NGO Role in Promoting Best Practices for Emerging Space Stakeholders

Side Event on "Supporting Regional Development Efforts Using Space Technology"

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Secure World Foundation

Who We Are

- Secure World Foundation ***is a private operating foundation*** that promotes cooperative solutions for space sustainability

- **Our vision:** The secure, sustainable and peaceful uses of outer space contributing to global stability and benefits on Earth

- **Our mission**: SWF works with governments, industry, international organizations and civil society to develop and promote ideas and actions for international collaboration that achieve the secure, sustainable, and peaceful uses of outer space for the socioeconomic and environmental benefits to Earth

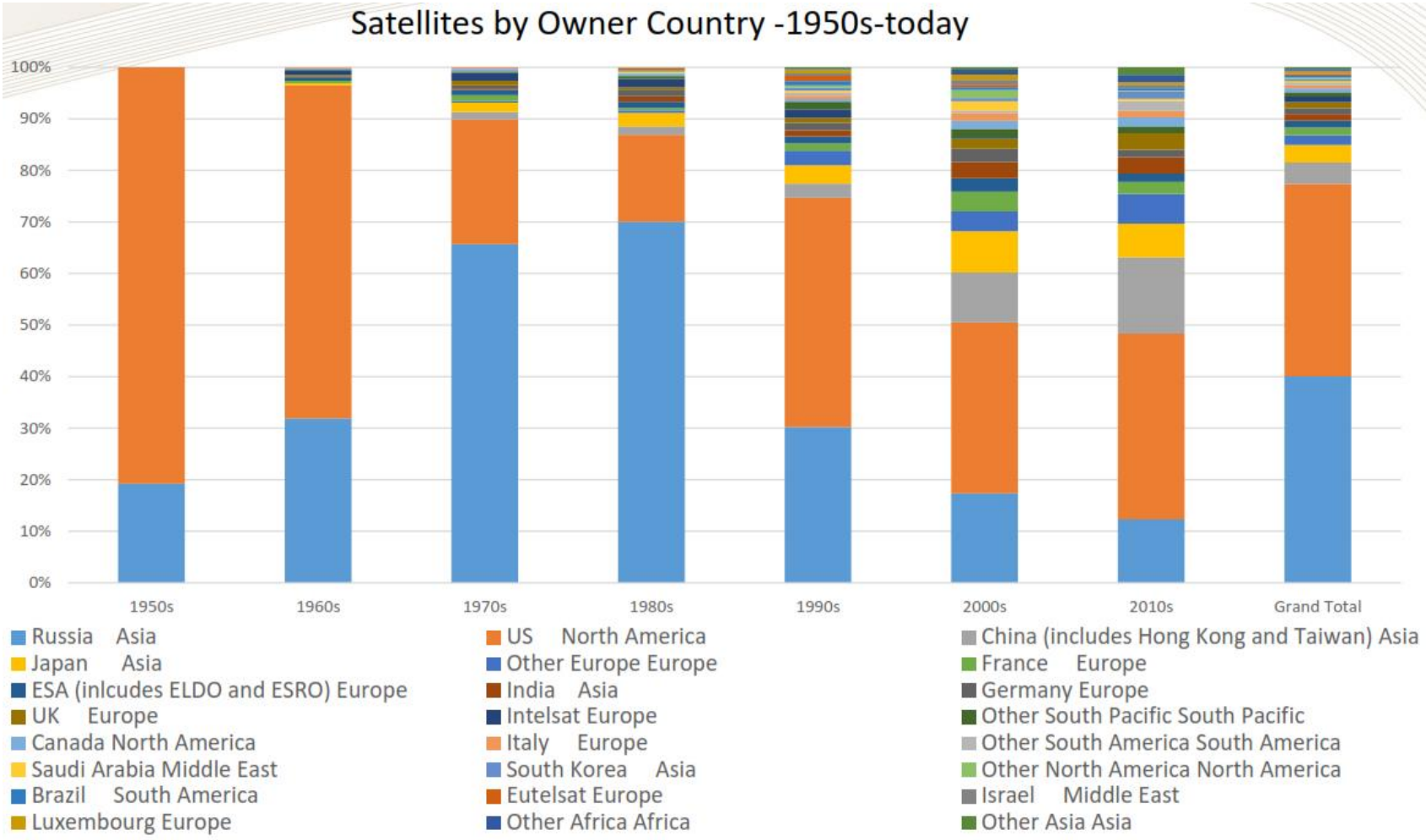
What We Do

- The Foundation acts as a **research body, convener and facilitator** to examine key space policy topics
  - To promote **international cooperative governance** for increased space sustainability
  - To increase **human and environmental security** by promoting improved governance of the delivery of information gathered from space systems in ways that promote its utility
  - To assist in the **development of effective national and international space policies and laws** both in established and emerging space nations

THE CHANGING NATURE OF SPACE ACTORS

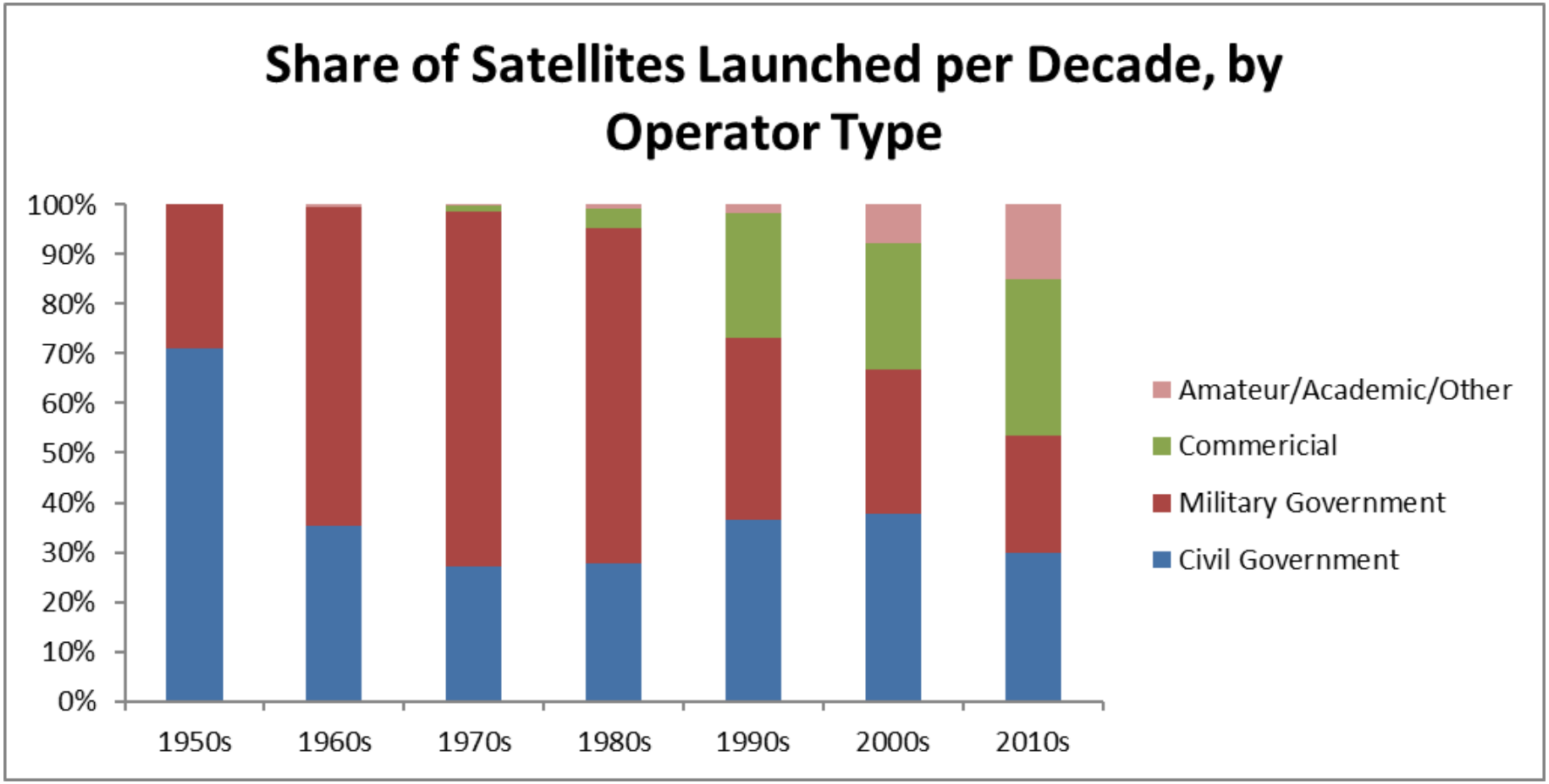
A growing, diversifying, and rapidly innovating community

Space is Becoming More International



Adapted from [IDA Global Trends in Civil and Commercial Space Study]

Space is Becoming More Diverse



Source: McDowell, Jonathan C, 2017—Satellite Statistics
http://www.planet4589.org/space/log/stats2/own_categ.txt

Implications

Opportunities

- Lower costs of access to space technology
- Lower technical and scientific barriers
- Broaden and diversify actors and users
- Enable new and innovative applications and services
- Provide increased societal benefit

Challenges

- Regulatory fit, efficiency, and scale
- Diverse, heterogeneous set of actors
- Few standards for operations
- Spectrum, SSA, and potential space debris implications

BEST PRACTICES & NORMS OF BEHAVIOR

How can governments and the private sector work together to ensure sustainability of the space domain?

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

Osaka

Historically – stand on right, walk on left

Tokyo

Historically – stand on left, walk on right

Areas of Opportunity to Develop Norms of Behavior

SWF regularly holds events and workshops discussing issues and best practices in several areas:

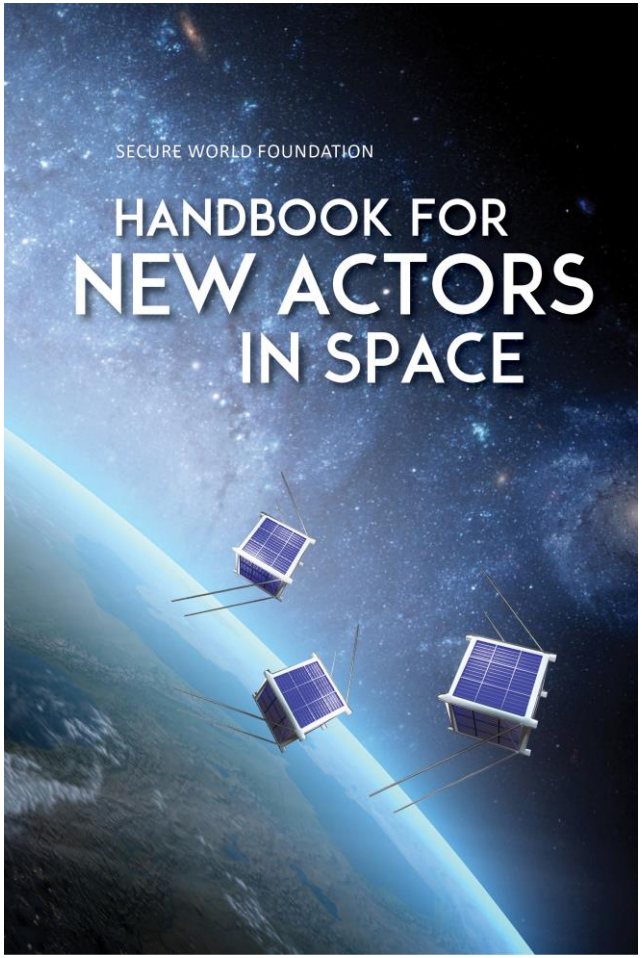
- Satellite operator best practices for minimizing collisions
- Space situational awareness (SSA)
- Cubesat launch and deployment best practices
- Cubesat post-mission disposal best practices;
- Principles for safe and responsible active debris removal
- Operations principles for large commercial satellite constellations
- On-orbit servicing
- Applications facilitation

HANDBOOK FOR NEW ACTORS IN SPACE

SWF Handbook for New Actors in Space

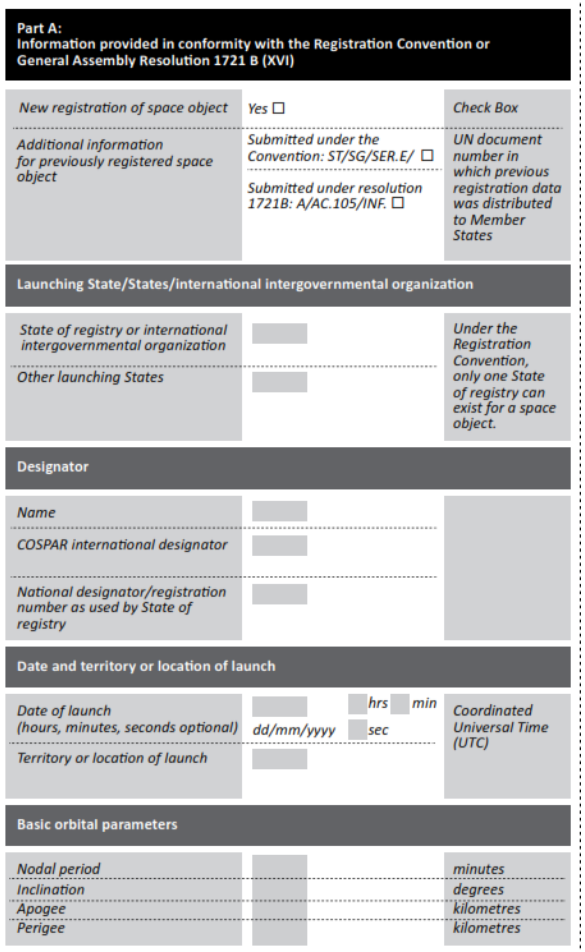
- **Goal:** Create a publication that provides an overview fundamental principles, laws, norms, and best practices for safe, predictable, and responsible activities in space

- **Two specific audiences:**
  - Countries developing space programs and/or having to oversee and regulate their first satellites
  - Universities and start-up companies that are developing/operating satellites or applications



Chapter 1 – International Framework

- Freedom and Responsibility
- Registration of Space Objects
- International Frequency Management
- Remote Sensing
- International Standards
- International Export Control
- International Liability
- Dispute Settlement
- Environmental Issues
- Advanced Issues
- International Organizations



Part A:
Information provided in conformity with the Registration Convention or General Assembly Resolution 1721 B (XVI)

New registration of space object	*Yes* ☐	*Check Box*
Additional information for previously registered space object	*Submitted under the Convention: ST/SG/SER.E/* ☐ *Submitted under resolution 1721B: A/AC.105/INF.* ☐	*UN document number in which previous registration data was distributed to Member States*

Launching State/States/international intergovernmental organization

State of registry or international intergovernmental organization		*Under the Registration Convention, only one State of registry can exist for a space object.*
Other launching States		

Designator

Name		
COSPAR international designator		
National designator/registration number as used by State of registry		

Date and territory or location of launch

Date of launch (hours, minutes, seconds optional)	*dd/mm/yyyy* *hrs* *min* *sec*	*Coordinated Universal Time (UTC)*
Territory or location of launch		

Basic orbital parameters

Nodal period		*minutes*
Inclination		*degrees*
Apogee		*kilometres*
Perigee		*kilometres*

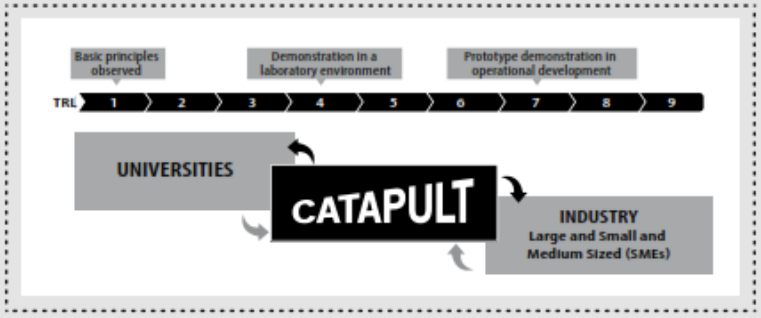
UNOOSA International Registry Form

Chapter 2 – National Policy and Administration

- Public Policy
  - Rationales, objectives, principles
  - Government roles and responsibilities
- Public Administration and National Oversight
  - National regulators and licensing
  - National frequency administration
  - Export controls
- Case Study: Remote Sensing Policy and Administration

Case Study:
The United Kingdom Satellite Applications Catapult

The United Kingdom Satellite Applications Catapult was established by the government of the United Kingdom (UK) in May 2013 with the goal of creating economic growth in the UK through supporting the development, commercialization, and use of satellite applications. According to its Delivery Plan 2015–2020, the Catapult (Figure 8) aims to promote satellite application and technology development and to help domestic industry "bring new products and services more rapidly to market." The Satellite Applications Catapult is one of 11 "Catapults" operating in the UK, each focusing on different technologies and application areas. The Catapult operates as a private, not-for-profit research organization. It is governed by a board, which includes representation from the United Kingdom Space Agency (UKSA) and from Innovate UK—a government agency focused on fostering technology and economic development.



UK Satellite Applications Catapult

Chapter 3 – Responsible Space Operations

- Pre-launch
  - Licensing
  - Launch vehicle selection and integration
  - Insurance
- Launch
  - Safety considerations
- On-orbit
  - Orbit determination, propagation, and tracking
  - Conjunction assessment and collision avoidance
  - Anomaly response
- End-of-life

Examples of CA Screening Volumes

Orbit Regime	Orbit Regime Criteria/Definition	Predict/ Propagate/ Time	Radial Miss (km)	In-Track Miss (km)	Cross-Track Miss (km)
GEO	1300min < Period < 1800 min Eccentricity < 0.25 & Inclination < 35°	10 days	12	364	30
HEO 1	Perigee < 2000 km & Eccentricity > 0.25	10 days	40	77	107
MEO	600 min < Period < 800 min Eccentricity < 0.25	10 days	2.2	17	21
LEO 4	1200 km < Perigee ≤ 2000 km Eccentricity < 0.25	7 days	0.5	2	2
LEO 3	750 km < Perigee ≤ 1200 km Eccentricity < 0.25	7 days	0.5	12	10
LEO 2	500 km < Perigee ≤ 750 km Eccentricity < 0.25	7 days	0.5	28	29
LEO 1	Perigee ≤ 500 km Eccentricity < 0.25	7 days	2	44	51

Examples of close approach screening volumes

Next Steps

- The Handbook was officially released in February 2017
- Electronic copies are available through the SWF website, free of charge: www.swfound.org/handbook
- Printed copies are also be available at the MEDB booth (A1) at this conference
- SWF is exploring the development of online resources to compliment the text
- Feedback is welcome

Questions?

Thanks.

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