

Chapter 11

Convention on International Liability for Damage Caused by Space Objects



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11.1 Introduction and Regulatory Context

For obvious reasons, space activities are generally classed as ultra-hazardous endeavours, i.e. they are inherently dangerous, not only for the various vehicles leaving the Earth atmosphere, but also the cargo such vehicles carry, be it human or otherwise. Additionally, space activities generate environmental risks in outer space that can, at times, impact the Earth as what goes up, must inevitably come down. The hazards of spaceflight come from multiple sources, including, but not limited to, the technology used (e.g. nuclear power sources) and the hostile nature of outer space

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which is difficult to reach, difficult to survive in and difficult to return from.¹ This inherent danger has been tragically highlighted not only by the shuttle disasters involving Challenger (1986) and Columbia (2003) but also by the vast field of radioactive debris left in Canada after the uncontrolled re-entry of the Soviet satellite Cosmos 954 in 1977. The latter accident exemplifies that ultra-hazardous activities require liability rules because when something goes wrong, the consequences can be significant for any injured parties.² However, it cannot be said that Canada's contamination by Cosmos' debris triggered the international agreement on a contractual liability regime for space activities, rather that was something born from the early awareness of the United Nations Committee on the Peaceful Use of Outer Space (COPUOS), established by the UN General Assembly in 1958.³ Indeed, the international discussion on establishing a proper space liability regime was a direct consequence of the space race between the USA and USSR which started in 1955 when the US announced its intention to launch artificial satellites. The USSR, however, was the first nation to successfully launch an orbital payload using the unmanned Sputnik 1 satellite on 4 October 1957. Unfortunately, disagreements between the two major space-faring nations and cold-war enemies hampered reaching any agreement on a comprehensive space liability regime until the General Assembly, in 1963, adopted Resolution 1962 (XVIII), proclaiming the legal principles governing the activities of States in the exploration and use of outer space, a declaration that included a principle on liability (para. 8).⁴ The UN GA's Declaration of Principles is the predecessor of today's Outer Space Treaty, which was agreed upon by the General Assembly in 1966⁵ and entered into force in October 1967, almost exactly 10 years after Sputnik's first orbital flight.⁶ However, in light of the difficult relationship between the USSR and the USA, it was clear from the outset that the treaty's rather rudimentary responsibility and liability provisions (Article VI and VII) needed to be both further specified and supplemented, a process to be addressed in the "Convention on International Liability for Damage Caused by Space Objects". Work on this Liability Convention built on proposals made by the USA⁷ as early as 1962 and by Belgium and Hungary in 1964.⁸ Within the institutional framework of COPUOS, a compromise on the space liability regime was finally found in 1971 and subsequently adopted by the General Assembly as Resolution 2777 (XXVI).⁹ The Liability Convention entered into force in September 1972 as *lex specialis* to Article VII of the Outer Space Treaty for those States, which

¹ Soucek (2011), p. 324.

² Jenks (1966), p. 122.

³ GA Resolution 1348 (XIII) of 13 December 1958.

⁴ GA Resolution 1962 (XVIII) of 13 December 1963.

⁵ GA Resolution 2222 (XXI) of 19 December 1966.

⁶ 972 UNTS 119.

⁷ A/AC.105/C.2/L.4 (1962), reproduced in A/AC.105/6 Section II (4) at 6.

⁸ UN Docs A/AC.105/C.2/L.7 and L.10 (1964).

⁹ GA Resolution 2777 (XXVI) of 29 November 1971.

are a States party to the Convention.¹⁰ To date, 96 States have ratified the Liability Convention and four international organisations¹¹ have accepted all the rights and obligations under it. By way of comparison, 109 States are party to the Outer Space Treaty. There is, unsurprisingly, a close link between the two treaties: the understanding of the elements in Article VII Outer Space Treaty is informed by corresponding provisions of the Liability Convention and *vice versa*, given that both treaties have their origin in the same negotiation process and drafting history. Having said that, the Liability Convention was considered by its drafters as a supplementary treaty, designed to expand upon the provisions of the Outer Space Treaty.¹²

The Outer Space Treaty's main aim is not to protect the environment on Earth or in space as a common good of humanity, nor is the space liability regime designed to deal with providing compensation for environmental damage as such. However, by allowing the payment of monetary damages for harm caused by space objects, the Liability Convention includes environmental damage in its scope as this is seen as an integral part of public or private property.

11.2 Liability Model

11.2.1 Material Scope of the Space Liability Regime

The Liability Convention applies to damage caused by space objects launched by a State, irrespective of whether the space object causes damage on the surface of the Earth, to an aircraft in flight (Article II) or elsewhere (Article III). Applicability of the Liability Convention is not limited to space objects that were successfully launched as damage caused by a failed launch still falls within the scope of the treaty (Article I (b)).

The question of what constitutes the launching State is of no importance for determining the material scope of the Liability Convention because the term is used in a manner so that there is always a launching State, which was always going to be basic truth from a mid-twentieth century technological standpoint. The same is valid for the liability-provision found in Article VII of the Outer Space Treaty, which differs between the launching State and the procuring State.¹³ Therefore, both treaties' scope of application is primarily ascertained by the understanding of the term space object, which must cause the damage to be compensated under the

¹⁰961 UNTS 187.

¹¹UN Doc A/AC.015/C.2/2019/CRP.3: European Space Agency, European Telecommunications Satellite Organisation, Intersputnik International Organization of Space Communication; European Organization for the Exploitation of Meteorological Satellites.

¹²Kerrest and Smith (2013), Article II para. 76.

¹³Kerrest and Smith (2009), Article VII para. 35–37.

Liability Convention (Article II and III). The Convention does little to clarify the term space object, apart from stipulating in Article I(d) that the term includes component parts of a space object as well as its launch vehicle and parts thereof. From this, it follows that an object, such as an entire satellite or parts thereof, becomes a space object from the moment the launch countdown timer reaches zero.¹⁴ Therefore, damage caused by a satellite being transported to the launch facility does not fall within the scope of the Liability Convention, neither does damage caused by equipment on the launch pad.

- 5 The term space object indicates that the object causing the damage must have both material¹⁵ and physical properties,¹⁶ which precludes any inclusion of damage emanating from electromagnetic waves, communication (optical) lasers or other non-tangible signals and emissions.¹⁷ Also worthy of note at this point is the fact that the size of the space object is immaterial and thus includes the micro-debris already in outer space created by the cascading collisions of objects in orbit (the so-called Kessler effect). This broad catch-all understanding of what constitutes a space object is what was settled on, even though there had been proposals for a more specific definition during the negotiations, such as the joint proposal by Argentina, Belgium and France that sought to define the term ‘space object’ as “any object made and intended for space activities”.¹⁸ However, this proposal was rejected and an alternative definition acceptable to all has remained elusive.¹⁹

11.2.2 *Limitations to the Scope of Application*

- 6 As stipulated in Article VII of the Liability Convention, the regime does not apply to damage caused to nationals of the launching State (a) or foreign nationals participating in the operation of the space object (b). The nationality-rule reflects a generally accepted principle of diplomatic protection according to which claims of nationals of the responsible State are not subject to protection by another State. The second limitation, the exclusion of foreign participants, was introduced at the behest of the USSR and was a reflection of its long-standing practice pertaining to such participants.²⁰ If foreign nationals knowingly and willingly participate in ultra-hazardous space activities at the invitation of the launching State, the question

¹⁴Countdown 0 means an intentional or accidental ignition of the rocket engines, see Bueckling (1982), p. 24.

¹⁵Types of material properties are *inter alia* physical, chemical, mechanical, thermal, electrical and magnetic, acoustical and optical.

¹⁶Christol (1980), p. 354.

¹⁷Kerrest and Smith (2009), Article VII para. 51.

¹⁸UN Doc PUOS/C.2/70/WG.I/CRP.16 and A/AC.105/85.

¹⁹For a thoroughly interpretation of the term see Wins (2000), pp. 87–97.

²⁰UN Doc A/AC.105/C.2/SR. 49.

inevitably arises as to whether these participants have waived possible claims for damages vis-à-vis the launching State; a question that has to be answered by the competent national courts of the launching State. Article VII(b) of the Liability Convention clarifies that under this convention, any harm suffered by foreign participants is not a matter of international liability law.

11.2.3 *Actors Addressed by the Liability Regime*

There is only one category of actor that is addressed by the liability regime of both the Liability Convention (Article II and III) and the Outer Space Treaty (Article VII), namely the launching State. That means that only States parties, or consenting international organisations,²¹ are proper respondents to liability claims under the Liability Convention and that private operators are excluded. The rapid commercialisation of the space industry by private companies in recent years means more and more space objects are being launched by the private sector using their own or shared launch facilities and the treaties' limitations in this regard are the source of some concern for States whose territory is used by such companies. Although having said that, from the perspective of the Liability Convention, the liable State is free to recover any damages payable under the Convention from a company that ultimately caused the damage by using its own domestic laws.

Eligible claimants are the claimant State (Article VIII) and any consenting international or intergovernmental organisation (Article XXII). It is worth noting that it is not required for the claimant State to be a party to the Liability Convention (Article IV Liability Convention in conjunction with Article 34 VCLT); however, Article IV does not extend to non-consenting international organisations. If individuals, companies or NGOs are injured parties, the State of nationality, the State on whose territory the damage occurred or the State of residence of the injured party has to present their claims (Article VIII) to the launching State. In this regard, the Liability Convention closely follows in the footsteps of the customary rules of diplomatic protection, although a remarkable deviation is that the claimant State does not have to establish a genuine link between the State and the victim as the ICJ famously ruled in the *Nottebohm* case,²² nor is the exhaustion of local remedies required (Article XI(1)). This is further evidence of the Convention's distinctive victim-oriented approach, an aspect that was repeatedly emphasised throughout the drafting process.²³

The only qualification to be the proper respondent in any liability case is being a launching State as only launching States and consenting launching organisations

²¹ Meaning: intergovernmental organisations.

²² ICJ *Nottebohm Case* (Liechtenstein v Guatemala) Second Phase [1955] ICJ Rep 4.

²³ UN Doc A/AC.105/C.2/SR.162 at p. 72 (Belgium), at p. 78 (Japan), at p. 98 (Sweden and Canada).

(Article XXII), be that a single actor or group thereof, are liable under the Outer Space Treaty and the Liability Convention. If more than one launching State is liable, the States shall be jointly and severally liable for any damage caused (Article V). Article I of the Liability Convention defines what exactly a launching State is, however, this remains controversial in detail. For this contribution, it suffices to say that a launching State has to meet at least one of the following four alternatives: it has (1) launched a space object, or (2) procured the launching of the space object, or (3) a space object is launched from the State's territory or (4) launched from one of its facilities. This four-fold concept of the launching State is intended to ensure that at least one State has to respond to the liability claims, i.e. the State on whose territory the launch took place. A growing number of voices both in practice and academia question this concept, especially because of the growing involvement of private companies' activities in the space sector and the possibility to launch objects from the high sea.²⁴

11.2.4 *Standard of Liability*

10 Existing international space law establishes a dual liability system: One or more launching States are absolutely liable under Article II Liability Convention for any damage caused by a space object on the surface of the Earth or to any aircraft in flight ('strict liability', Sect. 11.2.5, ¶ 15). In the event of damage being caused somewhere other than on the surface of the Earth—that is in space itself or an air space involving an object other than an aircraft—Article III of the Liability Convention imposes fault-based liability on the launching State(s). Consequently, the type of liability that is applicable in the given case depends primarily on the location where the damage occurred.

11 From the outset of the liability regime negotiations, it was unanimously accepted that absolute liability should be the adopted standard of liability because "it would be difficult to prove fault or negligence", as the UK representative maintained.²⁵ Evidently, this argument was also seen as valid for damage caused to space objects actually in outer space, which prompted the US to propose that absolute liability applies to these cases as well.²⁶ However, shortly before the text of the Liability Convention was adopted, the Italian representative proposed a fault-based liability regime instead of absolute liability and changed the mind of the drafters, who accordingly changed the text to what is now Art III.²⁷ Therefore, if two space objects collide in outer space, at least one launching State must be at fault.

²⁴ Schrögl (1999); see also Zhao (2004).

²⁵ Yearbook of the United Nations 1962, p. 45.

²⁶ Yearbook of the United Nations 1964, p. 78.

²⁷ UN Doc A/AC.105/C.2/L.40, art 4 (2).

In contrast to the concept of absolute liability, which covers all manner of accidents and disasters, Article III's fault-based liability is tainted with legal uncertainties as it does not define fault, although from the wording of Article VI (exoneration from absolute liability) it can be concluded that fault can be assigned on the grounds of intent and/or gross negligence at least. That being said, the different regulatory purposes of Article VI and Article III do not allow Article III to be restricted to the two forms of fault referred to in Article VI. Rather, Article III's fault-based concept is broader and also covers cases of slight negligence. Applied to the peculiarities of space activities, this means that the launching State is liable under Article III if the operational control of the space object is deemed to have negligently disregarded the relevant code of conduct in outer space adopted by competent space agencies and international bodies.²⁸

The question then arises, whose faulty behaviour triggers the launching State's liability? In answering this, Art III of the Liability Convention addresses this issue by stipulating that a State "shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible". Given that the actions and omissions attributable to a State under general international law are considered acts of that State, the faulty behaviour of State agents acting in their official capacity must be considered "its fault", i.e. the State's fault as opposed to "the fault of persons for whom it is responsible". Since private companies have now begun their own space activities, a crucial question remains as to whether the wording of Article III ("for whom it is responsible") refers to the general rules of attribution of private acts to the State, which requires the State's effective control over the faulty private act, or whether the term indicates a responsibility arising from the particularities of being the launching State. Even though Article III obviously aims to curb the liability for launching States, the decidedly victim-oriented focus of the Liability Convention favours an interpretation of Article III that is congruous with that focus. Thus, the reference to responsibility should not be viewed as a reference to attribution for the purpose of State responsibility (Article 8 ASR; Chap. 3) but to the responsibility arising from being the launching State. Consequently, the State from whose territory a private actor launched a space object is liable for damage caused to other space objects simply because that State is responsible for the private actors that made it the launching State (Article I).²⁹ Whether or not this aim-oriented interpretation ultimately passes the practice test remains to be seen; nevertheless, Article III of the Liability Convention has been rightly criticised for the fact that it is almost impossible for victims (i.e. astronauts, passengers and their dependants³⁰) as well as States acting on their behalf to prove fault. Even in cases where a disused satellite is intentionally destroyed and thus creates a hazardous debris field endangering both manned and unmanned space objects, it remains difficult to prove when damage

²⁸UN COPUOS, "Report of the Legal Subcommittee on its fifty-fourth session" (13 to 24 April 2015), Appendix 2(1).

²⁹Hurwitz (1992), p. 35.

³⁰Hurwitz (1992), p. 35.

occurs and from which space object the offending debris originated. The entire liability regime established by the Liability Convention and the Outer Space Treaty, be it absolute or fault-based, is founded on the assumption that the launching State is known, leaving victims of damage from unidentified space objects with no course of action under international space law.

11.2.5 Exemptions from Liability

14 Even though the Liability Convention is noted for its victim-oriented approach, it provides for the launching state to be exonerated from absolute liability to the extent that damage has resulted either wholly or partially from gross negligence or intent to cause the damage on the part of the claimant State or the person the claimant State represents (Article VI(1)). Exoneration is not granted in cases of space activities infringing relevant rules of international law (Article VI(2)).

15 The exemption from liability stipulated in Article VI(1) of the Liability Convention is limited to the absolute liability regime (Article II), which makes “absolute” a misnomer when one follows the common law terminology according to which absolute liability does not allow for any defence in contrast to strict liability. Article VI applies only to Article II, because it is inherent to the fault liability regime of Article III that contributory intent and negligence delimits the fault liability of the launching State. Even though Article VI introduces a fault element to the ‘absolute’ liability regime of space law, the difference between Article II and Article III remains: Where the claimant State has to prove fault on the part of the respondent State under Article III, the respondent State has to prove fault on the part of the claimant State for exoneration. From the victim’s perspective, this allocation of the burden of proof is vital.

16 Apart from the exoneration provision, the space liability regime is rather inclusive: it deliberately does not grant any relief from liability in cases of force majeure (e.g. a meteoroid hits a space object, the debris of which causes further damage), nor does it provide for a non-liability rule in cases of nuclear power source related damage caused by space objects. Both of these options were discussed but eventually abandoned as consensus could not be found.³¹

11.2.6 Damage

17 Naturally, the term damage is also of central importance for the Liability Convention, given that without damage there is no liability. Article I(a) begins by clarifying the term and differing between personal damage and property damage. Personal

³¹ See Harndt (1993), p. 543.

damage consists of loss of life, personal injury or other impairment of health, a wording that is often used in international conventions dealing with this subject matter. The central question concerning personal damage revolves around the understanding of the term 'health', and more specifically whether psychological health is covered by the term. Whereas it is clear that the impairment of physical health e.g. by exposure to radioactive space object debris is covered by the Convention, it is open to debate whether the impairment of mental well-being caused by stress is also covered. Two lines of reason support such an inclusion: If only physical health is compensable damage under the Convention, the references to health have no distinct meaning beyond 'injury'.³² In addition, the Liability Convention has to be interpreted in the light of contemporary principles of public international law, including human rights law, the latter of which is generally accepted as embracing the right to mental and emotional well-being.³³

With regard to property damage, property rights issues have to be solved based on the claimant State's domestic legal order. The only aspect Article 1 Liability Convention addresses is which owner can claim compensation: States, natural and legal persons (including companies and non-profit organisations) as well as international governmental organisations.

For both personal and property damage it is evident that direct damage is compensable, meaning that the space object or parts of it directly caused such damage. Less self-evident is the compensability of indirect damage, e.g. impairment of earning capacity, loss of profits, loss of services and so forth. In contrast to direct damage, the compensability of indirect damage is not recognised in every national jurisdiction, as Hurwitz rightly points out.³⁴ Moreover, one international agreement that served as an important templet for the Liability Convention, the 1952 Rome Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface, explicitly excludes indirect damage (Article 1(1)). Strengthening concerns in this area is the fact that Hungary's proposal to stipulate loss of profits and moral damage as indemnifiable damage under the Liability Convention was rejected.³⁵ As such, one has to rely on the report of Aldo Cocca, the Argentine representative to COPUOS and Professor of Space Law, that in the end it was accepted by consensus that indirect damage was included in the Liability Convention because due to its imminence "it did not appear necessary to include an express mention thereof in the text of the Convention."³⁶

With regard to the compensation which the launching State is liable to pay for the damage described above, Article XII of the Liability Convention clarifies that the amount of compensation payable shall be determined not only in accordance with

³² Alexander (1978), p. 155.

³³ UN HRC, Report of the United Nations High Commissioner for Human Rights, Mental Health and Human Rights, 31 January 2017, UN Doc A/HRC/34/32.

³⁴ Hurwitz (1992), p. 15.

³⁵ For the Hungary proposal see UN Yearbook 1964, p. 78.

³⁶ Cocca (1984), p. 158.

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international law but also pursuant to the principles of justice and equity, granting a great margin of appreciation to the negotiating parties. In this regard, international law provides rich jurisprudence as an adequate guideline as to how best to calculate damages. Any monetary payments settled upon (Article XIII) serve to provide such reparation in respect to the damage incurred to best restore the relevant conditions which would have existed if the damage had not occurred. The Liability Convention deliberately does not provide for any maximum limit to damages (Article XVIII), even though one might question the practicality of this decision.³⁷

11.2.7 Enforcement and Jurisdiction

- 21 The Liability Convention dedicates a number of articles to dispute settlement (Article X and Articles XIV to XX): Every claim for compensation starts with diplomatic negotiations between the claimant State and the respondent State (Article X) or international organisation as the case may be (Article XXII). The Liability Convention sets a surprisingly short period of limitations of one year for lodging the claim following the date of the occurrence of the damage, the identification of the liable State (Article X(1)), or one year after the State can be reasonably expected to have learned of the facts (Article X(2)).
- 22 If diplomatic negotiations fail to produce a satisfactory outcome for the claimant State, a claims commission is to be established at the request of either the claimant or respondent state (Article XIV). Such a commission, which will have either a three-member or single-member panel (Article XV, Article XVI) has to decide upon procedural and jurisdictional matters as well as on the merits of the case, applying international law and the principles of justice and equity (Article XII). If the parties to the dispute agree beforehand, the commission's award or decision is final and binding on the parties; otherwise, it is purely recommendatory in character (Article XIX). The Liability Convention does not provide for any rules on enforcement of the legally binding award but relies on public pressure, which can be significant given the media attention such cases often attract. The results of any such commission's findings, including the award, have to be public and a certified copy has to be delivered to the UN Secretary-General (Article XIX).
- 23 The Liability Convention does not prevent a claimant state or those who have suffered damage in person to pursue their claims before government agencies, domestic courts, administrative tribunals or other bodies of dispute settlement of the launching state. However, while these remedies are not excluded by the Liability Convention, nor are they regulated by it. That being said, Article XI stipulates that a claimant must pursue a claim by irreversibly selecting one of two paths: either going before domestic courts of the launching state or choosing another international judicial body (e.g. the ICJ), as the same claim cannot be presented under the Liability

³⁷Hurwitz (1992), p. 55.

Convention in both, even if the claim ultimately fails before the judicial body of first-choice.

11.3 Rationale Behind the Space Liability Concept

The most distinguishing feature of the liability regime established by the Outer Space Treaty and the Liability Convention is that both treaties establish a genuine international liability for launching States, but not for private space companies. In addition, the Liability Convention deliberately abstains from establishing a civil liability regime for the operator of space activities. The reason why international space law took the path of international State liability is a historical one: In the 1960s and 70s of the twentieth century, States were the only actors operating in space and those States so engaged were also regarded as financially powerful enough to be able to satisfy any claims resulting from their ultra-hazardous space activities that resulted in damage being done. It is safe to say that today this rationale is patently no longer valid given the diversity now present within the group of actors undertaking space activities. 24

With regard to the decision to adopt a dual liability system under the Liability Convention, the reasons again reflect the realities of the early years of space activities. With relatively few space objects orbiting the Earth, the chances of an orbital collision occurring were mathematically improbable and notions of privatised launches, commercial satellites and even space tourism were seen as science-fiction, hence the focus was clearly centred on the damage suffered by people and States on Earth. In 2019, UNOOSA determined that almost 5000 space objects are orbiting the earth and US Strategic Command estimates these objects share earth orbit with some 130 million pieces of debris capable of causing catastrophic damage to anything they hit. As such, it is safe to say that today the focus is more on the risks present in Earth's orbit than to its surface. 25

In COPOUS, several reasons were provided why the launching State should be absolutely liable for any damage caused on the Earth's surface and to aircraft in flight (Article II). The severity of the possible damage caused by space objects imposes a high risk for uninvolved States and victims and these should not carry the impossible burden to prove faulty or negligent action, which would require them to have access to details which are usually kept secret by launching States. In addition, the launching State often reaps significant rewards in one form or another from its space activities and it should be such States, rather than the unwitting victim, that must be prepared to bear the consequences attached to such activities when something goes amiss.³⁸ Regarding the last-minute decision to introduce fault liability for damage occurring in space as a consequence of a collision between two or more space objects, the rationale for the change of mind is difficult to verify. As Hurwitz 26

³⁸Wins (2000), pp. 68 f.

noted: “Fault liability shows the maturity of technology. Absolute liability shows the maturity of society. Fault liability shows that technology has reached a stage where operators may be held liable for activities which violate an accepted code of behaviour. Absolute liability shows that society recognizes (...) the fact that (technology) cannot be regulated due to the many unknown dimensions involved with its development and exploitation.”³⁹

11.4 Particularities

- 27 The most important particularity of the liability regime is that it is the first and last conventional regime that has established a system of international State liability, i.e. the international duty of a launching State to pay monetary compensation for any damage caused by its space objects. Even though the space liability regime shares some traditional features of general international law, most importantly the mediatization of the natural and legal person on the international level, some of its features were progressive for the time when the Liability Convention was drafted. This is especially true for the comprehensive liability approach regarding the launching State that entirely absorbs the consequences of any harm resulting from private space activities. Then again, private space launches were inconceivable in the early 1970s, a fact that drove the State-centred language of the Liability Convention. With only a handful of States being able to launch space objects at the time, the Liability Convention’s ignorance of operator liability is a historical particularity. Furthermore, State liability was a political compromise between western States and socialist States as liability under private law could not have been enforced against the resistance of the socialist States. The operation of private space corporations was hardly conceivable in the economic system of the socialist States.⁴⁰ Nevertheless, the ILC in its commentary to the Draft Principles on the Allocation of Loss in the Case of Transboundary Harm arising out of Hazardous Activities (2006) considered ultrahazardous outer space activities the only example for which State liability—in contrast to operator liability—is generally accepted.⁴¹ That said, it remains to be seen whether, in the event of an actual case of damage caused by a private space object, the launching State’s liability will be considered outdated or whether it remains the prevailing liability concept subject to reimbursement claims against the private operator.

³⁹ Hurwitz (1992), p. 36.

⁴⁰ Gehring and Jachtenfuchs (1988), p. 110.

⁴¹ ILC, Draft principles on the allocation of loss in the case of transboundary harm arising out of hazardous activities, with commentaries, YBILC 2006 Vol II part 2, UN Doc A/61/10, Principle 8 para. 8.

11.5 Practical Relevance

So far, not a single liability claim has been processed under the Liability Convention even though several incidents involving space object and their debris have caused considerable damage. The most famous case is that of the Cosmos 954, a nuclear-powered satellite launched by the USSR on 17 September 1977. The mission of Cosmos 954 was to have lasted for approximately 70 days before being moved to and abandoned in higher orbit where the 55-kilogram uranium power-source would decay. Unfortunately, the satellite malfunctioned and made an uncontrolled re-entry into Earth's atmosphere on 24 January 1978, showering radioactive debris across northern Canada in an area of the size of Austria.⁴² The Canadian government settled its claims against the USSR bilaterally outside of the Liability Convention's framework. The joint US-Canadian clean-up operation cost Canada approximately C\$14 million and the U.S. some US\$ 2–2.5 million. Canada billed the USSR for C\$6 million of which the USSR paid C\$3 million as a full and final settlement.⁴³

There have been several near misses with space debris—Lottie Williams was in a park in Tulsa, Oklahoma in 1997 when she was fortunate not to have been injured after being struck a glancing blow by what NASA deduced was a fragment from the second-stage of a Delta rocket. The semi-controlled return to Earth of the 77,000 kg Skylab in 1979 tried to bring the debris left over after the station disintegrated in the upper atmosphere down in an area of the Indian Ocean 1300 km south-east of Cape Town. In the end, the station remained significantly intact until only 16 km from the Earth's surface and the debris rained down in an unpopulated area of Australian desert 480 km east of Perth, Western Australia.

Even though the Cosmos case has remained the most prominent space object incident to cause damage to this day, there are other cases such as the European Space Agency's Sentinel-1A satellite which was hit in 2016 by a piece of space debris estimated to be only 1 mm in diameter. Even though this was only relatively minor damage to a solar panel, it is and remains remarkable that the Liability Convention does not play any role in practice.

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⁴²Hurwitz (1992), p. 114.

⁴³Cohen (1984), p. 80.

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