

The Outer Space Treaty and Prohibited Military Space Activities

Laura Montgomery, March 31, 2023

FINAL

The Outer Space Treaty of 1967¹ (the “Outer Space Treaty” or the “Treaty”) was entered into during the height of the Cold War and during the space race to the Moon between the United States and the Soviet Union. The Treaty establishes the basis for a legal regime governing the activities of nation states, referred to as “States Parties” throughout the Treaty, in outer space.² Under Article XIII, the Treaty applies “to the activities of States Parties to the Treaty in the exploration and use of outer space.” As the U.S. Secretary of State, Dean Rusk, explained in his statement to the Senate, “[t]he treaty is not complete in all possible details. It does not deal with all problems that may develop. But it is responsible to those problems that can be described and forecast today.”³ This assessment focuses on whether and how the Treaty prohibits military activities in outer space, with an eye toward determining which are clear and which are ambiguous.

In summary, it is clear that states party to the Treaty may not place nuclear weapons or other weapons of mass destruction in a full orbit around the Earth. They may deploy intercontinental ballistic missiles (“ICBMs”) armed with nuclear warheads. Although the weight of opinion of two major spacefaring nations appears to be that fractional orbital bombardment systems armed with nuclear warheads comply with the Treaty, one may argue that that conclusion is not certain. States party to the Treaty may place weapons that are neither nuclear nor WMD in orbit, on celestial bodies, including the Moon, or otherwise in outer space. Similarly, there is no Treaty prohibition on military reconnaissance, communications, or navigation satellites. The Treaty requirement to use celestial bodies exclusively for peaceful

purposes allows for self-defense. Space between Earth and the Moon does not fall under this requirement, so it need not be used exclusively for peaceful purposes. Parties to the Treaty undertake not to establish military bases, installations, or fortifications and to abstain from testing any types of weapons or conducting military maneuvers on celestial bodies. The U.S. position identifies the Moon as a celestial body for purposes of this prohibition, but, again, that is arguably ambiguous. States parties to the Treaty may verify treaty compliance on the Moon and other celestial bodies. Access requires reciprocity, advanced notice, consultations, safety precautions, and avoiding interference in the operation of a facility accessed. If two countries were at war, the U.S. position appears to be that the Treaty would not apply as between the two belligerents.

I. Basic rules for interpreting the Outer Space Treaty

A. A treaty's language governs its interpretation

The Outer Space Treaty addresses a host of activities that a country may carry out in outer space, and includes military activities amongst those it governs. Few if any court opinions address the Outer Space Treaty, which means that anyone seeking to interpret its meaning must rely on the text. Where the text is ambiguous, a reader may look to the treaty's drafting history to ascertain the intent behind unclear language.

This approach to interpretation is rooted in the law of the United States. For example, the first step relies on the rubric that the language of a treaty tells us what the treaty means. When interpreting a treaty, the Supreme Court explained that the treaty's unambiguous text governs its interpretation, regardless of the treaty's drafting history.⁴ In the same case in which the Supreme Court applied this rule, it also pointed out that where the treaty language is clear, the court may not "insert an amendment."⁵ In other words, a reader may not assume that the plain language of

a treaty has somehow lost its effectiveness or contains a provision not present in writing because doing so might suit that reader's own purposes.

Only if a treaty provision is ambiguous will the courts consult the drafting history to help understand its meaning.⁶ For example, although the court in *Narayanan* pointed out that the treaty's drafting history lent support to the court's interpretation, the court made sure to first disavow the need to even look at that history.⁷

Although the United States is not a signatory to it⁸, the Vienna Convention on the Law of Treaties⁹ ("Vienna Convention") offers insights into how the international community interprets a treaty. The approach is very similar to that taken by the U.S. courts. Article 31, for example, provides that a treaty shall be interpreted in accordance with the ordinary meaning to be given its terms in their context and in the light of its object and purpose. Likewise, as U.S. courts allow, Article 32 permits a court to review preparatory work and the circumstances surrounding the treaty when the treaty terms are ambiguous or obscure.

There are other more detailed tools designed for idiosyncratic situations available for treaty interpretation, but the tools described here are those which must guide any analysis at the outset.

This review of the Outer Space Treaty's military requirements and prohibitions takes into account the testimony of the Treaty's negotiators to the U.S. Senate during the Treaty's ratification hearings. Testimony was provided by the chief U.S. treaty negotiator to the United Nations, the Secretaries of State and Defense, the Chairman of the Joint Chiefs of Staff, and the State Department's Legal Adviser. Consideration of their testimony serves two purposes. The Treaty does contain ambiguous or undefined terms, and the testimony helps explain the U.S. understanding of some of those terms. There are also points where the testimony appears to

contradict the plain language of the treaty, thus creating confusion for scholars in the decades that have followed.

This assessment will also highlight where the Outer Space Treaty contains ambiguities, because it can be useful to know when the legal terrain may be shaky beneath one's feet. Even if the executive branch of the United States has been definite about an interpretation, that might not mean a court would agree. Additionally, another country might have an equally definite but opposite interpretation, and it is useful to know the possibility in advance, particularly if the other country is an adversary.

B. Customary international law

Where a treaty does not address a disputed issue, where a treaty is silent, or where a treaty term is undefined, customary international law may apply. Customary international law—which is roughly akin to common law on the domestic front—contains a number of elements. The U.S. Department of State recently relied on the Statute of the International Court of Justice to identify them:

To demonstrate the existence of a rule of customary international law, there must be “evidence of a general practice accepted as law,” as stated in the Statute of the International Court of Justice (ICJ). This formulation reflects the two elements required for the formation of customary international law: (1) State practice and (2) *opinio juris* (acceptance as law).

The formation of a rule of customary law requires that the relevant State practice be general and consistent; it must be “settled practice,” as described by the ICJ. Moreover, such practice must have “occurred in such a way as to show a general recognition that a rule of law or legal obligation is involved” (*opinio juris*).

For a rule to become part of customary international law, it is necessary for both the State practice and *opinio juris* requirements to be satisfied. Failure to satisfy either requirement has the effect that the suggested rule has not been established as a matter of international law.¹⁰

This analysis is useful when assessing whether a vague Outer Space Treaty term has acquired a definition under customary international law. This analysis will come into play in the

context of determining whether the Treaty's prohibition on nuclear weapons in orbit around the Earth applies only to full orbits or to the abbreviated orbits of a fractional orbital bombardment system.

II. What military space activities does the Outer Space Treaty prohibit?

Article IV of the Treaty contains a list of prohibitions on military space activity:

States Parties to the Treaty undertake not to place in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner.

The moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration of the moon and other celestial bodies shall also not be prohibited.

A. The treaty contains restrictions on nuclear weapons and any other kinds of weapons of mass destruction.

The language of Article IV is plain with regards to nuclear weapons and any other kind of weapons of mass destruction ("WMD"). States may not place such weapons in orbit around the Earth, install them on a celestial body, including the Moon, or station them anywhere else in outer space.

Nuclear weapons. The Outer Space Treaty does not define nuclear weapons, so official definitions must be found elsewhere. However, using principles of plain language, and the fact that nuclear weapons existed and had been used by 1967, when the Treaty was passed, we are likely safe in following a current definition provided by the U.S. Centers for Disease Control and Prevention (CDC), which describes a nuclear weapon as "a device that uses a nuclear reaction to

create an explosion.”¹¹ According to the CDC, nuclear weapons may come in the form of bombs or missiles.

Weapons of mass destruction. Although nuclear weaponry is a known technology and creates few ambiguities, the definition for a “weapon of mass destruction” is not as clear.¹² As with other terms, the Treaty does not define “weapons of mass destruction.” However, to the extent the term is ambiguous, we may look to the Treaty’s ratification history before the U.S. Senate to obtain guidance. Former Justice Arthur J. Goldberg, Ambassador to the United Nations, and the chief U.S. negotiator on the Outer Space Treaty explained during Senate ratification hearings that a weapon of mass destruction is “a weapon of comparable capability of annihilation to a nuclear weapon, biological.”¹³ U.S. Deputy Secretary of Defense Cyrus R. Vance’s testimony clarified that chemical and biological weapons would be included in the definition.¹⁴ Ambassador Goldberg further testified that observational or navigation satellites are not weapons of mass destruction.¹⁵

Lyall and Larsen appear not to consider Goldberg’s guidance sufficiently clear. They view the treaty’s lack of definition for WMD as allowing, “considerable leeway for a narrow or wide interpretation.”¹⁶ They recommend looking to other sources of law¹⁷ for making arguments in this regard. However, given the possible ambiguity surrounding the term, search for the U.S. position in this regard should start with the Ambassador’s definition, and should focus, as he does, on whether a weapon’s capacity for annihilation is on par with a nuclear weapon’s capabilities.

Other weapons in orbit. According to the General Counsel of the U.S. Department of Defense (DOD), writing in the 2016 DOD Law of War Manual, the Treaty does not ban all weapons in orbit.¹⁸ In fact, as DOD’s Office of the General Counsel noted in 2002, “The treaty

permits placing in orbit weapons other than nuclear weapons and other weapons of mass destruction.”¹⁹ The Treaty is silent with respect to other types of weapons being stationed in orbit, and Russian state practice reflects at least one spacefaring nation’s understanding of this interpretation, namely, that if the Treaty does not address other weapons, then it must not prohibit them. Historically and currently, Russian cosmonauts have carried guns to their orbiting platforms and to the International Space Station. The Russians considered them survival aids for after astronaut landings and before recovery in the Siberian wilderness, where bears and wolves were a concern.²⁰ They carried a triple barreled combination pistol from 1986 until 2006, and took a regular semi-automatic pistol from 2007, onwards.

More advanced weapons also fall outside the Article IV prohibition on nuclear and other WMD in orbit around the Earth. For space, those may include kinetic anti-satellite weapons which destroy an orbiting satellite through impact.²¹ As Major Grunert²² notes:

Over the past year alone, Russia has tested both space-based and direct-ascent anti-satellite weapons — activities the United States has decried as “irresponsible,” but which are not prohibited under existing international space law. China, which infamously destroyed one of its own satellites with a direct-ascent anti-satellite weapon in 2007, is also believed to be developing a wide range of anti-satellite and space weapons. The use of such weapons by China, Russia, or the United States would violate, or, at least, implicate, the Outer Space Treaty’s Article III application of other areas of international law, including the laws of armed conflict, to outer space. However, the Outer Space Treaty and international space law permit the development of such weapons and their placement into orbit, provided they do not constitute “weapons of mass destruction.”²³

Likewise, this provision of Article IV does not prohibit jamming and cyberattacks, which may render satellites inoperable. These activities may, however, be subject to the provisions of the Treaty’s Article IX, which calls for States Parties to the Treaty to conduct their activities in the exploration and use of outer space “with due regard to the corresponding interests of all other States Parties to the Treaty.”²⁴ Cyberattacks and jamming likely constitute

the kind of harmful interference for which Article IX requires prior consultations. Likewise, the use of electro-magnetic pulse (EMP) weapons could run afoul of Article IX's requirement to consult prior to engaging in harmful interference. An EMP weapon when detonated,

produces a pulse of energy that creates a powerful electromagnetic field capable of short-circuiting a wide range of electronic equipment, particularly computers, satellites, radios, radar receivers and even civilian traffic lights. Since EMP is electromagnetic energy traveling at the speed of light, all of the vulnerable electronic equipment in the detonation zone could be affected simultaneously.²⁵

Were a nation to detonate an EMP in space without prior consultation with those who would be affected, the EMP's destruction of satellite capabilities would likely be deemed harmful interference under Article IX. Accordingly, even if a country placed a nuclear weapon in only a "fraction" of an orbit so as to avoid the restrictions of Article IV as discussed below, the EMP could run afoul of Article IX.

Applicable orbits. To which orbits may Article IV's restriction on weapons of mass destruction, including nuclear weapons, apply? There is clarity regarding a full orbit and suborbital launches. There are theories and arguments to make about partial orbits, which are also known as fractional orbits.

Article IV's statement that "States Parties to the Treaty undertake not to place in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction," addresses the permissibility of such weapons orbiting the Earth, that is going around Earth in its entirety. For example, a nation state might wish to place a nuclear weapon in low-Earth orbit, and just leave it there until needed. The nuclear weapon could orbit Earth for years, presumably to serve as a deterrent to poor behavior by potential adversaries. NASA defines an orbit as "a regular, repeating path that one object in space takes around another one."²⁶ If an orbit "around the Earth" consists of an object making a complete circuit then Article IV's

prohibition on orbiting WMD applies, and the nation state may not place a nuclear weapon in low-Earth orbit, and just leave it there until needed.

During the Senate ratification hearing for the Outer Space Treaty, the U.S. government's interpretation was clear: no signatory to the Treaty may place nuclear weapons or other WMD in orbit around the Earth under Article IV. Even if the Treaty itself were not so clear, a review of the preparatory work both reveals the official U.S. interpretation from the outset and confirms this interpretation. President Johnson welcomed the Treaty as "the most important arms control development since the limited Test Ban Treaty of 1963."²⁷ Ambassador Goldberg's testimony was even more pointed, referring repeatedly to the Treaty's prohibition on "bombs in orbit."²⁸ General Wheeler, Chairman of the Joint Chiefs of Staff, also spoke approvingly of the Treaty's "no bombs in orbit" provision.²⁹

Might Article IV's prohibitions also include a suborbital trajectory? It does not appear so. Ambassador Goldberg's testimony addressed this issue clearly, although without much explanation of his rationale, in the context of whether Article IV applies to intercontinental ballistic missiles (ICBMs). We may deduce from the ambassador's testimony that Article IV's prohibition does not apply to ICBMs for two reasons. First, he explains that the Treaty does not apply to activities on the ground, stating that the Treaty does not cover ground activities at all. He then suggests that ICBMs must be dealt with in a separate treaty, not only because they launch from the ground but because they do not launch *into orbit*.³⁰ (Emphasis added). Given that an ICBM may reach an apogee of 2,000 kilometers (1,200 miles),³¹ which far exceeds altitudes at which an object may achieve orbit, it is evident that Article IV's statement means what it says. As the DOD's Office of the General Counsel noted as of 2002, a nuclear weapon

may pass through outer space but not be placed in orbit, and thus Article IV's restriction would not apply.³²

While on the topic of ICBMs, it bears mention that Article IV also prohibits a State Party to the Treaty from stationing nuclear weapons and other kinds of WMD "in outer space in any other manner." This expansive language might seem at first blush to prohibit an ICBM's passage through outer space at all. However, Article IV prohibits states from undertaking to "station" such weapons in outer space in any other manner, indicating that such weapons may not be placed in outer space permanently or even, perhaps, for an extended duration. An ICBM may reach its intended destination in an under an hour, while travelling far in excess of the speed of sound. This swift and limited travel creates no permanent "stationing" of the missile, and, thus, this portion of Article IV does not apply to ICBMs.

Nor do Lyall and Larsen consider ballistic missiles with suborbital trajectories prohibited by Article IV of the OST.³³ Their view is consistent not only with Goldberg's testimony, but with state practice subsequent to the Treaty's passage: the United States and the Russian governments have both possessed intercontinental ballistic missiles with nuclear warheads since then. Lyall and Larsen observe that although the trajectory of a ballistic missile may take it into space (assuming a clear boundary for "space" is agreed upon eventually), the missile would not be in orbit.³⁴

A fraction of an orbit. Whether Article IV's WMD prohibition applies to complete orbits or suborbital trajectories is clear enough. It applies to the one but not the other. There is a more difficult and ambiguous case, however: that of a fractional orbit, where a weapon "can stay on orbit as long as the user determines and then it de-orbits it as part of the flight path."³⁵ The Soviet Union's fractional orbital bombardment system was designed and tested in the early

1960's³⁶—prior to the Outer Space Treaty's entry into force—to place a thermonuclear device in an incomplete orbit, one where it would not accomplish a full circuit of the Earth before diverting to its target. The Soviets claimed that Article IV's prohibition did not apply to an incomplete orbit, and went so far as to construct 18 operational FOBS silos.³⁷ More recently, the People's Republic of China has engaged in weapons test of a FOBS that employed a hypersonic glide vehicle.³⁸

The U.S. Government appears to share the former Soviet Union's view that Article IV does not apply to fractional orbits. According to the U.S. DOD Law of War Manual:

The prohibition on placing weapons of mass destruction “in orbit around the earth” refers only to their placement in full orbit around the Earth; thus, the Outer Space Treaty does not ban the use of nuclear or other weapons of mass destruction that go into a fractional orbit or engage in suborbital flight.¹⁵⁸ For example, intercontinental ballistic missiles (ICBMs) will travel a portion of their trajectory in outer space; but because ICBMs would enter outer space only temporarily, their entry into outer space with nuclear warheads would not violate this prohibition.¹⁵⁹³⁹

It is hard to argue with the interpretations of two major spacefaring nations; and although I could not find the Soviet rationale for its determination, the U.S. interpretation provides some explanation. The DOD Law of War Manual appears to rely on the Treaty's reference to an orbit “around the Earth,” to mean “*all* around the Earth,” not merely “*part way* around the Earth.” However, neither limiting phrase “all” or “part way” are present in Article IV's text.

Despite these rather weighty interpretations to the contrary, it is evident that an ambiguity may exist regarding fractional orbits. Even when relying on the text, as the U.S. and Soviet positions purport to do, a different conclusion may be reached. Article IV does not say the Treaty's signatories undertake not to place restricted weapons in a *full* orbit. Instead, that provision is silent with respect to whether an orbit consists of a full or partial revolution around the Earth, thus indicating that the provision applies to any type of orbit around the Earth. That

being so, the Treaty restriction could (and perhaps should) apply to any nuclear weapon or other WMD that achieves orbit, regardless of whether it achieves a full orbit or not. “Around the Earth” could refer to either a full orbit or to an orbit’s location, that is, to contrast the orbit in question with one around the Moon, for example. Physicists speak of an object in orbit as “falling” around the Earth,⁴⁰ that is, in more colloquial terms, that it stays up there on its own. In contrast to an object achieving orbit, Congress has, as a matter of U.S. law, described a suborbital trajectory as meaning the intentional flight path of a launch vehicle, reentry vehicle, or any portion thereof, whose vacuum instantaneous impact point does not leave the surface of the Earth.⁴¹ If a FOBS weapon’s instantaneous impact point left the surface of the Earth, it would arguably no longer be on a suborbital trajectory and thus would be in orbit around the Earth, however briefly or temporarily. Both interpretations appear reasonable and grounded in the Treaty’s text, and thus create ambiguity.

Scholars differ on whether Article IV prohibits carriage of a WMD in an incomplete orbit. For example, Lyall and Larsen maintain that an object’s incomplete orbit counts as being in orbit for purposes of Article IV, and, thus, the Treaty prohibits the carriage on that object of a nuclear weapon or other weapon of mass destruction.⁴² Other commenters see the matter differently,⁴³ with some saying that Article IV fails to address fractional orbital weapons at all.⁴⁴

With it being possible to argue about the plain language of the prohibition, with spacefaring nations and scholars disagreeing, and with the fact that the former Soviet Union had started designing and testing its FOBS by 1965, two years before the Outer Space Treaty, it becomes evident we have a possible ambiguity here. Because of this, we may look to the restriction’s underlying intent.

When the language of a law or Treaty is not clear, a court may look at the intent underlying an ambiguous provision. Even that, however, is not helpful in this instance. There appears to be consensus that Article IV does not apply to ICBMs. Like an ICBM, a FOBS object is not in a permanent station around the Earth. They both merely use outer space to reach their targets. Because ICBMs are allowed under the Treaty, and because FOBS are functionally similar, perhaps the Treaty was not intended to apply to a system such as FOBS either. Moreover, it appears the drafters intended Article IV to stop nation states from placing WMD in space on a permanent basis. An orbiting object may stay in space for years, even decades or more. The drafters clearly intended Article IV to prevent that situation. Likewise, Article IV prohibits “stationing” WMD in outer space in any other manner, again demonstrating the drafter’s concern with nuclear weapons or other kind of WMD being located in space for an extended duration. One might argue that the FOBS’ limited duration passage through outer space does not violate the Treaty’s intent.

One might also argue the contrary, namely, that a concern regarding permanence was not the only reason for prohibiting WMD in orbit. The ability to detect incoming nuclear warheads was also a concern. An ICBM launch is difficult enough to monitor and plan for. How much more difficult would it be to detect a warhead suddenly coming in from orbit, without benefit of first detecting the launch phase? If preventing surprise was the intent behind the Article IV prohibition, then a FOBS would not comply with that intent. More historical research on the question might prove fruitful.

Lastly, the FOBS scenario provides an opportunity to explore whether a WMD in a fractional orbit could be found compliant with Article IV as a matter of customary international law. The answer is not available without further historical research. Customary international

law requires settled state practice and acceptance as law. Although one country, the Soviet Union, fielded a FOBS, it did not deploy it in its partial orbit (thankfully). Even though the construction of the silos might count as state practice, so might not launching them into a fractional orbit. The absence of a launch might be interpreted as an absence of state practice. Although the Chinese are testing a fractional orbital system, it is not one with a nuclear weapon of other kind of WMD, and thus provides no evidence of state practice with respect to such weapons. Research uncovered no U.S. fractional orbiting of a nuclear weapon. Accordingly, the existence of settled state practice is unclear. More clear is the fact that both the former Russian government and the United States appear to view FOBS as compliant with Article IV, so that there is evidence of their acceptance of the interpretation as law. However, to find a rule of customary international law, both settled state practice and legal acceptance must be present. The former is not.

Installing WMD on the moon. Article IV's restrictions on nuclear weapons and other weapons of mass destruction includes a prohibition on installing such weapons "on celestial bodies." Legal scholar Nicholas Matte points out that the installation prohibition makes no mention of the Moon, which means that this restriction is ambiguous with respect to whether the Treaty would prevent a State Party from installing WMD on the moon.⁴⁵ On the one hand, as Matte notes, the fact that the Treaty's title, other provisions, and a later portion of Article IV refer to celestial bodies as including the Moon suggests that the truncated reference implicitly includes the Moon, and that thus WMD may not be stationed there. On the other hand, Matte points out, under the rules of interpretation, the moon's exclusion here when it is mentioned so many times in concert with other celestial bodies throughout the rest of the Treaty suggests that the exclusion was deliberate. Under the logic of the latter interpretation, nuclear weapons and

other WMD could be stationed on Earth's moon. However, the next provision is a catch-all that ensures that WMD may not be stationed in outer space in any other manner, and thus should resolve Matte's concerns.

Stationing WMD in outer space. Article IV also prohibits the Treaty's signatories from stationing WMD "in outer space in any other manner." This final prohibition on a country's ability to station nuclear weapons or other WMD "in outer space in any other manner" means that the prohibition is not limited to Earth orbit and celestial bodies. Under the plain language of Article IV, the prohibition applies to lunar orbit,⁴⁶ and, to orbits around any other celestial bodies. The DOD's Office of the General Counsel has been clear that such weapons may not be placed on the Moon,⁴⁷ and this particular prohibition could perhaps serve as the source of the Treaty's prohibition of nuclear weapons and WMD on the Moon.

Where outer space begins. Ambiguity surrounds the question of where outer space begins. Although the legal record provides clarity on whether certain locations are in airspace or outer space, the line where one becomes the other remains ambiguous. To date, the U.S. Government has declined to define the boundary between air space and outer space. There is a longstanding U.S. Government concern over identifying a boundary between air and space, dating back to the early 1960's. For example, the U.S. Air Force pointed out that establishing a "floor" for space might be premature because it could eventually be exceeded by high flying aircraft.⁴⁸ In 1962, the Joint Chiefs of Staff opposed prematurely defining outer space on the grounds that it could limit military space operations.⁴⁹ The Treaty itself establishes no definition, and Ambassador Goldberg's Senate testimony made it clear that any definition itself remained a subject for further and later study.⁵⁰

In addition to the official reasons for avoiding a definition of outer space, the lack of clarity provides other benefits. If, for example, one country sends a high-altitude vehicle over another country's territory, the sensed country has no basis for complaint if the vehicle is in outer space. This is because Article II of the Treaty provides that no country may claim sovereignty over outer space. Conversely, the sensed country does have grounds for complaint if the high-altitude vehicle enters its airspace without authorization. So long as no clear line demarcating the end of airspace and the beginning of outer space is identified, countries may address the question on a case-by-case basis. Technology may allow for vehicles to be operated at higher and higher altitudes. This may lead a country to seek to regulate more and more of its airspace. If a high-altitude vehicle could affect aircraft at lower altitudes or people on the ground, there might be strong reasons to regulate at these higher altitudes. We may not be able to currently foresee such technology, the uses to which it might be put, or the hazards it could cause, so that preserving the ability to decide later could save on making a terrible mistake.

Nonetheless and despite the benefits of ambiguity, there are points of certainty. For example, high altitudes remain part of the air space of nation states. Ambassador Goldberg testified during the Treaty's ratification hearings that the Treaty drafters had agreed that commercial aviation and supersonic air travel were not in outer space.⁵¹ During the same hearings, Dean Rusk, the U.S. Secretary of State, reported a consensus, affirmed by Ambassador Goldberg, that an object in orbit is in outer space.⁵² The Moon and other celestial bodies are in outer space, the Moon because it orbits the Earth, and other celestial bodies because they are beyond Earth orbit. Once we leave the murky area of where airspace ends and outer space begins, the Treaty makes clear that no nuclear weapons or other WMD may be installed on

celestial bodies or stationed elsewhere in outer space, which should include cislunar space, lunar orbit, and, this writer suggests, the lunar surface.

B. States parties must use the Moon and other celestial bodies exclusively for peaceful purposes. This includes a right of self-defense.

As Secretary of State Dean Rusk noted, Article IV says that “Parties to the treaty undertake as well to use the moon and other celestial bodies exclusively for peaceful purposes.” Two points merit mention. First, in applying this requirement only to the Moon and other celestial bodies, the provision avoids requiring that interplanetary space be exclusively peaceful. Second, scholars note that the United States views this provision as allowing the use of force when necessary for self-defense.

Interplanetary space need not be used exclusively for peaceful purposes. The requirement for States Parties to use the Moon and other celestial bodies exclusively for peaceful purposes, does not apply to interplanetary space.⁵³ For purposes of this discussion, “interplanetary space” is usage borrowed from Grunert, and is intended merely to signify areas that are not on the moon or another planet. Interplanetary space may thus include “the areas between celestial bodies, including Earth orbit, cislunar space and cislunar orbit, and farther areas of deep space.”⁵⁴ As Grunert succinctly phrases the matter, “In other words, while celestial bodies *are* to be used only for exclusively peaceful purposes, certain military uses of interplanetary space are, by omission, *permitted!*”⁵⁵ In short, States Parties to the Treaty may use interplanetary space for non-peaceful purposes, and the Treaty doesn’t stop them. The Treaty doesn’t actually grant permission so much as not deny it.

Hence, we see military satellites and dual-use technology in orbit and otherwise in interplanetary outer space. Grunert observes that other treaties, including the failed Moon Treaty,

have attempted to place “more expansive and explicit” restrictions on space weapons, but those attempts have not panned out.⁵⁶

Self Defense is a peaceful use. Historically, while the U.S. maintained that peaceful purposes included the right to self-defense, the Soviet Union maintained that peaceful meant non-military.⁵⁷ As early as 1957, when Senator Albert Gore Sr. addressed a UN Committee about space, he stated that “it is the view of the United States that outer space should be used only for peaceful—that is, *non-aggressive and beneficial*—purposes. Until [general disarmament] is achieved, the test of any space activity must not be whether it is military or non-military, but *whether or not it is consistent with the United Nations Charter and other obligations of law.*”⁵⁸ During the Treaty’s Senate ratification hearings, Secretary of State Rusk noted that the UN Charter will apply in outer space.⁵⁹ and Article 51 of the UN Charter recognizes the right of self-defense. Attorneys within the Office of the Secretary of Defense and the services agreed that “‘peaceful purposes’ were consistent with self-defense under the UN Charter.”⁶⁰

In the decades since the Treaty came into being, both the United States and the Russian governments have used outer space to orbit military satellites and conduct anti-satellite tests, thus providing evidence of state practice from both countries—as well as others—that “peaceful” need not mean non-military.

C. Military bases, installations, fortifications, and maneuvers prohibited on celestial bodies.

Lastly, in the words of Secretary of State Rusk during the Senate ratification hearings, Article IV says that “Parties to the treaty ... undertake not to establish military bases, installations or fortifications and to abstain from testing any types of weapons or conducting

military maneuvers on celestial bodies. There is, of course, no prohibition on the use of military personnel and equipment for peaceful purposes.”⁶¹

The first question that arises is whether this provision applies to the Moon. A close reading shows that the Moon is omitted from the prohibition. Following Professor Matte’s earlier logic discussed above, he struggled with the question of whether the omission means that the Treaty prohibits military bases, installations, fortification, testing, or maneuvers on the Moon, or only on other celestial bodies. Under common rules of interpretation, the Moon’s exclusion here—when it is mentioned so many times in concert with other celestial bodies throughout the rest of the Treaty—suggests that the exclusion was deliberate.⁶² When the Treaty’s drafters meant a provision to apply to the moon, they said so repeatedly. Here they did not. As the Supreme Court noted in *Chan v. Korean Airlines*, in interpreting a treaty, “courts should read international agreements without “alter[ing], amend[ing], or add[ing] to any treaty, by inserting any clause, whether small or great, important or trivial.”⁶³

The DOD Law of War Manual suggests Professor Matte should not have been concerned. The Manual states that “Article IV of the Outer Space Treaty places certain prohibitions on military activities *on the moon* and other celestial bodies: (1) the establishment of military bases, installations, and fortifications; and (2) the testing of any type of weapons; and (3) the conduct of military maneuvers.”⁶⁴ (Emphasis added). On its face, the Manual appears to include the Moon as being a location where these activities are prohibited. Implicit in the Manual’s assertion is the apparent conclusion that celestial bodies always include Earth’s moon. However, the Manual does not address the legal concern occasioned by the Moon’s absence from the text, and thus provides no information on how the conclusion was reached. In support of the Manual’s conclusion, when referring to using “[t]he moon and other celestial bodies” exclusively for

peaceful purposes, Article IV's reference to "other celestial bodies" suggests that the moon is indeed a celestial body. This reference might be a permissible basis for the Manual's implicit conclusion.⁶⁵

To the extent the provision itself is ambiguous, more research into the provision's historical intent may be required because it would be hard to claim intent is clear without that information. The Treaty was drafted before the first man had even set foot on the Moon. Different intents may be reasonable to surmise. On the one hand, it would make sense for someone to want to preserve the Moon for military bases and maneuvers, implying that the Moon's omission was deliberate. After all, the Treaty does not prohibit nuclear ICBMs. On the other hand, the Moon's proximity to Earth would provide a good reason to attempt to keep it free of military activity, and we might rely on the reference to the Moon as an "other celestial body" elsewhere in Article IV to determine that the prohibitions on establishing military bases, installations or fortifications and on testing any types of weapons or conducting military maneuvers indeed apply to the Moon.

D. Article XII allows for inspections with reciprocity and advance notice.

The Treaty's Article XII provides a mean of verifying treaty compliance⁶⁶:

All stations, installations, equipment and space vehicles *on the moon and other celestial bodies* shall be open to representatives of other States Parties to the Treaty on a basis of reciprocity. Such representatives shall give reasonable advance notice of a projected visit, in order that appropriate consultations may be held and that maximum precautions may be taken to assure safety and to avoid interference with normal operations in the facility to be visited. (Emphasis added)

As is evident from the text, the Treaty limits inspections to the Moon and other celestial bodies. For example, this Article does not apply to stations, installations, equipment, or vehicles on the ground on Earth.⁶⁷ As Ambassador Goldberg noted in his Senate testimony, the Soviet held up negotiations for two months when they tried to insist on access to U.S. tracking facilities

anywhere in the world, but the United States did not agree.⁶⁸ Additionally, the Chairman of the Joint Chiefs, General Wheeler, noted in his Senate testimony that this provision did not apply to facilities on orbit.⁶⁹ Thus, one nation would not be able to access another country's orbiting satellite.

One area of ambiguity may be found in the requirement for reciprocity. Article XII provides that facilities on celestial bodies shall be open "on a basis of reciprocity." On its face, this language could be understood to mean that countries have to agree with each other on whether to allow inspections. A court might, in fact, look no further if it had to interpret the question.

Ambassador Goldberg, however, explained that the reciprocity requirement does not grant a nation a "veto" power of another country's right of access. The Ambassador explained that the Soviets had insisted on the reciprocity, but the United States did not want the language to suggest it allowed anyone to deny access under Article XII. Accordingly, Ambassador Goldberg made sure the UN record reflected the U.S. understanding and its reliance on that understanding, making an official, on-the-record statement at both the UN's Legal Subcommittee and the Political Committee of the General Assembly.⁷⁰ He then explained the substance of the matter as follows:

In these clarifying statements [at the UN] I pointed out that the words "on the basis of reciprocity" in Article XII do *not* import a veto. That is, they do *not* mean that State A may visit State B's facilities or installations on a celestial body only if B asks to visit those of A. On the contrary, "on the basis of reciprocity" merely states what would be true in any event under international law. Any party to the Treaty has the right to visit installations of another party on a celestial body—whether or not the other party chooses to exercise its reciprocal right. If, however, the prospective visitor has illegally and in violation of the treaty, barred visits to its facilities by the State whose installations it wishes to inspect, the second state may deny a visit to the breaching party. This result is simply an application of the principle that when one party breaches a material obligation which is owed to another party, the latter is entitled to withhold performance of a commensurate obligation which it would otherwise have owed to the first party. ... Thus, in the event of a material breach, a

party would have the option of treating the entirety of its treaty obligations toward the breaching party as having come to an end, to be revived only upon remedial action by the defaulter.⁷¹

In short, this provision of the Treaty requires a country of whom access is requested to agree to it. The requesting country must also agree to any request. No preliminary reciprocity agreements are required. The Treaty does, however, require advance notice of a projected visit for purposes of taking safety precautions and to avoid interference with normal operations.⁷² The Moon's precarious circumstances with respect to oxygen and other necessities mandate planning ahead.⁷³ Additionally, any verification activities must themselves comply with Article IX's admonition against interfering with other states.

E. Whether the Treaty applies during war is unlikely as between belligerents

The Outer Space Treaty's applicability provision at Article XIII states that "The provisions of this Treaty shall apply to the activities of States Parties to the Treaty in the exploration and use of outer space, including the moon and other celestial bodies, ..." If the Treaty applies only to "exploration and use" it may be argued that neither of those activities include war, although a broader interpretation might view war as a "use." However, General Wheeler testified to the Senate during the 1967 ratification hearings that the Treaty would *not* apply during war.⁷⁴ DOD's Office of the General Counsel later provided a fuller explanation in 1999 and as updated in 2002:

During an international armed conflict between the two nations concerned, however, the law of armed conflict would apply unless it was trumped by the principle of noninterference with space systems. Resolution of this issue depends largely on whether the four space treaties will be considered to apply during an armed conflict. None of them has any specific provision that indicates whether the parties intended that the agreement apply in wartime. There appears to be a strong argument that the principle of noninterference established by these agreements is inconsistent with a state of hostilities, at least where the systems concerned are of such high military value that there is a strong military imperative for the adversary to be free to interfere with them, even to the extent of destroying the satellites in the system. As indicated in the

discussion of treaty law in the introduction to this paper, the outcome of this debate may depend on the circumstances in which it first arises in practice. Nevertheless, it seems most likely that these agreements will be considered to be suspended between the belligerents for the duration of any armed conflict, as least to the extent necessary for the conduct of the conflict.⁷⁵

In short, the U.S. Department of Defense seems unlikely to apply the strictures of the Outer Space Treaty during an armed conflict. The DOD position does not appear to have changed as of the 2016 DOD Law of War Manual, which states in reliance on the 1999 assessment quoted above: “Certain provisions of these treaties may not be applicable as between belligerents during international armed conflict.”⁷⁶

¹ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (the "Outer Space Treaty"), Jan. 27, 1967, 610 U.N.T.S. 205 (adopted by the General Assembly in its resolution 2222 (XXI) and entered into force on 10 October 1967.

² Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 4, 90th Cong. (1967).

³ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 4, 90th Cong. (1967).

⁴ *Chan v Korean Air Lines*, 490 U.S. 122, 134 (1989); *Narayanan v British Airways*, 747 F3d 1125, 1131 (9th Cir. 2014).

⁵ *Chan v Korean Air Lines*, 490 U.S. 122, 134 (1989)(finding courts should read international agreements without “alter[ing], amend[ing], or add[ing] to any treaty, by inserting any clause, whether small or great, important or trivial”); *Narayanan v British Airways*, 747 F3d 1125, 1129 (9th Cir. 2014) (“Plaintiffs effectively ask us to write an implied fourth trigger into the Convention’s terms. This we cannot do.”).

⁶ *Chan v Korean Air Lines*, 490 U.S. 122, 134 (1989); *Narayanan v British Airways*, 747 F3d 1125, 1131 (9th Cir. 2014) (Where the language is unambiguous, a court need not assess a treaty’s drafting history).

⁷ *Narayanan v British Airways*, 747 F3d 1125, 1131 (9th Cir. 2014) (Where the language is unambiguous, a court need not assess a treaty’s drafting history).

⁸ Archives, Statement of U.S. Department of State, at <https://2009-2017.state.gov/s/1/treaty/faqs/70139.htm> (last checked Jan. 6, 2023).

⁹ Vienna Convention on the Law of Treaties; Vienna, done 23 May 1969, entered into force 27 January 1980; 1155 UNTS 331; UKTS 1980 No. 58; Cmnd. 4818; ATS 1974 No. 2; 8 ILM 679 (1969). Available at https://legal.un.org/ilc/texts/instruments/english/conventions/1_1_1969.pdf

¹⁰ U.S. Dept. of State, *Limits in the Seas, No. 150, People’s Republic of China: Maritime Claims in the South China Sea*, State Practice Supplement, 2 (Jan. 2022)(footnotes omitted). Available at <https://www.state.gov/wp-content/uploads/2022/01/LIS150-SCS-Supplement.pdf>. (Last checked Feb. 1, 2023).

¹¹ Centers for Disease Control and Prevention, Environmental Health Infographics, “Nuclear Weapon.” Available at https://www.cdc.gov/nceh/multimedia/infographics/nuclear_weapon.html (Last checked Jan. 19, 2023).

¹² Lyall, F., and Larsen, P., *Space Law, A Treatise*, 2d ed., 460 (2018).

¹³ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 76, 90th Cong. (1967).

¹⁴ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 100, 90th Cong. (1967).

¹⁵ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 77, 90th Cong. (1967).

-
- ¹⁶ Lyall, F., and Larsen, P., *Space Law, A Treatise*, 2d ed., 460 (2018).
- ¹⁷ Lyall, F., and Larsen, P., *Space Law, A Treatise*, 2d ed., 460 (2018).
- ¹⁸ General Counsel of the Department of Defense, U.S. *Department of Defense Law of War Manual*, 943 n. 161, Jun. 2015 (Updated Dec. 2016) (citing David A. Koplow, ASAT-isfaction: Customary International Law and the Regulation of Anti-Satellite Weapons, 30 MICHIGAN JOURNAL OF INTERNATIONAL LAW 1187, 1198 (2009) (“This provision does not impede the stationing of non-nuclear weapons (including conventional ASAT weapons) in space, nor does it affect a nuclear weapon that makes only a temporary transit of outer space, as when propelled by an intercontinental ballistic missile (ICBM) toward its target, rather than being ‘stationed’ in space.”)). Available at <https://dod.defense.gov/Portals/1/Documents/pubs/DoD%20Law%20of%20War%20Manual%20-%20June%202015%20Updated%20Dec%202016.pdf?ver=2016-12-13-172036-190>. (Last checked Jan. 24, 2023).
- ¹⁹ Department of Defense, Office of the General Counsel, An Assessment of International Legal Issues in Information Operations (2nd ed., Nov. 1999), reprinted and updated in 76 *U.S. Naval War College International Law Studies*, 459, 494 (2002). Available at <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1381&context=ils>. (Last checked Feb. 1, 2023).
- ²⁰ Wikipedia, TP-82, available at <https://en.wikipedia.org/wiki/TP-82>, (last checked Jan. 20, 2023).
- ²¹ Ferreira-Snyman, A. “SELECTED LEGAL CHALLENGES RELATING TO THE MILITARY USE OF OUTER SPACE, WITH SPECIFIC REFERENCE TO ARTICLE IV OF THE OUTER SPACE TREATY,” *Potchefstroom Electronic Law Journal* (2015).
- ²² Major Jeremy Grunert is a U.S. Air Force JAG officer and attorney. He teaches space law as an assistant professor at the U.S. Air Force Academy.
- ²³ Grunert, J., “The ‘Peaceful Use’ of Outer Space?” *War on the Rocks*, (Jun. 22, 2021). Available at <https://warontherocks.com/2021/06/outer-space-the-peaceful-use-of-a-warfighting-domain/> (Last checked Jan. 27, 2023).
- ²⁴ The Outer Space Treaty, Art. IX.
- ²⁵ Washington State Dept. of Health, “Electromagnetic Pulse,” 2, Fact Sheet (Sept. 2003). Available at https://doh.wa.gov/sites/default/files/legacy/Documents/Pubs/320-090_elecplfs_fs.pdf (Last checked Mar. 30, 2023).
- ²⁶ NASA, “What is an Orbit?” (Jul. 7, 2010). Available at <https://www.nasa.gov/audience/forstudents/5-8/features/nasa-knows/what-is-orbit-58.html>. (Last checked Jan. 19, 2023).
- ²⁷ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 115, 90th Cong. (1967).
- ²⁸ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 22, 34, 90th Cong. (1967)(noting that Article IV puts into treaty form the “no bombs in orbit” resolution originally sponsored by the United States, and which was adopted by the U.N. [resolution] in 1963.
- ²⁹ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 83, 89, 90th Cong. (1967).
- ³⁰ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 72, 90th Cong. (1967) (“Ground activities are not covered at all by this treaty. We are dealing with activities in space, just like as I said earlier, that you have to leave for a disarmament treaty the question of ICBMs and their launching from ground and not into orbit.”)
- ³¹ HandWiki, Encyclopedia of Knowledge, “Physics: Ballistic Missile,” (undated). Available at https://handwiki.org/wiki/Physics:Ballistic_missile. (Last checked Jan. 21, 2023).
- ³² Department of Defense, Office of the General Counsel, An Assessment of International Legal Issues in Information Operations (2nd ed., Nov. 1999), reprinted and updated in 76 *U.S. Naval War College International Law Studies*, 459, 495 (2002). Available at <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1381&context=ils>. (Last checked Feb. 1, 2023). Matte, N., *Aerospace Law*, 298 (1969).
- ³³ Lyall, F., and Larsen, P., *Space Law, A Treatise*, 2d ed., 460, n.76 (2018).
- ³⁴ Lyall, F., and Larsen, P., *Space Law, A Treatise*, 2d ed., 465 (2018).
- ³⁵ Hitchens, T., “It’s a FOBS, Space Force Saltzman confirms Amid Chinese Weapons Test Confusion,” *BreakingDefense* (Nov. 29, 2021) (quoting Lt. Gen. Chance Saltzman, deputy Space Force chief for operations). Available at <https://breakingdefense.com/2021/11/its-a-fobs-space-forces-saltzman-confirms-amid-chinese-weapons-test-confusion/>. (Last checked Jan. 24, 2023).

-
- ³⁶ Eisel, B., “The FOBS of War,” *Air Force Magazine*, 75 (Jun. 2005). Available at <https://www.airandspaceforces.com/PDF/MagazineArchive/Documents/2005/June%202005/0605fobs.pdf> (Last checked Jan. 24, 2023).
- ³⁷ Eisel, B., “The FOBS of War,” *Air Force Magazine*, 75 (Jun. 2005). Available at <https://www.airandspaceforces.com/PDF/MagazineArchive/Documents/2005/June%202005/0605fobs.pdf> (Last checked Jan. 24, 2023).
- ³⁸ Hitchens, T., “It’s a FOBS, Space Force Saltzman Confirms Amid Chinese Weapons Test Confusion,” *BreakingDefense* (Nov. 29, 2021). Available at <https://breakingdefense.com/2021/11/its-a-fobs-space-forces-saltzman-confirms-amid-chinese-weapons-test-confusion/>. (Last checked Jan. 24, 2023).
- ³⁹ General Counsel of the Department of Defense, U.S. *Department of Defense Law of War Manual*. Jun. 2015 (Updated Dec. 2016). Available at <https://dod.defense.gov/Portals/1/Documents/pubs/DoD%20Law%20of%20War%20Manual%20-%20June%202015%20Updated%20Dec%202016.pdf?ver=2016-12-13-172036-190>. (Last checked Jan. 24, 2023).
- ⁴⁰ NEED CITATION
- ⁴¹ 51 U.S.C. 50902(25). See also the FAA’s implementing regulations at 14 C.F.R. 401.5.
- ⁴² Lyall, F., and Larsen, P., *Space Law, A Treatise*, 2d ed., 460, n.76 (2018) (asserting that fractional orbital bombardment systems are limited by Article IV).
- ⁴³ See, e.g., Jasentuliyana, N. and Lee, R., *Manual on Space Law*, Vol. I, 13, 14, 254 (1979) (averring with neither explanation nor citation that the drafters did not intend the prohibition on WMD to apply to fractional orbits).
- ⁴⁴ Strijdom, S.H., “The Use of Outer Space for Military Purposes, Article IV of the Outer Space Treaty,” 35, *Univ. of Pretoria* (2013).
- ⁴⁵ Matte, N., *Aerospace Law*, 298 (1969).
- ⁴⁶ Lyall, F., and Larsen, P., *Space Law, A Treatise*, 2d ed., 461 (2018).
- ⁴⁷ Department of Defense, Office of the General Counsel, An Assessment of International Legal Issues in Information Operations (2nd ed., Nov. 1999), reprinted and updated in 76 *U.S. Naval War College International Law Studies*, 459, 495 (2002)(“ The Outer Space Treaty provides that the parties will not "place in orbit around the Earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies [i.e., the moon, planets, and asteroids], or station such weapons in outer space in any other manner.”)(emphasis added). Available at <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1381&context=ils>. (Last checked Feb. 1, 2023).
- ⁴⁸ Terrill, D., *The Air Force Role in Developing Outer Space Law*, 56 (1999) citing DOD Planning Luncheon, paper, U.S. Initiative at the 16th General Assembly, (Sept. 12, 1961).
- ⁴⁹ Terrill, D., *The Air Force Role in Developing Outer Space Law*, 57 (1999).
- ⁵⁰ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 16, 90th Cong. (1967).
- ⁵¹ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 28, 90th Cong. (1967).
- ⁵² Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 17, 18, 90th Cong. (1967).
- ⁵³ Grunert, J., “The ‘Peaceful Use’ of Outer Space?” *War on the Rocks*, (Jun. 22, 2021). Available at <https://warontherocks.com/2021/06/outer-space-the-peaceful-use-of-a-warfighting-domain/> (Last checked Jan. 27, 2023).
- ⁵⁴ Grunert, J., “The ‘Peaceful Use’ of Outer Space?” *War on the Rocks*, (Jun. 22, 2021). Available at <https://warontherocks.com/2021/06/outer-space-the-peaceful-use-of-a-warfighting-domain/> (Last checked Jan. 27, 2023).
- ⁵⁵ Grunert, J., “The ‘Peaceful Use’ of Outer Space?” *War on the Rocks*, (Jun. 22, 2021). Available at <https://warontherocks.com/2021/06/outer-space-the-peaceful-use-of-a-warfighting-domain/> (Last checked Jan. 27, 2023).
- ⁵⁶ Grunert, J., “The ‘Peaceful Use’ of Outer Space?” *War on the Rocks*, (Jun. 22, 2021). Available at <https://warontherocks.com/2021/06/outer-space-the-peaceful-use-of-a-warfighting-domain/> (Last checked Jan. 27, 2023).
- ⁵⁷ Senator Albert Gore, Sr., Treaty on Outer Space: Hearings Before the Committee on Foreign Relations, U.S. Senate, 59, 90th Congress, (1967) (“We interpret peaceful purposes as being non-aggressive and beneficial.”); see also General Counsel of the Department of Defense, U.S. *Department of Defense Law of War Manual*, 944 n.166 (suggesting linguistic differences in that “military” in the Russian language carries connotations of “warlike”), Jun. 2015 (Updated Dec. 2016). Available at

<https://dod.defense.gov/Portals/1/Documents/pubs/DoD%20Law%20of%20War%20Manual%20-%20June%202015%20Updated%20Dec%202016.pdf?ver=2016-12-13-172036-190>. (Last checked Jan. 30, 2023).

⁵⁸ Grunert, J., “The ‘Peaceful Use’ of Outer Space?” *War on the Rocks*, (Jun. 22, 2021)(quoting, with emphasis added, Sen. Gore’s remarks to the U.N. General Assembly’s First Committee, 15 (Dec. 3, 1962) available at https://www.unoosa.org/pdf/garecords/A_C1_PV1289E.pdf). Available at

<https://warontherocks.com/2021/06/outer-space-the-peaceful-use-of-a-warfighting-domain/> (Last checked Jan. 27, 2023).

⁵⁹ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 4, 90th Cong. (1967).

⁶⁰ Terrill, D., *The Air Force Role in Developing Outer Space Law*, 57 (1999).

⁶¹ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 4, 90th Cong. (1967).

⁶² Matte, N., *Aerospace Law*, 299 (1969).

⁶³ *Chan v Korean Air Lines*, 490 U.S. 122, 134 (1989).

⁶⁴ General Counsel of the Department of Defense, U.S. *Department of Defense Law of War Manual*, 941 n.153, Jun. 2015 (Updated Dec. 2016). Available at

<https://dod.defense.gov/Portals/1/Documents/pubs/DoD%20Law%20of%20War%20Manual%20-%20June%202015%20Updated%20Dec%202016.pdf?ver=2016-12-13-172036-190>. (Last checked Feb. 1, 2023).

⁶⁵ See also, Department of Defense, Office of the General Counsel, “An Assessment of International Legal Issues in Information Operations.” (2nd ed., Nov. 1999), reprinted and updated in 76 *U.S. Naval War College International Law Studies*, 459, 495 (2002). Available at <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1381&context=ils>.

(Last checked Feb. 1, 2023).

⁶⁶ Wheeler, Chairman, Joint Chiefs, Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 84, 90th Cong. (1967); See also *id.*, Goldberg at 115, Meeker at 101-102.

⁶⁷ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 77, 90th Cong. (1967).

⁶⁸ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 77, 90th Cong. (1967).

⁶⁹ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 91, 90th Cong. (1967). See also *id.*, Goldberg at 19.

⁷⁰ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 152, 90th Cong. (1967).

⁷¹ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 152, 90th Cong. (1967).

⁷² Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 44, 90th Cong. (1967).

⁷³ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 44, 90th Cong. (1967).

⁷⁴ Treaty on Outer Space: Hearing before the Comm. on Foreign Relations of the U.S. Senate, 98, 90th Cong. (1967).

⁷⁵ Department of Defense, Office of the General Counsel, An Assessment of International Legal Issues in Information Operations (2nd ed., Nov. 1999), reprinted and updated in 76 *U.S. Naval War College International Law Studies*, 459, 494 (2002). Available at <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1381&context=ils>.

(Last checked Feb. 1, 2023).

⁷⁶ General Counsel of the Department of Defense, U.S. *Department of Defense Law of War Manual*, 941 n.153, Jun. 2015 (Updated Dec. 2016). Available at

<https://dod.defense.gov/Portals/1/Documents/pubs/DoD%20Law%20of%20War%20Manual%20-%20June%202015%20Updated%20Dec%202016.pdf?ver=2016-12-13-172036-190>. (Last checked Feb. 1, 2023).