

9th MANFRED LACHS SPACE LAW MOOT COURT COMPETITION 2000

The Case Concerning a Nuclear Powered Satellite (Homeria v. San Marcos)

1. INTRODUCTION

The **semi finals** of the 9th Manfred Lachs Space Law Moot Court Competition were held in Rio on Tuesday 3 October 2000 between Hamline University (USA) (Bryant Tchida and Allen Blair) as Applicant and the National University of Singapore (Valerie Phua and Tan Kok Peng) as Respondent. The semis were judged by Professors F. Lyall, P. Larsen and T. Kosuge. Hamline University (USA) was the winner and moved on to the Finals.

The **finals** were held on Thursday 5 October at the First Court of Justice of Rio, between Hamline University (USA) as Applicant and the University of Paris XI (France) (Odile Giraud, Oliver Huth & Marie Diop) as Respondent. President Guillaume, Judge Rezek and Judge Vereshchetin of the International Court of Justice judged the finals, which were won by the **University of Paris XI**. The Law Offices of Sterns and Tennen provided the award for the Best Oralist, won by **Allen Blair** of the USA, and the new "Eilene M. Galloway Award for Best Brief", consisting of a certificate and a sum of money, sponsored by Ms. Marcia Smith and Prof. Diederiks-Verschoor was won by the Applicant brief of the **University of Paris XI**. Prof Gorove had sent specially dedicated copies of the Journal of Space Law which were presented to the 3 Judges. A **reception and dinner** were hosted by the Local Organizing Committee at the beautiful Palacio da Cidade. Around 130 guests attended, and Dr. Antonio Guerreiro, head of the Division of Special Themes at the Brazilian Ministry of External Relations gave a dinner speech.

The Institute is most grateful to all those who helped making the Moot Court a success: especially the Local Organizing Committee, the Brazilian Society for Aerospace law and Prof Monserrat Filho. IISL is also very fortunate with the continued support of the Members of the International Court of Justice in judging the Finals of the Competition.

2. THE PROBLEM

Maglandia, San Marcos and Homeria are neighboring states. Homeria is an island archipelago comprised of hundreds of small islands spread over an area of approximately 300 kilometers by 1,000 kilometers. The three nations share the same language and religious heritage, but developed distinct religious sects and linguistic dialects, as well as similar but distinct cultural traditions and practices. During the Cold War, Maglandia officially was neutral, but San Marcos and Homeria each received substantial technical and economic aid from the competing superpowers.

The relations between San Marcos and Homeria were characterized as "diplomatic brinkmanship." Both states have taken actions which have instigated diplomatic crises. However armed hostilities were averted, largely through the efforts of Maglandia acting as a neutral mediator. On occasion, the mediated resolution of a diplomatic crisis has included a program for cooperation between the states in various economic and technological areas. Nevertheless, San Marcos and Homeria have continued to be very suspicious of each other, and diplomatic incidents often have been accompanied by inflamed rhetoric.

Maglandia developed an independent space program, including an operational launch system, which competes on the open market as a launch services provider, offering launches of payloads into both low Earth orbit (LEO) and geostationary orbit (GSO). The launches are conducted from a facility located on a small island in the territory of Homeria, pursuant to a 99 year lease of land from the Homeria government. The tracking and control (T&C) center for the Maglandia launches, however, is located in the territory of San Marcos, also pursuant to a 99 year lease of government property from San Marcos. Both of these leases were executed as intergovernmental agreements on the same day in January, 1990, as part of a Maglandia-mediated resolution to a diplomatic incident between San Marcos and Homeria. The leases contain identical provisions except for the legal description of the leased premises and the specific purposes for which the premises can be used. Included among the lease terms is a provision prohibiting discrimination against or interference with the use of leased facilities for the launch or T&C of any payload. The two agreements were notified to the United Nations as treaties.

In 1992, the government of Homeria established a program for a geostationary telecommunications satellite named BARTSAT. The BARTSAT was launched using Maglandia's launch services in 1995. BARTSAT provides a full range of telephony services throughout the island archipelago, which otherwise lacks an effective and complete terrestrial communications infrastructure. The satellite had an intended useful life of 10 years, and cost US\$100 million, including launch costs. Maglandia's standard form of launch services contract was utilized for this launch, and provided that Homeria is the "launching State" of the payload, which was carried on the national registry of Homeria and filed with the United Nations pursuant to the Registration Convention. Furthermore, pursuant to the standard form of contract, Homeria agreed to be primarily responsible for the satellite commencing thirty days following its successful orbital insertion.

On December 15, 1999, pursuant to a standard form of launch services contract, Maglandia launched a telecommunications satellite, LISAT, into a GSO for SMT&T, an agency of the San Marcos government. LISAT was spaced one degree from BARTSAT on the GSO. LISAT was intended to provide commercial television and voice and data communications to customers throughout the geographic region, including customers in Maglandia, San Marcos and Homeria. On January 1,

2000, LISAT experienced a malfunction, which resulted in an intermittent loss of control over the physical positioning of the spacecraft. That is, the satellite developed a perturbation in its orbit and as a result, the satellite periodically intersected with the orbital slot occupied by BARTSAT. Nevertheless, LISAT remained capable of performing approximately 95% of its intended commercial telecommunications functions, and did not directly interfere with the functioning of BARTSAT.

Homeria government officials were concerned with the safety and security of BARTSAT, and engaged in close active monitoring of LISAT. This required the stationing of several additional personnel at the Maglandia tracking and control facility in San Marcos. Based upon such monitoring, the BARTSAT periodically was maneuvered, as deemed necessary as a preventative measure, to avoid either a collision with or harmful interference by LISAT. These maneuvers were very expensive, and interfered with the ability of BARTSAT to perform all its intended functions during the conduct of the maneuvers. These maneuvers also required the premature use of BARTSAT'S on-board attitude control and positioning propellants, thereby reducing the expected useful life of the satellite by an estimated two and one half years. Nevertheless, at no time did LISAT intersect the segment of the orbit where BARTSAT had been immediately prior to a preventative repositioning maneuver.

The perturbed orbit of LISAT slowly but inexorably extended further and further from the original orbital slot. Homeria held discussions with many other states and private satellite operators, but San Marcos was not invited and did not request to be included in these discussions. The consensus of the participants was that LISAT posed a substantial risk to other satellites. No other state or satellite operator, however, had engaged in active maneuvering of its satellite to avoid a collision with or harmful interference from LISAT.

On July 1, 2000, Homeria sent a diplomatic note to San Marcos requesting that LISAT be removed from the GSO as a safety precaution "for the benefit of the international community," by either de-orbiting the satellite or boosting it to a higher "parking" orbit. This diplomatic note stated that in the event San Marcos refused to remove LISAT from the GSO, Homeria reserved the right to take whatever action it deemed necessary for the protection of its citizens and property. San Marcos responded through official channels, and declined to remove LISAT from the GSO. The San Marcos response claimed that the satellite remained "95% functional" and that the alleged danger was exaggerated.

Three days after San Marcos issued its response, the BARTSAT exploded. Fragments of the BARTSAT struck LISAT, rendering the satellite completely useless. In the first few days following the explosion of BARTSAT, the popular press reported that measurements by scientists from around the globe indicated the presence of an abnormally high degree of radiation on the portion of the orbital arc occupied by BARTSAT immediately preceding the explosion. San Marcos claimed that the explosion of BARTSAT was intentional by Homeria, and for the precise purpose of destroying LISAT. Officials of

Homeria issued a statement claiming that the explosion was purely accidental, and denied any intent to destroy the property of another state. The official statement of Homeria further claimed that it could not account for the reports of abnormal radiation readings. Privately, Homeric government sources suggested that LISAT may secretly have had a nuclear power source.

The statement of Homeria inflamed the population of San Marcos, and massive demonstrations against Homeria took place in every major city in San Marcos. An angry mob descended on the Maglandia T&C facility, and removed Homeria's personnel from the building. In addition, the mob seized the computers and records of Homeria located within the facility, and turned the property over to the San Marcos national police. In an official public statement, San Marcos announced that a review of these records revealed that BARTSAT was powered by a nuclear power source. That information was not contained in either the national registry of Homeria nor disclosed in the U.N. registry. San Marcos and Homeria denounced each other for "flagrant and blatant violations of international law."

Following the disclosure of its own records, Homeria conceded publicly that BARTSAT did in fact contain a nuclear power source. Homeria claimed that the use of a nuclear power source was reasonable for the satellite, that disclosure was not required, and that it acted in conformity with international law. In addition, Homeria claimed that the nuclear power source was not the cause of the explosion of BARTSAT. Tensions between Homeria and San Marcos reached an unprecedented intensity. Maglandia interceded, and offered to act as a mediator if both sides would agree to maintain the status quo. Through exhaustive diplomatic efforts, Maglandia was able to obtain agreement to a temporary cooling off period, and armed hostilities were averted.

Homeria and San Marcos each convened separate Boards of Inquiry to investigate the circumstances of the BARTSAT explosion. Officials of Homeria declined an invitation to participate in the San Marcos investigation, asserting that San Marcos already had all available information in the materials which were "improperly seized" at the Maglandian facility. Officials from San Marcos were not invited to participate in the Homeric investigation, for the stated reason that such persons could not add any "relevant" information. The San Marcos Board concluded that the BARTSAT explosion centered in the nuclear power source, but could not reach a conclusion as to the precise event which triggered the explosion or whether the explosion was caused intentionally. The Board of Homeria also concluded that the explosion centered in the nuclear power source. However, the precise cause was identified as a lack of sufficient coolant as a result of the premature depletion of the coolant by the maneuvers to avoid a collision with the LISAT. The report emphatically concluded that the explosion was an accident.

Maglandia was unable to mediate a resolution of the crisis. Both San Marcos and Homeria claimed damages against the other. Through the good offices of Maglandia, the parties agreed to submit the dispute to the

International Court of Justice for resolution. The parties also agreed to the Compromis.

San Marcos and Homeria are members the United Nations and the ITU, and are parties to the Outer Space Treaty, the Return and Rescue Agreement, the Liability Convention, the Registration Convention, and the Moon Agreement. In addition, the delegation of San Marcos to the U.N. General Assembly favored adoption of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space, but the delegation of Homeria was not present at the General Assembly on the day the principles were adopted. All parties to this dispute are self-insured. There has been compliance with all procedures of the ITU. There are no issues relating to the jurisdiction of the Court, the standing of the parties, or the monetary amount of damages being sought by either party. In addition, the parties are conducting separate diplomatic discussions to resolve issues pertaining to the exclusion of Homertian personnel from the Maglandia T&C facility, and the seizure of Homeria's property.

ISSUES

The following issues are presented by the Compromis for decision by the Court:

- 1.
2. Is San Marcos in breach of international law for failing and refusing to remove LISAT from the GSO?
3. Is San Marcos liable under international law for the premature loss of BARTSAT and the expenses of and lost revenues incurred during the monitoring and maneuvers to avoid a collision with LISAT?
4. Is Homeria in breach of international law for launching the BARTSAT with a nuclear power source without first disclosing its existence?
5. Is Homeria liable under international law for the damage to LISAT?

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3. WINNING BRIEFS

A. MEMORIAL FOR HOMERIA

AGENTS

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ARGUMENT

I. SAN MARCOS BREACHED INTERNATIONAL LAW BY FAILING AND REFUSING TO REMOVE LISAT FROM THE GEOSTATIONARY ORBIT.¹

San Marcos breached international law when it failed and refused to remove LISAT from the GSO. San Marcos was inefficiently using limited space in the GSO in violation of international law. San Marcos also harmfully interfered with other states' beneficial and efficient use of the GSO in violation of international law. Additionally, San Marcos harmfully contaminated the GSO in violation of international law. Finally, San Marcos violated the principle that space should be used peacefully and in a spirit of cooperation.

A. San Marcos had a duty to use the GSO efficiently because the GSO is a limited resource.

The GSO, essentially an elliptical volume of outer space² located above the Earth's equator, is a valuable³ but limited natural resource.⁴ As a limited resource, both

conventional and customary international law prohibit the inefficient use of the GSO.

1. Conventional law prohibited San Marcos's inefficient use of the GSO.

Read together, both the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies⁵ and the International Telecommunications Union Convention⁶ prohibit wasteful or inefficient use of the GSO.⁷ Article I of the Outer Space Treaty states that "the exploration and use of outer space . . . shall be carried out for the benefit and in the interests of all countries" because outer space is the "province of all mankind."⁸ While there has been scholarly debate about what the "province of all mankind" means, Article I goes on to assert that at a minimum, access to and use of outer space shall be free to all countries, "on a basis of equality and in accordance with international law."⁹

Since the GSO is a limited resource, beneficial use of the GSO on a basis of equality for all states demands that states pay "due regard to the corresponding interests of other states."¹⁰ In order to pay due regard to the interests of other states, the GSO "must be used efficiently and economically . . . so that countries or groups of countries may have equitable access [to it]."¹¹ Indeed, the ITU Convention says, "members shall endeavour to limit the number of frequencies and the spectrum space used to

¹ Hereinafter GSO.

² See BIN CHENG, *STUDIES IN INTERNATIONAL SPACE LAW* 81 (1997). Although no express international agreement exists that defines where outer space begins, a practice has grown up among States defining outer space as the region where artificial satellites are able to orbit. *Id.* Indeed, a careful study of the discussion on outer space in the United Nations reveals that States are in general agreement that orbiting satellites in their orbits are in outer space. *Id.*

³ See Michael Bourely, *The Contributions Made by International Organizations to the Formation of Space Law*, 10 J. SPACE L. 139, 149 (1982). See also Background Paper for the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Efficient Use of the GSO, at 4 U.N.DOC. A/CONF. 101/BP/7 (1981); Michael J. Finch, *Limited Space: Allocating the Geostationary Orbit*, 7 J. INT'L L. BUS. 788, 788 (1986) (stating that there are at least seven beneficial and profitable uses for the GSO: communications, meteorology, earth and environmental monitoring, navigation and aircraft control, testing of new systems, astronomy, and data relay).

⁴ See Kurt Anderson Baca, *Property Rights in Outer Space*, 58 J. AIR L. & COM. 1041, 1073 (1993) (noting that use of the GSO is limited by the potential for physical interference and the potential for radio frequency interference); Jannat C. Thompson, *Space for Rent: The In-*

ternational Telecommunications Union, Space Law, and Orbit/Spectrum Leasing, 62 J. AIR L. & COM. 279, 284 (1996) (noting that satellites must be spaced a safe distance apart for their own protection and ability to function effectively).

⁵ *Opened for signature* Jan. 27, 1967, 610 U.N.T.S. 206 [hereinafter Outer Space Treaty].

⁶ *Opened for signature* Oct. 25, 1973, 28 U.S.T. 2497 [hereinafter ITU Convention]. The ITU is an agency of the U.N. that provides a regime for regulating and allocating radio frequencies and satellite orbits. See Michael S. Straubel, *Telecommunication Satellites and Market Forces: How Should Geostationary Orbit be Regulated by the F.C.C.*, 17 N.C. J. INT'L L. & COM. REG. 205, 209 (1992).

⁷ The ITU Convention and regulations promulgated under its authority have the binding force of treaties on the signatories of the Convention. See generally CARL Q. CHRISTOL, *THE MODERN INTERNATIONAL LAW OF OUTER SPACE* 547-604 (1982); MILTON L. SMITH, *INTERNATIONAL REGULATION OF SATELLITE COMMUNICATIONS* 23-44 (1990).

⁸ Outer Space Treaty, *supra* note 5, art. I.

⁹ *Id.* at art. I.

¹⁰ *Id.* at art. IX.

¹¹ ITU Convention, *supra* note 6, at art. 33.

the minimum essential to provide in a satisfactory manner the necessary services."¹²

In this case, as LISAT began to wander ever further from its allotted orbital slot, it began to function at less than 100% of its capacity. Accordingly, San Marcos was violating the requirement that states use the minimum space needed to meet their telecommunications goals.

Additionally, LISAT was not operating efficiently in economic terms. San Marcos foisted external costs of LISAT's faulty operation on Homeria.¹³ Homeria spent valuable personnel resources and time preventatively maneuvering BARTSAT in order to avoid a possible collision with LISAT. This maneuvering was expensive and interfered with BARTSAT's functionality. This limited functionality in turn impacted Homeria's economy, since BARTSAT was serving as the backbone for Homeria's terrestrial communications infrastructure.¹⁴ The maneuvering also reduced the expected useful life of BARTSAT by 2 _ years, at a cost of \$25 million. Finally, the maneuvering resulted in the untimely destruction of BARTSAT.

San Marcos argues that it complied with all of the ITU's regulations when it launched LISAT and, therefore, that it has effectively complied with the mandates of the ITU Convention. San Marcos also argues that because LISAT was providing commercial communications to customers throughout the geographic region, its use of the GSO was benefiting all humankind. Finally, San Marcos excuses LISAT's complicity in causing expenses related to BARTSAT's maneuvering, claiming that LISAT never intersected BARTSAT's immediate prior orbit.

These arguments, however, fall short of exculpating San Marcos. The ITU Convention and the Outer Space Treaty provide a conventional framework that mandates the continuing efficient use of the GSO. If these efficient use mandates applied only to the original status of satellites, irrespective of how inefficient they are currently operating, the conventions would be rendered meaningless. Additionally, although LISAT was serving a wide range of customers, it is inequitable to argue that San Marcos's wasting of a valuable communal resource was excused simply because San Marcos was gaining a financial benefit. Finally, a consensus of States considering San Marcos's wasteful use of the GSO concluded that LISAT was a threat to other satellites. The preventative maneuvering of BARTSAT was justifiable under these circumstances. In short, San Marcos's inefficient use of the GSO breached conventional law.

¹² *Id.* Although this mandate applies, on its face, to use of the radio spectrum, article 4 of the Convention reinforces that this sort of "rational use" should be applied broadly to all telecommunications activities. *Id.* at art. 4.

¹³

¹⁴ See Roy Carlton Howell, *International Telecommunications and the Law: The Creation of Pan African Satellites*, 31 HOW. L. J. 575, 576 (1988) (telecommunications technology can increase agricultural and industrial productivity and enhance the quality of life).

2. Customary law prohibits the inefficient use of the GSO.

The idea that common resources must be used efficiently is also supported by customary international law.¹⁵ Many jurists argue that outer space, as the "province of mankind," is *res communis*, or a global commons.¹⁶ Whatever the exact implications of this label are, the concept that certain common resources must be used beneficially and efficiently is not new and is followed by states in practice.¹⁷ Indeed, states treat the high seas and Antarctica, as well as outer space as global concerns.¹⁸ In the Icelandic Fisheries Case, this court recognized that "states have an obligation to take full account of each other's rights...the former laissez-faire treatment of [the limited resources] of the high seas has been replaced by a

¹⁵ Customary Law is generally thought of as having two elements: 1) the *corpus*, which is usage or conduct by states that embodies a rule, and 2) the *animus* or psychological element where "a State is of the conviction that the rule embodied in usage is binding (*opinio juris*)." BIN CHENG, *STUDIES IN INTERNATIONAL SPACE LAW* 137-138 (1997). Cheng goes on to argue, however, that *opinio juris* is the functional element and effectively displaces the *corpus* element. *Id.* at 139.

¹⁶ See GYULA GAL, *SPACE LAW* 122 (1969) (arguing that the principle of the *res communis* status of outer space has found support both in theory and in official declarations). Some scholars have even suggested that the principle that states must have equal freedom to use, explore, and exploit the *res communis* areas of the universe is a preemptory norm of general international law, or *jus cogens*. See Carl Q. Christol, *Judge Manfred Lachs and the Principle of Jus Cogens*, 22 J. SPACE L. 33, 42-43 (1994).

¹⁷ See Jefferson H. Weaver, *Illusion or Reality? State Sovereignty in Outer Space*, 10 B.U. INT'L L.J. 203, 233 (1992).

¹⁸ See United Nations Convention on the Law of the Sea, *opened for signature* Dec. 10, 1982, U.N. Doc.A/CONF.62/122, 21 I.L.M. 1261 (1982) [hereinafter LOS Convention] (recognizing the desirability of establishing the efficient and equitable utilization of the seas and oceans); Antarctic Treaty, *opened for signature* Dec. 01, 1959, 402 U.N.T.S. 71. See also DELBERT D. SMITH, *SPACE STATIONS: INTERNATIONAL LAW AND POLICY* 152 (1970); CARL Q. CHRISTOL, *SPACE LAW PAST, PRESENT, AND FUTURE* 71 (1991) (noting that the "province of mankind" provision was a species of freedom-of-the-seas provision); MYRES S. MCDUGAL, HAROLD LASSWELL AND IVAN VLASIC, *LAW AND PUBLIC ORDER IN SPACE* 301-311 (1963) (arguing that states which want to use outer space must do so reasonably). See also PATRICIA W. BIRNIE AND ALAN E. BOYLE, *INTERNATIONAL LAW AND THE ENVIRONMENT* 425 (1992) (noting that states have begun to recognize that exploitation of common resources "must be conducted on a rational basis, that is, with conscious, reasonable, objectives, taking account of scientific advice").

recognition of a duty to have due regard to the rights of other states."¹⁹

San Marcos had the right to have LISAT in the GSO so long as LISAT was using a reasonable amount of space. In this case, however, San Marcos was acting as if it could use the GSO with *laissez-faire* abandon. LISAT was taking up an ever-increasing expanse of space to perform less than 100% of its intended functions. Since there is only a limited amount of space available in the GSO, it was vital for San Marcos to carefully circumscribe its use of that orbit.

San Marcos retorts that its use of the GSO was reasonable because it was servicing a number of customers, and no other state was in immediate need of the space used by LISAT. The fact that LISAT was servicing a number of customers, however, does not make its use of the GSO *prima facie* reasonable. In fact, at least one other State did desire to use the extra space that LISAT was occupying—Homeria. Accordingly, LISAT was unreasonably and inefficiently using space in the limited GSO contrary to principles of customary law.

B. San Marcos's harmful interference with other states' beneficial and efficient use of the GSO in violated international law.

Straying ever further from its allotted orbital slot, LISAT was harmfully interfering with other states' beneficial and efficient use of the GSO. Since the GSO is the "province of mankind" or a global commons, all states have the right to beneficially and efficiently use the GSO free from harmful interference. This right is supported by both conventional law and customary law.

1. San Marcos breached conventional law by harmfully interfering with other states' beneficial and efficient use of the GSO.

The Outer Space Treaty and the ITU Convention prohibited San Marcos from harmfully interfering with other states' beneficial and efficient use of the GSO. Article 4 of the ITU Convention states that one of the purposes of the convention is "to eliminate harmful interference" in telecommunications.²⁰ Article 35 goes on to say that all stations must be "operated in such a manner as not to cause harmful interference to the radio services or communications of other members."²¹ These principles reflect the Outer Space Treaty's mandate that states pay

"due regard to the corresponding interests of all other states."²²

San Marcos was harmfully interfering with other states' efficient and beneficial use of the GSO in several ways. First, LISAT was directly interfering with the normal operations of BARTSAT which was beneficially and efficiently using a part of the GSO. BARTSAT was beneficial because it was serving a vital function for Homeria.²³ BARTSAT was efficient because it remained in its allotted orbital slot prior to LISAT's malfunction. In contrast, LISAT was intersecting BARTSAT's orbit and thereby forcing Homeria to preventatively reposition BARTSAT. This repositioning interfered with BARTSAT's functionality as a communications station in direct violation of the ITU Convention. This repositioning also lessened the intended useful life of BARTSAT.

Additionally, a consensus of the international community who gathered to discuss San Marcos's rogue satellite concluded that LISAT was a substantial risk to other satellites. While no other states actually repositioned their satellites, it was quite likely that they would have had to preventatively maneuver their satellites in the future. At the very least, these states' beneficial and efficient use of the GSO was interfered with because they had to expend the resources to monitor LISAT and attend international discussions to consider the dangers posed by LISAT.

San Marcos argues quite simply that LISAT did not interfere with BARTSAT and that LISAT did not interfere with any other states' use of the GSO. This argument rests upon the superficial premise that LISAT never intersected BARTSAT's immediate prior orbit. This lone fact does not justify LISAT's trespass into the orbital slot of BARTSAT, and does not alleviate the fact that Homeria had to act preventatively because it did not know whether or not LISAT would be directly in BARTSAT's path. There is no evidence to suggest that any state, including San Marcos, could have known what LISAT's position would be at any given moment. Furthermore, even if LISAT would not have directly collided with BARTSAT, by minimizing the separation between the two satellites, LISAT could have interfered with BARTSAT's use of the radio-frequency spectrum.²⁴ Given this lack of certainty, LISAT was harmfully interfering with other states' beneficial and efficient use of the GSO in violation of conventional law.

¹⁹ (U.K. v. Ice.), 1974 I.C.J. 3 (1974). See also United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks: Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982, Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, *opened for signature* Aug. 4, 1995, U.N. Doc A/CONF.164/38 (1995).

²⁰ ITU Convention, *supra* note 6, art. 4.

²¹ *Id.* at art. 35.

²² Outer Space Treaty, *supra* note 5, at art. IX.

²³ See Howell, *supra* note 14, at 576. By serving Homeria directly, BARTSAT was also serving the global community by making Homeria a more competitive global trading partner. *Id.*

²⁴ See G.C.M. REIJNEN AND W. DE GRAAFF, THE POLLUTION OF OUTER SPACE, IN PARTICULAR OF THE GSO 43 (1989)(stating that when the separation between adjacent orbital slots becomes too small, interference between the signals transmitted by satellites in these slots can no longer be avoided); Baca, *supra* note 4, at 1073-74 (noting that the current recommended spacing for satellites is two degrees).

2. *San Marcos breached customary international law by harmfully interfering with other states' beneficial and efficient use of the GSO.*

Principles of international customary law also prohibit one state from harmfully interfering with another state's beneficial and efficient use of a *res communis* area. Additionally, jurisdictional competence over special zones of limited *res communis* has historically been recognized.²⁵ These special jurisdictional zones vest the right to reasonably use part of a global commons area, but they do not vest any sovereignty rights over those areas.²⁶ This semi-exclusive use must be reasonable and not unduly hamper or interfere with another state's freedom to use the commons.²⁷ Reasonableness should be determined on the "basis of a careful balancing of all the variable factors in context."²⁸

Orbits in the GSO are analogous to special jurisdictional zones in *res communis* areas. States have a right to semi-exclusive use of the GSO, but they do not have sovereignty over any part of that orbit. San Marcos failed to reasonably use its orbit because it extended its jurisdictional competence over a greater area of the GSO than it reasonably needed to achieve its goals. Additionally, San Marcos's wasteful use of the GSO was unreasonable because the GSO is a limited, irreplaceable, and valuable natural resource. Finally, San Marcos's use of the GSO was unreasonable because it could have removed LISAT from the GSO and launched another satellite into orbit to achieve the same goals. Alternatively, it could have consulted with other states, including Homeria, and potentially reached an agreement whereby LISAT could remain in orbit for a fee, offsetting the expenses for reasonable monitoring and repositioning.

C. San Marcos breached international law by harmfully contaminating the GSO.

The rogue satellite, LISAT, harmfully contaminated the GSO in violation of international law. The volume of space debris or rogue space objects orbiting the Earth is acknowledged to be one of the most pressing and serious

problems confronting the future of space activities.²⁹ Specifically, with regard to the GSO, there are two important ways that rogue objects may contaminate the outer space environment. First, rogue objects may collide with other objects and result in the death of persons or destruction of property.³⁰ Second, and most importantly, rogue objects substantially increase the risk of the Kessler cascade effect.³¹ Kessler, based upon his work with complex mathematical models, hypothesized that when the population of space debris and rogue space objects reaches a certain threshold, collisions between those objects will create so much new debris that the GSO will become unusable.³²

San Marcos's harmful contamination of the GSO breached Article IX of the Outer Space Treaty. Article IX asserts that states shall "pursue studies of outer space and conduct exploration of them so as to avoid...harmful contamination."³³ Furthermore, states shall "adopt appropriate measures to further this purpose."³⁴ These mandates clearly reflect the Outer Space Treaty's description of outer space as the "province of all mankind"³⁵ which demands that states act with "due regard" to the interests of other states.³⁶

²⁹ HOWARD A. BAKER, *SPACE DEBRIS: LEGAL AND POLICY IMPLICATIONS* 1 (1989).

³⁰ See Christopher, D. Williams, *Space: The Cluttered Frontier*, 60 J. AIR L. & COM. 1139, 1146 (1995).

³¹ See Kessler & Court-Palais, *Collision Frequency of Artificial Satellites: Creation of a Debris Belt*, in *SPACE SYSTEMS AND THEIR INTERACTIONS IN THE EARTH'S SPACE ENVIRONMENT* 707, 724 (H.B. Garret & C.P. Piker eds. 1980).

³² *Id.* See also Howard A. Baker, *Space Debris: Law and Policy in the United States*, 60 U. COLO. L. REV. 55, 60 (1989).

³³ Outer Space Treaty, *supra* note 5.

³⁴ *Id.*

³⁵ *Id.*

³⁶ *Id.* See also Rio Declaration on Environment and Development, *opened for signature* June 13, 1992, 31 I.L.M. 874 (1992) [hereinafter Rio Declaration]. Principle 3 of the Rio Declaration states that "the right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations." *Id.* Certainly, the rights of future generations are a part of the "due regard" that must be paid to other countries. See also The 1979 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, *opened for signature* July 11, 1984, 18 I.L.M. 1434 [hereinafter Moon Treaty]. Article 7 of the Moon Treaty states that "in exploring and using the moon, States Parties shall take measures to prevent the disruption of the existing balance of its environment." *Id.* Additionally, The spirit of environmental protection is also supported by the provision in Article 10 requiring that states "adopt all practicable measures to safeguard the life and health of persons on the moon." *Id.*

²⁵ See F. Kenneth Schwetje, *Protecting Space Assets: A Legal Analysis of "Keep-Out Zones"*, 15 J. SPACE L. 131,141 (1987). Jurisdictional competence is a term of art that refers to areas of the global commons that can be used semi-exclusively, which is to say that a state can occupy part of a *res communis* area, but cannot appropriate such an area. *Id.* See also MALCOM N. SHAW, *INTERNATIONAL LAW* 416 (5th ed. 1997).

²⁶ Schwetje, *supra* note 25 at 141.

²⁷ *Id.*

²⁸ *Id.* at 41-42. These factors include the extent of the usage, the degree of usage necessary to achieve the desired goal, the importance of the area effected by such semi-exclusive claims, and the availability of alternatives that might achieve the same purpose *Id.*

The 1974 Convention on Registration of Objects Launched Into Outer Space³⁷ also implicitly prohibits the contamination of the GSO by rogue space objects like LISAT. Article IV asserts that states must register information about the basic orbital parameters of their space objects.³⁸ Information about the orbital parameters of space objects helps to further states' ability to safely plan their own activities in space.

LISAT was a rogue space object no longer under the control of San Marcos, straying ever further from its original orbit. As a rogue space object, it threatened to collide with at least one other space object, BARTSAT. This fact, by itself, makes LISAT a harmful contaminant: it was "harmful" because it threatened to destroy or impair the property of another state, and it was a contaminant because it threatened to create more space debris. Additionally, LISAT was a potential threat to other states' property and to the life of astronauts.³⁹ Although San Marcos registered LISAT with United Nations pursuant to the Registration Convention, the information provided to the United Nations was rendered meaningless because LISAT strayed from its orbital parameters. As a result, any beneficial planning by other states facilitated by the Registration Convention was frustrated thereby enhancing the dangers of collisions and the proliferation of space debris. Consequently, San Marcos was in breach of conventional law for harmfully contaminating the GSO.

D. San Marcos failed to use Space cooperatively and peacefully.

San Marcos should have removed LISAT from the GSO under the Principle of Cooperative and Peaceful Use of Outer Space established by conventional and customary international law. The preamble to the Outer Space Treaty summarizes the Principle of Peaceful and Cooperative use of Outer space: "broad international cooperation in the scientific as well as the legal aspects of the exploration and use of outer space for peaceful purpose . . . will contribute to the development of mutual understanding and to the strengthening of friendly relations between States."⁴⁰ This sort of global cooperation with regard to the res communis areas of the universe is

also endorsed by customary law in the Principle of Good Neighborliness and the duty to cooperate.⁴¹

San Marcos blatantly violated the principle of cooperative and peaceful uses when it refused to remove its satellite, which was threatening the international community. In light of the past tensions between San Marcos and Homeria, San Marcos had an even more pronounced duty to use outer space to promote rather than frustrate international peace and security.

II. SAN MARCOS IS LIABLE UNDER INTERNATIONAL LAW FOR THE PREMATURE LOSS OF BARTSAT, EXPENSES INCURRED DURING THE PREVENTATIVE MONITORING OF LISAT AND MANEUVERING OF BARTSAT, AND LOST REVENUES INCURRED DURING BARTSAT'S REPOSITIONING.

Article VII of the Outer Space Treaty says that a state that "procures the launching of an object into outer space...is internationally liable for damage to another State...by such object."⁴² This provision echoes well-developed customary international law relating to liability generally.⁴³ The 1972 Convention on International Liability for Damage Caused by Space Objects,⁴⁴ simply expands upon this basic rule by providing for two general types of liability in outer space: absolute liability and fault liability. Because San Marcos was the

⁴¹ See generally DAVID HUNTER, *INTERNATIONAL ENVIRONMENTAL LAW AND POLICY* 374-376 (1998).

⁴² Outer Space Treaty, *supra* note 5.

⁴³ See Jay H. Ginsburg, *The High Frontier: Tort Claims and Liability for Damages Caused by Man-Made Space Objects*, 12 SUFFOLK TRANSAT'L L.J. 515, 517 (1989). See also Sompong Sucharitkul, *State Responsibility and International Liability Under International Law*, 18 LOY. L.A. INT'L & COMP. L.J. 821, 828-29 (1996) (noting that the origin of international liability is the Roman and common law concept that one must use her property in such a way as not to harm others); RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW OF THE UNITED STATES § 901 (1987) (stating that when a state has breached a legal obligation to another state, the breaching state must terminate any action furthering the violation). See also *Military and Paramilitary Activities In and against Nicaragua (Nicar. v. U.S.)*, 1986 I.C.J. 14 (June 27); *Corfu Channel (U.K. v. Alb.)*, Merits, 1949 I.C.J. Rep. 4 (Judgment of Apr. 9); *Trail Smelter (U.S. v. Can.)*, 3 U.N. Int'l Arb. Awards 1905 (1949); Ruling of the Secretary-General of the United Nations on the Rainbow Warrior Affair Between France and New Zealand, July 6, 1986, 26 I.L.M. 1346 (1987) [hereinafter *Rainbow Warrior*], all standing for the proposition that states are liable to pay reparations for damages that they have caused.

⁴⁴ *Opened for signature* Sept. 1, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187 [hereinafter *Liability Convention*].

³⁷ *Opened for signature* Sept. 15, 1976, 28 U.S.T. 695, 1023 U.N.T.S. 15 [hereinafter *Registration Convention*].

³⁸ *Id.*

³⁹ See Baker, *supra* note 32, at 55 (stating that a one centimeter object could penetrate a pressurized crew module). See also F. Alby and R. Mansard, *Monitoring of On-Orbit Collision Risk*, in 96 SPACE SAFETY AND RESCUE 241 (Gloria W. Heath et al. eds., 1997) (noting that the United States, during space shuttle missions, has conducted four precautionary maneuvers to avoid a collision).

⁴⁰ Outer Space Treaty, *supra* note 5.

launching state for LISAT, because San Marcos caused Homeria damages, and because the damages that Homeria suffered as a result of San Marcos's breaches of international law are compensable, San Marcos is liable to Homeria. San Marcos is absolutely liable for the expenses and lost revenues incurred during the monitoring of LISAT and the preventative maneuvering of BARTSAT, since these damages were realized on the surface of the Earth. Alternatively, San Marcos is liable for these losses and for the premature loss of BARTSAT because San Marcos was at fault.

A. San Marcos Is the Launching State for LISAT.

The Liability Convention defines, in pertinent part, "launching state" as a "state which launches or procures the launching of a space object."⁴⁵ Although the Liability Convention provides that there may be several "launching states" in a particular case, Article V of the Convention says that joint launching states may enter into "agreements regarding the apportioning" of liability.⁴⁶

In this case, San Marcos procured the launching of LISAT and is, therefore, a launching state. San Marcos argues that since LISAT was launched from a leased facility in Homeria, Homeria should be considered a joint launching state and therefore jointly and severally liable for damages caused by LISAT. Homeria, however, was not responsible for any phase of LISAT's launch or operation. The fact that San Marcos has requested damages for LISAT before this court attests to the fact that LISAT was San Marcos's space object. Additionally, San Marcos agreed to be primarily responsible for LISAT 30 days after LISAT was successfully placed in the GSO. In this case, LISAT was successfully placed in its allotted orbit. It remained in that slot for 16 days and then developed a serious malfunction. San Marcos, however, did not remove LISAT, but left it in the GSO and continued to reap benefits from LISAT for more than 30 days. Accordingly, San Marcos should be considered primarily responsible for LISAT.

B. San Marcos caused damage to Homeria.

Under both the absolute liability standard and the fault liability standard of the Liability Convention, a launching state's space object must have caused damage to a claimant state in order to be adjudged liable. While the term "caused" is not defined in the Convention, the drafters Convention recommended that it should be interpreted flexibly.⁴⁷ Indeed, the drafters contemplated "adequate causality," as opposed to direct causality, as sufficient to justify compensation for damages.⁴⁸

⁴⁵ Liability Convention, *supra* note 44, at art 1.

⁴⁶ *Id.*

⁴⁷ See CARL Q. CHRISTOL, *THE MODERN INTERNATIONAL LAW OF OUTER SPACE* 96 (1982).

⁴⁸ Bin Cheng, *Convention on International Liability for Damage Caused by Space Objects*, in *MANUAL ON SPACE LAW* 83 (1979) (noting that the drafters contem-

While it seems that the Liability Convention only mandates a causal nexus between a breaching state and a claimant state, even if this court were to adopt some sort of proximate cause requirement,⁴⁹ San Marcos should be held to have caused damage to Homeria.⁵⁰

In this case, LISAT, in breach of a number of international laws, intersected with BARTSAT's orbital slot. It was foreseeable that LISAT's intersection with BARTSAT's orbit would cause damage to Homeria. In fact, San Marcos knew that its rouge satellite was causing damage to Homeria, since Homeria sent San Marcos a diplomatic note requesting that San Marcos remove its satellite from the GSO. Additionally, a consensus of users of the GSO agreed the LISAT was a substantial risk to other satellites. Since San Marcos did not attempt to avoid the costly risk of a collision, Homeria was fearful for the safety of its property and took reasonable precautionary steps to avoid a collision with LISAT. Homeria would not have had to take these precautions but for San Marcos's breaches of international law. Accordingly, San Marcos caused all of the damages that flowed from these preventative maneuverings.

C. The Damages that Homeria Suffered are compensable under international law.

Article I of the Liability Convention defines "damage" in pertinent part as the "loss of or damage to property of States."⁵¹ The Preamble recognizes that there is a need for "a full and equitable measure of compensation to victims of such damage."⁵² Article XII then says that

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 . . . [claimant] State . . . to the condition which

plated "adequate causality" not direct causality as sufficient to justify compensation for damages in outer space). See also Ginsburg, *supra* note 43, at 540 (noting that the intent of the Liability Convention is to establish legal fault).

⁴⁹ Although proximate cause has little history of application in the international context, principles of international tort law are informed by domestic laws and "provide a continuous legal framework for recovery from harm or damages which may result from the use or exploration of outer space." Ginsburg, *supra* note 43, at 540.

⁵⁰ Proximate cause in Anglo-American jurisprudence involves two factors: foreseeability and avoidability of risk. See *Overseas Tankship (U.K.), Ltd. v. Miller Steamship Co. Pty. Ltd.*, (1966) 2 All E.R. 709; *Marshall v. Nugent*, 222 F.2d 604 (5th Cir. 1955).

⁵¹ Liability Convention, *supra* note 44.

⁵² *Id.*

would have existed if the damage had not occurred.⁵³

In fact, "once causation has been established, the whole range of recovery . . . is available to the claimant including loss of profits, interruption of business activities, reasonable costs for repairs or medical expenses, loss of services of a third party, or other damages."⁵⁴ The notion of full compensation for damages is also supported by customary international law as evidenced through the decisions of international tribunals.⁵⁵ In *Chorzow Factory*, for instance, the court held that reparations must, as far as possible, wipe out all the consequences of the breaching state's illegal act and establish the situation which would in all probability have existed if the act had not been committed.⁵⁶

In this case, the damages that Homeria has suffered are compensable under the Liability Convention and customary international law. Homeria suffered damage to its property on a number of levels. Most obviously, its \$100 million dollar satellite was destroyed as a result of San Marcos's breaches of international law. Prior to its destruction, however, Homeria's satellite was damaged because it was forced to prematurely use its coolant, thereby reducing its useful life by approximately two and a half years at an estimated cost of \$25 million dollars. San Marcos's property on the surface of the earth was also damaged. Homeria had a property interest in the time and energy its personnel spent monitoring LISAT and preventatively maneuvering BARTSAT.⁵⁷ These personnel resources could have been used in a more productive pursuit. Instead, Homeria had to expend them on defensive or precautionary monitoring and maneuvering. As a result, Homeria's interest in this property right was harmed or "damaged" in violation of the Liability Convention. Finally, Homeria suffered losses to its terrestrial communications infrastructure because BARTSAT's functionality was disturbed during its preventative maneuverings.

⁵³ *Id.*

⁵⁴ Ginsburg, *supra* note 43, at 539-40. Accordingly, remote damages such as lost profits are compensable under international law in the appropriate cases. *See e.g. Trail Smelter*, *supra* note 43 (holding Canada liable for the reduction in the usefulness of land in the United States).

⁵⁵ *See e.g. Rainbow Warrior*, *supra* note 43 (awarding \$7 million to the Government of New Zealand "as compensation for all the damage it has suffered"); *Wimbledon Case*, 1923 P.C.I.J. (ser. A) No. 1 (1923) (noting that monetary compensation is a suitable means of re-establishing the pre-injury situation).

⁵⁶ *Chorzow Factory Case* (Ger. v. Pol.), 1928 P.C.I.J. (ser. A) No. 17 (Sept. 13). *See also* Shaw, *supra* note 25, at 541.

⁵⁷ *See generally* G. BECKER, HUMAN CAPITAL (2d ed. 1975). *See also generally* G. BECKER, ECONOMIC THEORY 160 (1971).

D. San Marcos is absolutely liable for losses incurred on the surface of the Earth.

Article II of the Liability Convention says that "a launching state shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth."⁵⁸ Since a large part of the damages caused by LISAT were to Homeria's interests on the surface of the Earth—the time and energy that Homeria's personnel had to spend monitoring and maneuvering BARTSAT—San Marcos should be held absolutely liable for damages to that property.

E. San Marcos was at fault and therefore liable for damages to Homeria.

Article III of the Liability Convention asserts that launching states are liable for damage caused "elsewhere than on the surface of the earth" if the damage is due to the fault of that state.⁵⁹ The Liability Convention, however, does not explicitly define fault.⁶⁰ While some have argued that the failure to define "fault" is a defect in the Convention,⁶¹ the drafters of the outer space treaties intended to fill any lacunae in the treaties with other rules of international law.⁶² Article III of the Space Treaty says that states may incorporate general principles of international law to elaborate unclear portions of the Space Treaties.⁶³

As a general rule in international law, a state is held at fault if it has breached an international obligation and if another state has suffered damages or loss as a result of

⁵⁸ Liability Convention, *supra* note 44.

⁵⁹ *Id.*

⁶⁰ Christol, *supra* note 47, at 117.

⁶¹ *See* H. DeSaussure & P.P.C. Haanappel, *A Unified, Multinational Approach to the Application of Tort and Contract Principles to Outer Space*, in PROCEEDINGS OF THE 21ST COLLOQUIUM ON THE LAW OF OUTER SPACE 138 (1978).

⁶² *See* Christol, *supra* note 47, at 117-118. *See also* Jay H. Ginsburg, *supra* note 43, at 517 (stating that "there is a continuum of international law as applied to transnational spaces which has its roots in trade and maritime law and which, by extension, has been applied to modern aviation law and the evolving field of the law of outer space"); Article 31 of the Vienna Convention on the Law of Treaties Between States and International Organizations or Between International Organizations, *opened for signature* May 23, 1969, U.N. Doc. A/Conf. 39/27, art. 31.

⁶³ Outer Space Treaty, *supra* note 5. *See also* Carl Q. Christol, *The Legal Common Heritage of Mankind: Capturing an Illusive Concept and Applying it to World Needs*, in PROCEEDINGS OF THE 18TH COLLOQUIUM ON THE LAW OF OUTER SPACE 48 (1976) (arguing that United Nations Resolution 1721 of December 20, 1961, which states that "international law . . . applies to outer space and celestial bodies," became treaty law with the acceptance of Article III of the Outer Space Treaty).

that breach.⁶⁴ As preceding sections have shown, San Marcos has breached a number of international laws and therefore was at fault.

Even if this court were to adopt a more stringent test for fault, however, San Marcos should still be held liable. For instance, this court could adopt the reasoning of the tribunal in the Trail Smelter case, which found that Canada had caused damage to the United States because it had lost "efficient control" over its smelter's activity.⁶⁵ Alternatively, this court could adopt the reasoning of the court in the Corfu Channel case. In that case, this court held that a state was liable for knowingly allowing its territory to harm another state.⁶⁶ Finally, this court could adopt a due diligence test for liability.⁶⁷ Fault, according to a due diligence test in the context of outer space, might include 1) failing to remove a potentially inactive satellite to a disposable orbit or 2) failing to maintain the required spacing between satellites.⁶⁸

In this case, San Marcos lost efficient control over its satellite. San Marcos was periodically losing complete control of LISAT's positioning. As a result, LISAT began to intersect with the orbital slot of BARTSAT. Homeria was forced to preventatively maneuver BARTSAT, at great expense, and eventually lost BARTSAT as a result of these maneuverings. In essence, Homeria was forced to pay for San Marcos's inefficient control of LISAT.

Alternatively, San Marcos should be held liable because it knew that LISAT was harming Homeria. Homeria sent San Marcos a diplomatic note through proper channels requesting that San Marcos remove LISAT from the GSO for the benefit and safety of the international community. San Marcos was put on notice that LISAT was intersecting with BARTSAT's orbit slot, thereby forcing BARTSAT to undertake preventative maneuvering.

⁶⁴ See Shaw, *supra* note 25, at 542. See also *Chorzow Factory*, *supra* note 56 (holding that "any breach of an [international law] involves an obligation to make reparations"); International Law Commission Draft Articles on State Responsibility, *adopted* Aug. 30, 1977, 16 I.L.M. 1249, U.N. Doc. A/32/183; *Military and Paramilitary Activities In and Against Nicaragua*, *supra* note 43; *Barcelona Traction, Light & Power* (Belg. v. Spain) 1970 I.C.J. (Feb. 5); RESTATEMENT (THIRD) OF TORTS § 917 (1977) (stating fault is shown by the illegal breach of a duty that causes damage).

⁶⁵ *Trial Smelter*, *supra* note 43.

⁶⁶ *Corfu Channel*, *supra* note 43.

⁶⁷ See Shaw, *supra* note 25, at 593; LOS Convention, *supra* note 18, at art. 194 (providing that states are to take "all measures that are necessary to prevent, reduce and control [harm] . . . using for this purpose the best practicable means at their disposal in accordance with their capabilities").

⁶⁸ See Howard Baker, *Liability for Damage Caused in Outer Space by Space Refuse*, in 13 ANNALS OF AIR & SPACE L. 183 (Nicholas Mateesco Matte ed., 1988).

Finally, San Marcos should be held liable under a due diligence standard. LISAT was malfunctioning and intersecting with BARTSAT's orbital slot. While San Marcos retained periodic control over LISAT, it is likely that as LISAT wandered from its allotted orbital slot that San Marcos would have entirely lost control of LISAT. Consequently, LISAT was a potentially inactive satellite, and San Marcos should have moved LISAT to a safe orbit. Therefore, San Marcos failed to exercise due diligence and is liable for the damage to BARTSAT.

III. HOMERIA HAD NO DUTY TO DISCLOSE BARTSAT'S NUCLEAR POWER SOURCE UNDER INTERNATIONAL LAW.

Homeria's non-disclosure of BARTSAT's nuclear power source was consistent with its rights and obligations under the Space Treaties. Under the Common Heritage Principle,⁶⁹ Homeria had the right to use outer space in a reasonable manner. Homeria properly registered BARTSAT under the terms of the Registration Convention and was under no duty to disclose the fact that BARTSAT was powered by a nuclear source. Furthermore, Homeria was not required to make a safety assessment of BARTSAT publicly available prior to launch pursuant to the NSP Principles because the NSP Principles do not have the force of law.

A. Homeria had no duty to disclose BARTSAT's nuclear power source under Conventional International Law.

The objective of the space treaties generally is to give the internationally community a set of guidelines that allow outer space to be used beneficially. The objective of using space in a beneficial manner is contained in the Common Heritage principle embraced by the space treaties. As long as Homeria was acting reasonably in its usage of space, Homeria was acting within its rights under the Space Treaties. In this case, Homeria acted reasonably.⁷⁰

The only treaty that arguably imposed an affirmative duty on Homeria to disclose BARTSAT's nuclear power source prior to launch is the Registration Convention. The Registration Convention, however, does not require the disclosure of a satellite's nuclear power source. The Registration Convention merely requires the general function of a space object to be registered by a launching state on the launching state's space object registry⁷¹ and

⁶⁹ The Common Heritage Principle is effectively the same as the Province of All Mankind Principle. See Weaver, *supra* note 17 at 220.

⁷⁰ Nuclear power sources for satellites typically last anywhere from 8-20 years with 10 years being the most common. See Robert J. Noble, *Radioisotope Electric Propulsion of Spacecraft to the Outer Solar System and Near-Interstellar Space*, NUCLEAR NEWS, Nov. 1999 at 34. In this case, BARTSAT was slated for a 10-year mission, which was well suited for a nuclear power source.

⁷¹ Registration Convention, *supra* note 37, at art. II(1).

the Secretary General of the United Nations space object registry.⁷² Homeria made proper filings on its registry and the registry of the Secretary General of the U.N. The fact that states do not routinely register their satellite's nuclear power source as part of the general function of a space object⁷³ compels the conclusion that the "general function" of a space object refers to the object's purpose rather than its technical composition. An inequitable decision would result if this court were to now hold that Homeria was under a duty to register BARTSAT's nuclear power source under the Registration Convention where the entire corpus of launching states have interpreted the Registration Convention as imposing no duty to register a nuclear power source.

In this case, BARTSAT was launched to serve as the backbone of Homeria's terrestrial telecommunications infrastructure thereby benefiting Homeria and the global community.⁷⁴ BARTSAT's nuclear power source was a reasonable component because other power options are inferior to nuclear power sources in terms of the volume of power available and the useful life of the power source.⁷⁵ Because Homeria was acting in accord with its right to use outer space in a reasonable manner and complied with its duties under the Space Treaties including the Registration Convention, Homeria's launch of BARTSAT without first disclosing BARTSAT's nuclear power source was not a violation of conventional international law.

B. Homeria was not required to make a safety assessment of BARTSAT publicly available prior to launch pursuant to the United Nations General Assembly Resolution and Principles Relevant to the Use of Nuclear Power Sources in Outer Space⁷⁶ because the NPS Principles are not binding.

Although the U.N. General Assembly unanimously passed the NPS Principles,⁷⁷ U.N. General Assembly Resolutions are not binding.⁷⁸ Consequently, in order

⁷² *Id.* at art. III(1).

⁷³ www.un.or.at/OOSA_kiosk/treat/register.html (visited 4-1-2000).

⁷⁴ See Howell, *supra* note 14 at 576.

⁷⁵ See Christol, *supra* note 7 at 765.

⁷⁶ Dec. 14, 1992, 32 I.L.M. 921 [hereinafter NPS Principles].

⁷⁷ See Joseph A. Bosco, *International Law Regarding Outer Space—An Overview*, 55 J. AIR L. & COM. 609, 644 (1990).

⁷⁸ Gregory J. Kerwin, *The Role of United Nations General Assembly Resolutions in Determining Principles of International Law in United States Courts*, 1983 DUKE L.J. ??? 876-877 (1983). See also Arangio-Ruiz, *The Normative Role of the General Assembly of the United Nations and the Declaration of Principles of Friendly Relations*, 137 RECUEIL DES COURS 419, 446-47 (in so far as the letter of the Charter is concerned . . . while it

for Homeria to be bound by the NPS Principles, the NPS Principles would need to embody already existing norms of customary international law. The NPS Principles are not customary international law and Homeria is not bound by their terms.

Customary international law is the collective statement of the practices, beliefs and accepted principles of the international community. The formation of customary international law requires two elements: state practice⁷⁹ and *opinio juris*.⁸⁰ In regard to the disclosure of a satellite's nuclear power source, there has been no consistent state practice or *opinio juris*.

This court elaborated on the dual requirements of customary international law in the *North Sea Continental Shelf Case*,⁸¹ ruling that "state practice. . . [should be] both extensive and virtually uniform in the sense of the provision invoked, and should moreover have occurred in such a way as to show a general recognition that a rule of law or legal obligation was involved."⁸²

State practice in regard to disclosure of nuclear power sources on satellites has been rare and inconsistent.⁸³ There is an absence of treaties, international decisions, and national legislation requiring the disclosure of a satellite's nuclear power source prior to launch. This lack of international practice compels the conclusion that the disclosure of a satellite's nuclear power source prior to launch is not customary international law. Consequently, Homeria did not breach international law by not disclosing BARTSAT's nuclear power source prior to launch. The idea that a nation can be required to follow declarations of the U.N. General Assembly is repugnant to the

would be simply naive to look for a provision spelling out the non-binding character of unqualified General Assembly Resolutions, the relevant Articles do all that is necessary – short of spelling it out in as many words – to exclude the binding character of such resolutions."); J. CASTANEDA, *LEGAL EFFECTS OF UNITED NATIONS RESOLUTIONS 2-3, 197 n.2* (1969) (the drafters of the ICJ statute knew very well that within the system of the new United Nations Charter, General Assembly Resolutions would not be binding); RESTATEMENT (REVISED) OF THE FOREIGN RELATIONS LAW OF THE UNITED STATES § 103 reporter's note (Tent. Draft No. 1, 1980).

⁷⁹ State practice references the consistent use of a particular principle by states. See D.J. HARRIS, *CASES AND MATERIALS ON INTERNATIONAL LAW* 24 (5th ed.1998). The International Law Commission has listed treaties, decisions of international courts, national legislation or practice by international organizations, as sources of evidence of state practice. *Id.*

⁸⁰ *Opinio juris* references the subjective belief in a principle as a legal obligation. See Shaw, *supra* note 25, at 29.

⁸¹ ICJ Reports, 1969, at 44.

⁸² See Shaw, *supra* note 25, at 61.

⁸³ See MARIETTA BENKO, WILLEM DE GRAAFF, AND GIJSBERTHA C.M. REIJNEN, *SPACE LAW IN THE UNITED NATIONS*, 68-69 (1985).

concept of sovereignty.⁸⁴ Moreover, when a General Assembly Resolution takes fourteen years to pass as did the NPS Principles,⁸⁵ indicating a large volume of international disagreement, it would be inequitable to require a state to adhere to principles that are not widely practiced in the international community.

IV. HOMERIA IS NOT LIABLE FOR THE DAMAGE TO LISAT UNDER INTERNATIONAL LAW

Homeria is not liable to San Marcos for the damage sustained by LISAT because Homeria was not at fault for the damage to LISAT. Article III of the Liability Convention requires that a launching state whose space object causes damage to the space object of another launching state be at fault in order to be liable for damage caused to a space object of another state.⁸⁶ However, the Liability Convention does not provide a definition of fault.⁸⁷ Under Article III of the Outer Space Treaty, states may incorporate general principles of international law to elaborate unclear portions of the Space Treaties.⁸⁸ As stated earlier in this Memorial, this court may adopt any one of several standards of fault for determining liability. Homeria is not liable to San Marcos for the damage to LISAT under any of the proposed standards of liability.

A. Homeria is not liable for the damage to LISAT because Homeria did not breach a duty and did not cause damage to LISAT.

In order to be liable under international law, a state must have breached a duty and that breach must have caused damage to another state.⁸⁹ In this case, Homeria has not breached any of its duties under international law, and even if this court were to find that Homeria had breached a duty, that breach was not the cause of the damage to LISAT.

As stated previously in this Memorial, Homeria has complied with all of its duties under international law and is not liable for the damage to LISAT.

San Marcos claims that the NPS Principles became instant customary international law when the Principles were adopted unanimously by a United Nations Resolution. Consequently, San Marcos argues that Homeria breached a duty under international law. San Marcos argues further that that breach of international law is the cause of the damage to LISAT because Homeria did not conduct a safety assessment of BARTSAT's nuclear power source prior to launch.

San Marcos's argument fails. As stated previously in this memorial, the NPS Principles were adopted only after fourteen years of disagreement. The Principles contain a

provision requiring a reopening for revision of the NPS Principles after two years.⁹⁰ The international community does not possess the requisite *opinio juris* that would create a duty to which Homeria would be required to adhere.

Even if this court were to hold that Homeria breached an existing duty by not adhering to the provisions of the NPS Principles, Homeria would not be liable for the damage to LISAT because the nondisclosure of BARSAT's nuclear power source prior to launch was not the cause of the damage to LISAT. The objective evidence before this court indicates that BARTSAT was an extremely well designed satellite. BARTSAT operated perfectly for approximately five years prior to the launch of LISAT. Upon LISAT's loss of control, BARSAT was able to make extensive maneuvers to avoid a collision for a period of six months. BARTSAT performed above and beyond the level of performance that would have been required had LISAT not threatened to destroy BARTSAT. Had Homeria performed a safety assessment of BARTSAT prior to launch, the objective evidence indicates that Homeria would have only been able to conclude that BARTSAT was an extremely well designed satellite that would be able to perform all of its required functions once in space.

Because Homeria has not breached any of its duties under international law, and even if it has breached a duty, that breach was not the cause of the damage to LISAT, this court should hold that Homeria is not liable for the damage to LISAT.

B. Homeria did not knowingly or intentionally damage LISAT.

The *Corfu Channel* case requires a state to knowingly use its property to the detriment of another state in order to be liable for damage.⁹¹ In this case, Homeria did not know that BARTSAT was going to explode. BARSAT had been functioning perfectly for a period of five years prior to the launch of LISAT. Upon LISAT's loss of control, BARTSAT was able to undertake extraordinary maneuvers for a period of six months in order to avoid a collision with LISAT. What Homeria knew was that it had a well designed satellite that sustained movements that went far beyond the demands placed upon BARTSAT for normal operations.

San Marcos argues that because Homeria designed and built BARTSAT, Homeria had the technical ability to know that BARTSAT was going to run out of coolant and explode. Therefore, San Marcos argues, Homeria knowingly used its property to the detriment of another state and is therefore liable for the damage to LISAT.

San Marcos's argument is unfounded. The *Compromis* does not indicate that Homeria had any information that would allow Homeria to know that BARTSAT was going to explode. Furthermore, Homeria reasonably believed that LISAT posed a threat to BARTSAT. As a matter of practicality, Homeria could not afford to stand

⁸⁴ See generally MARK W JANIS, AN INTRODUCTION TO INTERNATIONAL LAW 4-6 (3d ed. 1999).

⁸⁵ See Bosco, *supra* note 77, at 644.

⁸⁶ Liability Convention, *supra* note 44.

⁸⁷ *Id.*

⁸⁸ Outer Space Treaty, *supra* note 5.

⁸⁹ See Shaw, *supra* note 25, at 542.

⁹⁰ NPS Principles, *supra* note 76, at princ. 11.

⁹¹ *Corfu Channel*, *supra* note 43.

idle while BARTSAT, a \$100 million satellite that served as the backbone of Homeria's telecommunications infrastructure, was threatened by the rogue satellite LISAT.

Had San Marcos adhered to its obligations under international law by removing LISAT from the GSO or moving LISAT to a higher parking orbit, Homeria would not have had to maneuver BARTSAT in the first place. Homeria did not know that the eventual consequence of these forced maneuverings would be the explosion of BARSAT. Consequently, Homeria is not liable to San Marcos under the *Corfu Channel* knowing standar

C. Even if this court were to determine that Homeria was liable under international standards, Homeria should be exonerated under general principles of international law.

Under General Principles of international law, a state should not be able to recover damages where that state has been grossly negligent in relation to the damages claimed to have been suffered. Furthermore, if a state has acted in response to a dangerous situation, that state's actions can be excused as necessity or distress.

1. San Marcos was grossly negligent in operating LISAT.

Gross negligence goes beyond a lack of ordinary care. Gross negligence entails negligence that is substantially and appreciably greater than ordinary negligence or conduct that is devoid of the want of even slight care.⁹²

In this case, San Marcos knew that its satellite was losing periodic control to a degree that caused LISAT to intersect with BARTSAT's orbital slot. San Marcos knew that LISAT was spaced only one degree from BARTSAT instead of the recommended 2 degree spacing. Although the one-degree spacing was authorized by the ITU, the shorter spacing placed San Marcos under an even greater duty to exercise due care in the operation of LISAT.

San Marcos argues that there is no evidence to suggest that LISAT was going to collide with BARTSAT. San Marcos argues that absent direct evidence that LISAT would strike BARTSAT, San Marcos had no duty to take any steps to alter LISAT's orbit or remove LISAT from orbit.

San Marcos' arguments are unpersuasive. When LISAT malfunctioned and threatened to collide with BARTSAT, San Marcos should have either moved LISAT to a safe parking orbit or taken LISAT out of orbit all together. Instead, San Marcos did nothing. San Marcos failed to initiate international consultations. San Marcos ignored Homeria's diplomatic requests. San Marcos sat idle while BARTSAT was forced to undertake extensive maneuvers for a period of seven months.

Consequently, San Marcos' conduct rises to the level of being devoid of the want of even slight care because San Marcos took no affirmative steps to address the possibility that LISAT would strike BARTSAT much less take

affirmative steps to alleviate the danger posed to BARTSAT. Therefore, San Marcos can not recover damages for the loss of LISAT because San Marcos was grossly negligent in relation to the damages claimed.

2. Homeria maneuvered BARTSAT out of necessity and therefore should not be held liable for the damage to LISAT.

The International Law Commission Draft Articles on State Responsibility reflect customary international law on the defense of necessity. Article 33 of the Draft Articles on State Responsibility provides that a state may claim necessity if its response was "the only means of safeguarding an essential interest of the state against a grave and imminent peril."⁹³

In this case, LISAT was threatening to strike BARTSAT. LISAT was originally spaced one degree from BARTSAT. Upon losing periodic control, LISAT began intersecting with BARTSAT's orbital slot. Knowing that San Marcos could again lose control of LISAT at any time, Homeria was fully justified in maneuvering BARTSAT to prevent a collision.

San Marcos argues that absent any objective evidence that LISAT was going to strike BARTSAT, Homeria did not have to reposition BARTSAT. Consequently, San Marcos claims that Homeria is not entitled to the defense of necessity.

San Marcos' argument is erroneous. BARTSAT was a \$100 million satellite that was serving as the backbone of Homeria's telecommunications infrastructure. As a practical matter, the loss of BARTSAT would have been detrimental to Homeria. Homeria was justified in maneuvering to avoid a collision with LISAT. The fact that LISAT was intersecting BARTSAT's orbital slot placed BARTSAT in imminent danger. Consequently, Homeria is entitled to the defense of necessity and is not liable to San Marcos for the damage to LISAT.

⁹³ International Law Commission Draft Articles on State Responsibility, *supra* note 64. See also article 51 of the U.N. Charter "nothing in the present Charter shall impair the inherent right of individual or collective self-defense." U.N. CHARTER, at art. 51.

⁹² 57A AM. JUR. 2D NEGLIGENCE § 243 (1989).

B. MEMORIAL FOR SAN MARCOS

AGENTS

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ARGUMENT

I. SAN MARCOS IS NOT IN BREACH OF INTERNATIONAL LAW FOR FAILING AND REFUSING TO REMOVE LISAT FROM THE GSO.

San Marcos has violated neither telecommunication law (A), nor space law (B), nor general international law (C) by not removing LISAT from GSO and refusing to do so. Finally, the alleged danger of a collision was exaggerated (D).

A. San Marcos is not in breach of ITU provisions for not removing LISAT

There is no obligation under the regulation of the International Telecommunication Union (ITU) providing to remove a satellite from GSO. Therefore, neither harmful interferences (1), nor the intersection of another orbital slot (2) implies the obligation to remove LISAT.

1. Potential harmful interference caused by LISAT does not imply its removal

Homeria might accuse San Marcos of having caused harmful interference and thus having troubled BARTSAT's services. San Marcos concedes harmful interference might have occurred. However, this incident does not lead to an obligation of removing LISAT from the GSO. The only obligation that can be found under ITU provisions is to engage consultations when interference occurs pursuant to article S15 of the Radio Regulations (RR). Furthermore, it should be noted that Homeria could have informed San Marcos of all the possible factors likely to cause harmful interference during the ITU coordination procedure¹. Especially the close and unusual spacing of one degree cannot be reproached to San Marcos². If Homeria had considered this distance too small for perturbation-free transmissions of BARTSAT's telephone signals, this should have been notified during the coordination procedure.

2. The intersection of BARTSAT's orbital slot does not imply an obligation to remove LISAT

San Marcos concedes it had to respect the 0,1 degree station-keeping accuracy according to article S22.8 of the Radio Regulations. However, satellites constantly

have to be repositioned due to the different natural forces³, and movements are therefore not unusual. In no way can one deduce an obligation from this provision to completely remove a satellite from the GSO. Furthermore, as LISAT remained capable to provide 95% of its services and the loss of control was only intermittent, the requested measure seems unnecessary and by far unproportional⁴.

B. San Marcos is not in breach of the Outer Space Treaty for failing and refusing to remove LISAT from GSO

LISAT is a telecommunication satellite. The regime applicable to space telecommunications is, in a general way, determined by the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies (OST).

Article I(2) OST guarantees the freedom of use of outer space, which is the fundamental principles of space law. This also includes the exploitation by national satellites for space telecommunications⁵. San Marcos' right to make use of the GSO with its satellite LISAT therefore is protected under the OST.

Moreover, no obligation to remove a satellite can be deduced from OST provisions. Article IX OST⁶ does not provide any substantial basis for such a request to be followed. San Marcos is well aware that article IX OST mentions the "principle of cooperation and mutual assistance" as well as the "due regard to the corresponding interests of all other States". However, these principles are formulated in a very general and unspecified way. An interpretation of Article IX OST implying the obligation to remove a satellite from GSO exceeds the recognized interpretation method pursuant to article 31 of the 1969

³ For example attraction by the moon and the sun, or solar radiation pressure, see "Physical Nature and Technical Attributes of the Geostationary Orbit", UN Doc. A/AC.105/404 of January 13, 1988, n°18.

⁴ In addition, since there is not even an international mandatory requiring to take out inactive satellites of the orbit at the end of their useful lives, there cannot possibly be an obligation to take out a malfunctioning satellite after a mere perturbation of its orbit, R.S. JAKHU, "Space Debris in the Geostationary Orbit: A Major Challenge for Space Law", *Annals of Air and Space Law*, Vol. XVII-I (1992), p. 317.

⁵ L. PEYREFITTE, "Droit de l'espace", Paris, Dalloz, 1993, p. 255.

⁶ Article IX OST reads: "In the exploration and use of outer space, including the moon and other celestial bodies, States Parties to the Treaty shall be guided by the principle of cooperation and mutual assistance and shall conduct all their activities in outer space, including the moon and other celestial bodies, with due regard to the corresponding interests of all other States Parties to the Treaty.[...]"

¹ According to the Statement of Facts, p. 6, there has been compliance with all procedures of the ITU.

² The Federal Communications Commission in the United States allows a two-degree minimum spacing, whereas in France the Agence Nationale des Fréquences requests at least a three-degree spacing. Interview with L. RUIZ, Centre National d'Etudes Spatiales (CNES).

Vienna Convention on the Law of Treaties⁷. Furthermore, the creation history of the OST shows that it was not intended to give article IX OST such a legal impact⁸. The principles of article IX OST thus remain vague and do not create self-executing obligations.

In addition to that, Homeria cannot accuse San Marcos of violating the principle of cooperation of article IX OST, since itself had been uncooperative by not inviting San Marcos to be included in the discussion concerning the removal of LISAT.

Homeria's argumentation to remove LISAT "as a safety precaution for the benefit of the international community"⁹ is not conclusive either. No State or satellite operator had engaged in any maneuvering of their satellites because of LISAT. Thus, it was exaggerated to request the complete removal of the object. Homeria cannot call in the removal in the name of the "international community" when no other State formally joins in this request. Moreover, it is recognized under international law that there is no possibility to demand the unilateral removal of **inactive** satellites of other States under article IX OST¹⁰. That must even more be valid for **active** satellites like LISAT, whose utilization is part of the protected freedom of use of outer space, as shown above.

Finally, it has to be kept in mind that at the time of the demand for removal, LISAT had been in orbit for only about half a year. Boosting LISAT out of GSO after this short period, while it still had a long useful life, would have caused severe economic impacts and lost revenues for San Marcos.

C. San Marcos is not in breach of the general principle of non-intervention

Homeria could argue that San Marcos has violated the principle of non-intervention in the domestic affairs by perturbing BARTSAT's telephony functions and not removing LISAT from the GSO. As will be explained, this argument cannot be justified. For such an intervention to be given, three conditions have to be fulfilled simultaneously¹¹. First of all, the *domaine*

*réserve*¹², corollary of a State's sovereignty, has to be infringed. Secondly, the intervention has to be imputable to a subject of international law. Finally, the victim State must effectively have been prevented from exercising its exclusive competence in this domain. However, such an intervention is not given in the present case.

1. The right to regulate telecommunication is not part of a State's domestic affairs

What issues belong to international law and what matters belong to the domestic affairs of each sovereign State is a constantly changing standard¹³. It depends on the extent of each State's willingness to transfer some aspects of its sovereignty to international organizations or through international treaties. The more a State opens itself to international law, the less domestic affairs it will retain. Homeria might consider its competence to regulate its telecommunications as a part of its domestic affairs. However, today's telecommunication law is more and more leaving the sphere of municipal law, and the exclusive competence of each State to regulate telecommunications is shrinking. As an example, one might recall the General Agreement on the Trade in Services (GATS)¹⁴, which comprised negotiations in the telecommunication sector. An increasing number of private companies are offering their services to customers as the government-owned telecommunication entities are being privatised. These facts clearly outline that the regulation of telecommunication cannot be considered as part of a State's domestic affairs. No exclusive competence of Homeria therefore was affected.

2. The telecommunication network of Homeria was not seriously affected

Even if telecommunication regulation were considered as a domestic affair, Homeria would have to prove that BARTSAT was its **only** telecommunication service. BARTSAT, however, simply completed the terrestrial infrastructure. Furthermore, Homeria's satellite telephony services only were interrupted intermittently. This cannot be qualified as an intervention infringing international law. The perturbation remains in the field of tolerated annoyance to which no legal quality can be attributed. In addition to that, the jurisdiction of the ICJ has been very reluctant to easily admit an intervention. Even in the *Nicaragua* case¹⁵, where all elements of a violation of the principle of non-intervention were united, the Court only considered the territorial intervention.

⁷ Vienna Convention on the Law of Treaties, May 23, 1969. Article 31 § 1 of the Convention reads: "A treaty shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose."

⁸ C. G. SGROSSO, "Liability for Damage Caused by Space Debris", *Proceedings of the 37th Colloquium on the Law of Outer Space, International Institute of Space Law of the IAF*, Norway, 1995, p. 78.

⁹ Statement of Facts, p. 3.

¹⁰ M. WILLIAMS, "The Development of Article IX of the 1967 Space Treaty", *Proceedings of the 40th Colloquium on the Law of Outer Space, International Institute of Space Law of the IAF*, Italy, 1997, p. 179.

¹¹ ICJ, *US Diplomatic And Consular Staff In Teheran case*, May 24, 1980, *ICJ Reports*, 1980, p. 3.

¹² The *domaine réservé* describes State activities where the State competences are not bound by international law. N.Q. DINH, P. DAILLER, A. PELLET, *Droit international public*, LGDJ, Paris, 1999, p. 435.

¹³ M.N. SHAW, *International Law*, Grotius Publications, New York, 1995, p. 146.

¹⁴ Signed in Marrakech on April 15, 1994, Annex to the GATT.

¹⁵ ICJ, *Nicaragua case*, June 27, 1986, *ICJ Reports*, 1986, p. 14.

3. Intervention does not imply removal

Supposing the interruption of BARTSAT's services were a violation of the principle of non-intervention in the domestic affairs of Homeria, in no way would it be an inevitable consequence to remove LISAT from the GSO. At the most, San Marcos would have been obliged to reposition its satellite. Already by this mean, Homeria's exclusive competence could have been restored. Thus, there is no obligation of removal under general principles of international law.

D. The alleged danger of collision with BARTSAT was exaggerated

In order to reinforce the arguments mentioned above, the technical aspects can also be considered. To realistically estimate the risk of a collision of two satellites, one must keep in mind the dimensions concerning the geostationary orbit. A one degree spacing corresponds to a distance of 750 km, and the typical station-keeping ability of $\pm 0,1^\circ$ of longitude represents a range of 150 km¹⁶, 75 km to the east and to the west. Given these dimensions, the risk of collision is very low. Even if ten satellites with a cross-section of 100 square meters were placed in the same nominal position, there would only be a probability of collision every 400.000 years¹⁷.

Even though LISAT had periodically intersected with the orbital slot occupied by BARTSAT, the risk of a collision thus was extremely low. The statistics therefore support San Marcos' opinion that the removal was not necessary because the alleged danger was exaggerated. In addition to that, a removal of a satellite always is a risky operation that can cause harmful consequences¹⁸. As a conclusion, nothing obliges San Marcos to remove LISAT from GSO.

II. SAN MARCOS IS NOT LIABLE UNDER INTERNATIONAL LAW FOR THE PREMATURE LOSS OF BARTSAT AND THE EXPENSES OF AND LOST REVENUES INCURRED DURING THE MONITORING AND MANEUVERS TO AVOID A COLLISION WITH LISAT.

¹⁶ "The Feasibility of Obtaining Closer Spacing of Satellites in the Geostationary Orbit", UN Doc. A/AC.105/340/Rev.1 of April 22, 1985, n°20.

¹⁷ R.L. WHITE, H.M. WHITE, *The Law and Regulation of International Space Communication*, Norwood, USA, 1988, p. 12.

¹⁸ If Homeria's request had been followed, the effects might have been much more serious than the given perturbation of LISAT's orbit. See R. S. JAKHU, "Space Debris in the Geostationary Orbit: A Major Challenge for Space Law", *Annals of Air and Space Law*, Volume XVII-I, p. 317.

San Marcos is neither liable under the Liability Convention (A) nor under the general international responsibility regime (B).

A. San Marcos is not liable under the Liability Convention

San Marcos is clearly not liable under international law for any damage caused to BARTSAT whether it is either the premature loss of BARTSAT or the expenses of and lost revenues. First, the conditions of the Liability Convention are not fulfilled (1). Second, if the Liability Convention is applicable, San Marcos does not have to compensate the damages (2). Anyway, if one admits the liability of San Marcos, then Homeria also is liable (3).

1. The conditions required for the application of the Liability Convention are not fulfilled

The requirements of article III¹⁹ of the Liability Convention are not given. Indeed, the damages endured by BARTSAT were not caused by a space object (a). Moreover, San Marcos did not commit any fault (b).

a. The damages suffered by BARTSAT were not caused by LISAT

Pursuant to article III of the Liability Convention, a **direct causal link** must exist between the damages and their origin, that is to say that a damage must have been **caused by** a space object, which is not the case concerning the disagreement between Homeria and San Marcos.

It is clear that the wording of article III of the Liability Convention deals only with one occurrence: a **collision** between space objects in outer space²⁰. In the case, it is clear that there is no collision between LISAT and BARTSAT, since there is no physical impact²¹. Thus, Homeria cannot invoke the application of the Liability Convention. Furthermore, it would be dangerous for the significance of the Liability Convention and its scope to extend its application to damages caused by something else than by collision.

Nowadays, more and more satellite services are being developed. To include damages due to these services within the scope of the Convention would be a mis-

¹⁹ Article III states: "In the event of damage being caused elsewhere than on the surface of the Earth to space object of one launching State or to persons or property on board such a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or persons for whom it is responsible".

²⁰ B.A. HURWITZ, *State Liability for Outer Space Activities in Accordance with the 1972 Convention on International Liability for Damage caused by Space Objects*, Martinus Nijhoff Publishers, The Hague, 1992, p. 33.

²¹ When a damage occurs on earth, an impact is always required by the Liability Convention Regime. Such an obligation should also be taken into account in outer space.

interpretation of this text. Dealing with space activities, States have never admitted the application of the Liability Convention when damages were not caused by a collision, but by a service. In this way, the Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting²² state only the OST, and do not mention the Liability Convention, when dealing with questions of liability. The Resolution "Principles Relating to Remote Sensing of the Earth from Outer Space"²³ is clearer about this matter. Not only does it consider the responsibility according to the OST, but also many States joined an interpretative declaration to their vote that formally excluded the Liability Convention application for the damages caused by this service²⁴. San Marcos can also give the example of a GNSS²⁵ satellite whose radio signals cause a damage in outer space or even on earth. Once more, it is impossible to make an analogy between such signals and a space object and to consider both as causes under the 1972 Convention.

Furthermore, international case law has always rejected any interpretation that would lead to an "absurd and unreasonable result"²⁶. The Liability Convention's aim was first, to indemnify damages incurred by people on earth and due to the use of outer space, second, to solve damages caused by a collision in outer space. These objectives both ensue from the literal interpretation of the treaty *corpus*, confirmed by the *travaux préparatoires* that limit the application of the 1972 Convention to physical impacts²⁷. Even if the Court admits that Homeria had to maneuver BARTSAT to avoid an interference with LISAT, the Liability Convention is not applicable as it does not recognize interference as a damage. Consequently, San Marcos is not liable.

²² Adopted on December 10, 1982, (G.A. Res. 37/92).

²³ Adopted on December 3, 1986.

²⁴ According to the USA Declaration, "States are internationally responsible of their remote sensing activities, or those caused by their nationals only when this responsibility already exists in the 1967 Treaty and in international law in general".

²⁵ GNSS stands for Global Navigation Satellite System. "It will become a world-wide system for positioning and radio navigation *via* satellites, M. FERRAZZANI, "The European Initiatives and Programmes for Satellite Navigation", *Proceedings of the 41st Colloquium on the Law of Outer Space, International Institute of Space Law of the IAF*, Australia, 1998, p. 1.

²⁶ ICJ, *South West Africa* Cases, Preliminary Objections, December 21, 1962, *ICJ Reports*, 1962, p. 319. See also ICJ, *Admission of a State to the United Nations* case; Advisory Opinion, May 28, 1948, *ICJ Reports*, 1948, p.57.

²⁷ According to the United Kingdom and USSR points of view the Liability Convention applies only for physical impacts, UN Doc. A/AC.105/C.2/SR.255, p. 7 par. 24 and 26.

Anyway, as there is no causal link between the drift of LISAT from its original orbital slot and the explosion, expenses and lost revenues, the Liability Convention can not be put forward before the Court. Consequently, there cannot be any damage attributed to San Marcos.

b. San Marcos did not commit any fault

As noticed, San Marcos did not breach any international obligation²⁸. Consequently, no fault can be opposable to it. Moreover, Homeria's Inquiry Board clearly established that the explosion was due to a lack of coolant, which has to be considered as the only generator fact of the damage. Given that, there is no causal link between the LISAT drift and the explosion of BARTSAT. Homeria has to bear the consequences of its negligence.

2. Even if the Court affirms the application of the Liability Convention, San Marcos is not liable for all the damages

Article I of the Liability Convention provides a certain definition of the term "damage", which does not include "indirect damage"(a). Moreover, one cannot deny that Homeria participated in the premature loss of its satellite, a fact which automatically exonerates San Marcos from liability (b).

a. The premature loss of BARTSAT is not indemnifiable

Even if the premature loss of BARTSAT is a damage as defined in article I of the Liability Convention, it is not indemnifiable. Indeed, as the Inquiry Board of Homeria established, the premature loss occurred because of the lack of coolant. As there is no direct causal link between the intersection of LISAT in the orbital slot of BARTSAT and the explosion of the latter, the premature loss appears as an indirect damage which is not taken into account in the definition of the term "damage"²⁹ provided in article I(a).

Furthermore, concerning fault liability, there is an automatic exoneration in the case of negligence. In this case, Homeria should have anticipated that its satellite would have to be repositioned due to the different natural forces. It was negligent not to put sufficient coolant in its satellite. Therefore, San Marcos is not liable.

b. The expenses and lost revenues are not indemnifiable

Financial damages are not included in the definition of "damage" in article I of the 1972 Convention. Thus, the expenses and lost revenues that Homeria claims cannot be taken into account. Homeria could argue that its financial damages could be considered as indi-

²⁸ See above I.

²⁹ Article I(a) of the Liability Convention states: "The term "damage" means loss of life, personal injury or other impairment of health; or loss of or damage to property of States or of persons, natural, juridical, or property of international intergovernmental organisations".

rect damages³⁰. However, as stated above, the definition of the term "damage" does not include "indirect damage".

Even when considering the expenses of and lost revenues as indirect damages, they only are taken into account when they are the **consequences** of a damage as defined in article I of the Liability Convention³¹. In the case, the expenses and lost revenues due to the maneuvers to avoid a collision with LISAT incurred **before** the explosion. As noticed, an indirect damage flows from a direct damage, therefore occurs **after** a first incident. Therefore San Marcos is not liable for the expenses and lost revenues.

3. If one admits the liability of San Marcos, then Homeria is also liable

Article V of the Liability Convention deals with the occurrence of a damage caused by a space object launched by more than one launching State. It establishes that a State, which permits its territory to be used for the launch, shall be liable on an equal level to any other State involved in the launch³². LISAT was launched from Homeria's territory, which makes the archipelago a co-launching State of LISAT (a), regardless of the 99-year lease of land for Maglandia (b).

a. Homeria is a co-launching State of LISAT

If San Marcos should be held liable for the damages, Homeria's liability can also be established pursuant to article V. It states "A State from whose territory or facility a space object is launched shall be regarded as a participant in a joint launching". Homeria is the State from where LISAT was launched. Thus one cannot deny that it is a co-launching State of San Marcos' satellite. The fact that Homeria only plays a minor role in the launch is not decisive as all launching States as defined in Article I are jointly and severally liable for compensation³³.

³⁰ C. Q. CHRISTOL, "International Liability for Damage Caused by Space Objects", 1980, quoted by B.A. HURWITZ, *State Liability for Outer Space Activities in Accordance with the 1972 Convention International Liability for Damages caused by Space Objects*, Martinus Nijhoff Publishers, The Hague, 1992, p. 15.

³¹ An indirect damage is a "loss or injury as does not flow directly and immediately from the act, but only from some of the consequences or results of such act". Communication of Aeronautical & Space Sciences, U.S. Senate, Convention on International Liability for Damages caused by Space Objects, 1972, quoted in B.A. HURWITZ, *State Liability for Outer Space Activities in Accordance with the 1972 Convention on International Liability for Damages Caused by Space Objects*, Martinus Nijhoff Publishers, The Hague, 1992, p.15.

³² Article V clearly stipulates that whenever two States jointly launch a space object, "they shall be jointly and severally liable for any damages caused".

³³ W.F. FOSTER, "The Convention on International Liability for Damage Caused by Space Objects", *The Canadian Yearbook of International Law*, 1972, p.152.

b. The 99 year lease of land does not exclude Homeria's liability

Homeria cannot argue that, since the launching area was leased for 99 years, this territory did not remain its property. Indeed, the lease of land is only temporary. The assigning State remains entitled to its State sovereignty and keeps the vocation to get it back *in integrum* at the end of the 99 years lead of land³⁴. The territorial competences are transferred but the territory remains one of the assigning States³⁵. Therefore, the territory from where LISAT was launched is still Homeria's one. Consequently, Homeria certainly is a co-launching State of LISAT. The damages caused thus have to be compensated by both States, if San Marcos could be considered liable.

B. San Marcos is not liable under the general international State responsibility

Homeria could argue that San Marcos is liable under principles of international State responsibility, as it was codified from custom by the International Law Commission (ILC) since 1963³⁶. A project of articles hereto was adopted in 1996³⁷. The conditions for the application of the international responsibility of States are not fulfilled in the present case (1). Consequently, San Marcos is neither responsible for the premature loss of BARTSAT nor for the expenses and lost revenues (2).

1. The international State responsibility regime cannot be applied

To be applicable, general international responsibility requires the proof of **a damage imputable to a subject of international law**. The conditions that must be fulfilled are: a breach of an international obligation in force between two States which is imputable to one State, a damage caused to a law subject and resulting from an unlawful act (a) and the existence of a causal link

³⁴ For comparison, see P. SLINN, "Aspects juridiques du retour à la Chine de Hong-Kong", *AFDI*, 1996, pp. 273-295, and the Sino-Portuguese agreement about the restitution of Macao, April 13, 1987. The theory of China, telling that Hong-Kong and Macao never stopped to belong to it has been accepted by the UNGA.

³⁵ N.Q. DINH, P. DAILLER, A. PELLET, *Droit international public*, LGDJ, Paris, 1999, p. 480.

³⁶ Since 1963, a priority was given to the codification of the international responsibility of States. Following the work of the Subcommittee on State Responsibility, the members of the Commission expressed agreement, in 1963, on the following general conclusion: for the purposes of codification of the topic, priority should be given to the general rules governing international responsibility of the State.

³⁷ ILC Report of July 12, 1996, to the General Assembly, UN Doc, 51st session, n°10, A/51/10.

between the generator fact and the damage caused consequently (b)³⁸.

a. San Marcos did not breach any international obligation

Article 1 of the ILC project of articles states that "every internationally wrongful act of a State entails the internal responsibility of that State". Moreover, article 3 stipulates that: "There is an internationally wrongful act of a State when: (a) conduct consisting of an action or omission is attributable to the State under international law; and (b) that conduct constitutes a breach of an international obligation of the State"³⁹. In the case and as given above, San Marcos did not breach any international obligation⁴⁰.

Furthermore, article 6 stipulates "there is a breach of an international obligation by a State when an act of that State is not in conformity with what is required of it by that obligation". In the case, San Marcos had no obligation to remove LISAT and certainly did not commit any wrongful act.

b. Even if the general State responsibility regime is applicable, there is no causal link between San Marcos' wrongful act of and the damages suffered by Homeria

A causal link between two facts exists when one of them clearly and exclusively results from the other without any intermediary. In the present case there is no direct link between the said wrongful act of San Marcos and the damages suffered by Homeria⁴¹.

2. San Marcos does not have to compensate the damages suffered by Homeria

As only direct damage engages the duty to compensate, San Marcos did not have to indemnify the premature loss of BARTSAT and the expenses and loss of revenues (a). Furthermore, because Homeria contributed to its proper damage, there are concurrent causes that exonerate San Marcos of any liability (b).

³⁸ These requirements have been made clear in a number of leading cases. In the *Spanish zone of Morocco* case, the panel emphasised that "responsibility is the necessary corollary of a right. All rights on an international character involve international responsibility. Responsibility results in the duty to make reparation if the obligation in question is not met." Arbitral Award, *Spanish zone of Morocco* case, May 1, 1925, RSA, II, p. 627.

³⁹ This principle, shaped by custom, was recognised and applied frequently by a constant jurisprudence since: PCIJ, *Chorzow Factory case*, September 13, 1928, *Series A*, n° 17.

⁴⁰ See above I.

⁴¹ The question of causality, closely linked to the question of compensation, will be detailed further down.

a. The damages suffered by Homeria are not indemnifiable

According to the practice and international case law, only the direct damage allows the application of the international responsibility⁴². In the case, as said before, the direct causal link does not exist. Hence, Homeria cannot be compensated for the damages it suffered to its interests, consisting in property and other economic values.

b. Homeria's contribution to its proper damage leads to the suppression of San Marcos Liability

The negligence of Homeria exonerates San Marcos from liability

The doctrine supports that, if a wrongful act being given, an act of the victim intervenes and participates in the occurrence of a damage it complains about, one can consider that the causal link is broken and thus the victim cannot ask for any compensation. This theory called "dirty hands"⁴³ implies that if the victim was negligent and therefore had something to reproach to itself, the damages it suffered cannot be indemnifiable. In the case, it is clear that Homeria was negligent by not foreseeing enough coolant in case it had to move its satellite for any reason⁴⁴. Therefore, Homeria certainly intervened in the occurrence of its damages and consequently cannot ask for compensation.

Homeria's intervention in its damage breaks off the causal link

When there are concurrent causal links, the theory of the adequate causality allows to consider that the cause of the damage is the one which, regarding the ordinary flow of the events, has lead to the damage. The adequate causality is therefore the natural causality. When two facts intervene in the occurrence of a damage, only the one that would have naturally caused the damage is the only juridical cause. In the case, Homeria's own behaviour was the exclusive cause of the damage (i). Even if the Court does not recognize this, the theory of the parallel intervention remains applicable (ii).

(i) Homeria's exclusive intervention

This theory is applicable in cases where a wrongful act being given with the appearance of intervention of several causal links, only one element is the exclusive cause of the damage. It ensues from this theory

⁴² Arbitral Award of the Senate of Hamburg, *Yulle-shortridge* case, October 21, 1861, *RAI*, volume II, p. 78.

⁴³ Free translation from French. B. Stern, "Responsabilité Internationale", *Répertoire de Droit international*, Volume III, *Encyclopédie Dalloz*, Dalloz, Paris, 1998, p. 26.

⁴⁴ Repositioning maneuvers of satellites are not unusual since different natural forces have impact on the satellite's position.

that no compensation can be asked from the State that committed the wrongful act. In the case, Homeria's inquiry board clearly established that the precise cause of the premature loss was identified as a lack of sufficient coolant⁴⁵. Even if the Court considers that San Marcos committed a wrongful act, the lack of coolant is the exclusive cause of the premature loss. Here again, San Marcos is exonerated of compensation for the damages caused to Homeria.

(ii) Homeria's parallel intervention

This theory represents the case where a wrongful act causes a damage, but this damage would have occurred even if this wrongful act did not exist⁴⁶. It appears that in such a case, the victim of the damage cannot ask for any compensation to the State which committed the wrongful act. In the case, even if the Court considers that San Marcos committed a wrongful act, Homeria cannot be indemnifiable for the damages to BARTSAT, as they would have occurred even without this wrongful act. Indeed, BARTSAT's explosion was provoked by the lack of coolant. If BARTSAT should have moved for any other reason, the same damage would have occurred. Therefore, San Marcos does not have to compensate any damages.

III. HOMERIA IS IN BREACH OF INTERNATIONAL LAW FOR LAUNCHING BARTSAT WITH A NUCLEAR POWER SOURCE WITHOUT FIRST DISCLOSING ITS EXISTENCE

First, the State of Homeria did not have the right to launch a satellite with a nuclear power source (NPS) on board (A). Second, the State of Homeria should have disclosed its existence (B).

A. Homeria is in breach of international law for launching BARTSAT

Homeria did not have the right to launch BARTSAT with a NPS on board both on the ground of outer space law (1) and on the ground of environmental law (2).

1. Homeria is in breach of outer space law

Homeria has violated the dispositions of the Resolution on the Principles Relevant to the Use of Nuclear Power Sources in Outer Space⁴⁷ (a) and the dispositions of the OST (b).

⁴⁵ Statement of Facts, p. 5.

⁴⁶ J. PERSONNAZ calls it the "coincidence of causes", quoted in B. STERN, "Responsabilité Internationale", *Encyclopédie Dalloz, Répertoire de Droit international*, volume II; Dalloz, Paris, 1998, p. 21.

⁴⁷ *Principles Relevant to the Use of Nuclear Power Sources in Outer Space*, UN General Assembly Resolution 47/68, December 14, 1992. Hereinafter "the NPS Resolution."

a. Homeria is in breach of the principles enounced in the NPS Resolution

Several dispositions of the NPS Resolution, applicable to Homeria on the ground of custom (a), have been violated (b).

Homeria is bound by the principles enounced in the NPS Resolution

Even if the NPS Resolution is not a binding text, its content has a legal force on the ground of custom (i) and Homeria cannot be considered a persistent objector (ii).

(i) *The Principles have customary value*

A custom is an international source of law according to article 38 of the Statute of the ICJ that defines it as "a general practice accepted as law"⁴⁸. Two elements appear in this definition: the material element, the practice of States called the *consuetudo*; and the psychological element, the acceptance of a rule as being law, called the *opinio juris*.

In the field of space law, one can notice the high level of cooperation between the different actors. Even formally non-binding documents are well respected. Even if an infringement were not necessarily sanctioned, a State not respecting them would certainly be excluded from the space community. This general practice that follows after the adoption of these documents accelerates the formation of custom⁴⁹.

One can also notice that three principles of the NPS Resolution are planned to be included in the Registration Convention, which would give them a legal force. Their future inclusion in a binding document would strengthen their weight⁵⁰.

The adoption of the Resolution by consensus, without fundamental objections, can be interpreted as showing an *opinio juris*⁵¹.

⁴⁸ Definition confirmed in ICJ, *Asylum* case, November 20, 1950, *ICJ Reports*, 1950, p. 266 and in ICJ, *North Sea Continental Shelf* cases, February 20, 1969, *ICJ Reports*; 1969, p. 3.

⁴⁹ M. FERRAZZANI, "Soft Law in Space Activities", *Outlook on Space Law over the next Thirty Years*, under the direction of G. Lafferranderie and D. Crowther, Kluwer Law International, The Hague, 1997, p. 442.

⁵⁰ M. BENKÖ, "The 1998 European Initiative in the UNCOPUOS Legal Subcommittee to improve the Registration Convention", *Proceedings of the 40th Colloquium on the Law of Outer Space, International Institute of Space Law of the IAF*, Australia, 1998, p. 4.

⁵¹ E. SUY, "Rôle et signification du consensus dans l'élaboration du droit international", *Yearbook*, Institut of

When this *opinio juris* is accompanied by a general practice, it gives birth to a custom. The ICJ stated that the *opinio juris* can be deduced from the attitude of States toward UNGA resolutions, and it added that the consent to their content could be seen as an adhesion to the value of the rule enounced by the resolution⁵². The NPS Resolution has been adopted by consensus. This shows the general acceptance of its principles⁵³. Furthermore, principle 8 of the Resolution states that non-compliance with the NPS Principles entails international responsibility. In international law, the question of responsibility only arises when a legal norm is violated. The acceptance of this principle proves the conviction of the whole international community that NPS Principles are binding rules⁵⁴. The NPS Principles therefore have customary value⁵⁵.

(ii) *Homeria is not a persistent objector*

Homeria could argue that it is a persistent objector to the custom, meaning that it is not bound by it⁵⁶. Certainly, Homeria was absent at the time of the adoption of the NPS Resolution, but this is not sufficient to be a persistent objector. To be considered as such, Homeria should have expressly announced its disagreement with the content of the Resolu-

tion⁵⁷. Instead, it kept silence. An established custom also binds States that have not participated in its formation⁵⁸.

Homeria has violated different NPS Principles

Both principle 3 "Guidelines and criteria of safe use" (i), and principle 4 "Safety assessment" (ii) have been violated by Homeria.

(i) *Homeria has breached principle 3 "Guidelines and criteria of safe use"*

Two conditions provided in principle 3 have not been respected. First, Homeria has not complied with the condition of necessity for the use of a NPS. The introducing sentence provides that "the use of nuclear power sources in outer space shall be restricted to those space missions which cannot be operated by non-nuclear energy sources in a **reasonable way**". Nowadays, NPS are merely used in low earth orbits, because satellites are frequently in the shadow of Earth and cannot use solar power, and for deep space missions, e.g. for the purpose of exploration⁵⁹, since such satellites need much more power there. These are the only uses that should be considered "reasonable". Satellites on GSO can well perform with solar power⁶⁰.

The second condition not respected by Homeria concerns the safety requirements of the satellite. Principle 3§1(a) provides that the design and use of the NPS shall "ensure with a high degree of reliability that radioactive material does not cause a significant contamination of outer space" and that "the hazards, in **foreseeable** operational or accidental circumstances, are kept below acceptable levels". The term foreseeable is defined in principle

International Law, Pedone, Paris, Session of Strasbourg 1997, p.33.

⁵² ICJ, *Military and paramilitary activities in and against Nicaragua* case, June 27, 1986, *ICJ Reports*, 1986, p. 14.

⁵³ The only space resolution that has not been adopted by consensus is also the only one that has not customary value. Principles Governing the Use by States of Artificial Earth Satellites for International Direct Broadcasting, UN General Assembly Resolution 37/92, December 10, 1982.

⁵⁴ M. HOSKOVA affirms that "this resolution may be considered as an expression of (...) a legal conviction of all members of the world organisation, or a overwhelming thereof", M. HOSKOVA, "the Notification principle in the 1992 NPS Resolution", *Proceedings of the 36th Colloquium on the Law of Outer Space, International Institute of Space Law of the IAF*, Austria, 1993, p. 304.

⁵⁵ In 1978, the Cosmos 954 accident and the radioactive fallout over Canada increased the awareness of the international community as to the danger of NPS. Discussions about this subject began in the UNCOPUOS the same year. States' awareness facilitated the development of the custom.

⁵⁶ Concerning the persistent objector, see ICJ, *Anglo-Norwegian Fisheries* case, December 18, 1951, *ICJ Reports*, 1951, p. 116.

⁵⁷ E. SUY, "Rôle et signification du consensus dans l'élaboration du droit international", *Yearbook*, Institut of international law, Pedone, Paris, Session of Strasbourg, 1997, p. 33.

⁵⁸ For another application of this rule, see D. BARDONNET, "La dénonciation par le gouvernement sénégalais de la Convention sur la mer territoriale et la zone contiguë et de la Convention sur la pêche et la conservation des ressources biologiques de la haute mer en date du 29 avril 1958 à Genève", *AFDI*, Paris, 1972, pp. 123-168.

⁵⁹ The different Russian satellites COSMOS are examples of NPS low earth orbit satellites. Deep exploration satellites are for instance the American satellites Galileo, Ulysse or Cassini.

⁶⁰ If the NPS used in BARTSAT was a nuclear reactor (Homeria did not give information about the nature of the NPS), Homeria could argue that, according to principle 3§2, nuclear reactors can be operated in sufficiently high orbits. Admittedly, the GSO is a high orbit. However, according to the definition of a high orbit given in paragraph 2(b), the minimization of the risk of collision should be taken into consideration. The GSO is increasingly being used and becomes congested. Therefore, Homeria cannot justify the use of a NPS for BARTSAT.

2§3. It includes the “credible possibilities” that an event occurs. Obviously, Homeria has not complied with this principle. It is quite common that a satellite has to be repositioned and thus has to use more coolant. This fact has to be considered in the conception of the satellite. It is unacceptable that in the middle of its expected life, BARTSAT had already run out of coolant. Homeria should have foreseen the risk of explosion. Moreover, principle 3§1(c) states that the design shall render the probability of accidents “extremely small”. A mere lack of coolant should not provoke a nuclear explosion.

**(ii) Homeria has breached principle 4
“Safety assessment”**

Principle 4§1 provides that, prior to the launch, the launching State shall “ensure that a thorough and comprehensive safety assessment is conducted”. Homeria cannot have made this seriously since its satellite exploded at the first difficulty⁶¹.

**b. Homeria is in breach of articles IX and I
OST**

Article IX OST requests that States must conduct space activities so as to avoid harmful contamination of outer space. Homeria, by launching an NPS satellite with the risks that this produced, for a mission that did not necessitate a NPS, has exposed outer space environment to an unjustified risk. Homeria has not taken into consideration the environmental issue of the launching of BARTSAT. A solar powered satellite would have been as much efficient as an NPS satellite.

Article I OST provides that the use of outer space “shall be carried out for the benefit and in the interests of all countries” and that “there shall be freedom of scientific investigation in outer space”. This scientific investigation is hindered, as it has been established that NPS in outer space severely disturb scientific observation and research⁶².

2. Homeria is in breach of environmental law

Environmental law does not explicitly prohibit the launch of a NPS satellite, but it provides that certain conditions and procedures must be respected before engaging an activity that may endanger people’s health and environment.

⁶¹ Principle 4§3 concerning the disclosure of a NPS satellite launch has also been violated but this point will be studied further down in this paper.

⁶² NPS in outer space damage severely the important field of gamma-ray astronomy, “critical for the study of such important phenomena as quasars, black holes, supernovae and neutron stars”. J.C. CLAYTON, “Nuclear Power Sources for Outer Space, Political, Technical, and legal Considerations”, *Proceedings of the 32nd Colloquium on the Law of Outer Space, International Institute of Space Law of the IAF*, Spain, 1989, pp. 286-295.

The launching of a satellite is not a safe activity. A problem may arise from the rocket at the time of the launching and the satellite may dysfunction before it reaches a sufficiently high orbit. In a case of a failed launch of a NPS satellite, the risk of re-entry with radioactive fallout on Earth is significant. It may severely endanger people, flora and fauna lives and damage terrestrial, atmospheric and maritime environment. But even when the launching is a success, environmental considerations are still relevant, as far as the space environment shall also be respected⁶³. However, Homeria has not taken into consideration the environmental issues of the launching of BARTSAT.

One cannot argue that environmental law merely provides non-binding principles. This is not conclusive. Environmental law is fully applicable in this case. Even if there is not a specific convention that applies to the present case, the following principles belong to the *corpus* of international law, since they have been recognized by the ICJ and have a customary value⁶⁴. From the most general to the most specific environmental principle, Homeria should have respected: the right to live in a sane environment (a), the duty of prevention (b) and the duty to make an environmental impact assessment (c).

a. Homeria has not respected the right to each person to live in a sane environment

Each person, according to principle 1 of the 1972 Stockholm Declaration, has the right to live in a sane environment. This implies that each State has the duty to protect its environment and the environment of its neighbouring States. The Court affirmed that this duty is “now part of the corpus of international law relating to the environment”⁶⁵. The Court

⁶³ According to article IX OST, States shall avoid space contamination. Furthermore, article 2 of the 1992 Rio Declaration provides that States shall not damage environment in areas not submit to national jurisdiction. The ICJ, Advisory Opinion, *Legality of the Threat or Use of Nuclear Weapons* case, July 8, 1996, *ICJ Reports*, 1996, p. 66, has confirmed it. It may be relevant to note that today; 1300 kg of plutonium is on orbit. J. ARNOULT, “L’espace et l’éthique”, CNES, Paris, 1999, p.45.

⁶⁴ P.M. DUPUY, “Où en est le droit international de l’environnement à la fin du siècle ?”, *RGDIP*, Pedone, Paris, 1997, p. 876 and p. 880-881.

⁶⁵ This duty has been recognized in ICJ, *Legality of the Threat or Use of Nuclear Weapons* case, July 8, 1996, *ICJ Reports*, 1996, p. 66. The Principle is also proclaimed in principle 21 of the 1972 Stockholm Declaration and in principle 2 of the Rio Declaration. It has been rec-

also specified the content of this general principle. It concerns notably "widespread, long-term and severe environmental damage". The Court stressed the unique characteristics of the nuclear pollution more particularly in its long-term dimension, taking into account the interest of the future generations and the sustainable development⁶⁶. The temporal dimension of this principle obliges States to prevent any occurrence of damage to the environment. Prevention is an element of the general duty of due diligence⁶⁷.

b. Homeria has not complied with the duties of prevention and precaution

This obligation is recognized by ICJ in the *Gabiskovo-Nagymaros* case⁶⁸. It is also present in article 3 of the 1998 Project of Articles of the ILC concerning the liability *ex-ante* of States⁶⁹. From this obligation of prevention follows the principle of precaution defined in the Rio Declaration principle 15. It consists in measures of precaution that shall be applied by States in case of a risk of serious and irreversible damage to environment. It adds that the lack of scientific knowledge shall not be used as an excuse to postpone the adoption of measures to prevent the damage to environment⁷⁰. The dangerous launch of NPS does not meet these requirements. As a consequence of this obligation of prevention, States shall, before engaging activities, which may damage environment, carry out an environmental impact assessment on environment.

ognized for the first time in the Arbitral Award, *Trail Smelter* case, March 11, 1941, *RSA*, III, p. 907.

⁶⁶ The principle of sustainable development has been enounced in principle 1 of the Stockholm Declaration, principle 4 of the Rio Declaration and recall by the Court in the *Gabiskovo-Nagymaros Project* case, September 25, 1997, *ICJ Reports*, 1997, p. 87.

⁶⁷ Arbitral Award, *Trail Smelter* case, March 11, 1941, *RSA*, III, p. 907.

⁶⁸ ICJ, *Gabiskovo-Nagymaros Project* case, September 25, 1997, *ICJ Reports*, 1997, p. 87. This obligation was originally enounced in principle 21 of the Stockholm Declaration and principle 2 of the Rio Declaration.

⁶⁹ ILC Report on the 53rd session, A/53/10, p.18.

⁷⁰ For other application of this principle, see for instance, Article 206 of the Montego Bay Convention (10 December 1982), the Bamako Convention of January 30, 1991 or article 130 R of the Maastricht Treaty (7 February 1992).

c. Homeria has not complied with the obligation to make an environmental impact assessment

According to the Court, "respect of the environment is one of the elements that go to assessing whether an action is in conformity with the principles of necessity and proportionality"⁷¹. It has been already shown that the NPS on the satellite is obviously not necessary for a communication mission on the GSO. To make sure that the condition of necessity and proportionality is fulfilled, Homeria should have carried out an impact assessment prior to the launch. This is notably enounced in principle 17 of the Rio Declaration⁷². The realisation of this impact assessment is a prior necessary step for a good appliance of the duty of information that will be explained further down⁷³.

It has been demonstrated that Homeria has breached environmental law principles by launching BARTSAT. Moreover, Homeria, according to the same rules, should have informed the other States of the risks inherent to the launching.

B. Homeria is in breach of international law for not disclosing the presence of a NPS on board of BARTSAT

Admittedly, the 1975 Registration Convention does not provide an obligation to disclose the presence of a NPS on board of a satellite as far as it is not mentioned in article IV(2) concerning the information to be made publicly available prior to the launch. But Homeria should have disclosed the NPS on the ground of the principle of information (1) and the principle of cooperation (2).

1. Homeria has breached the obligation of information

In the 1998 ILC project of articles mentioned above, the general obligation of precaution implies an obligation of transparency and information when an activity risks to damage environment⁷⁴. According to arti-

⁷¹ ICJ, Advisory opinion, *Legality of the Threat or Use of Nuclear Weapons* case, July 8, 1996, *ICJ Reports*, 1996, p. 66.

⁷² The obligation to carry out an impact assessment is present in numerous other conventions, for instance: in the Espoo Convention on Environmental Impact Assessment on Environment in a Transboundary Context (February 25, 1991) and article 205 of the Montego Bay Convention. Article 17 of the Vienna Convention on Nuclear Safety provides that an impact assessment shall be conducted before the installation of a nuclear plant.

⁷³ The Espoo Convention provides that an environmental impact assessment shall be carried out before any activity that may damage environment.

⁷⁴ For other application of this principle, see for instance ECHR, *Anna Maria Guerra* case, February 18, 1998,

cles 10 and 14, this information must be given to the public and the "States likely to be affected". Article 16 specifies that the exchange of information shall be done periodically during the activity. San Marcos, a neighbouring State of Homeria, would have been directly concerned in case of a failed launching of BARTSAT. Its territory as well as its territorial Sea could have been severely damaged by radioactive fallout. San Marcos in the first place, but also the whole international community, should have been informed of the launching. If BARTSAT had dysfunctioned in outer space on its way to the GSO, it could have re-entered the atmosphere at any place, all the States being potentially concerned by the radioactive fallout.

Principle 4§3 of the NPS Resolution states that a safety assessment shall be made publicly available prior to the launch of a NPS satellite⁷⁵. This rule clearly implies the disclosure of the NPS. The information shall be transmitted to the States concerned and to the Secretary General of the United Nations. As paragraph 3 makes a reference to article XI OST, it can be concluded that the principle merely recalls a rule that pre-exists. Thus, Homeria is bound by the obligation of disclosure not merely on the ground of the Resolution, but also on the ground of the OST⁷⁶.

Even if it is considered that the obligation of information does not bind Homeria, the same obligation can be deduced from the general obligation of cooperation that shall prevail between States engaged in space activities.

2. Homeria has breached the general obligation of cooperation

The principle of cooperation⁷⁷ has been recognized by the ICJ in the *Gabiskovo-Nagymaros project*

RGDIP, 1998, p.1010, the Directive of the European Union Council 90/313/EEC (JOCE n° L 158 23.06.90), June 23, 1990, p.56, the Resolution 1807 (1996) of the General Assembly of the Council of Europe concerning the consequences of the Chernobyl accident, April 26, 1996, Article 14 of the Convention on Biological Diversity, June 5, 1992, Article 15 of the Convention on the Transboundary Effects of Industrial Accidents, March 17, 1992, UN Framework Convention on Climate Change, May 9, 1992.

⁷⁵ For the applicability of the NPS Resolution to Homeria, see above III-A-1.

⁷⁶ M. HOSKOVA, "The Notification principle in the 1992 NPS resolution", *Proceedings of the 36th Colloquium on the Law of Outer Space, International Institute of Space Law of the IAF*, Austria, 1993, pp. 304-311.

⁷⁷ This principle is present in the Convention on Climate Change, May 9, 1992, in the Convention on the Law of the Sea, December 10, 1982 and in Niue Treaty on Cooperation in Fisheries Surveillance and Law Enforcement in the South Pacific Region, July 9, 1992. It can also be found in principle 24 of the Stockholm Declaration, in principles 7, 12, 14 and 27 of the Rio Declaration, in article 11 of the ILC project of articles.

case⁷⁸. Articles III, IX, and XI OST also provide the principle of international cooperation in the use of outer space⁷⁹. The GSO is a particular strategic orbit where all States' interests meet. It is congested and satellites are close to each other. The presence of a NPS satellite interests the other States as far as in case of accident, there is a risk of pollution by radioactive debris in area of the orbit. Cooperation is made through consultation. According to article IX, a State that has reason to believe that its activity would cause potentially harmful interference with other States' activities shall undertake appropriate international consultations before proceeding with any such activity. This last paragraph and the logic of cooperation and consultation of the treaty imply that Homeria should have disclosed the existence of the NPS on board of BARTSAT. The fact that, even after the accident, Homeria kept on denying as long as possible the presence of the NPS shows its bad faith and lack of cooperation.

IV. HOMERIA IS LIABLE UNDER INTERNATIONAL LAW FOR THE DAMAGE TO LISAT.

Homeria is liable for the damage to LISAT under the Liability Convention (A) and under general international law (B).

A. Homeria is liable under the Liability Convention for the damage to LISAT

As the incident occurred in the GSO and hence "elsewhere than on the surface of Earth"⁸⁰, San Marcos can seek compensation under article III of the Liability Convention, which establishes a liability regime based on fault. The loss of LISAT is a "loss of property" as defined in article I(a) of the Liability Convention. The damage to LISAT was caused by a space object (1) due to Homeria's fault (2).

1. The damage to LISAT was caused by a space object

Homeria might question if the damage to LISAT had been caused by a **space object**, since it was a **fragment** that struck LISAT. As will be shown, the fragment can be considered a space object. This is in conformity with the following general interpretation principles.

First, the fragment is a space object according to the interpretation principle of the most evident solution. This method of interpretation has been defined by the ICJ as the interpretation with the ordinary meaning of the words in their context⁸¹. Second, the fragment is a

⁷⁸ ICJ, *Gabiskovo-Nagymaros Project case*, September 25, 1997, *ICJ Reports*, 1997, p. 87.

⁷⁹ It provides that activities in outer space shall be conducted with due regard to the interests of other States.

⁸⁰ Article III Liability Convention.

⁸¹ ICJ, *Temple of Preah Vihear case*, May 26, 1948, preliminary exceptions, *ICJ Reports*, 1961, p. 32.

space object according to the *effet utile* interpretation method that consists in rendering as effective as possible the dispositions of a treaty, permitting its best application⁸². As the Liability Convention is victim oriented⁸³, an extensive interpretation of the words "space object"⁸⁴ should be employed in favour of the victim San Marcos. Third, the *travaux préparatoires* also show that a fragment can be considered a space object. In the Convention drafts, many States have indeed adopted a wide interpretation of the term⁸⁵.

Homeria could argue that the fragment is a space debris for which a special regime has to be applied. Even though there is a need to regulate the matter concerning space debris and the legal situation seems insufficient⁸⁶, the Liability Convention still applies. It is generally accepted that debris are "space objects" as employed in the *corpus* of space law⁸⁷. Homeria has never denied the fact that the fragment's origin was BARTSAT. The typical legal problem of space debris, their tracking and identification, is not given in the present case. Moreover, since States shall retain jurisdiction and control over their space objects, the owner shall stay responsible even if its space object is nothing more than space junk⁸⁸. There is no reason to deny the application of the Liability Convention by arguing that the fragment is only a debris.

2. Homeria has caused the damage by fault

In the sense of article III of the Liability Convention, a fault is a failure to exercise the degree of prudence considered reasonable under the circumstances. As already stated, Homeria has been negligent in the conception of BARTSAT. The NPS was not safely designed and

⁸² ICJ, *Channel of Corfu* case, April 9, 1949, *ICJ Reports*, 1949, p. 24.

⁸³ C.Q. CHRISTOL, *Space law, Past, Present, and Future*, Kluwer, Boston, 1991, p. 219.

⁸⁴ Moreover, the definition of the term space object given in article I(d) of the Liability Convention includes "component parts". See also B.A. HURWITZ, *State Liability for Outer Space Activities in Accordance with the 1972 Convention on International Liability for Damage Caused by Space Objects*, Martinus Nijhoff Publishers, The Hague, 1992, p. 24.

⁸⁵ For example, the *Indian Draft* (UN. Doc. A/AC.105/C.2/L.32/Rev.1 and Corr. I).

⁸⁶ W. FLURY, "Summary of the First European Conference on Space Debris", *Proceedings of the 36th Colloquium on the Law of Outer Space, International Institute of Space Law of the IAF*, Austria, 1993, p. 392.

⁸⁷ J. M. de FARAMINAN GILBERT, "Space Debris: Technical and Legal Aspects", *Outlook on Space Law over the Next Thirty Years*, under the direction of G. Lafferranderie and D. Crowther, Kluwer Law International, The Hague, 1997, p. 311.

⁸⁸ B.A. HURWITZ, *State Liability for Outer Space Activities in Accordance with the 1972 Convention on International Liability for Damage Caused by Space Objects*, Martinus Nijhoff, The Hague, 1992, p. 24.

an explosion was likely to occur even in usual conditions. Both boards of inquiry agreed in the fact that the explosion was centered in the NPS. Homeria cannot claim that the explosion was purely accidental. As shown, the use of a NPS on board of a geostationary telecommunication satellite constitutes by itself a gross negligence. This is aggravated by the fact that a mere lack of coolant could cause the explosion. Therefore, Homeria is liable under article III of the Liability Convention. As a consequence, San Marcos can be indemnified for the damage.

B. Homeria is liable under general international law for the damage to LISAT

As stated above, Homeria has violated international law by launching its NPS satellite without first disclosing its existence. Thus, it should be held liable for the damages caused to San Marcos on the ground of State responsibility regime (1). Even if it is not established that the launching of BARTSAT was a prohibited act, Homeria is still liable for the injurious consequences of this non-prohibited act (2).

1. Homeria is liable under State responsibility regime

All the conditions are fulfilled in the present case for the application of the international State responsibility regime. First, Homeria has breached two international obligations by having launched such an unsafe satellite. The launch of a satellite with a NPS on board itself constitutes a violation of international law⁸⁹. The second violation consisted in the gross negligence in the conception of the satellite's design. As said, repositioning maneuvers are not unusual. Homeria should have constructed its satellite considering this fact. Second, this infringement caused a damage to a legal protected right. In the case, this corresponds to the right of San Marcos to properly use its satellite and to gain profit from it. The loss of LISAT is the damage suffered by San Marcos. Finally, a direct causal link exists between the breach of international law and the damage to LISAT. Homeria's wrongful act was followed by the loss of LISAT. Homeria therefore is liable under the principles of State responsibility.

2. Homeria is liable for the damage caused to San Marcos even in the absence of a violation of international law

If Homeria considers its activities as legal, it still remains liable for the damage caused. Just because an act is accepted as legal does not mean that States are willing to accept damage resulting from such an act. Liability for non-prohibited acts is established when States conduct ultra-hazardous activities with substantial risks for other States. This liability regime is recognised by a large majority of States in many different fields of their

⁸⁹ See above III.

legislation. This proves that this form of liability is a general principle of law⁹⁰.

Since 1978, the ILC has been working on this topic. The foundation of the principle is based on risk. It is sufficient that the activity is dangerous to engage the State liability in case of damage to another State. The danger of the activity does not only depend on the probability that the hazard will materialise, but also on the far-reaching consequences in the event of the hazard materialising. The explosion of BARTSAT in the GSO was likely to occur due to its poor design. Moreover, the consequences of this radioactive contamination through a cloud of debris will prevent the further use of a large part of the GSO by other States. Such a severe damage to GSO as a unique natural and limited resource in outer space makes it impossible for many interested States to use certain segments of this orbit⁹¹. Fundamental principles of space law are infringed: the freedom of use and the common interests principle of article I OST. These long term and widespread consequences for the GSO clearly demonstrate and justify the existence of the liability for non-prohibited acts.

Furthermore, since there is no specific regulation dealing with the question of liability for nuclear damage in space, resort can be made to the existing treaties⁹² in the field of nuclear damage on the basis of analogy. These treaties almost unexceptionally have recourse to the regime of absolute liability for nuclear damage on earth. For the space environment, the situation is comparable. A nuclear accident aboard a space object can occur at any stage of the mission, causing radiological pollution and other severe damage on a very large scale.

Three arguments speak in favor of an absolute liability regime to be established for nuclear damages in outer space. First, from the point of view of the victim, the absolute liability regime is the adequate response to such hazardous activities. States using NPS expose other States conducting space activities, or planning to do so, to disproportional risks. Furthermore, having to prove negligence and thus a fault on the side of the launching state in case of a nuclear damage is very difficult for the victim. Second, NPS technology in space is still developing. Criteria for responsible behaviour as to what is negligent or not have not been established yet. Third, the actors involved in dangerous space activities must not only be prepared to receive the benefits, but also accept burdens, that is to bear the consequences of absolute liability. Thus, there is a need for an absolute liability regime for nuclear damages in outer space, not only for

environmental reasons⁹³. Such a regime also will promote a better safety design of NPS.

Consequently, Homeria is liable for the damage caused to LISAT according to this regime.

⁹⁰ N.Q. DINH, P. DAILLER, A. PELLET, *Droit international public*, LGDJ, Paris, 1999, p. 762.

⁹¹ Interview with Mrs. BENKÖ, Institute of Air and Space Law, Cologne University.

⁹² Paris Convention on Third Party Liability in the Field of Nuclear Energy, July 29, 1960, Vienna Convention on Civil Liability for Nuclear Damage, May 21, 1963.

⁹³B.A. HURWITZ, *State Liability for Outer Space Activities in Accordance with the 1972 Convention on International Liability for Damage Caused by Space Objects*, Martinus Nijhoff Publishers, The Hague, 1992, p. 32 and p. 68-69; J. M. de FARAMINAN GILBERT, "Space Debris: Technical and Legal Aspects"; *Outlook on Space Law over the Next Thirty Years*, under the direction of G. Lafferranderie and D. Crowther, Kluwer Law International, The Hague, 1997, p. 317.