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THE PRINCIPLES OF DUE REGARD
AND HARMFUL INTERFERENCE
IN ARMED CONFLICT

INTRODUCTION

Nowadays, space technologies play a particularly important role in our lives. They support telecommunications, navigation and Earth observation (EO) and provide essential services – such as global internet connectivity – without which our current society would be unimaginable. The so-called ‘New Space Age’ has brought rapid technological progress, making outer space more accessible and affordable. However, we cannot forget that these achievements are accompanied by significant challenges. The commercialisation of outer space has led to increasingly congested orbits and irresponsible activities that jeopardise the long-term safety, security and sustainability of the outer space environment.

From the beginning of the space age, the military and security implications of space activities have been a key consideration. Although the formation of international space law was guided by the purpose of preserving outer space as a peaceful and safe domain, recent developments and ongoing conflicts – most notably the Russian–Ukrainian conflict – have blurred the boundary between peaceful and military uses of outer space. For the first time in history, both parties to an armed conflict have extensively used space-based capabilities and satellites have become fully integrated into conventional warfare, enhancing battlefield awareness, precision targeting, communication and co-ordination between units. This conflict, therefore, illustrates how space technologies, including commercial satellite systems, have fundamentally transformed modern military operations.

Based on the above, the use of satellites in warfare is no longer limited to the traditional space powers – the United States and Russia – China and

India have also developed sophisticated space capabilities.¹ Anti-satellite (ASAT) weapons – tested also by these nations – highlight the potential destructiveness of space-based military technologies. Besides kinetic ASAT systems, States also possess non-destructive means of interference, including electronic jamming, cyber operations and laser systems, designed to temporarily or permanently disable satellites. These developments mark a shift in the militarisation of outer space, which increasingly encompasses cyber and electronic domains rather than purely physical confrontation.

From a legal perspective, these developments pose significant gaps and ambiguities in the current international legal framework. The Outer Space Treaty does not contain many specific provisions regarding military activities in outer space. As space law is not a self-contained regime, we can also suggest that the principles of law of war (*jus ad bellum* and *jus in bello*) also apply.² Furthermore, there are also provisions in international environmental law that may be of relevance. Therefore, the existing legal system is fragmented and struggles to address the realities of modern military space operations.

Article IX of the Outer Space Treaty establishes the fundamental principles for space activities, including co-operation, mutual assistance, the prohibition of harmful interference and non-contamination. The second part of the article provides a detailed overview of the consultation mechanism in place in the event of harmful interference. The due regard principle and the consultation mechanism both play a particularly important role in the event of an armed conflict. However, as their content remains undefined, it is not entirely clear how they interact with other rules and principles of the law of war, especially international humanitarian law (IHL, *jus in bello* or LOAC, law of armed conflict).

In light of these points, the primary objective of this study is to analyse the interaction between the principles of due regard and the prohibition of harmful interference and the consultation mechanism outlined in Article IX of the Outer Space Treaty, with humanitarian law norms in the context of an armed conflict. The study, therefore, examines the definitions of the due regard principle and harmful interference and investigates their

¹ O'MEARA 2024.

² BARTÓKI-GÖNCZY – SÜLYÖK 2022: 81.

relationship. Additionally, it examines the relationship between international humanitarian law principles – military necessity, distinction, proportionality and humanity – and the due regard and harmful interference principles.

THE RELATIONSHIP BETWEEN INTERNATIONAL SPACE LAW AND INTERNATIONAL HUMANITARIAN LAW

Before examining the relationship between the principles of due regard and harmful interference and the rules of international humanitarian law (IHL), it is first necessary to determine whether these principles remain applicable in case of an armed conflict. Guidance is provided by Article 3 of the International Law Commission's Draft Articles on the Effects of Armed Conflicts on Treaties (2011),³ which states that "[t]he existence of an armed conflict does not *ipso facto* terminate or suspend the operation of treaties: (a) as between States parties to the conflict; (b) as between a State party to the conflict and a State that is not".⁴ This provision affirms the principle of legal continuity and stability in treaty relations during armed conflict,⁵ and confirms that the outbreak of an armed conflict does not automatically extinguish treaty obligations. Of course, exceptions may arise where a treaty itself contains specific provisions governing its operation in situations of armed conflict.⁶ In such cases, those *lex specialis* clauses must be applied. Additionally, suspension, termination or withdrawal may be possible under certain circumstances. However, these are not automatic and require a case-by-case assessment of several factors, including the nature of the treaty, its objective, purpose, content and the characteristics of the armed conflict.⁷ In addition, a State intending to suspend or terminate a treaty must notify the other parties or the depositary in accordance with the applicable

³ International Law Commission 2011: 183–185.

⁴ ILC Draft Articles on Armed Conflicts, Article 3.

⁵ ILC Draft Articles on Armed Conflicts Commentary, 111.

⁶ ILC Draft Articles on Armed Conflicts, Article 4.

⁷ ILC Draft Articles on Armed Conflicts, Article 6.

rules.⁸ The Outer Space Treaty does not contain provisions addressing its applicability in situations of armed conflict, nor does it indicate that its operation would be suspended or terminated under such circumstances. On the contrary, its core objectives – namely, the peaceful use of outer space and the maintenance of safety and security in space activities⁹ – are not inherently neutralised by the existence of armed conflict. It follows that the principles of due regard and harmful interference may continue to apply during armed conflict and may retain significant normative relevance.

Additional guidance is found in Section 3 of the Vienna Convention on the Law of Treaties, which sets out the recognised grounds for termination, withdrawal or suspension of treaties. These include termination or withdrawal in conformity with the treaty's provisions, consent of all parties after consultation, material breach, supervening impossibility of performance, fundamental change of circumstances, severance of diplomatic or consular relations and the emergence of a new peremptory norm of general international law (*jus cogens*).¹⁰ While certain of these grounds may, in principle, become relevant in the context of hostilities, the Convention makes clear that armed conflict as such does not automatically result in suspension or termination.

Finally, there is no *a priori* hierarchical relationship between international space law and international humanitarian law.¹¹ Rather, these two bodies operate in a complementary way. Article III of the Outer Space Treaty explicitly links space activities to general international law by requiring that they be conducted “in accordance with international law, including the Charter of the United Nations”. This formulation confirms that both *jus ad bellum* and *jus in bello* apply to activities in outer space. Accordingly, the continued applicability of the Outer Space Treaty during armed conflict is not displaced by IHL. Instead, the relevant principles of space law and IHL must be interpreted and applied in a coherent and complementary way.

⁸ ILC Draft Articles on Armed Conflicts, Article 6.

⁹ Outer Space Treaty, Preamble.

¹⁰ VCLT 1969, Section 3.

¹¹ HANSEN 2015: 53.

THE NORMATIVE FRAMEWORK OF ARTICLE
IX OF THE OUTER SPACE TREATY

Interpreting the due regard principle

The principle of ‘due regard’ occupies a central, yet often underexamined, place within the legal framework governing the use and exploration of outer space. The legal roots of the principle extend beyond outer space law. It reflects a broader pattern in international law. The term was first drafted in the Chicago Convention, which requires aircraft to fly with due regard for the safety of civil aviation and seeks to ensure the safety of civil aviation.¹² Since then, the principle has also appeared in the 1982 UN Convention on the Law of the Sea (UNCLOS). In the context of space law, the principle of ‘due regard’ was first drafted by the UN COPUOS in 1963, in General Assembly Resolution 1962 (XVIII), which addressed the basic legal principles governing the activities of States in the exploration and use of outer space.¹³ Later, it was reaffirmed in the Outer Space Treaty as one of the most fundamental principles of international space law, as a compromise between the USA and the USSR.¹⁴ In recent years, the proliferation of small satellites, the increase in the amount of space debris in Earth orbits, space resource utilisation and other emerging issues have highlighted the importance of the due regard principle. However, due to the escalation of conflicts worldwide in recent years, the application of the principle in armed conflicts has also come into focus. Despite this important role, there is still no generally accepted definition of the due regard principle, and several ambiguities remain regarding the meanings of ‘due’ and ‘corresponding interests’.

According to Article IX of the Outer Space Treaty,

[i]n 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

¹² Chicago Convention, Article 3 (d).

¹³ United Nations General Assembly 1963: Principle 6.

¹⁴ HOBE et al. 2017: 583.

of co-operation 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.¹⁵

The Outer Space Treaty does not provide a precise definition of ‘due regard’ or ‘corresponding interests’. However, this also can reflect an intentional flexibility that allows adaptation to evolving technological and political contexts. The terms must also be interpreted in accordance with the 1969 Vienna Convention on the Law of Treaties (VCLT), which declares in Article 31 that “[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”.¹⁶ Consequently, the due regard principle functions as a ‘relational norm’ rather than a fixed rule, it is less about prescribing specific conduct and more about ensuring that interactions among spacefaring entities remain co-operative, transparent and non-harmful.¹⁷ On this basis, Article IX and the due regard principle basically serve as a limitation to the freedom of exploration, use and scientific investigation of outer space.¹⁸

The primary objective of the principle is to ensure that States avoid hampering the space activities of other States. Furthermore, it requires States to maintain a certain standard of care, attention and observance when conducting space activities.¹⁹ Based on this requirement, States must prove that they took every reasonable measure to prevent harm to other States’ activities or to the outer space environment. This, however, must be interpreted on a case-by-case basis.²⁰ However, it is important to note that this does not give a State the freedom to act in a manner that disregards the interests of the other State. Instead, the application of due regard is contingent on the nature and characteristics of the rights and duties involved.

¹⁵ Outer Space Treaty, Article IX.

¹⁶ VCLT 1969, Article 31.

¹⁷ JAROSE 2023.

¹⁸ Outer Space Treaty, Article I.

¹⁹ HOBE et al. 2017: 593.

²⁰ HARRINGTON 2023: 66–68.

The precise obligations required by the due regard principle can therefore be determined by the extent of the anticipated infringement of interests.²¹

The concept of ‘corresponding interests’ highlights that there are more interests in outer space, and States cannot follow a unilateral or discriminatory approach. Therefore, when conducting Space activities, States should also take into account the interests of other States.²² However, it should be noted that there is no universally accepted definition of what can be considered ‘corresponding interests’. Based on the Cambridge Dictionary, interest in the law context can be defined as ‘an involvement or a legal right’.²³ Additionally, in this context, ‘interests’ can be interpreted in two dimensions. Firstly, it can be understood to refer to the interests between spacefaring States. Secondly, it can be interpreted as the interests of a spacefaring nation and the wider international community.²⁴ The Permanent Court of Arbitration also defined it as a call on the State to have regard for the interests of another State as is required by the circumstances and by the nature of the given rights.²⁵ Interpreting ‘corresponding interests’ therefore requires situating them within the broader objectives of the Outer Space Treaty, such as the peaceful use of outer space, international co-operation and the prohibition of harmful interference. Furthermore, it is imperative to assess each case individually to determine what constitutes a relevant interest in the context. This can include financial, economic, safety, environmental, etc., interests of space actors.

Due regard is, of course, also linked to other obligations. First, it necessarily includes consultations in good faith²⁶ and requires that States undertake all appropriate measures to avoid harm to other States. As a duty of conduct,

²¹ HARRINGTON 2023: 66–68.

²² HOBE et al. 2017: 566–571.

²³ Cambridge Dictionary s. a.

²⁴ United Nations 2022.

²⁵ Chagos Marine Protected Area Arbitration (Mauritius v. United Kingdom), Award, 18 March 2015, PCA Case No. 2011-03, Permanent Court of Arbitration. Original: “[...] the ordinary meaning of ‘due regard’ calls for the [State] to have such regard for the rights of [another State] as is called for by the circumstances and by the nature of those rights. The Tribunal declines to find in this formulation any universal rule of conduct.”

²⁶ HARRINGTON 2023: 70–71.

due regard entails a balance of rights and interests and obligates States to seek compromise and to consider the interests of other actors. Second, it is also important to note that the due regard principle – and Article IX in general – is linked to Article VI of the Outer Space Treaty, which requires the appropriate State to authorise and continuously supervise national (governmental and non-governmental entities) space activities.²⁷ Taken together these Articles, Article VI, function as the enforcement mechanism for the due regard principle. As States are internationally responsible for all national activities, they must ensure – through licensing, authorisation and national regulatory frameworks – that both governmental and non-governmental entities comply with the due regard principles. Secondly, the concept of due regard is linked to environmental obligations, as enshrined in Article IX,²⁸ which provides that States shall avoid the harmful contamination of outer space, including the moon and other celestial bodies.²⁹ This also establishes an environmental dimension to the due regard principle. Based on this, States must assess environmental risks and prevent activities that could degrade the outer space environment. This is also linked to the UN Space Debris Mitigation Guidelines³⁰ and Long-term Sustainability Guidelines,³¹ which operationalise the principle in practice. Although these instruments are not legally binding, they specify exact measures – such as minimising debris generation, ensuring post-mission disposal, sharing information and conducting risk assessments – that reflect what the due regard principle requires in contemporary practice.

Furthermore, the due regard principle mirrors well-established norms in international environmental law. It is conceptually aligned with the no-harm rule, a long-established principle first recognised in the 1941 Trail Smelter Case and declared in Principle 2 of the Rio Declaration and Principle 21 of the Stockholm Declaration. In environmental law, States must ensure that activities within their jurisdiction do not cause significant transboundary

²⁷ Outer Space Treaty, Article VI; see more in GANCZER 2024: 209–237.

²⁸ Outer Space Treaty, Article IX.

²⁹ Outer Space Treaty, Article IX.

³⁰ United Nations Office for Outer Space Affairs 2010.

³¹ United Nations Committee on the Peaceful Uses of Outer Space 2019.

harm and must exercise due diligence, including conducting environmental impact assessments and engaging in consultation prior to activities that may have harmful effects.³² Similarly, in space law, due regard entails risk assessment, transparency and preventive measures to avoid significant interference or environmental degradation. Therefore, in space law, the due regard principle functions as an environmental due diligence obligation, which requires States to take reasonable measures to prevent harmful contamination and protect the shared outer space environment for present and future participants. In the 2025 advisory opinion on *Obligations of States in Respect of Climate Change*, the International Court of Justice (ICJ) also emphasised that States must take preventive measures, rely on the best available science and co-operate in order to avoid significant environmental harm.³³

Finally, it is essential to differentiate the principle of due regard from the concept of due diligence. While due regard requires States to show respect and consider the rights and interests of others during operations, due diligence is generally understood as the general duty of States not to “allow knowingly their territory to be used for acts contrary to the rights of other States”.³⁴ Due diligence can also be interpreted as a legal obligation to investigate before taking any action to prevent harm to others.³⁵ In this context, due regard involves striking a balance between interests as a procedural matter and due diligence as a more concrete obligation to take preventative measures to avoid harm. However, it is essential to note that there is often a relationship between these two terms, as due diligence obligations frequently stem from a general duty of due regard. Or in general, due regard can be interpreted as giving rise to a duty of due diligence.³⁶ This reasoning supports the interpretation of Article IX of the Outer Space Treaty. The ‘due regard’ obligation likewise reflects a preventive,

³² United Nations 1992: Principle 2, Principle 17, Principle 19; United Nations 1972: Principle 21.

³³ *Obligations of States in Respect of Climate Change*, Advisory Opinion, 23 July 2025.

³⁴ *Corfu Channel* (United Kingdom of Great Britain and Northern Ireland v. Albania), Judgment of 9 April 1949, I.C.J. Reports 1949, 22.

³⁵ FOSTER 2021: 89–91.

³⁶ HOBE et al. 2017: 593.

science-based standard of conduct requiring risk assessment, mitigation and consultation. The advisory opinion thus strengthens understanding of due regard in space law as a concrete due diligence obligation rather than merely a political principle.

As a summary, the ‘due regard’ principle requires States to conduct their space activities with reasonable consideration or ‘proper care’ for the legitimate interests of other States in the peaceful exploration and use of outer space. In essence, it imposes a standard of conduct: a State must assess whether its planned activities could cause harmful interference and, where there is a risk, engage in prior consultation. In this regard, the due regard principle also creates a balance between the maximum rights of a State and avoiding harm to another space actor. The term of ‘interests’ is interpreted broadly to encompass operational, scientific, environmental, safety and access-related interests of other States. The principle is applied through good-faith assessment, transparency and consultation, before proceeding with activities that may significantly affect others.

Application of the due regard principle in practice

Despite its foundational role, the practical application of the due regard principle faces several challenges. The first is the absence of precise enforcement mechanisms. Article IX relies on good faith and diplomatic consultations, rather than coercive enforcement.³⁷ As a result, compliance with due regard obligations depends largely on mutual trust and political will.

A second challenge arises from the increasing involvement of private actors in outer space. The Outer Space Treaty places international responsibility on States for national activities in outer space, whether conducted by governmental or non-governmental entities, as explained above.³⁸ Therefore,

³⁷ CARPANELLI 2024: 35–58.

³⁸ Outer Space Treaty, Article VI.

States must ensure that private companies act with due regard to other space actors, including private actors. However, the complexity of enforcing the principle increases as commercial activities expand.

The third major challenge concerns technological asymmetry and power dynamics among States. As outlined above, the term ‘corresponding interests’ lacks a defined meaning, which can result in confusion and disputes among space actors. One perspective may regard this as a violation of the principle, while another may find it lawful. As explained in the previous section, the assessment of interests must be conducted on a case-by-case basis, taking into account the specific circumstances of each case. This means there is no universally applicable boundary that would definitely determine what constitutes a violation of the due regard principle, although such a measure would be needed.

INTERPRETATION OF THE HARMFUL INTERFERENCE PRINCIPLE

The concept of harmful interference occupies a central place in international space law. Its origins lie primarily in Article IX of the Outer Space Treaty, the second part of which declares:

[i]f a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, including the moon and other celestial bodies, would cause potentially harmful interference with activities of other States Parties in the peaceful exploration and use of outer space, including the moon and other celestial bodies, it shall undertake appropriate international consultations before proceeding with any such activity or experiment. A State Party to the Treaty which has reason to believe that an activity or experiment planned by another State Party in outer space, including the moon and other celestial bodies, would cause potentially harmful interference with activities in the peaceful exploration

and use of outer space, including the moon and other celestial bodies, may request consultation concerning the activity or experiment.³⁹

This section outlines a two-sided consultation process to prevent harmful interference in outer space. Firstly, the State that plans the activity shall undertake appropriate consultations in case of potential harmful interference. According to the interpretation of Article IX, this obligation must be fulfilled before the authorisation or commencement of the activity.⁴⁰ Conversely, the potentially affected State may request consultations. This can supposedly happen before or during the activity.⁴¹ However, it is important to note that Article IX does not grant the potentially affected State a right of veto or any other specific rights, but the purpose of this step also goes beyond mere formality. As a procedure or duty, its primary objective is to address potentially harmful situations before activities are conducted, thereby promoting the safe and sustainable use of outer space. In accordance with the rules of treaty interpretation under Articles 31–32 of the Vienna Convention on the Law of Treaties,⁴² Article IX may also be interpreted in good faith and in light of its object and purpose to cover situations where the risk of harmful interference materialises at a later stage (e.g. due to an orbital modification), thereby extending the duty to consult evolving and newly emerging risks. In any event, the primary recourse in the event of disputes would be diplomatic negotiations.⁴³

Although preventing harmful interference is one of the most fundamental principles of international space law, the term ‘harmful interference’ remains undefined. The concept partially overlaps with definitions found in telecommunications law. In accordance with the Radio Regulations, harmful interference is “interference which endangers the functioning of a radionavigation service or of other safety services [...] seriously degrades, obstructs, or

³⁹ Outer Space Treaty, Article IX.

⁴⁰ HOBE et al. 2017: 581–583.

⁴¹ HOBE et al. 2017: 581–583.

⁴² VCLT 1969, Articles 31–32.

⁴³ VON DER DUNK 2015: 87–89.

repeatedly interrupts a radiocommunication service”.⁴⁴ Therefore, the ITU law defines harmful interference as an effect that endangers the functioning of radionavigation or safety services, or seriously degrades or repeatedly interrupts authorised communications. Furthermore, it is important to mention the Artemis Accords, unveiled by the United States of America on 13 October 2020. The Accords are not an international treaty but rather a political commitment, yet they may influence the development of the normative framework,⁴⁵ as evidenced by the fact that, as of 26 January 2026, the Accords have 61 signatories.⁴⁶ Section 11 of the Accords explicitly refers to Article IX and affirms that activities should be conducted to avoid harmful interference. However, it goes further by introducing practical co-ordination mechanisms. Based on the Accords, signatories commit to notifying relevant actors of their activities and to co-ordinating operations in order to prevent conflicts, particularly in the context of lunar surface activities and resource utilisation.⁴⁷ The Accords also introduce the concept of ‘safety zones’, which are operational co-ordination areas intended to prevent harmful interference by providing transparency about the location and nature of activities.⁴⁸ This also supports the view that harmful interference is not limited to technical disruptions, such as radio-frequency interference, but also includes physical obstructions, operational conflicts, or activities that could compromise the safety of personnel, equipment or missions. The emphasis on transparency, prior notification and real-time co-ordination appears as a tool of prevention in this context. As such, the Accords transform the open-structured consultation mechanism of Article IX into a more detailed obligation, where harmful interference means a trigger for information-sharing, co-ordination, making it into an operational mechanism.

In addition, although ‘harmful interference’ as a term does not explicitly appear in other fields of international law, there are structurally comparable concepts in several other fields. Firstly, in air law, under the Chicago

⁴⁴ International Telecommunication Union 2020: Section VII.

⁴⁵ BARTÓKI-GÖNCZY – NAGY 2024: 146.

⁴⁶ NASA 2020.

⁴⁷ NASA 2020: Section 11 (2), (3).

⁴⁸ NASA 2020: Section 11 (7).

Convention, interference is framed primarily as a matter of safety and security (e.g. the prohibition of the usage of weapons against aircraft⁴⁹) and is linked to the protection of civil aviation. Secondly, in the law of the sea under the UNCLOS, the emphasis lies on the obligation to give 'due regard' to the rights of other States, addressing interference by balancing sovereign rights.⁵⁰ Finally, in international environmental law, the comparable concept is the no-harm rule. In this case, this principle is reflected in Principle 21 of the Stockholm Declaration and Principle 2 of the Rio Declaration, which requires States to prevent significant transboundary harm.⁵¹ In the context of space law, the term has a similar, broader meaning. The term should encompass any action that significantly disrupts another State's legitimate use of outer space – whether physical, electronic or environmental. It therefore encompasses not only radio-frequency interference or telecommunications services, but also any interference with the operations of other States, such as physical interference (e.g. manoeuvres that hinder other operations, close-proximity operations or intentional destruction), observational interference (e.g. activities that hamper ground-based or space-based observation systems) and so on. In other words, it can be divided into kinetic (e.g. ASAT missiles) and non-kinetic (e.g. jamming, laser and cyber operations, spoofing) measures.⁵²

Furthermore, it is not determined whether there is a minimum extent the interference must reach or where the boundary lies. We can generally say that the risk of 'harmful interference' must be real and reasonably foreseeable, not merely hypothetical or speculative. The threshold is generally understood as one of credible risk of significant interference, assessed in good faith and on the basis of available scientific and technical information. Minor, remote, or purely theoretical risks would not normally trigger the consultation obligation. However, if there is a credible likelihood that an activity could substantially harm another State's space operations, access, safety or use of outer space, the duty to consult arises. The standard, therefore,

⁴⁹ Chicago Convention, Article 3 bis.

⁵⁰ UNCLOS, Preamble, Article 56.

⁵¹ United Nations 1992: Principle 2; United Nations 1972: Principle 21.

⁵² BLACK 2008: 5.

suggests a due diligence threshold. It is not necessary that harm be certain or imminent, but there must be a serious and objectively assessable risk.⁵³ For example, if a State plans to conduct a kinetic ASAT test that could generate long-lived orbital debris intersecting commonly used satellite orbits, the foreseeable risk of debris collisions would constitute a real threat of harmful interference, thus triggering Article IX consultations. By contrast, a routine satellite manoeuvre conducted in compliance with established space traffic co-ordination practices, posing only a negligible collision probability, would likely fall below the threshold. The key question is whether a reasonable State, acting in good faith and informed by technical data, would consider the activity capable of causing significant interference with others' lawful space activities or not.

As a summary, Article IX concerns consultations regarding activities that are important to the acting State, but that may risk harmful interference with others. It requires genuine, good-faith consultations aimed at preventing harm, not a mere procedural formality. At the same time, it does not grant potentially affected States a veto. Instead, it strikes a balance: before significant harm occurs, States must engage in meaningful dialogue and take appropriate preventive measures to avoid harmful interference.

Practical application of the harmful interference principle

Although the principle is considered one of the most important in space law, its practical application poses significant challenges. The core difficulty in enforcing the principle lies in risk assessment. A State may be unable to properly assess whether its planned activity poses a threat to others, as it lacks complete or reliable information about the space object or the activity of other space actors in general. Although the Outer Space Treaty⁵⁴ and the Registration Convention establish a duty to register space objects,⁵⁵ compliance remains imperfect, and around 12% of space objects remain

⁵³ BEARD–STEPHENS 2024: 177–184.

⁵⁴ Outer Space Treaty, Article VIII.

⁵⁵ Registration Convention, Article II.

unregistered.⁵⁶ More importantly, there is no comprehensive, binding global Space Traffic Management (STM) regime that ensures full transparency into orbital positions and manoeuvres. As a result, States often depend on external data sources, including commercially operated open-access databases provided by private actors such as SpaceX.⁵⁷ This raises further questions. If decisions are based on privately generated tracking data, does the provider assume any responsibility for inaccuracies, and if liability is contractually excluded, can a State be faulted for declining to rely on such information? The absence of transparent data sharing and the prevalence of dual-use technologies make it nearly impossible to prove if or which State caused harmful interference.

Another problem is the lack of a clear legal definition. As explained, the term 'harmful interference' is not precisely defined, leaving States to interpret it subjectively. Therefore, what one State may perceive as harmful, another might view as a legitimate action. This undermines predictability and consistency in applying the principle and discourages enforcement actions. Moreover, the proliferation of space debris also causes serious challenges. Many incidents that can be considered 'harmful' result from previous accidents, collisions and the long-term accumulation of space debris. The difficulty of assigning responsibility for debris-related interference weakens the effect of Article IX, as no clear actor can be held accountable, or the causality cannot be established.⁵⁸

Finally, the absence of a universally accepted enforcement mechanism leaves the harmful interference principle largely reliant on diplomatic measures, rather than legal solutions. Although Article IX provides for consultations between States to resolve potential conflicts,⁵⁹ there is no standing international body to resolve them, nor is there any international body with binding authority in this matter.⁶⁰ Mechanisms like the UN COPUOS facilitate dialogue, but lack enforcement power, and the ICJ

⁵⁶ United Nations Office for Outer Space Affairs s. a.

⁵⁷ Starlink s. a.

⁵⁸ VON DER DUNK 2015: 89–90; KAISER 2022: 585–587.

⁵⁹ Outer Space Treaty, Article IX.

⁶⁰ VON DER DUNK 2015: 87–89.

has never ruled on such a case. As a result, compliance depends more on political will and mutual restraint than on legal compulsion.

THE RELATIONSHIP BETWEEN THE DUE REGARD AND HARMFUL INTERFERENCE PRINCIPLES

The relationship between the principles of ‘due regard’ and ‘harmful interference’ under Article IX of the Outer Space Treaty reveals a balanced normative framework governing activities in outer space. Together, they form an integrated ‘preventive mechanism’ designed to reconcile freedom of exploration, use and scientific investigation of outer space with the protection of the space activities of all space actors.

Article IX contains both a general standard of conduct and a more specific procedural obligation. In this context, ‘due regard’ operates as a broad principle, requiring States to conduct their space activities with reasonable consideration for the corresponding interests of others,⁶¹ as explained in the previous sections. Therefore, it also reflects the idea that outer space, while not subject to national appropriation based on Article II of the Outer Space Treaty,⁶² is a domain of shared use in which activities must be co-ordinated through mutual respect and co-operation among space actors.⁶³ By contrast, ‘harmful interference’ represents the operational threshold at which the general duty crystallises into a concrete procedural obligation. Where a State has reason to believe that its planned activity would cause potentially harmful interference with the activities of other States, it must undertake appropriate international consultations, as explained above.⁶⁴ Thus, harmful interference functions as the triggering condition that activates the consultative mechanism embedded in Article IX. Therefore, due regard provides the overarching standard, while harmful interference defines the point at which that standard requires specific procedural action.

⁶¹ CARPANELLI 2024: 35–58.

⁶² Outer Space Treaty, Article II.

⁶³ Outer Space Treaty, Article IX.

⁶⁴ Outer Space Treaty, Article IX.

It is also important to highlight that both principles are preventive in nature, as explained above. They operate before damage occurs and are distinct from *ex post* liability regimes declared by the Liability Convention and Article VII of the Outer Space Treaty. The focus is not on fault or causation after harm has materialised, but on identifying risks in advance and mitigating them through dialogue and co-operation. Due regard, therefore, requires States to assess the broader impact of their activities. Similarly, harmful interference identifies the level of risk that cannot be ignored. Importantly, the threshold is not actual damage but a credible risk of significant disruption to another State's peaceful use of outer space, as explained above. In this sense, harmful interference gives concrete meaning to due regard, it translates a general standard of mutual consideration into a legally structured response mechanism.

The interaction of these principles also reflects the foundational balance within the system of the Outer Space Treaty. Outer space is governed by the principle of the freedom of use, exploration and scientific investigation for all States.⁶⁵ At the same time, such freedom is not absolute, there are several limitations in the Outer Space Treaty itself and also in general international law and other specific parts of it. Due regard also limits these freedoms by embedding them within a relational framework. States can have their national interests, but they must do so in a way that respects the legitimate interests of others. Similarly, harmful interference represents the legal boundary of acceptable conduct within that freedom. When activities cross into significant risk to others' operations, consultations become mandatory. Yet, Article IX does not create a veto right for affected States,⁶⁶ as mentioned above, therefore, it preserves a balance: the acting State retains freedom of action, but it must engage in good-faith dialogue and consider preventive adjustments. In this sense, the relationship between the two principles can be described as complementary. Due regard is the normative standard and harmful interference is the procedural safeguard.

The effective operation of this structural relationship depends on transparency and information-sharing. Without reliable data on orbital

⁶⁵ Outer Space Treaty, Article I.

⁶⁶ BEARD-STEPHENS 2024: 177–184.

positions, manoeuvres and operational intentions, States may struggle to determine whether a planned activity reaches the harmful interference threshold, as explained above. The absence of a binding global Space Traffic Management system further complicates the practical implementation of due regard. Consequently, the structural integrity of Article IX increasingly relies on co-operative data exchange, notification practices and good-faith engagement between States and private actors.

APPLICATION OF THE DUE REGARD AND HARMFUL INTERFERENCE PRINCIPLES IN ARMED CONFLICT

The principles of ‘due regard’ and ‘harmful interference’ form mutually reinforcing norms, which retain their relevance even during armed conflicts, as explained above. The Outer Space Treaty prohibits the placement of weapons of mass destruction in orbit and the militarisation of celestial bodies⁶⁷ while permitting non-aggressive military uses of outer space, such as communications, surveillance and navigation.⁶⁸ Within this framework, the obligation of ‘due regard’ under Article IX requires States to conduct their space-related activities responsibly, even during hostilities, taking into account the interests of other States.⁶⁹ Complementing this, the principle of harmful interference prohibits actions that adversely affect the space activities of other States, whether through physical, electronic or cyber means.⁷⁰ Together, these principles provide both legal and ethical guidance for the conduct of military operations in outer space, as demonstrated above.

Firstly, in the context of IHL, it is important to note that the ‘due regard’ principle remains relevant and IHL principles need to be considered in conjunction with this obligation to ensure that military actions are conducted responsibly and lawfully, as explained above.⁷¹ The principle of military

⁶⁷ Outer Space Treaty, Article VI.

⁶⁸ BARTÓKI-GÖNCZY – SÜLYÖK 2022: 81.

⁶⁹ Outer Space Treaty, Article IX.

⁷⁰ POIRIER 2024: 4.

⁷¹ BEARD – STEPHENS 2024: 170–176.

necessity requires that military actions be conducted for a legitimate military purpose and that the action must weaken the military capacity of the other State parties to the conflict.⁷² Therefore, for instance, the destruction of a satellite in armed conflict that has a purely scientific purpose, like the Hubble or James Webb space telescopes, would violate the mentioned principle, as the action would not result in a military advantage. Another key element of 'due regard' in armed conflict relates to the use and targeting of space objects. Based on the principle of distinction, Parties to a conflict must always distinguish between civilians and combatants, and civilian and military objects.⁷³ Consequently, concerns may arise about dual-use systems. Many satellites serve both civilian and military functions, such as communications or EO. Attacking or interfering with such systems during armed conflicts could have disproportionate and indiscriminate effects on civilian services. Here, the due regard principle functions as a practical and ethical constraint, encouraging States to adopt alternative means that minimise collateral harm and to co-ordinate, where possible, with other actors to prevent unintended interference. However, it can also be stated that, despite civilian services, as long as the satellite continues to contribute to military operations, its destruction does not violate the principle of distinction. This is also connected to the principle of proportionality, which states that the harm to civilians and civilian property from an attack cannot be excessive when weighed against the anticipated military advantage of the attack.⁷⁴ When applying the principle to outer space, the test of proportionality should be taken into account, and it must be investigated whether the collateral damage would be excessive when measured against the direct military advantage the given action could achieve.⁷⁵ Military operations that seek to disable or destroy satellites – whether for strategic or tactical advantage – inherently risk causing widespread and long-lasting debris, thereby endangering the peaceful uses of outer space by all. In this context, the principle of due regard complements IHL rules on distinction,

⁷² International Committee of the Red Cross s. a.

⁷³ American Red Cross 2024.

⁷⁴ International Committee of the Red Cross 2023.

⁷⁵ Medecins sans Frontieres s. a.

proportionality and precautions in attack. For instance, a kinetic ASAT test or strike that generates uncontrolled debris can be viewed as inconsistent with the obligation to act with due regard to the interests of other States and also with the prohibition of harmful interference principle, particularly if it jeopardises the safety of neutral satellites or civilian space infrastructure. It is important to note that although the Outer Space Treaty does not explicitly prohibit ASAT missiles, the use of such kinetic weapons clearly falls under the prohibition of harmful interference, as the term is intended to include all kinds of kinetic and non-kinetic measures,⁷⁶ as explained above. Finally, under IHL, belligerents must also avoid unnecessary suffering (principle of humanity). This means that the methods used in the armed conflict cannot be designed to cause unnecessary suffering or superfluous injury.⁷⁷ This principle is fundamental in the context of due regard in outer space. The mentioned weapons against combatants on Earth may be used from outer space. Therefore, it is essential to observe the obligations set out in international space law. As a self-restraint principle and ethical standard, the due regard obligation plays a vital role in this context.⁷⁸

Moreover, it must also be examined how the due regard principle relates to environmental obligations in armed conflict.⁷⁹ In the context of IHL, Additional Protocol I also declares that “[c]are shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage”.⁸⁰ Consequently, belligerents shall undertake all appropriate measures to prevent harm to the outer space environment even in the

⁷⁶ BLACK 2008.

⁷⁷ American Red Cross 2024.

⁷⁸ AOKI 2022: 3.

⁷⁹ There is growing recognition among the international community that outer space can be viewed as an environment, and that international environmental law may be applicable there. In this context, international environmental law treaties (e.g. the 1972 Stockholm Declaration, 1992 Rio Declaration) provide guiding rules and principles regarding the protection of the outer space environment (e.g. the harm rule, prevention of transboundary harm, notification obligation, environmental impact assessment, etc.). In addition, the ENMOD Convention specifically mentions outer space in Article II, which prohibits environmental modification techniques (KECSKÉS 2024: 248).

⁸⁰ Additional Protocol I, Article 55.

case of armed conflict. The due regard principle supports this obligation, obligating States to avoid collateral damage and the creation of space debris, and to take into account the rights and interests of other States.

Finally, while no formal enforcement mechanisms exist, the due regard obligation may serve as a basis for post-conflict accountability and diplomatic assessment. Actions during armed conflict that cause long-term, indiscriminate harm to the space environment could be considered violations not only of IHL but also of peacetime obligations under the Outer Space Treaty. In this sense, the principle provides a normative bridge between peacetime and wartime regulation, reaffirming that the domain of outer space must remain governed by the shared responsibility of all States to act with foresight, restraint and mutual respect.

Secondly, in contemporary warfare, attacks against satellites represent a tangible and growing threat. Such attacks may occur through kinetic or non-kinetic means, as explained above. In recent years, a new method of interference has emerged in the form of cyber operations, and it remains unclear whether the principle of harmful interference can be invoked in this context. Cyber operations present particular challenges, as identifying the attacker's IP address, the start time of the operation and all intended targets is often difficult.⁸¹ In the telecommunications domain, the ITU has called on member States to ratify the Budapest Convention on Cybercrime (2001) to enable the criminalisation of cyber offences directed against States.

Based on these, it is important to note that the principle of harmful interference may also be invoked in the context of armed conflicts, provided that specific conditions are met. First, the harmful interference must occur within the framework of the armed conflict and be attributable to a party to that conflict. Second, it must be undertaken for the purpose of contributing to military operations or disrupting humanitarian assistance.⁸² During armed conflicts, IHL governs the conduct of hostilities, including attacks on military objectives. At the same time, the Outer Space Treaty and related norms impose additional limitations, as demonstrated above. The principle of harmful interference complements IHL rules on distinction

⁸¹ POIRIER 2024: 4.

⁸² TAKAYA-UMEHARA 2019.

and proportionality by discouraging indiscriminate or large-scale disruption of space systems. For example, in the case of dual-use satellites, any damage could have far-reaching consequences for global communications, weather forecasting and navigation.⁸³ Therefore, even if a State claims that interference is justified under IHL, it may still breach its obligations under the Outer Space Treaty if the interference contravenes international space law. As an example, although the use of force in self-defence under Article 51 of the Charter of the United Nations⁸⁴ may be lawful, this does not automatically displace the applicability of Article IX, rather, the two regimes must be read together, meaning that even a permitted use of force must, as far as possible, comply with the due regard and harmful interference obligations. This interplay between the two regimes illustrates that space law and IHL must be interpreted in a mutually reinforcing, rather than mutually exclusive, manner.

Recent armed conflicts also illustrate the practical application of these principles. The Russian–Ukrainian conflict highlights how dual-use and civilian space assets have been employed for military, defensive and humanitarian purposes. Ukraine and its partners have relied on commercial satellite imagery, Earth observation data and communication networks to support situational awareness and co-ordination of humanitarian assistance.⁸⁵ Such use aligns with the due regard principle, as it seeks to balance military necessity with protection of civilian services and the rights of neutral States. In contrast, Russian operations include GPS jamming, signal interference and cyberattacks against satellite systems.⁸⁶ These actions arguably violate both the due regard obligation and the principle of harmful interference, as they disregard the legitimate interests of other States and threaten the safety of civilian and neutral space infrastructure.

One of the most notable cases of the conflict was the Viasat KA-SAT cyberattack, which targeted a commercial satellite network providing communication services between Europe and, therefore, affected services

⁸³ HANSEN 2015: 44–50.

⁸⁴ UN Charter, Article 51.

⁸⁵ CLONTS 2023.

⁸⁶ CLONTS 2023.

not only for Ukraine but also for France, Germany, Hungary, Greece, Italy and Poland.⁸⁷ The incident, therefore, demonstrated the transboundary consequences of irresponsible space operations. The incident also illustrates a new form of harmful interference, namely cyber operations. This raises significant legal questions about the consequences of cyberattacks conducted during armed conflicts that have detrimental effects on non-belligerent States and civilian infrastructure. Other examples of the violation of the harmful interference include widespread GPS jamming and signal disruption conducted by Russian forces near conflict zones and border regions. These operations not only impaired Ukrainian military operations but also international civil aviation and maritime security.⁸⁸

While formal enforcement mechanisms remain limited, these principles serve as a bridge between peacetime and wartime obligations, providing a framework for accountability, diplomacy and normative expectation. Actions causing indiscriminate or long-lasting harm to the space environment could constitute violations of both IHL and the Outer Space Treaty, emphasising the shared responsibility of all States to act with foresight, restraint and mutual respect. In the New Space Age, these norms require States to co-ordinate their operations, consider the legitimate expectations of others, and integrate precautionary measures into the planning and execution of military activities. In conclusion, the Russian–Ukrainian conflict demonstrates that the principles of due regard and harmful interference remain legally binding. Their integration provides a coherent framework for regulating military activities in space, ensuring that operations are conducted responsibly, dual-use assets are assessed appropriately, and the long-term sustainability and safety of outer space are preserved. Strengthening international co-ordination, promoting norms of responsible behaviour, and developing clear guidance for dual-use and cyber-enabled operations are necessary steps to prevent escalation, uphold international law.

⁸⁷ POIRIER 2022: 6.

⁸⁸ CLONTS 2023.

CONCLUDING REMARKS

The increasing connection between outer space and military operations on Earth represents one of the most profound transformations in the conduct of warfare. The principles of due regard and harmful interference remain among the few that seek to preserve outer space as a domain of peaceful co-operation, even amid geopolitical tensions and armed conflict. This study has demonstrated that these principles, while formulated in a different technological era, continue to hold significant legal, ethical and operational relevance in the contemporary 'New Space Age'.

The principle of due regard demands that States exercise their freedoms in outer space responsibly, mindful of the corresponding interests of others. In the context of armed conflict, it serves as a restraint mechanism that links peacetime obligations to wartime conduct. The principle obliges belligerents to consider the broader implications of their military actions, not only in terms of immediate tactical advantage but also in light of long-term impacts on the sustainability of the orbital environment and the safety of neutral States. As such, it functions as a moral guideline in a domain where law, ethics and technology intersect. Similarly, the prohibition of harmful interference represents a cornerstone of responsible space operations. Its relevance in the era of hybrid and cyber warfare is significant. The concept's flexibility allows it to encompass new forms of interference, ranging from kinetic ASAT operations to non-kinetic jamming and cyberattacks. However, its unclearness also poses a risk, without clearer definitional and procedural standards, States may interpret or exploit this ambiguity to justify aggressive conduct. The Russian–Ukrainian conflict has illustrated this tension. The Viasat KA-SAT cyberattack and widespread GPS jamming demonstrated that harmful interference can now manifest in digital form, blurring the boundaries between the space and cyber domains. These incidents underline the need to refine the interpretation of 'harmful interference' to include cyber operations that degrade or disable space-based infrastructure.

The interplay between space law and IHL further underscores the enduring relevance of both principles. The principles of military necessity, distinction, proportionality and humanity resonate closely with the due

regard obligation. Together, they create a complex legal framework that fills the gap between freedom of military use and the preservation of outer space as a safe domain. Yet, the lack of enforcement mechanisms renders these obligations largely dependent on voluntary compliance, diplomatic interests and political will. The Outer Space Treaty, while fundamental, was never designed for the complexities of dual-use satellites, private actors and cyber-enabled operations. Therefore, future legal instruments (e.g. treaties, declarations, soft law documents) should define thresholds for harmful interference and due regard, establish consultation protocols for space-related military activities and create clear enforcement standards.

As a summary, the due regard and harmful interference principles, despite their ambiguities, continue to provide a vital ethical and legal framework. They remain a reminder that even in conflict, outer space must remain guided by co-operation and mutual assistance and used for peaceful purposes. Thus, the challenge for the coming decades is clear: to transform these fundamental principles from abstract ideals into enforceable standards.

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