

# Rights and Obligations in International Consultation for Establishing Safety Zones in Outer Space

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## Abstract

There is no doubt that the concept of safety zones in outer space embraces the safety of activities in space but discourages any notion of space hegemony. This idea has already found application in providing clear space or separation for safety in aviation, safe distance at launch pads, and safety bubbles for conjunction assessment around spacecraft. Another analogy is the no-fly zone or Air Defense Identification Zone (ADIZ), sometimes established unilaterally. The differences among the analogies lie in their operational nature. An object-centric safety zone, such as separation or a bubble, can be seen as an extension of the current operation of spacecraft where established practices exist. The other is an area-centric zone, no-fly zone, or ADIZ, a novel concept applied in outer space; it requires deep scrutiny. This paper discusses the legality of the two types of safety zones under the UN Space Treaties, *inter alia*, regarding the rights and obligations specified in Article IX of the Outer Space Treaty (OST). Establishing a safety zone can be interpreted as a declaration of hazardous activities by the establishing State. In theory, the state establishing the safety zone acts as the area controller of the ADIZ and deny entry to the zone. This may be unacceptable under OST Article 2. Even in an area-centric safety zone, the innocent passage of another state's vehicle through a zone should be granted. In other words, a safety zone needs to be an area without a general coercive authority. Consequently, Article IX is the only requirement imposed on a State to establish a safety zone. This Article imposes the obligation of consultation of the state conducting space activities potentially harmfully interfering with another state's activities. The Article also acknowledges the right of the affected state to request a consultation with the conducting state. Through a conceptual analysis of the legality of acts of those players, this paper describes the burden of risks of the state establishing the safety zone and the state passing through them. The final goal of this paper is to identify legally desirable conditions for establishing and operating safety zones in outer space.

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**Keywords:** Safety zone, Area centric, Object-centric, sovereignty, area control

## 1. Introduction

The Artemis Accords introduced the concept of a safety zone into outer space.<sup>1</sup> It states that the safety zone will be “implemented to avoid harmful interference” and will “protect public and private personnel, equipment, and operations from harmful interference.” Although the Artemis Accords is not a legally binding document, it represents a political commitment by the states of signatories and will be interpreted based on the provisions of international law. A safety zone can be seen as a declaration of harmful activities by the establishing state. Conceptually, a safety zone is an area in outer space controlled as a denial area, which conflicts with the Outer Space Treaty<sup>2</sup> Article II. Therefore, the innocent passage of another state’s vehicle through that zone should be granted. In other words, a safety zone needs to be an area without a general coercive authority. It should allow trespassing and avoid harmful interference with each other’s activities at the same time. At this point, OST Article IX is the only requirement imposed on a state to align the interest of both states. This paper discusses the legality of the safety zone and describes the burden of risks to the state establishing the safety zone and the state trespassing in the zone.

## 2. Area-centric safety zone and object-centric safety zone

The legal basis for establishing a safety zone has two parts, application to area-centric zones and to object-centric zones. An area-centric safety zone is an area that is controlled because of constant harmful activities therein. Establishing an area of this type can be seen as a declaration of conducting activities with potentially harmful interference. Other operators need to avoid that area for safety reasons. It seems that access to that area would be permanently denied and limited to those who are permitted entry. An area-centric zone is analogous to a no-fly zone or an Air Defense Identification Zone (ADIZ) of traditional air space. This zone will require monitoring and action against every trespassing vehicle. The establishing state must maintain its capability of actively controlling the area as the air traffic controllers execute in the vicinity. It will be required to deploy surveillance assets (e.g., radar), communicate with other spacecraft and their operators, perform enforcement for a hostile vehicle, prepare for emergencies, and take measures for interruption of the original activities to avoid accidents. Since this notion entails tremendous costs, it has

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1 The Artemis Accords Section 11 (2020).

2 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies § 610 UNTS 205, 18 UST 2410, TIAS No 6347, 6 ILM 386 (entered into force 10 October 1967) (1967).

not been practicable as an initial measure to date. In addition, the legal basis of an area-centric safety zone may be discussed in terms of the sovereignty of the area. In air space, the right to establish a no-fly zone is based on the exclusive sovereignty of the state of jurisdiction.<sup>3</sup> However, exclusive sovereignty applies only to an object in outer space, and there is no legal basis for establishing a no-fly zone in an area in outer space.

Although an area-centric safety zone is unrealistic because of its cost and legal issues, a safety zone can be established as object-centric. A state establishing an object-centric safety zone can argue that harmful intervention may occur only from a space object; therefore, safety zones should always be established around space objects. From this point of view, the safety zone is already recognized in practice, as demonstrated by the safety bubble in conjunction with analysis operations or separation requirements in the safety regulations<sup>4</sup>. Since static objects on a celestial body, such as a Moon base, will also be recognized as space objects, it will be logically possible to establish a static safety zone around those objects that looks like an area-centric safety zone but is actually a space object. However, the object-centric safety zone is recognized according to the activities of the space object. It should be established not only around space bases but also around vehicles. Therefore, the object type safety zone established around all the space objects needs to be applied to a common, reasonable standard of safety requirements. It would not be unreasonable to say that a habitable base could be far more harmful than a vehicle since a base does not move or explode immediately, but a vehicle may do so. Therefore, it will be reasonable to recognize that an object-centric safety zone can reasonably be established around space objects for operational safety. An area-centric safety zone may be established covering a certain operational area by only declaratory implication. The question is whether an establishing state has a legal basis to control, prevent entry, or force the landing of a vehicle trespassing in its area-centric safety zone. At this point, the trespassing vehicle is entitled to the jurisdiction of its launching state, and the established state does not retain the jurisdiction of controlling the area. In other words, the launching state has exclusive jurisdiction over the trespassing vehicle, and the state establishing the safety zone does not. At this point, establishing an area-centric safety zone is not legally realistic under current international law.

It is reasonable to say that a safety zone needs to be object-centric. An object-centric zone will be based on the current practices for safety bubbles used in conjunction analysis. A safety bubble assumes that the calculated uncertainty of the observed trajectory of an orbiting object recognizes the conjunction

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3 Convention on International Civil Aviation Article 1 § 15 UNTS 295, ICAO Doc 7300/6 (1944).

4 NASA, "NASA Spacecraft Conjunction Assessment and Collision Avoidance Best Practices Handbook", NASA/SP-20205011318 (2020).

probability of multiple objects. Since a Moon base will also be recognized as a space object, it will be theoretically possible to establish a safety zone around the Moon base. However, this zone will be small enough to cover the conjunction analysis with another object since the Moon base will be stable on the surface of the Moon. In most cases, it should be recognized that the safety zone around a space object will be established based on the probability of hazard of that object, including its conjunction analysis with another object. The result of the conjunction analysis will be provided to the possible collision object, but it is totally in hands with that object whether they execute an avoidance maneuver or maintain their trajectory since the establishing state of a safety zone does not have the right of enforcement. Therefore, it should be recognized that the individual message from the conjunction analysis to another object constitutes an offer of consultation under the OST Article IX. The state receiving this consultation will not be entitled to follow the instructions or requirements of the providing state, but even though it has the right to request ceasing the activities with possible harmful interference because of their need or urgency of trespassing. Based on the principles of general international law, the use of force is also prohibited in outer space,<sup>5</sup> the establishing state cannot physically force the trespassing state to follow their requests. The only way to maintain that area's safety will be to suspend the original potentially harmful activity in case the consultation ends unsatisfactorily.

### 3. Rights and obligations of the states regarding safety zones

Based on the discussion in the previous section, it is recognized that the safety zone will be established around each space object to meet the requirements of the OST Article IX stated as follows (*italic added by the author*).

In the exploration and use of outer space, including the Moon and other celestial bodies, States Parties to the Treaty shall be guided by the principle of cooperation and mutual assistance and shall conduct all their activities in outer space, (...), with *due regard* to the corresponding interests of all other States Parties to the Treaty. (...)

This provision can be seen as the foundation of the safety zone as a measure of due regard to other space activities. The state establishing the safety zone is regarding the safety maintenance of the area by declaring that they are conducting possibly harmful activities in the area. The question is to what extent the due regard to this provision will be recognized as sufficient. In object-centric safety zones the current best practices of conjunction analysis and messaging or coordination among the operators may be recognized as

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<sup>5</sup> Charter of the United Nations Article 2.4 § Can TS 1945 No 7 (1945).

measures of due regard. It is stated in the “Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee on the Peaceful Uses of Outer Space” (“LTS Guidelines”)<sup>6</sup> and certain national legal rules, such as those of the US, France, and Japan. However, advance notice of possible harmful activities, such as unusual maneuvers or deployment of another space object, is not yet included in the established practices. Also, for area-centric safety zones, a standard must be established by consensus among the potential active states; this has not been done to date.

The rights and obligations of the establishing state and the trespassing state will also be necessary to consider from the burden of obligation. At this point, Article IX of the OST states as follows (emphasis added by the author).

If 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.

This provision stresses that the obligation of providing consultation opportunities is entitled to be on the side of the establishing state of the safety zone since its establishment can be recognized as a declaration of potential harmful interference. The other states are merely allowed to request consultations. Therefore, the state other than the establishing state of the safety zone may argue that the establishing state needs to constantly assess and offer consultation opportunities to the potentially affected states. In this case, the establishing state must be aware of the other states’ activities to recognize the potentially affected activities. There are no concrete measures to do so to date.

On the other hand, one may think in the opposite way. Namely, establishing a safety zone is not a declaration of harmful interference itself but merely an announcement of an activity to incentivize consultation from any other possible harmful interference activity. In other words, establishing a safety

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6 *Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee on the Peaceful Uses of Outer Space*, UNGA, 74th Sess., A/74/20 (2019) Annex II [*LTS Guidelines*].

zone is soliciting consultations for any other potentially harmful interference. In this case, the burden of obligation to offer consultation opportunities will flip to the side of the trespassing state. The state that will affect an already set safety zone will be required to assess and offer consultations to the state that established the safety zone.

Since both arguments sound reasonable, it is safe to say that the establishing state of a safety zone, whether they are area-centric or object-centric, needs to be prepared for both sides' arguments. It should be admitted that it will be safe to cover the following issues while establishing a safety zone, whatever the basis of the zone is.

- 1) Disclose not only through diplomatic channels but also in public;
  - the overview of prepared activities, including possible harmful activities.
  - information on the specific area of the activities.
  - information on the possible hazard in case of malfunction or accident in the activities.
  - the contact point for prior consultations.
- 2) Constant monitoring of the surrounding activities.
- 3) Active consultations in case of detecting a possible harmful activity.

Covering those issues will maintain the viability of the safety zone and simultaneously signify that the establishment requires a few efforts and costs.

## **5. Conclusions**

Through a conceptual analysis of the legality of the act of state establishing a safety zone and the state trespassing zone, this paper described the burden of risks among those states. The nature of a safety zone determines whether it is area-centric or object-centric, but the issues needing to be discussed in establishing the zone can be extracted as three common points. The legally desirable conditions for establishing and operating safety zones in outer space will promote the evolution of the practices of the Article IX of OST. This consideration will elaborate on future activities on the Moon and other celestial bodies. It should be recognized as a further challenge that the liability issue between the establishing and trespassing states needs to be discussed in detail.

## **Acknowledgments**

This work was supported by JSPS KAKENHI (B), Grant Number JP20H01438. The author acknowledges the Serendipity, Inc. for English proofread of this paper.