be acceptable to nations who had legal systems similar to that of the Soviet Union). The United States view was that:

[T]he suggestion that the law of the launching State might be relevant is inconsistent with a strict view of the sovereignty of States. Insistence on the application of some foreign system of law to injuries suffered by United States citizens in the United States would amount to a suggestion that the Constitution and the laws of the United States were somehow inappropriate, irrelevant or insufficient.

U.N. Doc. A/AC.105/PV.73, at 66 (1969). The law of the launching state was therefore unacceptable to all of the non-Soviet bloc states and Romania. P. van Fenema, *supra* note 43, at 177.

64. Belgian Proposal, *supra* note 57, at 1; see Cheng, *supra* note 3, at 122-24 (discussing the non-Soviet bloc proposals); Nanda, *Liability for Space Activities*, 41 U. COLO. L. REV. 509, 519-21 (1969). The application of the national law of the person injured was objected to because of the possibility that, in case the damage involved victims of many different nationalities, a veritable plethora of domestic laws would apply in respect of the same incident, thus complicating the procedures. P. van Fenema, *supra* note 43, at 178; see Deleau, *supra* note 42, at 882. Furthermore, the application of so many different laws is likely to produce inconsistent adjudications of the same case. P. van Fenema, *supra* note 43, at 178.

65. The law of the place where the damage occurred, or *lex loci delicti commissi*,

from most of the non-Soviet bloc states.⁶⁶

The Soviet bloc nations opposed this proposal because they were afraid that nonspace powers would fashion extremely self-serving laws, and that launching states might thereby be held internationally responsible for damages they would not be liable for under their own laws.⁶⁷ Clearly, a compromise was necessary.⁶⁸

was proposed by France. Summary Record of the Ninety-First Meeting, U.N. Doc. A/AC.105/C.2/SR.91, at 9 (1968) (statement of France). It quickly gathered support from nations wishing to apply a national law. P. van Fenema, *supra* note 43, at 179; see Cheng, *supra* note 3, at 123.

This proposal had the advantage of allowing nations the opportunity to ensure that their subjects would get the same treatment as any other victims in a given case, and that relief would "not differ according to the type of accident." Summary Record of the Ninety-Ninth Meeting, U.N. Doc. A/AC.105/C.2/SR.99, at 131 (1968) (statement of France); see P. van Fenema, *supra* note 43, at 179.

66. See *supra* note 58. The United States Proposal, *supra* note 57, called for the application of international law and the principles of justice and equity to the determination of compensation for damages. *Id.* While the United States temporarily gave support to the concept of *lex loci delicti commissi* in this context, it eventually returned to its original proposal. See Cheng, *supra* note 3, at 127.

67. Cheng, *supra* note 3, at 124-25. The worst Soviet fear seemed to be that they would be forced to pay exorbitant compensation for "moral and immaterial" damage. *Id.* The Soviet Delegate said that "in his delegation's view the draft agreement should not apply to compensation for moral damage or, in other words, pain and suffering." U.N. Doc. A/AC.105/C.2/SR.100, at 137 (1968) (statement of the U.S.S.R.). This view was based on the difference between Soviet law, which does not allow awards of punitive damages, and the civil law of countries which do allow punitive damage awards. *Id.* at 137-38.

That Soviet fear was probably well-founded. In the words of the Italian Delegate, the advantage of allowing for application of the law of the place of the accident was that it "would provide more effective protection for the victim, since the State concerned might well pass a special law in favour of its own nationals." *Id.* at 137 (statement of Italy). This concept was also expressed by reference to "full compensation" made by many of the delegates. See, e.g., Cocca, *supra* note 19, at 92. This was a central theme of the debate on applicable law. See Cheng, *supra* note 3, at 125; see also Rajski, *supra* note 17, at 253 (discussing "full compensation").

The views of many of the delegates were summed up by the delegate from Lebanon, who stated that "[w]hat he wanted was simply the law that was most favourable to the victim state." Verbatim Record of the Seventy-Fifth Meeting, U.N. Doc. A/AC.105/PV.75, at 102 (1969) (statement of Lebanon); see U.N. Doc. A/AC.105/C.2/SR.100, at 134 (1968) (statement of Czechoslovakia). "Mr. Riha . . . said that a number of speakers had stressed that the proposed convention should be as simple as possible, should be designed to protect the interests of the victim and that its provisions should be specific." *Id.* at 134; U.N. Doc. A/AC.105/C.2/SR.99, at 131 (1968) (statement of France). "The main concern of his country was for the victim, who should be ensured the same treatment whatever the circumstances. It was essential that regulations concerning the victim should be uniform and should not differ according to the type of accident." *Id.*; Cheng, *supra* note 3, at 129.

68. Dembling & Arons, *supra* note 39, at 367-68; see also Cheng, *supra* note 3, at

The Legal Sub-Committee finally adopted a compromise proposal that compensation should be determined in accordance with international law and the principles of justice and equity.⁶⁹ Although the proposal was not greeted with enthusiasm,⁷⁰ it eventually won the grudging support of the Legal Sub-Committee.⁷¹

122-31 (discussing proposals and counter-proposals on applicable law). *See generally* P. van Fenema, *supra* note 43, at 179-85 (discussing the complete "deadlock" between opposing members of the Legal Sub-Committee).

69. Liability Convention, *supra* note 1, art. XII; *see* United States Proposal, *supra* note 57, art. II(4). The debate on applicable law and the settlement of disputes dragged on through the ninth session in 1970. P. van Fenema, *supra* note 43, at 181. In that session, Italy made reference to the United States Proposal, *supra* note 57, of using international law without any reference to national law in the determination of compensation. *Id.*; *see* Summary Record of the One Hundred Forty-Ninth Meeting, U.N. Doc. A/AC.105/C.2/SR.149, at 81 (1970) (statement of Italy); *see also* Cheng, *supra* note 3, at 130 (discussing the statement of the Italian delegate).

During the ninth session, debate was mostly informal, but when the plenary meetings began again, it was clear that no agreement had been reached on these two issues. P. van Fenema, *supra* note 43, at 181. It was during this session as well that the concept of restoration "*in full to the condition equivalent to that which would have existed if the damage had not occurred*" was introduced. *Id.* at 182.

Just when "deadlock was complete," a more favorable political climate prevailed and in 1971 the two major space powers were finally induced to agree on a compromise proposal submitted by Belgium, Hungary and Brazil. P. van Fenema, *supra* note 43, at 184. This compromise proposal marked a return to the approach of the United States Proposal, *supra* note 57, and was eventually, "with some . . . stylistic changes . . . embodied in the joint Belgium, Brazil and Hungary proposal presented to the tenth session of the Legal Sub-Committee in 1971." Cheng, *supra* note 3, at 130; *see* Summary Record of the One Hundred Sixty-Second Meeting, U.N. Doc. A/AC.105/C.2/SR.162, at 71 (1971) (introduction of joint proposal).

70. Criticism of the proposal was based on the view that international law was too vague to provide sufficient guidelines for the determination of compensation. Rajski, *supra* note 17, at 252; P. van Fenema, *supra* note 43, at 185-86; *see also* Deleau, *supra* note 42, at 886 (acceptance of the compromise language was arrived at "sans enthousiasme"). The Romanian Delegate to the Legal Sub-Committee, in particular, criticized the compromise language of the compensation provision because he said that there is "no established international law in the field under consideration There were no generally recognized rules of law that were applicable" U.N. Doc. A/AC.105/C.2/SR.54, at 11 (1966) (statement of Romania).

71. Deleau, *supra* note 42, at 886. *See generally* Cheng, *supra* note 3, at 128-31. The compromise text on compensation found support in the statement of the Italian Delegate of June 11, 1971. Summary Record of the One Hundred Fifty-Sixth Meeting, U.N. Doc. A/AC.105/C.2/SR.156 (1971) (statement of Italy). He maintained that international law was clear in requiring that "reparation must, as far as possible, wipe out all the consequences" of the damage-causing event and reestablish situations which would, in all probability have existed if the damage had not occurred. *Id.* at 32; *see* U.N. Doc. A/AC.105/C.2/SR.99 (1968) (statements of Canada and Italy); U.N. Doc. A/AC.105/C.2/SR.100 (1968) (statement of United Kingdom).

When the reference to the principles of justice and equity is seen as a reference

The result is that because of inconsistencies in the definition and determination of damages, the Liability Convention is incapable of providing prompt compensation to a victim that suffers anything other than physical, psychological, or property damage or loss of life.⁷² The Cosmos 954 incident provided the first case where a claim was made by one sovereign state against another based on the Liability Convention.⁷³ Since the resolution of the Cosmos 954 incident, speculation on the recoverability of damages under the Convention has grown.⁷⁴

V. THE COSMOS 954 INCIDENT

A. Background

Cosmos 954 was an ocean surveillance satellite⁷⁵ that had

to "recognized standards and not to that of particular society," the argument that international law is too vague loses much of its validity. Rajski, *supra* note 17, at 252. As one commentator has observed,

many . . . states . . . held the erroneous idea that the matter had little to do with public international law and that, in order to achieve their objective, private international law dictated the choice of the *lex loci delicti commissi*. A number of them committed the further mistake of either believing that public international law was, in this regard, vague and deficient, or thinking that the fact space law was still "embryonic" had anything to do with the matter, as if the problem was specific to space law.

Cheng, *supra* note 3, at 125-26. See generally Dembling & Arons, *supra* note 39, at 367 (report on the progress of the Legal Sub-Committee on the issue of applicable law). This point takes on added emphasis if the term equity is used in its popular sense to signify moral justice and not in its Anglo-American legal sense. See *supra* note 55.

72. See *supra* notes 52-56 and accompanying text.

73. Schwartz & Berlin, *After the Fall: An Analysis of The Canadian Claim for Damage Caused by Cosmos 954*, 27 *MCGILL L.J.* 676, 677 (1982). There have been, however, numerous reentries by space objects into the earth's atmosphere since the beginning of space exploration. See STAFF REPORT, *supra* note 13, at 74; Facts on File, Feb. 4, 1978, at 57. Two United States spacecraft bearing nuclear reactors had reentered the atmosphere accidentally and had disintegrated. *Id.*

More recently, the nuclear-powered Soviet satellite Cosmos 1402 fell from its orbit and plunged into the atmosphere over the Indian Ocean. Most of it burned up on reentry and the remains, if any, fell harmlessly into the ocean. Wilford, *Russian Satellite Falls Harmlessly Over Indian Ocean*, N.Y. Times, Jan. 24, 1983, at A1, col. 6.

74. See, e.g., G. ZHUKOV & Y. KOLOSOV, *supra* note 2, at 67-68; Alexander, *supra* note 55; Cheng, *supra* note 3; Deleau, *supra* note 42, at 885-88; Gorove, *supra* note 57; Haanappel, *supra* note 7; Legault & Farand, *supra* note 37, at 25-30; Reis, *supra* note 19; Schwarz & Berlin, *supra* note 73; Wilkins, *supra* note 14.

75. According to United States officials, the satellite was used to conduct surveillance of United States Navy surface ships. Facts on File, Feb. 4, 1978, at 57. "The 2,727 kilogram (6,000 pound) spacecraft carried a reactor containing 45 kilograms (100 pounds) of uranium-235 which was used to generate electricity for the radar that tracked the U.S. ships." *Id.*; see Canada: Claim Against the Union of Soviet So-

been placed in orbit by the Soviet Union on September 18, 1977.⁷⁶ On January 6, 1978, the satellite was sharply depressurized for unknown reasons and began to fall.⁷⁷ The satellite's descent was noted and traced by the North American Air Defense Command⁷⁸ (NORAD), which warned countries in a position of risk beneath the path of the falling satellite.⁷⁹ On January 24, 1978, the satellite reentered the earth's atmosphere over the Northwest Territories of Canada and spread debris⁸⁰ over an area of 124 thousand square miles.⁸¹ The Soviet satellite was equipped with a nuclear reactor⁸² which caused great concern about the possibility of serious nuclear contamination in Canada.⁸³

cialist Republics for Damage Caused by Soviet Cosmos 954, *reprinted in* 18 I.L.M. 899 (1979) [hereinafter cited as Canadian Claim]; Dembling, *supra* note 36, at 129; Legault & Farand, *supra* note 37, at 2; Schwartz & Berlin, *supra* note 73.

76. The satellite had been launched into orbit 240 kilometers (150 miles) above the earth. The reactor was supposed to have been boosted by rockets to a height of 1000 kilometers (625 miles) after use. At this height it would have taken the reactor 600 years to fall back to earth. Facts on File, Feb. 4, 1978, at 57.

77. This was according to the Soviet News Agency TASS. Dembling, *supra* note 36, at 130. According to reports, at least 12 nuclear reactors like the one in Cosmos 954 had been boosted into higher orbits. It remains unknown why the rockets of Cosmos 954 failed to boost the reactor. Facts on File, Feb. 4, 1978, at 57.

78. Dembling, *supra* note 36; Legault & Farand, *supra* note 37, at 3; *see* Aikman, *Operation Morning Light*, 2 *Sentinel* 5 (1978); Galloway, *Nuclear Powered Satellites: The U.S.S.R. Cosmos 954 and the Canadian Claim*, 12 *AKRON L. REV.* 401 (1979).

The United States Air Force North American Air Defense Command (NORAD), conducts operations, using radars, cameras, and radio equipment situated throughout the world, to observe and track all objects launched into space. *See* C. CHRISTOL, *supra* note 3, at 5; Doyle, *supra* note 12, at 107. "Among other functions, the NORAD Space Defense Center also compiles predictions for satellites, rockets and other pieces of debris that are likely to survive burnup in the friction of atmospheric reentry." *Id.*

79. *See* Dembling, *supra* note 36, at 130.

80. The satellite, upon reentry, "had . . . broken up and spread across hundreds of kilometres of almost totally uninhabited snow-covered land." Aikman, *supra* note 78, at 8.

81. "The satellite reentered the earth's atmosphere at 6:53 a.m. EST January 24th over the Great Slave Lake in the Mackenzie District of Canada's Northwest Territories and disintegrated from atmospheric friction 96 kilometers (60 miles) from Yellowknife, the territorial capital." Facts on File, Feb. 4, 1978, at 57.

82. Canadian Claim, *supra* note 75, para. 2, at 902. According to Soviet correspondence with Canada following the fall, the satellite carried on board a nuclear reactor powered by uranium enriched with isotope of uranium-235. *Id.*

83. *See* Aikman, *supra* note 78, at 5; Galloway, *supra* note 78, at 401. The concern was verbalized this way by Major Aikman: "Had the intensely radioactive core disintegrated while re-entering the earth's atmosphere? Or had it crashed, with its potentially lethal fragments radiating from the depths of an all-encompassing snow? Or

This concern led to a major search and recovery operation by the Canadian Armed Forces and the Atomic Energy Control Board of Canada, called Operation Morning Light.⁸⁴ It was an airborne and ground operation designed to locate and recover or remove parts of the Soviet satellite and any nuclear debris.⁸⁵ Specifically, the Canadians' purpose was

to identify the nature and extent of the damage caused by the debris, to limit the existing damage and to minimize the risk of future damage and to restore to the extent possible the affected areas to the condition that would have existed if the intrusion of the satellite and the deposit of the debris

had both occurred?" Aikman, *supra* note 78, at 5; *see also* Dembling, *supra* note 36, at 130 ("the satellite's reactor [c]ould have produced about 100,000 curies of fission products like strontium-90 and cesium-137. These are poisonous wastes of nuclear power."); Schwartz & Berlin, *supra* note 73, at 677 (concern about the reactor led to a large-scale airborne and ground recovery operation).

84. For a comprehensive account of Operation Morning Light, see Aikman, *supra* note 78. "Fourteen minutes after re-entry was confirmed by the tracking instruments of N.O.R.A.D., President Carter of the United States telephoned Prime Minister Trudeau [of Canada] to repeat an offer of immediate technical assistance for the clean-up and recovery operations." Schwartz & Berlin, *supra* note 73, at 677; *see* Aikman, *supra* note 78, at 5. This offer was immediately accepted by the Canadians. Canadian Claim, *supra* note 75, para. 3, at 902. The operation ran from the reentry date to mid-October 1978, interrupted only by spring thaw. Schwartz & Berlin, *supra* note 73, at 677.

Phase I lasted from January 24, 1978, to April 20, 1978. Phase II lasted from April 21, 1978 to October 15, 1978 and had an original price tag of Can.\$1,921,904.55 in the statement of claim, Canadian Claim, *supra* note 75, para. 8, at 904, but this was adjusted to Can.\$1,822,687.08 by The Note of Mar. 15, 1979 from the Department of External Affairs of Canada in Ottawa to the Embassy of the Union of Soviet Socialist Republics, 18 I.L.M. 909, 910 (1979). The total costs incurred by Canada in Operation Morning Light were Can.\$12,048,239.11. Canadian Claim, *supra* note 75, para. 8, at 904.

Canada claimed as compensation only the costs incurred "in order to restore Canada to the condition which would have existed if the damage inflicted by the Cosmos 954 satellite had not occurred," consistent with its claim for an article XII measure of compensation. Canadian Claim, *supra* note 75, para. 19, at 906. The language of paragraph 19 is drawn from article XII. *Id.* The amount claimed, Can.\$6,041,174.70, included only "incremental costs" that would not have been incurred if the incident had not taken place. Thus the salaries of military and public servants involved in Operation Morning Light were not included, although overtime, transport, and maintenance costs incurred by them as a direct result of the operation were included. Thus, even though Canada spent approximately Can.\$13 million on the operation, only six million dollars were included in the claim. Canadian Claim, *supra* note 75, para. 24, at 908.

85. Aikman, *supra* note 78, at 5. The Department of National Defense of Canada led the search for nuclear debris, while the Atomic Energy Control Board of Canada (AECB) was assigned general debris recovery duties. *Id. see* Legault & Farand, *supra* note 37, at 4; Schwartz & Berlin, *supra* note 73, at 677.

had not occurred.⁸⁶

The total costs incurred by Canada in Operation Morning Light were close to Can.\$14 million.⁸⁷

Approximately one year after the incident, Canada presented a claim against the Soviet Union⁸⁸ for just over Can. \$6 million as compensation for damage allegedly caused by the

86. Canadian Claim, *supra* note 75, para. 8, at 904.

87. *Id.*

88. The Soviet Union's delayed response to the questions of the Canadian Government regarding the satellite reentry was one reason for the year's lapse between the incident and the claim. *See id.* paras. 4, 7, at 902-03. On the day the satellite entered Canadian airspace, January 24, 1978, the Canadian Government had expressed to the Soviet Ambassador its surprise at not having been warned of the satellite's possible reentry. *Id.* Later the same day, Soviet authorities offered to send a "group of specialists to ameliorate the possible consequences and evacuate remnants of the satellite." *Id.* para. 5, at 903. The Canadian response was that their "urgent need was for immediate and complete answers to the questions posed earlier on January 24, 1978." *Id.* The Soviet aid, offered January 24, was declined because the search and recovery operations had already begun. *See Legault & Farand, supra* note 37, at 5. According to certain authors, "[t]he Soviet Union may have been concerned that the search and recovery programme was partly motivated by the desire to gather intelligence about the construction of the Cosmos satellite and not for safety reasons." Schwartz & Berlin, *supra* note 73, at 677.

Substantive information of any use to the Canadian authorities did not come from the Soviet Union until May 31, 1978. Legault & Farand, *supra* note 37, at 5. The initial diplomatic response of the Soviets ignored entirely the possibility of nuclear damage to Canadian territory. *See Canadian Claim, supra* note 75, annex B, at 917 (texts of Diplomatic Communications Between the Department of External Affairs and the Embassy of the U.S.S.R.).

While the Soviet Union eventually recognized that debris from Cosmos 954 did indeed land in Canadian territory, it "practically excluded" the possibility of nuclear contamination. *Id.* annex B, at 928 (note of May 31, 1978 from the Embassy of the U.S.S.R. at Ottawa to the Department of External Affairs of Canada). The Soviet Union did not request the return of the recovered parts of the satellite. *Id.* annex B, at 916 (note of Feb. 20, 1978 from the Embassy of the U.S.S.R. at Ottawa). The Soviets stated that "[t]he Embassy is authorized to state that the objects mentioned in the Department's note of February 8, 1978 do not present interest to the Soviet side as such and, consequently, the Canadian side can continue to dispose with them at its own discretion." *Id.* The Soviet Note of March 21, 1978, from the Embassy of the U.S.S.R. reiterated that: "The Embassy is authorized to state once again that those objects as such do not present interest to the Soviet side and accordingly the Canadian side can deal with them at its own discretion." *Id.* annex B, at 922.

The Soviet disclaimers may have been an attempt to avoid paying any compensation, under article 5 of the Return Agreement, for the search and recovery operations. Article 5 of the Return Agreement provides that: "Expenses incurred in fulfilling obligations to recover and return a space object or its component parts under paragraphs 2 and 3 of this article shall be borne by the launching authority." Return Agreement, *supra* note 33, art. 5(5). Taken by itself, article 5 of the Return Agreement appears to relieve the launching state of the duty to pay the costs of the search and recovery operation so long as it does not ask for the return of the space object or

fall of the Soviet satellite, Cosmos 954.⁸⁹ The Canadians did not rely exclusively on the Liability Convention in making this claim. Instead, they based it primarily on the Liability Convention, and, secondarily, on general principles of international law.⁹⁰

its component parts. Legault & Farand, *supra* note 37, at 16; *see supra* notes 36-38 and accompanying text.

89. Canadian Claim, *supra* note 75; *see* Legault & Farand, *supra* note 37, at 14. Canada decided to depart from normal diplomatic procedure and publish the claim and the accompanying documents and diplomatic exchanges between itself and the Soviet Union. The Canadians felt that public knowledge of the claim would foster a better understanding of the principles and rules of international law which were involved. *Id.* at 14-15. The claim was drafted by an interdepartmental committee of the Departments of Justice and External Affairs of the Canadian Government. *Id.* at 6. The claim may be summarized as follows:

The main element of the claim, at least from a jurist's point of view, is the "statement of claim". This document, in a first section titled "the facts", recalls the events on a chronological basis. Mention is made of the launching of the satellite and the related notification to the Secretary General of the United Nations, the entry of the satellite into earth's atmosphere, and the scattering of debris over a wide area of Canadian territory. It analyses the communications established between Canadian and Soviet authorities in Ottawa. It explains the reasons that prompted the undertaking of search and recovery operations. The objectives and costs of these operations are fully described. A link is clearly established between the debris recovered and the launching State, the USSR. In a second section entitled "the law", the Canadian Government held the USSR responsible for the damage suffered by Canada following the fall of Cosmos 954. Other documents were included in the claim: annexes B, C, D and E contained technical data supporting the allegations made by the Government of Canada in its statement of claim.

Id. at 7-8.

90. Canadian Claim, *supra* note 75, para. 17, at 905; *see* Galloway, *supra* note 78, at 413; Legault & Farand, *supra* note 37, at 9.

Canada's claim is based jointly and separately on (a) the relevant international agreements and in particular the 1972 *Convention on International Liability for Damage caused by Space Objects*, to which both Canada and the Union of Soviet Socialist Republics are parties, and (b) general principles of international law.

Canadian Claim, *supra* note 75, para. 14, at 905. The claim itself indicated it was based jointly and severally on applicable conventions and general principles of international law, but it relied heavily on the Liability Convention as the legal basis for the claim. "In other words, the Canadian government chose to focus on the remedies available under the convention rather than on other legal grounds." Legault & Farand, *supra* note 37, at 9.

This focus is evident from paragraphs 15 through 19 of the claim. Paragraph 19 in particular addresses the measure of compensation under article XII of the Liability Convention. Paragraph 19 reads as follows:

In respect of compensation for damage caused by space objects, the Convention provides for ". . . such reparation in respect of damage as will re-

B. Analysis of the Claim

Canada's use of a secondary claim based on general principles of international law is illustrative of the problems a state faces in attempting to frame a claim for damages under the Liability Convention. Used as the basis of a claim for damages, this secondary claim is superfluous and undercuts the validity of the Convention by intimating its lack of force.⁹¹ The purposes of the Convention in establishing certain procedures would be thwarted if other channels could be used to present a claim.⁹²

The elements of the Canadian Claim included damage to

store . . . [the claimant] to the condition which would have existed if the damage had not occurred" (Article XII). In accordance with its Preamble, the Convention seeks to ensure ". . . the prompt payment . . . [under its terms] of a full and equitable measure of compensation to victims of such damage" (Fourth preambular paragraph). Canada's claim includes only those costs which were incurred in order to restore Canada to the condition which would have existed if the damage inflicted by the Cosmos 954 satellite had not occurred. The Convention also provides that "[t]he compensation which the launching State shall be liable to pay for damage under this Convention shall be determined in accordance with international law and the principles of justice and equity. . . ." (Article XII). In calculating the compensation claimed, Canada has applied the relevant criteria established by general principles of international law and has limited the costs included in its claim to those costs that are reasonable, proximately caused by the intrusion of the satellite and deposit of debris and capable of being calculated with a reasonable degree of certainty.

Canadian Claim, *supra* note 75, para. 19, at 906.

91. Schwartz & Berlin, *supra* note 73, at 707. "[T]he history of its development and its text support the contention that the *Liability Convention* is intended to be exhaustive The international law of state responsibility for unintentional intrusions was uncertain to begin with, and its application to space objects even more contentious." *Id.* The Principles Treaty was too broad to provide adequate clarity in international law on this issue, and it was for this reason that the Liability Convention was needed in the first place. *See id.* at 707-10. The history of the drafting of the Liability Convention indicates that it was intended to be exhaustive of the claimant's rights in space accident cases. That intent would be undermined if states could resort to more ambiguous sources of international law to make further claims. *Id.* at 708-09.

92. *Id.* at 708-09. Article XI(2) of the Liability Convention, *supra* note 1, is consistent with this notion in that it allows no claims outside the Convention for the same damages as those claimed under the Convention. Article XI(2) provides as follows:

A State shall not, however, be entitled to present a claim under this Convention in respect of the same damage for which a claim is being pursued in the courts or administrative tribunals or agencies of a launching State or under another international agreement which is binding on the States concerned.

Id. art. XI(2). *See generally* Schwartz & Berlin, *supra* note 73, at 711 (the general policy

property,⁹³ mitigation of or prevention of damage⁹⁴ and violation of sovereignty.⁹⁵ Of these, the primary claims were those of damage to property and mitigation of damages.⁹⁶

1. Damage to Property

The Canadian claim described as damage to property the "deposit of hazardous radioactive debris from the satellite throughout a large area of Canadian territory, and the presence of that debris in the environment rendering part of Canada's territory unfit for use."⁹⁷ It is not certain, however, that damage as contemplated in article I of the Convention did in fact occur,⁹⁸ because the Cosmos 954 satellite landed in uninhabited territory.⁹⁹ This landing resulted in alteration of the

of article XI being that claimants under the Liability Convention should not be able to resort to other channels).

93. Canadian Claim, *supra* note 75, para. 15, at 905.

94. *Id.* para. 17, at 905-06.

95. *Id.* para. 21, at 907.

96. *See generally* Legault & Farand, *supra* note 37, at 9-14 (analysis of the legal basis for the Canadian Claim). "One of the more crucial assertion[s] in Canada's claim was that regarding the existence of damage under the terms of the Liability Convention." *Id.* at 9.

97. Canadian Claim, *supra* note 75, para. 15, at 905; *cf.* Foster, *supra* note 2, at 156-57 (discussing what constitutes damage to property under the Liability Convention).

98. *See* Dembling, *supra* note 36, at 133 ("an argument may be made out that there was no such damage since there was no loss of life, no personal injuries involved, or other impairment of health"); Gorove, *supra* note 57, at 138, 140-42 (discussing the "intricate" process of assessing liability and the extent of the damage); Haanappel, *supra* note 7, at 147-48 (the Liability Convention's definition of damage "can by no stretch of the imagination" cover Canada's costs "in preventing potential damage where actual damage never occurred or remains unmeasurable"). *But see* Schwartz & Berlin, *supra* note 73, at 714-16 (discussing damage to persons and property and mitigation); Legault & Farand, *supra* note 37, at 9-10 (discussing the Canadian claim for damages).

99. Aikman, *supra* note 78, at 5, 8. Doubt about the existence of actual damage was caused by the fact that the satellite landed in almost totally uninhabited territory. *Id.* "This was in a sense fortunate, for the land between the two points consists of the Barrenlands; for the most part a treeless, uninhabited area." *Id.* at 5. In fact, one of the major discoveries of radiation, at the Thelon River site, was made accidentally by two campers who had "left the campsite on January 25 to travel by dogsled north along the Thelon River to learn more about the barrenlands." *Id.* at 8.

The unknown quality of the danger to human life was what necessitated the cleanup operation and thus the great expense to which Canada went. Schwartz & Berlin, *supra* note 73, at 716. The impossibility of making safe use of the land was called "damage to property." Legault & Farand, *supra* note 37, at 9-10; *cf.* Foster, *supra* note 2, at 156-57. Damage to property has been characterized as interference

conditions on the land which, while making the territory unsafe, made it unsafe to an unknown degree.¹⁰⁰ Unless there was damage within the article I meaning of the word, article XII was powerless to supply the compensation Canada sought in its claim despite its reference to international law and the principles of justice and equity.¹⁰¹ If the property damage issue had come before a Claims Commission pursuant to articles XIV through XX of the Liability Convention, it is conceivable that Canada could have been denied recovery on this basis.¹⁰²

2. Preventive Measures

Compensation was also sought by the Canadians pursuant to a perceived "duty to take the necessary measures to prevent and reduce the harmful consequences of the damage and thereby to mitigate damages."¹⁰³ Canada's mitigation claim consisted of search, recovery, removal, testing, and cleanup

therewith resulting in the property being rendered unfit for the use for which it was intended. *Id.*

The Liability Convention makes no direct mention of nuclear damage. See G. ZHUKOV & Y. KOLOSOV, *supra* note 2, at 102; Deleau, *supra* note 42, at 878. "In fact, the view has been expressed that the convention covers every kind of damage, including nuclear damage, but this does not follow from its text." G. ZHUKOV & Y. KOLOSOV, *supra* note 2, at 102. The majority view seems to be that nuclear damages are incorporated in the article I reference to "damage to property." See, e.g., C. CHRISTOL, *supra* note 3, at 94; S. GOROVE, STUDIES IN SPACE LAW: ITS CHALLENGES AND PROSPECTS 128 (1977); Cheng, *supra* note 3, at 115; Foster, *supra* note 2, at 155-57.

100. See Aikman, *supra* note 78, at 5.

101. See Gorove, *supra* note 57, at 142; *supra* notes 52-56 and accompanying text. "[T]he occurrence of actual damage is the precondition of the invocation of the principles of justice and equity as well as of the eventual restitution." Gorove, *supra* note 57, at 142. The argument has been made, based on the concept of a "precondition of damage," that the article I definition "can by no stretch of the imagination cover the costs incurred by Canada in preventing potential damage, where actual damage never occurred or remains unmeasurable (such as general damage to the environment)." Haanappel, *supra* note 7, at 148-49 (footnote omitted).

102. Haanappel, *supra* note 7, at 149. This is especially true given that the reference to "justice and equity" introduces an arbitrary element, i.e., the views of the claims judges, into the Convention's dispute resolution procedure. Legault & Farand, *supra* note 37, at 13.

103. Canadian Claim, *supra* note 75, para. 17, at 905-06. This reveals some ambiguity in the Canadian Claim. Paragraph 17 was printed in the section of the claim entitled "International Agreements" under subheading "(a)." Subheading "(b)" was reserved for "General Principles of International Law." Still, the mitigation claim in paragraph 17 was based on general principles of international law, with no reference at all to the Liability Convention. Most conspicuous by its absence from this paragraph is any reference to article XII, the only article of the Liability Convention

operations.¹⁰⁴ The Canadians based their claim for preventive costs on general principles of international law alone without reference to the Convention.¹⁰⁵

Consideration of the preventive cost claim, as well as the violation of sovereignty claim, requires rejection of the principle that the Liability Convention delimits the full extent of the claimant's rights in a case involving damage caused by space objects.¹⁰⁶ If Canada had claimed preventive costs based solely on the Liability Convention, its costs would not be recoverable.¹⁰⁷ However, under international law and the principles of justice and equity, preventive costs should be recoverable where, as in the Cosmos 954 incident, they are reasonable and measurable.¹⁰⁸ While this is an equitable solution, especially in the Cosmos 954 incident,¹⁰⁹ it is not possible to be

which even hints that general principles of international law might provide some relief. *See supra* note 54 and accompanying text.

104. Canadian Claim, *supra* note 75, para. 17, at 905-06.

105. *See id.* (paragraph on preventive measures).

106. *See supra* note 91.

107. This is because of the inconsistencies pointed out earlier between articles I and XII of the Liability Convention. *See supra* notes 52-56 and accompanying text.

It has been hypothesized that a space object might reenter the earth's atmosphere in such a manner as to cause "massive hysteria" in a densely populated city, "requiring hospitalization of people for shock or mental anxiety." Gorove, *supra* note 57, at 138-39. "What if some radiation injury had occurred requiring subsequent and extensive precautionary measures? Would the cost of such measures be covered in addition to damage for radiation injuries?" *Id.*

Some think it would. *See, e.g.,* Schwartz & Berlin, *supra* note 73, at 697. "[I]t would not have been unthinkable . . . that the state might have had a valid claim for damages . . . under . . . the *Liability Convention*." *Id.*; *see* Christol, *supra* note 13, at 359.

The policies of the Liability Convention, *see supra* notes 12-19 and accompanying text, require an affirmative response to Gorove's question. Schwartz & Berlin, *supra* note 73, at 717. "[I]t would be entirely inconsistent with the expressly stated policy of the *Liability Convention* not to allow compensation for costs in mitigating damages." *Id.*

108. *See* Legault & Farand, *supra* note 37, at 13; *supra* note 55. *See generally* Schwartz & Berlin, *supra* note 73, at 695-98 (discussing the prevention of future damage by the Canadians).

109. If equity is used in the popular sense of the word, *see supra* note 55, article XII of the Liability Convention would seem to require that the Canadian costs incurred by Operation Morning Light be considered by the Soviet Union.

"The purpose of compensation is, after all, to restore an economic position that would have existed had an accident not occurred" U.N. Doc. A/AC.105/PV.73, at 64 (1969) (statement of United States). Unfortunately for Canada, article XII's reference to justice and equity does not require that Canada's preventive measures be considered by the Soviet Union. Article I limits the costs which

compensated under article XII until damages as defined in article I are proven.¹¹⁰

C. *Diplomatic Resolution of the Cosmos 954 Incident*

The Canadian claim against the Soviet Union was resolved through diplomatic channels.¹¹¹ After three rounds of negotiations in which the Canadian claim was discussed "with full consideration given to its legal and factual implications," a settlement was reached.¹¹² On April 2, 1981, a protocol was signed between the Government of Canada and the Government of the Soviet Union stating that the Soviets would pay, and Canada would accept Can.\$3 million in full settlement of the claim and all matters arising out of the crash of the Soviet satellite.¹¹³ The text of the protocol gave no indication of a basis for agree-

must be considered by the Soviet Union to those incurred by the occurrence of physical, psychological, or property damage or loss of life. See *supra* notes 52-56 and accompanying text. The Canadians claimed that under general principles of international law, Canada's duty to mitigate and prevent damages would be recognized, see Canadian Claim, *supra* note 75, para. 17, at 905-06, but article I limits the application of these general principles to cases of article I damage. In the Cosmos 954 incident, it is not at all clear that there are any article I damages. See *supra* notes 98-101 and accompanying text.

110. See *supra* notes 52-56 and accompanying text.

111. See Legault & Farand, *supra* note 37, at 18-19. Article IX of the Liability Convention provides that a claim for compensation should be presented to a launching state through diplomatic channels. Liability Convention, *supra* note 1, art. IX. Furthermore, article XIV states that if no diplomatic resolution is reached within one year from the date of notice of the claim "the parties concerned shall establish a Claims Commission at the request of either party." *Id.* art. XIV. It has been suggested that such diplomatic negotiations had the purpose of defining the parameters of a dispute before any sort of tribunal took jurisdiction. Legault & Farand, *supra* note 37, at 18. "Direct diplomatic discussions, in a written or oral form, are the simplest means offered to States in order to reach a settlement, particularly if the discussions are exclusively bilateral. The aim of diplomacy in such circumstances is to prevent, reduce or resolve conflicts that may arise between the two States." *Id.* (footnote omitted).

112. Legault & Farand, *supra* note 37, at 19.

The Soviet response to Canada's claim comes [sic] one year after its formal presentation. Before the expiration of this period, the Soviet authorities indicated their willingness [sic] to begin negotiations. The first round took place in Ottawa in March 1980, the second in Moscow in June, and the third and conclusive round was held in Ottawa in November of that same year. The discussions took place at a time when East/West relations were deteriorating rapidly as a result of the invasion of Afghanistan and the western boycott of the Moscow Olympic games.

Id.

113. Protocol Between the Government of Canada and the Government of the

ment.¹¹⁴ As a result, the resolution amounts to no more than a tacit admission by the Soviets of their responsibility to the Canadians in the wake of the Cosmos 954 crash.¹¹⁵ In terms of the application of the Liability Convention, the resolution of the Cosmos 954 incident provides almost no guidance.¹¹⁶ Speculation about the measure of damages will continue¹¹⁷ because the parties did not resort to the procedural provisions.¹¹⁸

Union of Soviet Socialist Republics, Moscow, April 2, 1981, *reprinted in* 20 I.L.M. 689 (1981) [hereinafter cited as Protocol].

114. *Id.*

115. Legault & Farand, *supra* note 37, at 20. "This laconic settlement obviously does not address the matter of Soviet liability under the 1972 Liability Convention, nor does it accept or reject any particular allegations that may have been made by one party or the other during the course of negotiation of the claim." *Id.* at 19-20. The acknowledgement of responsibility by the Soviets is somewhat clouded by the actual monetary settlement. The Canadians published actual costs of approximately Can.\$13 million in connection with Operation Morning Light. Canadian Claim, *supra* note 75, para. 8, at 903-04. They claimed six million dollars. *Id.* The Soviet Union eventually agreed to pay one half of the claimed amount in the settlement. Protocol, *supra* note 114. See Legault & Farand, *supra* note 37, at 26-27.

Canada was able to recover one half of its claim against the USSR, and given the complex and controversial issues of fact and law that were involved in this case of first impression, that result appears to be satisfactory not only from a bilateral, political point of view but also from the broader legal perspective. It should help to promote the future implementation and elucidation of the Liability Convention, whatever its value as a precedent *strictu sensu*.

Id. It must, of course, be remembered that many factors weigh in the outcome of any diplomatically resolved dispute. See *id.* at 21-22.

116. Legault & Farand, *supra* note 37, at 22. "It remains uncertain the settlement of Canada's claim will set a precedent establishing a rule of international law respecting State responsibility and liability beyond the circumstances of this particular case." *Id.* At best, "[a] practice has been established under which a launching State will compensate other States that have suffered, or whose nationals have suffered damage caused by space objects." *Id.* at 26.

117. Before the Protocol, *supra* note 114, it was expected that the issue of what constitutes a "taking of property" would be resolved by the resolution of the Cosmos 954 incident. See Christol, *supra* note 13, at 347. It is evident that such clarification of the Liability Convention has not occurred. See *supra* note 73 and accompanying text.

118. Legault & Farand, *supra* note 37, at 19-23. Due to the diplomatic nature of the resolution, there was no opportunity to see how the substantive provisions of the Liability Convention would work in the context of a satellite reentry and crash. *Id.* "Furthermore, it should be recognized that the Cosmos 954 claim was settled before a formal legal dispute had arisen between the parties." *Id.* at 22-23.

Considering that Canada received approximately one-half of the damages claimed which amounted to approximately one-half of the actual expenses of Operation Morning Light, it is evident that the only thing established by the Cosmos 954 resolution is that the victim might recover up to one-quarter of the costs incurred in mitigation of damages in a case like this one. See *id.* at 19-23.

VI. PROPOSAL

The Cosmos 954 incident focused international attention on the Liability Convention,¹¹⁹ but failed to provide any guidelines regarding what damages are compensable under the Convention.¹²⁰ As a result, a victim of space object damage is no more certain to recover "full compensation" under the Liability Convention today than it was before the Cosmos 954 incident.

The Legal Sub-Committee's treatment of articles I and XII demonstrates a disregard for the necessary consistency between the definition of damages and the measure of compensation.¹²¹ This disregard comes from the perception of the delegates that consideration of such terms as indirect damage or delayed damage, in a discussion of damages,¹²² would result in no agreement at all on the definition.¹²³ Unfortunately, the re-

119. See *supra* note 74. Volume Six of the Journal of Space Law was devoted entirely to the Cosmos 954 incident and the liability resulting from space object reentries.

120. See *supra* notes 116-18 and accompanying text.

121. See *supra* notes 57-74 and accompanying text.

122. "Indirect damage" and "delayed damage" are terms used to describe injuries which are not the direct result of the harmful event but derive therefrom due to conditions existing before the event or delayed reactions to the event. See C. CHRISTOL, *supra* note 3, at 95-97; Christol, *supra* note 13, at 358-65; Foster, *supra* note 2, at 155-60.

123. C. CHRISTOL, *supra* note 3, at 117. "[H]ad it not been for the decision to use the formulation on applicable law set out in Article 12, namely, international law and the principles of justice and equity, . . . an extended effort to review and agree on municipal law standards would have prevented reaching a final agreement." *Id.*; see Japan: Working Paper, U.N. Doc. A/AC.105/C.2/L.61 and Corr.1, reprinted in Report of the Legal Sub-Committee on the Work of its Eighth Session to the Committee on Peaceful Uses of Outer Space, U.N. Doc. A/AC.105/58, annex II, at 31 (1969).

In order to avoid endless discussion on whether to include those terms of 'indirect damage' and 'delayed damage' in the definition of damage, we should discuss the problem of these two terms in the context of the manner in which the damage occurred, by introducing the notion of adequate relationship of cause and effect or so called 'the existence of proximity' in the Anglo-American laws.

Id. This Japanese solution ignores the problem of the narrow definition of recoverable damages in article I.

Use of the concept of causation to allow consideration of indirect damage or delayed damage has been the subject of some comment. See, e.g., C. CHRISTOL, *supra* note 3, at 96; Christol, *supra* note 13, at 361-62; Foster, *supra* note 2, at 157-58. However, this reliance on the concept of causation merely defers the determination of the recoverability of damages to the parties in a particular case. See *infra* note 143 and accompanying text.

sulting definition eliminated any possibility that damages other than those enumerated in article I would ever be recoverable.¹²⁴ Article I does not include the concepts of indirect damage or delayed damage in its definition.¹²⁵ However, article XII, by incorporating international law and the principles of justice and equity, necessarily encompasses indirect damage and delayed damage concepts.¹²⁶

The Permanent Court of International Justice,¹²⁷ in the *Case Concerning the Factory at Chorzow*,¹²⁸ addressed the issue of the measure of damages in international law. That court stated that:

reparation must, as far as possible, wipe out all the consequences of the illegal act and reestablish the situation which would, in all probability, have existed if that act had not been committed. Restitution in kind, or, if this is not possible, payment of a sum corresponding to the value which a restitution in kind would bear. . . .¹²⁹

124. See *supra* notes 49-57 and accompanying text.

125. Liability Convention, *supra* note 1, art I; see *supra* notes 122-23.

126. See C. CHRISTOL, *supra* note 3, at 97. "International law, rather than municipal law, will be invoked in reaching a decision as to the exact amounts to be recovered as damages." *Id.* This reliance on international law as expressed in article XII of the Liability Convention as the method of securing recovery for indirect damages ignores the precondition of actual damage required by article I of the Convention. See *supra* notes 98-102 and accompanying text.

127. Often called the "World Court," the Permanent Court of International Justice (PCIJ) was created by the Statute for the Permanent Court of International Justice, 6 L.N.T.S. 391 (1921); see I. BROWNLIE, *PRINCIPLES OF PUBLIC INTERNATIONAL LAW*, 712-13 (3d ed. 1979). The Covenant of the League of Nations, which became Part I of the treaties of peace signed between the Allied and the Axis powers in 1919 and 1920, see M. HUDSON, *THE PERMANENT COURT OF INTERNATIONAL JUSTICE: 1920-1942*, 102 (1943), did not have the authority to create a permanent judicial organ. However, the Covenant did lay the groundwork for a judicial organ by imposing on the Administrative Council of the Permanent Court of Arbitration the obligation of drawing up plans for what was to be called the Permanent Court of International Justice. See S. ROSENNE, *THE WORLD COURT: WHAT IT IS AND HOW IT WORKS* 19-26 (3d ed. 1973). The PCIJ was closely connected to the League of Nations but was not an organ of the League. Its procedures were governed by the Rules of Procedure, adopted by the League in 1936 and taken over, virtually unchanged, by the United Nations and the present International Court of Justice. *Id.* at 22.

The PCIJ saw 66 cases in 18 years, 38 being contentious and 28 advisory. Twenty-seven advisory opinions and 32 judgments were handed down by the PCIJ and 12 cases were settled independently of that body. *Id.* at 23.

128. (Ger. v. Pol.), 1928 P.C.I.J., ser. A, No. 17 (Judgment of Sept. 13). At the time of the *Chorzow Factory Case*, the PCIJ was still the judicial counterpart of the League of Nations. See ROSENNE, *supra* note 127, at 22.

129. 1928 P.C.I.J., ser. A, No. 17, at 47.

Article XII already reflects this concept by providing "such reparation . . . as will restore the person . . . on whose behalf the claim is presented to the condition which would have existed if the damage had not occurred."¹³⁰ The definition of damage in article I must be made consistent with the measure of compensation in article XII; it must provide for damages to be determined in accordance with international law.¹³¹

In modern times,¹³² international courts and tribunals have had little trouble assessing damages according to international law.¹³³ The principle of reparation enunciated in *Chorzow Factory* provides an adequate basis for defining damages in the international legal context.¹³⁴ If the definition of damages in the Liability Convention were consistent with the definition in *Chorzow Factory*, it would also be consistent with the definition in article XII and the Convention could more adequately achieve its purpose.¹³⁵

The dominant purpose of the Liability Convention is to provide full and fair compensation to victims of space related damage.¹³⁶ Because international law provides an adequate system for the determination and compensation of damages in international law, damages should not be defined as narrowly as they are defined in article I. Instead of limiting the Liability Convention to a definition of damages that has the distinct possibility of depriving deserving victims of compensation, the definition should be expanded to allow recovery for damages as defined by international law. The proposed definition would thereby replace the limited article I definition with a definition based on accepted principles of reparation and compensation. The proposed definition will remedy the problem left by the Return Agreement, which relieved the launching state of the obligation to pay the cost of cleanup when it de-

130. Liability Convention, *supra* note 1, art. XII.

131. This would remove the inconsistency between the limited article I definition of damage and the broader definition of compensation in article XII. *See supra* notes 72-74 and accompanying text.

132. "In modern times" means at least since the Jay Treaty arbitrations in 1794. Cheng, *supra* note 3, at 126.

133. *Id.*

134. *Id.*

135. *See supra* note 131.

136. *See supra* notes 14-19 and accompanying text.

clined to request return of the space object.¹³⁷ The principle that the launching state should be responsible for its space object at all times after it is launched¹³⁸ is defeated unless the launching state is held responsible for the cleanup, thereby relieving the victim state of that burden.¹³⁹ Under the proposed definition, preventive measures and cleanup costs would be recoverable where they are measurable and reasonable.¹⁴⁰

In drafting the Liability Convention, and in particular the definition of damage caused by space objects, the Legal Sub-Committee overlooked the fundamental premise on which the international law of outer space is based.¹⁴¹ At its inception, COPUOS agreed to apply international law, including the Charter of the United Nations, to outer space.¹⁴² However, instead of looking to international law to define damages in the Liability Convention, the Legal Sub-Committee drafted its own extremely limited definition, and relied on a reference to international law and the principles of justice and equity in article XII to broaden the article I definition.¹⁴³ The result is confu-

137. See Return Agreement, *supra* note 33, art. 5(5); *supra* notes 35-38 and accompanying text.

138. See Diederiks-Verschoor, *Harm Producing Events Caused by Fragments of Space Objects (Debris)*, in PROCEEDINGS OF THE TWENTY-FIFTH COLLOQUIUM ON THE LAW OF OUTER SPACE 1, 3 (1982).

139. *Id.* This result would be consistent with the "principle of risk liability" established by the Liability Convention. *Id.*

140. See *supra* note 108 and accompanying text.

141. The international law of outer space is to be based on general principles of international law including the Charter of the United Nations. See *supra* notes 21-22 and accompanying text.

142. See *supra* note 22.

143. See *supra* notes 70-74 and accompanying text. The general definition intentionally leaves many issues unresolved "because it is impossible to enumerate—and it would have been impossible to agree on—all the various kinds of damage for which there would be compensation." P. van Fenema, *supra* note 43, at 31. "Some measure of precision in this respect could only be expected from a national law, where a body of jurisprudence usually has given a more or less defined meaning to 'damage,' in the sense of what is compensable and what not." *Id.* at 31-32.

The question of what kinds of damage will give rise to compensation was further debated, together with the question of law or the principles to be applied to the assessment of damages. *Id.* at 33. In essence, the question of what damages would be compensable under the Liability Convention was meant to be deferred to the parties through either diplomatic resolution or the Claims Commission. P. van Fenema, *supra* note 43, at 33; see U.N. Doc. A/AC.105/C.2/SR.54, at 11 (1966) (statement of Romania). However, failure to defer the definition of what constitutes that damage confuses the process because compensable damages are now unreasonably limited to those listed in article I. See *supra* notes 101-02 and accompanying text.

sion for states which suffer cleanup and preventive measure costs.¹⁴⁴ The burden of bearing cleanup costs is left with the victim state.

CONCLUSION

The Liability Convention was completed after ten years of discussion and debate in the Legal Sub-Committee of COPUOS.¹⁴⁵ A provision for the determination of compensation was arrived at through a compromise between members of the Legal Sub-Committee who sharply disagreed on the law to be applied to such determination.¹⁴⁶ As a result of this compromise, the Liability Convention does not make clear what damages will be recoverable in accidents involving space object damage.¹⁴⁷ This ambiguity undercuts the basic purpose of the Liability Convention, which is to provide effective rules and procedures for the prompt payment of compensation to victims of damage caused by space objects.¹⁴⁸

The uncertainty engendered by the compensation provision of the Liability Convention can be remedied by defining damage, for the purposes of the Convention, consistently with the compensation provision.¹⁴⁹ Under such a definition, international law and the principles of justice and equity would be relied on both to define damage and to determine compensation for that damage. The Claims Commission and the diplomatic negotiators in a given case would then be better able to arrive at an internationally recognized damage recovery and the purpose of the Liability Convention would be more nearly met.

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144. *See supra* notes 103-04 and accompanying text.

145. *See supra* notes 23-44 and accompanying text.

146. *See supra* notes 57-72 and accompanying text.

147. *See supra* notes 72-74 and accompanying text.

148. *See supra* notes 14-19 and accompanying text.

149. *See supra* notes 119-44 and accompanying text.