

CHAPTER 6

LEGAL APPROACH TO COMMON SECURITY IN OUTER SPACE: AN EXAMINATION OF SOLUTIONS TO OUTER SPACE WEAPONIZATION ISSUE

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INTRODUCTION

The use of outer space is developing in two directions. On the one hand, space technology is used in every corner of contemporary human life; on the other hand, the world has experienced accelerating steps of outer space militarization. The traditional military use of outer space has spread from supportive roles such as communication, navigation, reconnaissance, surveillance and early warning at peacetime, to direct war fighting roles such as command and control, warhead identification, target positioning and bomb guiding. Even worse, outer space is facing an urgent danger of being weaponized and becoming a battlefield. Humankind is standing at the crossroads of outer space application. The idea of concluding a legal instrument to stop the dangerous military use is winning more and more support and becoming an important step in assuring security in outer space for all.

CHALLENGES AND HOPES FOR OUTER SPACE NON-WEAPONIZATION

To be frank, it is a tough issue to deal with outer space weaponization by legal means. Since the 1980s, the international community has experienced a series of frustrating efforts, both multilaterally and bilaterally. The end of the Cold War provided no impetus to the Prevention of an Arms Race in Outer Space (PAROS) issue, and the ad hoc committee on PAROS

has not functioned since 1995. Three are at least three explanations for this situation:

1. **Political obstacles.** With the adjustment of the Strategic Defense Initiative by the United States and the shift of focus on the Comprehensive Nuclear-Test-Ban Treaty, the outer space issue has been marginalized. The re-emerged concern about the outer space issue has been confronted by considerable change in the strategic framework after the Cold War. The military super power is inclined to pursue security by exerting power rather than by an arms control approach, and military superiority has overwhelmed the idea of strategic stability; the desire for unilateral security has overwhelmed the interests of common security.
2. **Military temptation.** Advanced technologies are always used first in the military arena. Some military decision makers deeply believe that the control of outer space by one country requires the acquisition of multi-dimensional tactics and strategic military superiority. They believe that outer space will eventually be weaponized just like sea and air space. With these beliefs in mind, it is understandable why arms control in outer space is so difficult.
3. **Complexity of technology.** Outer space is a medium that is different in many aspects from land, sea and air space. The unique environment and the development of related technology are changing the traditional ideas on weapons and the way force is used. The definition of relative terms (such as outer space, outer space weapon, deploy, test and use of force) and verification of a future treaty is complicated. This in turn will be an excuse for certain countries to block related negotiation.

However, in spite of the political, military and technical challenges, there are some decisive factors that will attract all—including the developing and the developed—parties to negotiate a legal instrument on the outer space non-weaponization issue. Due to its unique physical nature, outer space cannot be owned by any individual nation; a peaceful outer space will benefit all, and a weaponized outer space will endanger the interests of all, especially those countries that most rely on the assets of outer space. In this outer space era, no country, including the first one to introduce weapons in outer space, is immune from the severe consequences if outer space is polluted by debris, since all space assets, no

matter whether civil or military, will certainly be at high risk of being damaged.

THE CHARACTERISTICS OF SPACE SYSTEMS AND SPACE BEHAVIOUR

In the discussion about outer space non-weaponization, the following questions are frequently asked: what is an outer space weapon? What is a weapon component or weapon system? How can we deal with an Earth-based weapon with the potential of entering space? What kind of behaviours could be regarded as use of force? What are the criteria of outer space weaponization? In the environment of outer space, the generally accepted answers can only be given after clarifying the characteristics of space systems and space behaviour.

First, most space systems have a dual-use nature. It is generally believed that any man-made space object with manoeuvrable capability has the potential to be used as weapon. Some space systems are exclusively designed for war fighting; some systems for civil purposes can be transferred to military or weapon uses at wartime. Some space-based components that are supportive systems for civil or general military purposes at peacetime can be used for war fighting purposes. In addition to the civil–military and general military–war fighting dual-use nature, there is also an Earth–sky dual-use nature. Some Earth-based weapons are designed exclusively for outer space strikes; some Earth-based systems have anti-satellite (ASAT) potential.

Second, the nature of outer space behaviours is also hard to define in the environment of outer space. Like space weapon systems, many behaviours have a dual-use nature. Different definitions may lead to different legal implications. Take the use of force as an example. The typical way of using force is to destroy something by collision, explosion or directed energy, but in the outer space environment, use of force may take exotic forms. Various non-traditional ways to impose harm on an enemy's outer space assets are currently being debated, including de-orbiting, jamming, curtaining and other soft killing measures that can temporarily halt space assets' functions. If these non-violent behaviours are conducted at peacetime, it is difficult to determine whether military strikes occurred or not. If they have occurred, military reaction may be triggered; if not,

compensation for intentional or unintentional damages should be compensated.

Knowledge of the above-mentioned characteristics of outer space systems and behaviours is important for determining which systems and activities should be prohibited, limited and permitted.

A LEGAL FORMAT FOR OUTER SPACE NON-WEAPONIZATION

The legal system works by regulating behaviours and related matters. To prevent outer space weaponization, outer space behaviours and weapon systems are two key elements that should be examined. Given the complexity of weapons and behaviours related to outer space, it is appropriate to address different weapon systems with different legal norms. Prohibitive, restrictive and permissive measures should be created respectively for different systems and behaviours according to their relation with outer space weaponization. Generally, prohibitive norms should be applied for weapons designed exclusively for outer space use and obvious military action against, in and from outer space. For weapons with the potential of being used in outer space, space systems with the potential of being used as weapons or behaviours with a dual nature, restrictive measures should be imposed. For other outer space systems that are designed exclusively for peaceful and ordinary military uses, permissive norms should be applied. Regarding behaviours, any form of force in space should be prohibited. And some dangerous behaviours that may harm the space assets of other nations should be restricted as well (see Table 1).

Table 1: Analysis of weapon systems and the applied norms

Weapon systems	Norms applied			Remarks
	Prohibited	Restricted	Permitted	
Space-based weapon	▲			
Space-based dual-use system		▲		War fighting role should be prohibited
Earth-based weapon against space	▲			

Weapon systems	Norms applied			Remarks
	Prohibited	Restricted	Permitted	
Earth-based weapon with counter space potential		▲		Space strike should be prohibited
Space-based military operation supportive system at wartime	▲			
Space-based military supportive system at peacetime		▲		War fighting potential should be prohibited
Civil and commercial system			▲	
Military strike in, against and from outer space	▲			So called "soft killing" should be included
Military operation support in space	▲			
General military support activities in space			▲	
Dangerous behaviours could possibly harm outer space assets of other nations		▲		Activities in the vicinity of outer space assets should be prohibited
Civil and commercial application			▲	

DRAWING LINES: A COMPREHENSIVE APPROACH OR A PARTIAL ONE?

A critical question must be answered before lines can be drawn between outer space weaponization and reasonable military uses: What kind of activities could be regarded as outer space weaponization? In reality, there are a variety of systems and activities related to outer space

weaponization. When deciding the areas that future legal instruments should cover, political acceptability and technical feasibility must be taken into account. A balance between the prohibited and the permitted activities should be carefully addressed. In this regard, there are two approaches that should be addressed: a comprehensive approach and a partial approach.

COMPREHENSIVE APPROACH

In the comprehensive approach, all activities that may possibly lead to weapon deployment or military conflicts in space should be covered, including the activities conducted on the Earth and in outer space, in the beginning stages of weapon research and development, testing and production, and in the later stages of deployment and use. It is not only a weapons ban, but also an activities ban (see Table 2). The following items should be included:

Weapons and its components:

- space-based weapons, including kinetic and directed energy weapons;
- Earth-based weapons, including kinetic and directed energy ASAT weapons;
- Earth-based weapons with counter space capability, including missile defence systems;
- space-based weapon components that are exclusively responsible for target tracking identifying, guiding and striking, such as laser reflector or Space Based Infrared System-Low; and
- space-based weapon platforms, including spacecraft exclusively designed for harbouring weapons or dual-use space vehicles.

Activities related to outer space weaponization:

- research and development of relative weapons;
- flight tests of relative weapons;
- Earth deployment of relative weapons;
- space deployment of relative weapons; and
- use of force in or against outer space.

Obviously, this is an ideal but too ambitious solution to outer space weaponization issues. There are too many terms and grey areas to be defined. Considering the contemporary political and scientific situation, to

conclude such a comprehensive legal instrument would be a time consuming process.

Table 2: Comprehensive approach to outer space weaponization

Weapon systems	Weapon activities									
	Research & development/ production		Testing		Deployment		Normal use		Used as weapon	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Space-based weapons		▲		▲		▲		▲	-	-
Land-based weapons for space missions		▲		▲		▲		▲	-	-
Space-based weapon components		▲		▲		▲		▲	-	-
Land-based weapons with potential for space missions	▲		▲		▲		▲		-	-
Space-based general military support systems	▲		▲		▲		▲			▲
Space-based civil systems	▲		▲		▲		▲			▲

PARTIAL APPROACH

The partial approach does not pursue a comprehensive ban on all outer space weapons and related activities; instead, it focuses on the issues and areas that could possibly make a breakthrough in stopping the imminent threat of outer space weaponization (see Table 3).

A ban on specific behaviours could be one solution, including two key activities that should be prohibited:

- no deployment of weapons in outer space; and
- no use or threat of use of force in outer space

Table 3: Partial approach to outer space weaponization

Weapon systems	Weapon activities									
	Research & development/ production		Testing		Deployment		Normal use		Used as weapon	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Space-based weapons	▲		▲			▲		▲	-	-
Land-based weapons for space missions	▲		▲			▲		▲	-	-
Space-based weapon components	▲		▲		▲			▲	-	-
Land-based weapons with potential for space missions	▲		▲		▲		▲		-	-
Space-based general military support systems	▲		▲		▲		▲			▲
Space-based civil systems	▲		▲		▲		▲			▲

The Conference on Disarmament (CD/1679) working paper *Possible Elements for a Future International Legal Agreement on the Prevention of the Deployment of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects* put forward by China, the Russian Federation and five other nations on 27 June 2002 is an attempt at the partial approach.

Different from the comprehensive approach, the joint working paper advocates an end-control strategy, holding the last line in stopping outer space weaponization while temporarily putting other issues aside. The

proposal is designed to slide over some tough issues such as definition and verification, so as to make a breakthrough possible.

Another recommendation is a weapons ban, including ASATs and space-based weapons. The idea of an ASAT ban has been proposed since the early 1980s; proposals on space-based weapons ban are more recent initiatives. These efforts attempt to cover the entire process of research and development, testing, production, deployment and use of outer space weapons. Just like the comprehensive approach, it seems difficult to accomplish. Moreover, there is a causal relationship between different systems; it is illogical and impractical to prohibit certain categories of weapons while permitting others.

Of course, the joint working paper should not be regarded as providing the perfect solution, as it is more of an activities ban than a weapons ban. Neither does it deal with the initial stages of weaponization such as weapons research, development and testing or provide a detailed definition of the term “use of force”. Nevertheless, the paper covers the key points of preventing outer space weaponization, meets the most urgent needs and could serve as a platform to hold valuable proposals together. Significantly, both China and the Russian Federation have indicated that the proposal is open for further development.

CONCLUSION

Although there are different views on outer space weaponization among nations, most of them agree that there is no weapon in outer space at present. Thus, this is the window of opportunity. If this opportunity is missed, the world community will pay a high price for its negligence.

Many valuable proposals have resulted from the approaching danger of outer space weaponization. Although each of these proposals has its own perspective and emphases, most of them deserve serious consideration as long as they advocate positive steps toward the non-weaponization of outer space; however, it would be better if these proposals were more integrated and practical.

Of course, there is no simple solution to the problem of outer space weaponization, which bears so much security and development interest to

nations. The development of science and technology brings challenges to outer space issues, especially when the legal system is involved. In the space era, more and more countries will acquire the capability of entering outer space and more and more activities will be conducted in outer space. As a matter of principle, all countries have the equal right to use and enter outer space, and the prevention of outer space weaponization is just a way to protect this right.

Finally, it should be pointed out that no panacea exists in the contemporary world. There will always be something that even laws cannot resolve. Self-restriction and mutual trust are also important, and the common interests of humankind in outer space will be a driving force for all countries to come together to find a solution that makes outer space use more reasonable and peaceful.