



Scenario Workshop on Exploring Self-Defense in Space

Wednesday, September 9, 2015

Jefferson Meeting Room, Marriott Courtyard Washington, DC/Foggy Bottom
515 20th Street NW Washington District Of Columbia 20006 USA

Co-hosted by the Secure World Foundation (SWF) and
George Washington University's Space Policy Institute (SPI)

- 0900 Welcome and Introductions**
Brian Weeden, Technical Advisor, SWF
- 0915 Scenario 1: Commercial Satellite Operators, Hosted Payloads, and Pre-emption**
Moderated Discussion – Brian Weeden, Technical Advisor, SWF
- 1030 Coffee Break**
- 1045 Scenario 2: Threshold for Armed Attack and Cross-Domain Proportionality**
Moderated Discussion – Scott Pace, Director, SPI
- 1200 Lunch Break**
- 1230 Scenario 3: Hybrid Warfare and Collective Self-Defense**
Moderated Discussion – Victoria Samson, Washington Office Director, SWF
- 1330 Conclusion**
Moderated Discussion – Brian Weeden, Technical Advisor, SWF
- 1400 Adjourn**

Workshop Goal

At the moment, there is both a lack of understanding and significant divergence among many policy makers and the international community on the issue of self-defense in the context of space. While all nations have the inherent right to self-defense, there is little clarity or agreement as to how it applies in the context of actions and activities in space and under what circumstances. While a difficult subject, developing a better understanding of how the principle of self-defense may apply in space, and the resulting ramifications, is a key step towards informing decisionmakers and ensuring a more stable space environment.

The goal of this event is to identify and discuss important issues related to self-defense in space. Specific areas of interest are:

- What factors determine whether or not hostile actions taken against a space object constitutes an armed attack?
- What are the significant military, legal, and political uncertainties and risks in determining that an event constitutes an armed attack?
- How does international law apply to a nation state response to attacks on private sector entities?
- How does international law apply to a nation state's response to attacks by non-state actors?
- What steps could have been taken, unilaterally or multilaterally, to de-escalate tensions and prevent conflict?

Methodology

Over the course of this workshop, we will be using a series of simple scenarios to help focus the discussion. The scenarios are all based on potential real-world scenarios, but are not intended to be realistic portrayals of actual events. Details may have been simplified, altered, or omitted to stimulate discussion and explore specific issues.

Each scenario contains background information about the situation, the parties involved, and has one or more decision points. A moderated discussion will be used to walk through the major factors involved in the decision.

Ground Rules

1. This discussion is under Chatham House rule. Participants are free to use the content of the discussions but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed.
2. This discussion is at the unclassified level.
3. Unless otherwise stated, each participant is providing input based on their own personal expertise, experience, and opinions and is not representing the organization they currently work for, or previously worked for.
4. SWF will be compiling a summary report from the workshop that will be used for our internal planning and study and also published on our website.

Scenario 1 - Commercial Satellite Operators, Hosted Payloads, and Pre-emption

Country A utilizes commercial satellite services for military purposes. It has two major satellite contracts. One contract is with International Satellite Broadband Service (ISBS), a satellite communications provider headquartered in Country B, to host transponders for Country A's military on its commercial communications satellites. The transponders are used to route intelligence, reconnaissance, and surveillance (ISR) data between Country A's UAVs and its military ground networks. A second contract is with EagleEye Global, a remote sensing company headquartered in Country A, for commercial satellite imagery.

During a period of increased tensions between Country A and Country Z, ISBS reports to Country A that two of its satellites with hosted military payloads, located on the geostationary belt with coverage over Country Z, are experiencing uplink jamming that is preventing ISBS from issuing commands to those satellites. The satellites are beginning to drift out of their assigned geostationary slots, and as a result its customers are having trouble maintaining connectivity. Country A is also having trouble maintaining links to its hosted transponders on those satellites, and its ISR capabilities in the region are degraded.

ISBS has evidence to suggest that the jamming is ground-based and coming from Country Z. ISBS asks Country A for assistance in resolving the jamming.

Questions to consider:

- Does uplink jamming that prevents command and control of a satellite and degrades military capability constitute an armed attack?
- What is the role of Country B in this scenario?
- Can Country A legally use force to destroy the jamming sites? Under what restrictions?
- What is the role of the International Telecommunication Union (ITU) in this scenario?

After tensions escalate further between Country A and Country Z, Country Z uses ground-based kinetic interceptors to attack and destroy three of EagleEye Global's satellites. Country Z states that it was acting in self defense, and had intelligence indicating that Country A was using imagery from the EagleEye satellites to target preemptive attacks on Country Z's facilities.

Questions to consider:

- What is the legal standard for a pre-emptive attack on satellites in self-defense?
- Does the attack on EagleEye's satellites constitute an armed attack on Country A?
- What constitutes a proportional response by Country A?

Scenario 2 - Threshold for Armed Attack and Cross-Domain Proportionality

Country B has significant space-based capabilities that are used to augment its military power. These include space-based missile warning, targeting and tracking to support missile defense, extensive space-based ISR, and a space-based kinetic weapons system that can attack targets on the ground. Country C has some space-based capabilities, but much less relative to Country B. Country C has limited space-based ISR that is primarily used to target conventional ballistic missiles. Both countries are involved in a crisis over control of offshore resources. Tensions between Country B and C increase to the point where armed conflict is considered likely.

Country B begins to experience anomalies with two of its low Earth orbit (LEO) satellites that are part of its missile detection and tracking system. The satellites are still functional, but are experiencing power losses that have degraded their capabilities. Further investigation indicates that they recently passed over a suspected ground-based laser weapons installation in Country C. However, an alternative analysis indicates that there may have been a previously unknown manufacturing defect in their solar panels. Orbital analysis shows that several more of Country B's tracking satellites will be passing over the suspected laser installation over the next couple of days. The suspected laser ground station is located inside Country C's borders and in the middle of an urban area.

Policymakers in Country B are contemplating a list of options for response:

- a. Issuing a demarche to Country C for purposeful interference with Country B's satellites in violation of the Outer Space Treaty and demanding damages under the Liability Convention
- b. Using ground-based cyber capabilities to disable several of Country C's ISR satellites that are used to target its ballistic missiles
- c. Using a hypersonic missile to attack the laser ground station

Questions to consider:

- What is the burden of proof for Country B to demonstrate that Country C is responsible for damage to its satellites?
- What legal remedies would Country B have to respond to what might be an internationally wrongful act?
- Does Country C's purported laser attack on Country B's satellites constitute an armed attack?
- Is destroying the ground facility a proportional response to attacks on Country B's satellites?

Tensions escalate to the point where armed conflict occurs. Country B and Country C are actively exchanging fire between their air and maritime forces. Country C fires a salvo of mobile, conventionally-armed ballistic missiles at one of Country B's air bases, located near an urban population. As a result of the degraded tracking and targeting capabilities, Country B's missile defense system is only partially successful in intercepting the incoming warheads. Several have their trajectory altered by near misses from interceptors and land in the urban area, causing significant casualties.

The military leadership of Country B have determined that it is too difficult to locate and destroy the remainder of Country C's mobile ballistic missiles. Instead, they are urging use of its space-based kinetic weapons system to attack military and leadership targets in Country C in order to deter it from launching additional ballistic missiles. Several of these targets are located in or near urban populations.

Questions to consider:

- What are Country B's considerations for military necessity, proportionality, and distinction in weighing its response options?

Scenario 3 - Hybrid Warfare and Collective Self-Defense

Country R and Country S have a bilateral, mutual self-defense agreement with each other. Country R is a middle space power with some space capabilities, primarily for ISR. Country S has no militarily-useful space capabilities. Per bilateral agreement, Country R provides Country S with very limited access to some of its space capabilities for intelligence purposes.

Country S has on-going tensions with its neighbor, Country F, centered around a border region. The region has swapped control several times, and currently is under Country S's control despite being predominantly populated by people indigenous to Country F. Country F has approximately the same level of technological sophistication as Country S, and only very limited space capabilities of its own.

Insurgents in the border region between Country S and F launch armed attacks against Country S's occupying military forces, and eventually seize control of some key facilities and cities. At the same time, Country R begins to detect jamming against its space-based satellite navigation system. The jamming is localized to the border region between Country S and Country F. The jamming prevents civil or military use of the satellite navigation system by either Country R or Country F, but does not affect users outside the region.

Questions for consideration:

- Can Country S be held responsible for the jamming?
- What legal options do Country R or Country S have to respond to the jamming?

Country S publicly accuses Country F of backing the insurgents as an attempt to destabilize the border region and seize control. Satellite imagery indicating Country F is mobilizing military forces near the border region is leaked to the media. In response, Country S mobilizes its own military forces to reinforce the border region, which begin to wage an aggressive counterinsurgency campaign against both the insurgents and the population.

A mobile, ground-launched ballistic missile is launched from Country F. The payload detonates in LEO at the altitude used by many ISR satellites, creating a significant debris field. Within days, two of Country R's satellites are disabled, likely through collisions with pieces of debris too small to track. Analyses show that all satellites in the region are likely to experience significant risks of collision for the next 20 years. A week later, Country F's military forces enter the border region under the pretense of stopping what it considers to be ethnic cleansing.

Country S asks Country R to come to its defense.

Questions for consideration:

- Under what circumstances could Country F's creation of a debris cloud in orbit be considered an armed attack on Country R?
- How does the Liability Convention play into the discussion of self-defense and international law?