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UNITED STATES NAVAL WAR COLLEGE
Newport, RI



Rules of Engagement for Space: Where Do You Start?

By
Matthew D. Ovios
LCDR USN

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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3 February 2003

ABSTRACT

RULES OF ENGAGEMENT FOR SPACE: WHERE DO YOU START?

As the United States' reliance on space assets increases, so does its vulnerability. To limit the vulnerability, the Joint Staff and the Air Force have developed doctrine that follows our National Space Policy of assured access to space. International law supports this doctrine. The operational capability to fight a conflict in space will soon be upon us. Now is the time to develop the rules of engagement to link the policy, doctrine, international law and operational capability.

We have years of experience in conflicts at sea. Our maritime ROE are well crafted. Due to the similarities between space and the sea, maritime ROE is a natural framework upon which to develop ROE for a future conflict in space.

Some have called space the ultimate high ground, and many foresee the inevitability of a future conflict in space. Yet even today, space is a critical vulnerability for United States military operations – space assets are vital to our success, but are vulnerable to attack or damage.

Current research into the subject of space warfare and operational law focuses on legality of war in space and placing weapons in space. Little scholarly debate has been devoted to the next step – what will the rules of engagement (ROE) look like for a future conflict in space?

While the environment in which we will fight will be new, the issues pertaining to the crafting of rules of engagement are not. There is no need to start with a blank slate. Due to the similarities between space and the high seas and the years of experience in maritime operations, maritime ROE is a robust framework on which to base ROE for space. While no standing ROE exist for space today, maritime ROE serves as an excellent model for crafting future ROE for space.

The Importance of Space: United States' Reliance

Experiences in the last Gulf War, Kosovo and in Afghanistan highlight the warfighter's dependence on space. Without the Global Positioning System (GPS) and satellite communications, success in these

conflicts would have been neither as swift nor with as few casualties. Enhanced targeting and increased battle space awareness were the direct result of space assets and United States' dominance of space.¹

As the United States contemplates future conflicts, commanders continue to stress the importance of space. Compared to today, the warfighter's use of space was fairly limited during the first Gulf War. Space assets were used primarily for communications, imaging and limited use of the Global Positioning System. In the last ten years, the use of space by U.S. Forces has literally exploded. And despite still limited understanding of the capabilities of our space assets by planners and operators, elements of space are now incorporated into all facets of a military operations.²

Throughout these past conflicts, the United States exercised near total space dominance with little opposition. That may not be the case in the near future. As adversaries recognize our dependence on space, they will see this dependence as a critical vulnerability. It is a strength that an adversary will have to negate in order to even the playing field and perhaps cripple the U.S. forces.

¹ William B. Scott, "Improved Milspace key to Antiterrorism War," Aviation Week & Space Technology (10 December 2001): 36.

² William B. Scott, "Milspace Will Be A Major Player in 'Gulf War 2'," Aviation Week & Space Technology (13 January 2003): 398-399.

The Importance of Space: United States' Vulnerability

Just prior to his confirmation as Secretary of Defense, Donald Rumsfeld chaired a commission to study the organization and management of space activities specifically in support of national security.³ Their findings, commonly referred to as the Space Commission Report, pointed to the increased use of space by numerous nations, international consortia, and non-state actors, as a compelling reason for the United States to invest in increased space defense. As an example of the threat, the report cited a Chinese news agency report that China was pursuing an offensive capability in space to counter the United States military in a high-tech future war.⁴ Additionally, the Space Commission Report warned of a possible “Space Pearl Harbor” due to the United States’ vulnerability to an adversary’s action against our space systems.⁵ Without investing in protection of our space assets, they warned we were opening ourselves up to the possibility of a crippling surprise attack.

³ Donald Rumsfeld, Report of The Commission to Assess United States National Security Space Management and Organization (Washington, DC: 11 January 2001), 2.

⁴ Rumsfeld, 13-15.

⁵ Rumsfeld, 13.

More recently, there have been additional reports of anti-satellite (ASAT's) weapons under development by at least 20 other countries.⁶

Military planners have not been completely blind to the vulnerability of our space systems. Joint doctrine for space operations specifically directs commanders to consider the increased use of space by our adversaries. It warns that commanders must "...anticipate the proliferation and increasing sophistication of space capabilities and products with military utility that could be used by an adversary for hostile purposes."⁷

Furthermore, Joint Doctrine calls for commanders to "...anticipate hostile actions that attempt to deny friendly forces access to or use of space capabilities."⁸ Both Joint and Air Force doctrine exists for the United States to conduct offensive and defensive counter space operations. All of these elements direct the commander to plan for the inevitable war in space.

The Importance of Space: Inevitability of War in Space

⁶ "Race to Space," STRATFOR. 27 February 2001, <<http://www.stratfor.biz/Story.neo?storyId=103009>>, [22 January 2003].

⁷ Joint Chiefs of Staff, Joint Doctrine for Space Operations, Joint Pub 3-14 (Washington, DC: 9 August 2002), I-1.

⁸ Joint Chiefs of Staff, Joint Pub 3-14, I-1.

Because of our reliance and growing critical vulnerability in space, military conflict in space is inevitable. It is the ultimate high ground. One author described space as the ultimate tower from which to pour boiling oil.⁹

Many feel it is just a matter of time before our critical satellite assets are attacked. General Lance Lord, commander of Air Force Space Command, is clearly concerned about this very issue. Recently he stated that “It’s not a matter of if our systems will be messed with as we develop a center-of-gravity in space. It’s a matter of when. That’s why we have to take the initiative....If we lose a capability or link, I want to know: Is it a Solar Max event, or an equipment malfunction, or is someone messing with it?”¹⁰

The combination of the proliferation of operations in space by potential adversaries, our increased reliance on space, and the stated objective to protect our sovereign rights leads to the conclusion that a conflict in space is inevitable.

Current Doctrine:

⁹ Jack Hitt, “Battlefield: Space,” The New York Times Magazine, (5 August 2001): 32.

¹⁰ Scott. “Milspace Will Be Major Player in ‘Gulf War 2’,” 399.

National Space Policy and Joint Doctrine on Space Operations require the commander to plan for the protection of our space assets, as well as denying the use of space to our adversaries. According to doctrine, the United States will exercise space control – providing freedom of action in space while denying the same to our adversary. Figure 1 summarizes the range of space missions throughout the spectrum of conflict, while Figure 2 depicts the space control functions. Space control is divided into two disciplines, Offensive Counter Space (OCS) – denying space to our enemy, and Defensive Counter Space (DCS) – ensuring our access to space.

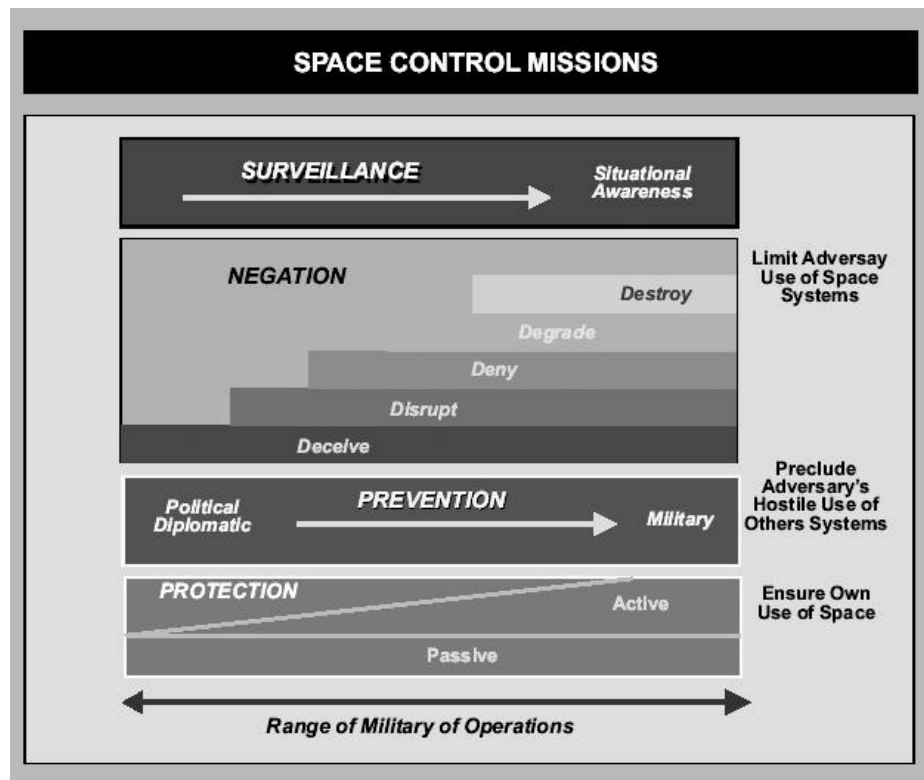


Figure 1¹¹

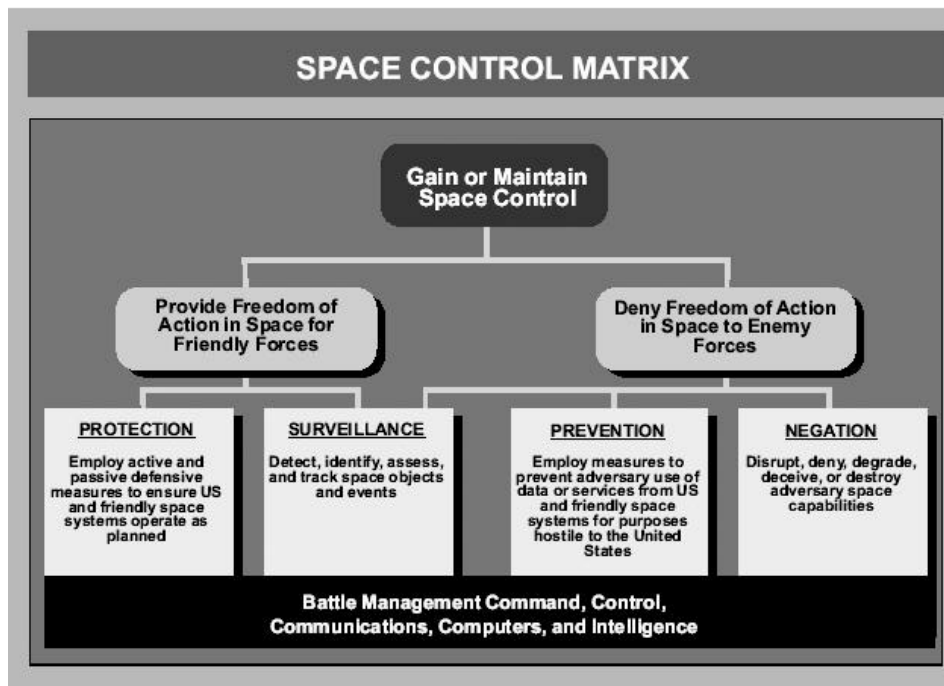


Figure 2¹²

Contrary to many operators' misunderstandings about weaponizing space, current international law does not outlaw a conflict in space.¹³ Some restrictions exist, but placing weapons in space is lawful. Air Force doctrine clearly states the legality of weaponizing space: "There are no laws or formal US policies expressly preventing the deployment of counterspace assets or conventional weapons in space. With few major exceptions, there is no legal prohibition against

¹¹ Joint Chiefs of Staff, Joint Pub 3-14, IV-6.

¹² Joint Chiefs of Staff, Joint Pub 3-14, IV-7.

¹³ Wayne E. Dillingham, "Navy Global 2000: One JAG's Perspective," United States Naval Institute Proceedings (December 2000): 74.

developing, deploying or employing weapons in, from or into space.”¹⁴

While the scope of this paper does not allow for a further detailed description of existing international law and treaties that pertain to weaponizing space, a summary is provided in the appendix.

As a reminder of the purpose behind the a conflict in space, Joint Doctrine notes that “...It is now US Government policy that interference with US space systems will be viewed as an infringement on the nation’s sovereign rights.”¹⁵

Current Rules of Engagement for Space

The current rules of engagement for space are scant. The only reference to space operations is the defense of United States property:

Military or civilian space systems such as communication satellites or commercial earth-imaging systems may be used to support hostile action. Attacking third party or civilian space systems can have significant political and economic repercussions. Unless specifically authorized by the NCA, commanders may not conduct operations against space-based systems or ground and link segments of space systems.¹⁶

¹⁴ U.S. Air Force, Space Operations, Air Force Doctrine Document 2-2 (Washington, DC: 27 November 2001), 45.

¹⁵ Joint Chiefs of Staff, Joint Pub 3 -14, I-1.

¹⁶ Joint Chiefs of Staff, Standing Rules of Engagement For US Forces, CJCS Instruction 3121.01A (Washington, DC: 15 January 2000), A-7.

Little scholarly debate exists on the topic of rules of engagement for space. The literature that does exist focuses on the legality of placing weapons in space and applicability of the law of war to space. As ROE has a basis in the law of war, analogies can be drawn.

Need for ROE in Space:

Both Joint Doctrine and Air Force Doctrine clearly call for offensive and defensive space operations. Although the doctrine may not be fully developed, protection of our satellites is clearly delineated.¹⁷

Yet, no coherent standing ROE exists. When the issue arises during futuristic wargames, a lot of confusion exists.¹⁸ Now is the time to establish standing rules of engagement so that those involved in space control are ready for the eventual conflict in space.

The Purpose of ROE:

Rules of Engagement establish the policy for initiating military action and the right of self defense. Protecting our space assets falls

¹⁷ For a detailed critique of Air Force space doctrine, see John Grenier, "A New Construct for Air Force Counterspace Doctrine," Air and Space Power. (Fall 2002): 17-23.

¹⁸ William B. Scott, "Legal Eagles' Coach Wargamers on Fine Points of Space Treaties," Aviation Week and Space Technology (12 March 2001): 58

under unit self defense as well as national self defense when considering commercial satellites.¹⁹

Standing ROE should adapt to the operating environment. With the operating environment increasingly including space, with increased operations and vulnerabilities, ROE for military action in space clearly needs to be developed.

ROE further ensures that military actions are truly representative of political policy. National policy, operational requirements, and international law make up the three pillars, or contributing factors, for establishing ROE.²⁰ Since these three pillars already exist for space, standing ROE can be developed. The National Space Policy supports military action in space to protect our vital assets,²¹ and as previously stated, doctrine supports this policy. International law allows the weaponization of space and the operational capability is under development by many nations. With all the pillars for the construction of ROE in place, little time should be wasted in developing the instructions for the commanders to link policy, and doctrine to a capability that will

¹⁹ Joint Chiefs of Staff, Standing Rules of Engagement, A-7.

²⁰ Richard Grunawalt, "The JCS Standing Rules of Engagement: A Judge Advocate's Primer." The Air Force Law Review 42 (1997): 247.

²¹ National Science and Technology Council, National Space Policy, (Washington, DC: 19 September 1996.), 5.

undoubtedly emerge in the future. With all three pillars established, it is obvious that standing ROE needs to be developed for warfighter.

But instead of starting with a blank sheet of paper, it would be useful to start the development of space ROE with an established framework. Maritime ROE offers the best parallels to space and are the natural starting point for developing space ROE.

How Space Is Like the Sea:

With centuries of military operations in the maritime environment, operations at sea are a natural place to find parallels for developing rules of engagement for space. The similarities of the international nature of space and the sea, issues of sovereignty, a mixture of commercial and military traffic, and the existence of established norms and conventions for each environment lead one toward using our maritime experience to craft ROE for space. Official rules for war at sea go back hundreds of years. It is the experience of crafting and working with these maritime rules that will aid in developing ROE for future warfare.

Although the characteristics of space are unique, there are several qualities that are directly analogous to characteristics of the maritime environment. One example is the common call for “Rules of the Road” for

space. Some envision a set of agreements for interactions in space analogous to those used for ships at sea.²²

These arguments are based on the fundamental international nature of space. This is not unlike the international nature of the high seas. The two are similar in their status as international domains. One author refers to the “commons” of space being similar to the sea: “Space has been described as both a frontier for exploration/exploitation and a fuel for the economy, but perhaps a more accurate descriptor is the term commons—an area for use by the community as a whole. In a legal sense, it also refers to an area open to use by one nation without interference from another.”²³ And due to the fact that space is common ground, it is a media where issues such as freedom of movement and universal access are prevalent, similar to the high seas.

Joint Doctrine recognizes this fact. Doctrine for Space Operations (Joint Pub 3-14) specifically directs commanders to be aware of the unique characteristics and operational impact due to the lack of the lack of geographical boundaries.²⁴

²² Krepon, Michael, “Lost in Space: The Misguided Drive Toward Antisatellite Weapons,” Foreign Affairs, May/June 2001, 7.

²³ John Hyten, “A Sea of Peace Or a Theater of War? Dealing With the Inevitable Conflict in Space,” Air and Space Power Journal, (Fall 2002): Proquest Direct <<http://proquest.umi.com>> [22 January 2003].

²⁴ Joint Chiefs of Staff, Joint Pub 3-14, I-2.

The space and maritime environments also have similar issues of sovereignty. Military satellites are similar to ships in that they represent a unit of national sovereignty. The joint doctrine on space operations and the National Space Policy both clearly state that interference with our space assets will be considered a violation of our national sovereignty. This is similar to the status that a US warship enjoys. Attack of a US naval vessel on the high seas is tantamount to attacking American soil and is a violation of national sovereignty. The same can be said for attack upon a satellite.

The mix of commercial and military use of space is also analogous to the sea. With the increasing use of dual use commercial satellites, an analogy can be drawn between merchant vessels flagged to a third country. It is the responsibility of the country under which the vessel is registered to ensure that it is operating according to international law.

The same is true for satellites. The country that launches and registers the satellite is responsible for any damage it may cause. While this may seem contrary to reason – why hold the launching country responsible for a satellite owned by a multinational corporation and contracted by yet another nation to collect images? According to the existing treaty law, the state is responsible for satellite operations. The similarity still remains to a merchant vessel. When we desire to board a

vessel, we must obtain permission from the state in which the vessel is registered, not from the country in which the shipping company is incorporated.

Furthermore, the laws of neutrality observed at sea can be extrapolated to space. Vessels running guns to an adversary are considered acceptable targets, even though they may be flagged under a neutral nation. This same argument can be applied to space. The satellite registered to a neutral nation that is providing damaging imagery to our adversary is a viable military target.²⁵

Based on this analogy between space and the sea, some have even argued for creating “Rules of the Road” for space.²⁶ Krepon takes the analogy to maritime operations one step further by arguing for space agreements that mimic the US-USSR Incidents at Sea agreements.²⁷ The author has called for emulating the Soviet / United States agreements over incidents at sea to avoid dangerous and embarrassing space interactions. The agreements were not formal treaties, but were arranged between navies to avoid and properly handle situations where Soviet and American ships in international waters could have

²⁵ David L. Willson, “An Army View of Neutrality in Space: Legal Options for Space Negation,” *The Air Force Law Review* 50 (2001): 175-213.

²⁶ Hyten

²⁷ Krepon, 7.

maneuvered into embarrassing situations. He sees these agreements as precedent setting for space.

The current Law of the Sea Treaty, one pillar for our maritime ROE, is an excellent model for space operations. The international nature of the media is similar, the regulation of the vessels is similar and the mixture of security and commercial interests is also similar. But for all their similarities, there are several differences between the maritime environment and space.

Differences between Space and the Sea:

The most obvious difference is that for the near future, any conflict in space will not involve the loss of human life. Taking military action against a ship likely will involve the loss of the crew, whereas destruction of a satellite will not destroy human life. This fact may limit our willingness to take military action. Many cannot equate the loss of military hardware to the loss of human life, nor are they willing to delegate the authority for preemptive action if loss of human life is not involved.

But with our growing dependence on space operations, one can easily paint scenarios where life could be lost due to the loss of a satellite. Consider the consequences of the loss of precise positioning

data from GPS satellites. Without precise destruction of aim points many innocent civilian may be killed due to imprecise bombing. In another scenario, communication vital to the success of a mission may be lost in mid transmission, subsequently leading to loss of life.

While no direct loss of life may come from an attack on an unmanned satellite, there would be some inevitable loss of military capability or possibly even loss of life on earth. So, while the loss of the hardware may not be mourned, the value to the warfighter is still extremely high.

One may also argue that the magnitude of effects of the destruction of a satellite is so great that decisions should only be made at the highest levels. Attack on a ship usually only involves a direct threat to the ship and its crew. But destruction of a satellite can have world-wide repercussions.

One such example was the global effect of the Galaxy incident. In May 1998 modern society's reliance on space was demonstrated when a Galaxy IV satellite malfunction led to the disruption of service for 45 million pagers and halted many credit card purchases.²⁸

It is only natural for the authority to carry out military action that may destroy a satellite with such a wide impact must be held at the

highest levels. And if the President is making the decision about taking action against a satellite with world-wide impact, then no standing rules of engagement need be developed for delegating authority.

This argument presumes that there would be sufficient time for the President to make the decision to take action against an adversary's satellite. The beauty of standing ROE is the efficiency of decentralized execution, with a common understanding of the limits on the means to accomplish the mission. While certainly a politically sensitive decision, retaining the decision to take action against a satellite at the highest level severely limits the efficiency.

This illuminates yet another difference between space and the sea. The time required to damage a satellite is different from the time required for an engagement on the sea. Most likely, this will leave more time for higher decision makers to act. Rules of engagement provide direction for self defense when there is no time to call to higher authority. With space interactions there just might be enough time. Yet this may change in the future. The reaction time will undoubtedly get shorter as weapons get more sophisticated.

It also remains to be seen whether we could detect and recognize a hostile act in space, notify the President, have him make a decision, and

²⁸ Hitt, 34.

then take preemptive action prior to destruction of our satellite. Not only is there a question as to the speed of this decision but also our ability to properly assess the situation.

Usually less knowledge about the threat begets more permissive rules of engagement. When we know less about a true identity, motives and threat to the force because of our inability to detect and classify, such as submarine, we are more likely to grant greater freedom of action in order to protect the force. As our adversaries become more sophisticated in their space operations, we may face similar circumstances, where a commander must act decisively to protect our space assets.

We need to know that interference with our satellite is deliberate and not the result of natural phenomenon. Our current system of monitoring is not up to the task. Even in the maritime environment, where we have high definition radar and sonar to detect the position of an adversary, hostile intent is a judgment call. It must be made by the on scene commander with guidance from standing rules of engagement.

Conclusion

In his New York Times Magazine review of the future of warfare, Jack Hitt came to the conclusion that “The future of space depends a

great deal on how we describe it, a struggle that is largely metaphorical. Is space merely an extension of the air and therefore the province of the Air Force? Or is it an entirely separate medium for power, like the land and sea, in need of a new doctrine?”²⁹

I argue that a hybrid of the two is correct. Space is a new medium for power, a frontier in which the rich history of war at sea can be applied to create much needed new rules of engagement.

Some argue that space is just an extension of terrestrial air space, and therefore ROE for air operations should apply. But this does not recognize the fundamental characteristic of space – the lack of borders. Only maritime ROE similarly deals with this characteristic.

Certainly in crafting future ROE for space all its unique qualities will have to be considered. But as a starting point, maritime offers the most profitable framework from which to develop space ROE.

²⁹ Hitt, 62.

Appendix

*Corpus Juris Spatialis*³⁰

Treaties and Other International Law Regarding Space

1. Treaty on Principles Governing the Activities of States in the Exploration of Outer Space, Including the Moon and Other Celestial Bodies (Outer Space Treaty) - 1967

This is by far the most important treaty regarding space. It establishes that international law applies to space. The treaty specifies that outer space, the moon and other celestial bodies are not subject to claims of sovereignty or occupation. It forbids placing nuclear weapons in space and establishes that space will be used for peaceful means. Additionally it prohibits the stationing of troops or creation of military installations on the moon or other celestial bodies. Furthermore, it states that nations bear responsibility for national activities in space – states are responsible for their citizen's actions in space.

2. Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (Rescue and Return Agreement) – 1968

³⁰ For an exhaustive review of the law of space see: Robert Ramey, "Armed Conflict on the Final Frontier: The Law of War in Space," *The Air Force Law Review* 49 (2000): 1-158. David Willson provides a case study for the application of space law in war in his article "An Army View of Neutrality in Space: Legal Options for Space Negation," *The Air Force Law Review* 50 (2001): 175-213. Joint Publication 3-14 (Space Operations) provides a sufficient summary for the warfighter (I-4).

This clarifies the duties of states relating to astronauts. It requires states to notify the United Nations when a state receives information that astronauts have suffered an accident, experienced distress, or have an emergency that requires landing on the high seas or in another state's territory. Furthermore it requires states to provide notification and return to the launching state of any space object found either on the high seas or within their territory.

3. Convention on the International Liability for Damage Caused by Space Objects (Liability Convention) - 1972

This treaty elaborates upon the Outer Space Treaty specifically regarding liability for damage caused by space objects. Its goal is to provide full and equitable compensation for damage in a prompt manner.

4. Convention on the Registration of Objects Launched into Outer Space (Registration Convention) - 1975

Establishes a mandatory system of registration for objects launched into space and holds the launching state responsible for jurisdiction and control over the objects.

5. Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Moon Agreement) - 1979

This agreement reiterates provisions of the Outer Space Treaty, which established the moon as a “province of all mankind.” Activities on the moon and other celestial bodies must be carried out for the benefit and interest of all countries.

6. Treaty Banning Nuclear Weapons in the Atmosphere, in Outer Space and Under Water (Limited Test Ban Treaty) - 1963

This Treaty forbids all nuclear detonations in space, including those for peaceful military or scientific purposes and testing. Debate remains over the implications for nuclear power, as fission can be classified as an “explosion.”

7. Anti-Ballistic Missile (ABM) Treaty - 1972

The treaty prohibits the testing or deployment of space based anti-ballistic missile systems. The treaty also forbids interference with “national technical means” of surveillance. The United States is no longer a party to the ABM Treaty.

8. United Nations Convention on Prohibition of Military or Any Hostile Use of Environmental Modification Techniques - 1977

This prohibits the use of environmental modification techniques as a means of destruction or damage to the environment, including outer space.

9. Frequency Spectrum Management

The International Telecommunications Union (ITU) governs the international use of the radio frequency spectrum for space systems as well as locations of satellites within the geosynchronous belt.

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