

Global Space Security Landscape

Pilot Course on Critical Infrastructure
Protection, European Security and
Defence College (ESDC)

Module 2 – From Risk Management to
Resilience
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Presentation Overview

1. Review of Global Space Security Trends
2. Space Security in An Era of Hybrid Operations
3. Economic and Financial Operations as a Strategic Threat
4. Key Challenges Ahead

1. Review of Global Space Security Trends

- Increasing number of space-dependent governments and private actors
- Counterspace dynamic driven by new China – Russia – U.S. space race
- Other nations seeking space capabilities for national security purposes (e.g. France, India, Israel, Japan, South Korea, Thailand, etc.)
- Non-reversible, destructive ASAT capabilities are among the most prominent concerns (U.S., Russia, China, and India demonstrated ASAT capability)
- “Grey zone” spectrum of threats associated with deliberate, reversible actions by state actors which are asymmetric in their knock-on effects
- Cyber-related vulnerabilities of space assets a major concern
- Heightened concern over terrestrial disputes cascading into space due to a deteriorating geopolitical environment among the major space powers

2. Space Security in An Era of Hybrid Operations

| Space Hybrid Operation | Examples |
|---|--|
| Directed Energy Operations that May Result in Space Debris | Low-Power Laser Dazzling or Blinding High-Power Microwave (HPM) or Ultrawideband (UWB) Emitters |
| Orbital Operations that Generally Do Not Result in Space Debris | Space Object Tracking and Identification; Rendezvous and Proximity Operations (RPO) |
| Electronic Operations | Jamming (Orbital/Uplink, Terrestrial/Downlink) Spoofing |
| Cyber Operations | Attack on satellite or ground station antennas Attack on ground stations connected to terrestrial networks Attack on user terminals that connect to satellites |
| Economic and Financial (E&F) Operations | Subsidized financing of targeted country's space infrastructure for the purpose of influence/control Provision of end-to-end space capabilities (i.e. space-related infrastructure, equipment, products/services and financing) |

3. Economic and Financial Operations as a Strategic Threat

Source Country ● China ● Russia ● Russia-China



- Chinese Transactions
- Russian Transactions
- China/Russia Transactions



PSSI's Global Map of Chinese and Russian Space Transactions
(as of February 29, 2020)



3. Economic and Financial Operations as a Strategic Threat

- Non-market economic and financial model of China and Russia puts Western companies and countries in disadvantageous position and often results in inordinate dependencies on smaller space nations.
- Recipient countries, which lack expertise and money to develop space capabilities, accept subsidized loans and other arrangements, exposing them to dependency on its “benefactors”.
- The rapid growth of international space partnerships forged by Beijing and Moscow pose an asymmetric threat to existing norms and standards and global space commerce.

Image: Kandy Teleport Center (aka Pallekelle Academy), Sri Lanka
(Source: Sundayobserver.lk, 2013)

4. Key Challenges Ahead

- Inherently dual-use nature of most space capabilities (even seemingly benign civilian technologies can have counterspace applications)
- Temptation of state actors to exploit asymmetric warfighting strategies
- Deployment of capabilities that disrupt or deny space benefits temporarily and reversibly
- Ambiguous attribution concerning hostile actions/activities
- Lack of precedents complicating effective preparedness and response strategy
- Doctrine-driven space strategy (integrating technology into a coherent vision for space stability/security) as opposed to technology-driven
- Competing models for space partnering arrangements among state actors
- Cyber threats and offensive economic and financial (E&F) operations in particular could cause major disruptions in the regional balance of power, as well as global space security