Space Situational Awareness, Norms of Behavior, and Space Security

Dr. Brian Weeden
Director of Program Planning
Secure World Foundation
The rhetoric about “war in space”

Trump floats the idea of creating a ‘Space Force’ to fight wars in space

- President Donald Trump floated the idea of developing another service branch, the Space Force.
- Trump said the idea started as a joke, but idea.”
- “Space is a war-fighting domain, just like president.

CSAF Predicts War In Space ‘In A Matter Of Years’

Christina Wilkie | @christinawilkie
Published 5:59 PM ET Tue, 13 March 2018 | Updated 6:

Space war is coming — and the U.S. is not ready

‘We are now approaching a point where “Star Wars” is not just a movie,’ one government adviser warns.

By BRYAN BENDER and JACQUELINE KLIMAS | 04/06/2018 05:11 AM EDT
The reality

Old Space Paradigm

➢ National
➢ Secret
➢ Military-led
➢ Independent
➢ Strategic

New Space Paradigm

➢ International
➢ Transparent
➢ Commercial-led
➢ Interdependent
➢ All levels of war

Space is becoming “normalized”
Space is moving towards this

Image credit: MaritimeTraffic.com
What are “norms”? 

- **Sociology**: informal understandings that govern the behavior of members of a society
- **International relations**: Standard of appropriate behavior for actors with a given identity

- Norms are useful tools to moderate or influence behavior in the absence of laws and regulations
  - **Example**: Stand on the right, walk on the left on Metro escalators
- Laws are often (but not always) codifications of existing norms
  - **Example**: Drive on the same side of the road
- Norms can often play as big a role in encouraging compliance with laws as actual penalties
  - **Example**: Bans on watering lawns
Norms in space governance

- Much of the existing space governance framework is based on norms
  - **Example:** Freedom of overflight for satellite reconnaissance
    - Launch of Sputnik in 1957 helped set the norm that satellite overflight did not breach territorial sovereignty
    - By mid-1960s, freedom of overflight was a generally accepted norm
    - Was not codified into “hard law” until Outer Space Treaty of 1967

- Norms are likely going to be the main mechanism to address future challenges
  - Far more space actors than ever before, with diverse interests and goals
  - Increasingly challenging to get global consensus on new “hard law”
RENDEZVOUS AND PROXIMITY OPERATIONS
Development of OOS and RPO Capabilities

- On-orbit servicing (OOS) and Rendezvous and Proximity Operations (RPO) are key to enabling future of on-orbit activities
- Benefits and challenges
  - Greatly increase the viability of and benefits from space activities
  - Raises a number of diplomatic, legal, safety, operational, and policy challenges that need to be tackled
- OOS and RPO are not new, and are already international
  - 50+ years of experience in doing it with human spaceflight, but increasingly shifting to robotic/autonomous
  - Multiple countries/companies developing and testing RPO capabilities
- How to develop norms and standards to enable cooperative OOS/RPO and mitigate challenges?
Are you coming to help or hurt?

Russian Luch Satellite Relocates — Next to Another Intelsat Craft
by Mike Gruss — October 16, 2015

Air Force sent GSSAP satellite to check on stalled MUOS-5
by Mike Gruss — August 18, 2016

Secretive ANGELS satellite part of new space experiments
by Mike Gruss — April 14, 2016

In-Space Eavesdropping? – China’s Shijian-17 completes High-Altitude Link-Up
@ December 9, 2016

Stalkers in Space: Defeating the Threat

Brian G. Chow
POSSIBLE FREEDOM OF NAVIGATION OPERATIONS

**Innocent Passage**
- All vessels have the right of "innocent passage" through the territorial sea. They cannot perform military activities, gather intelligence, or do anything not directly related to transit. A FONOP could assert this right around any rock or island.

**Non recognition of territorial sea**
- Low-tide elevations that lie outside the territorial sea of a rock or island do not generate a territorial sea of their own. Foreign ships can engage in any activities near them. The USS Lassen's October 26 FONOP was asserting this right.

**Military activity in Exclusive Economic Zone**
- Islands that can support human habitation and economic life generate an exclusive economic zone (EEZ). International law does not give states the right to restrict military activities in the EEZ, and FONOPs are often used to make that point.

**Freedom of overflight**
- A state can only restrict military or civilian traffic through the airspace above its territory and territorial sea. Navy and Air Force planes could engage in FONOPs to assert their rights to operate over any waters not part of a territorial sea.

*Image credit: Asia Maritime Transparency Initiative*
An “Incidents in Space Agreement”?

Image credit: Wikimedia Foundation
Space Rules of Engagement?

<table>
<thead>
<tr>
<th>DILEMMA</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. PROJECTILES THROWN (NO SOLDIERS INJURED, APPREHEND ASSAULTER(S) AFTER USING MINIMUM FORCE).</td>
<td>REPORT TO CHAIN OF COMMAND. MAKE DETAILED LOG ENTRY. EMPLOY COMBAT VHS CAMERA. INFORM POLICE LIAISON. DOODLE THE PROJECTILES; DO NOT THROW THEM BACK. APPREHEND THE ASSAULTER(S); TURN THEM OVER TO POLICE.</td>
</tr>
<tr>
<td>4. IN-PROGRESS CRIME AGAINST A PERSON (SERIOUS BODILY HARM OR DEATH MAY HAPPEN).</td>
<td>STOP THE ASSAULT WITH MINIMUM FORCE NECESSARY; USE DEADLY FORCE IAW ROE; REPORT TO CHAIN OF COMMAND. MAKE DETAILED LOG ENTRY. EMPLOY COMBAT VHS CAMERA. INFORM POLICE LIAISON.</td>
</tr>
<tr>
<td>5. IN-PROGRESS CRIME AGAINST (ARSON; LOOTING; DESTRUCTION) A JTF-DENIED “PROTECTED FACILITY.”</td>
<td>STOP THE CRIME WITH MINIMUM FORCE NECESSARY; USE DEADLY FORCE IAW ROE; REPORT TO CHAIN OF COMMAND. MAKE DETAILED LOG ENTRY. EMPLOY COMBAT VHS CAMERA. INFORM POLICE LIAISON.</td>
</tr>
<tr>
<td>6. IMMINENT HARM TO YOU.</td>
<td>PROTECT YOURSELF WITH MINIMUM FORCE NECESSARY; USE DEADLY FORCE IAW ROE. REPORT TO CHAIN OF COMMAND. MAKE DETAILED LOG ENTRY. EMPLOY COMBAT VHS CAMERA. INFORM POLICE LIAISON.</td>
</tr>
<tr>
<td>7. PERSON OBSERVED WITH WEAPON.</td>
<td>REPORT TO CHAIN OF COMMAND. MAKE DETAILED LOG ENTRY. EMPLOY COMBAT VHS CAMERA. INFORM POLICE LIAISON. OBSERVE.</td>
</tr>
<tr>
<td>8. ACCESS TO KEY/KEYS/KEYS/DESIGNATED FACILITY REQUESTED.</td>
<td>REPORT TO CHAIN OF COMMAND. MAKE DETAILED LOG ENTRY. EMPLOY COMBAT VHS CAMERA. INFORM POLICE LIAISON. CHECK WRITTEN SPECIAL INSTRUCTIONS. CHECK INDIVIDUAL’S ID. PROTECT YOURSELF WHILE MAKING CHECKS. BE COURTEOUS. DENY ENTRY TO UNAUTHORIZED PERSONNEL.</td>
</tr>
<tr>
<td>9. COME UPON CIVILIAN CASUALTY.</td>
<td>REPORT TO CHAIN OF COMMAND. MAKE DETAILED LOG ENTRY. EMPLOY COMBAT VHS CAMERA. INFORM POLICE LIAISON. RENDER FIRST AID. EVACUATE TO SAFE LOCATION.</td>
</tr>
</tbody>
</table>

Table H-1. Adapted rules of engagement dilemmas (continued).
HOW DO WE GET THERE FROM HERE?
CONFERS Team

Advanced Technology International (ATI)
• Prime, lead for consortium development

Secure World Foundation (SWF)
• Lead for outreach and engagement

University of Southern California Space Engineering Research Center (SERC)
• Conducting research into existing standards and practices

Space Infrastructure Foundation
• Space-related standards development expertise

Distribution Statement “A” (Approved for Public Release, Distribution Unlimited)
CONFERS: A Holistic Approach To Standards

- Interfaces and Designs
  - Engineering and design to increase the safety, viability, and interoperability of satellite servicing

- Operational Practices
  - Behavior of satellite servicing and RPO activities

- Data Exchange and Sharing
  - Information sharing between servicing companies, clients, and governments

- Transparency and Confidence-Building Measures
  - Mechanisms to reduce misperceptions and concerns about the dual-use nature

Distribution Statement “A” (Approved for Public Release, Distribution Unlimited)
CONFERS Process

FORMATION COMMITTEE

ESTABLISH CONSORTIUM

Executive Committee
Membership Tiers
Application process to be open to private sector stakeholders with “direct and material interest”

DRAFT STANDARD

Public Conference
Initial draft standards developed by CONFERS members will be formally released

FORMAL STANDARDS DEVELOPMENT

Distribution Statement “A” (Approved for Public Release, Distribution Unlimited)
The Woomera Manual

BUT WHAT ABOUT SSA?
SSA is fundamental to all of this

• Improved SSA for all space actors is critical to establishing and reinforcing norms of behavior

• More public and international sources of data will increase awareness of the problem and provide a foundation for norm development

• More private and national capabilities will increase trust that others are following norms (trust but verify)

• SSA could eventually provide ability to verify legally-binding agreements
THANK YOU. QUESTIONS?

bweeden@swfound.org