UN-CHINA-APSCO Workshop on Space Law

Beijing 17-20 November 2014

Session 1: Developments in Space Law and Policy

Perspectives on space-traffic management,

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DLR

Studies / Workshops on Space-traffic Management

1999/2001	American Institute of Aeronautics and Astronautics (AIAA) Workshops
2002	IISL/ECSL Symposium at the Legal Subcommittee
2001-2006	International Academy of Astronautics (IAA) Cosmic Study
2007	Report of the International Association for the Advancement of Space Safety (IAASS)
2008	ESPI-Workshop ‚10 Steps to Achieve Fair and Responsible Use of Outer Space‘
2011	Publication ‚The Need for an Integrated Regulatory Regime for Aviation and Space – ICAO for Space?‘

Earth-related Space Environment – Some Facts

Catalogued objects:
more than 30.000 objects in orbit, 12.000 objects larger than 10 cm; 1.100 objects in GSO.

Functional / Non-functional:
Currently only ca. 700 active satellites (out of which 380 satellites are in GSO)

Velocity and risk:
The typical velocity is 30.000 km/h or more. Few objects with manoevering capabilities.

Growing Space Debris problem:
Even without new space objects, constantly increasing debris population by collisions between existing objects. Some large high risk objects in orbits of 600-700 km.

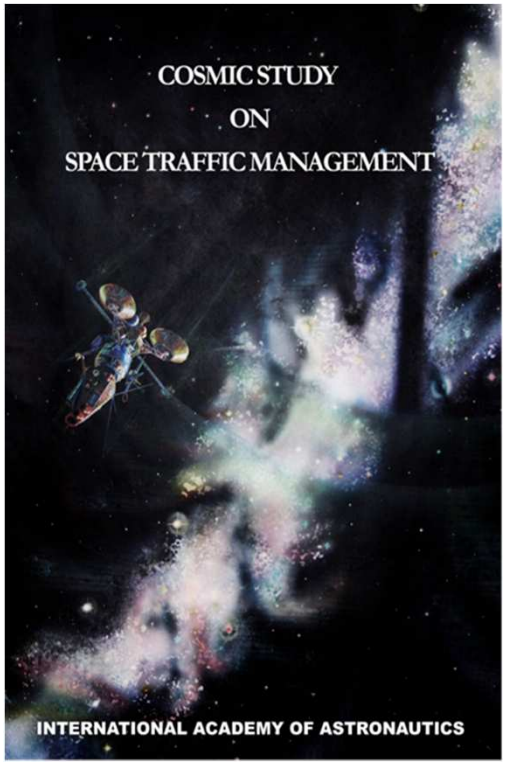
Findings of the IAA Cosmic Study

STM-Definition for the Cosmic Study:

„Space Traffic Management means
the set of technical and regulatory provisions
for promoting safe access into outer space, operations in outer space
and return from outer space to Earth
free from physical or radio-frequency interference.“

Purpose of STM:

- to provide appropriate means for conducting space activities without harmful interference
- to support the universal freedom to use outer space according OST
- for achieving a common good actors have to follow specific rules



Elements for a Space Traffic Regime

National legislation has a regular hierachie: Constitutional law / Administrative legislation / Traffic regulations. What could be the legal order in outer space in view of a STM-Regime?

The basic 5 UN-Treaties (OST / ARRA / LIAB / REG / MOON).

Resolutions and further Regulations for a consistent application of the 5 Treaties.

Additional Instruments for Clean Space / Space Debris Mitigation / Other Influences (Space Weather).

Safety and Security Aspects (An accessible Space Situational Awareness System / Real-time collision avoidance / Notifications and Confidence Building Measures).

Orbit management and the passage through airspace.

Traffic rules in a narrow sense.

Comparable Traffic Regimes ?

Are maritime traffic and air traffic comparable regimes?

Maritime and air traffic take place partially in international common spaces (res communis omnium), where no territorial jurisdiction applies.

Elements of an extension of territorial jurisdiction (coastal jurisdiction) are not a model for outer space.

ICAO-Air Traffic Management (ATM) is a highly sophisticated system with national ATM-Agencies and a network of international cooperation (e.g. delegated responsibility for foreign or international airspace).

Unique aspects of outer space: A regular sequence from functional to non-functional objects; not yet a system of space-debris removal / de-orbiting (only graveyard-orbits), high amount of non-manoeuvrable objects, no legal regime for the use of different types of orbits.

For good reasons no distinction between civil and military objects/traffic. Manned space traffic: Cosmonauts and specialists are the regular case, passengers are the exception.

State responsibility for non-governmental activities.

Liability Regime and Rules of the Road

Article III LIAB:

In the event of damage being caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object

by a space object of another launching State,

the latter shall be liable only

if the damage is due to its fault or the fault of persons for whom it is responsible.

Space Traffic: No fault without traffic-rules! No liability without fault!

Questions:

Which object has the right to be in a specific orbit? Without a manoeuvering capacity?

After its functional period for how long?

Who is obliged to make a collision avoidance manoeuver?

Developments with Elements of a STM-Regime

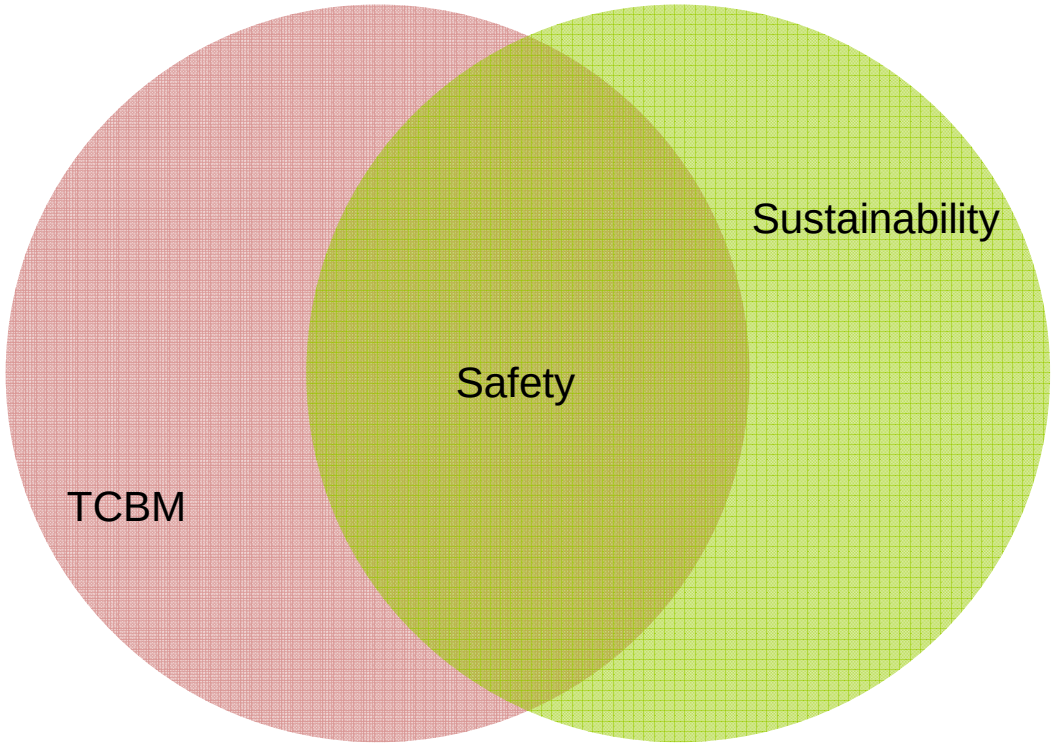
2007 **Space Debris Mitigation Guidlines (UNCOPUOS)**

2013 **Report of the Group of Governmental Experts (GGE)**
UNGA Resolution 68/50 of 5 Dec 2013

2014 **Report of the STSC Working Group ‚Sustainable Development‘ (Martinez-Report)**

2013/14 **‚Open-ended-consultations‘ of the (EU/Int.) Code of Conduct for Space Activities**

Post - Long Term Sustainability(LTS) - Process
(Flight-)Safety between Transparency and Confidence Building Measures(TCBM) and a Sustainability Concept



„It is generally acknowledged that such [TCBM] measures can augment the safety, sustainability and security of day-to-day space operations (…).“

GGE-Bericht (A/68/189, 29. Juli 2013, para. 25)

Long-term Sustainability of Outer Space Activities (UNCOPUOS/STSC)

- **4 Subject matters / 4 Expert Groups:**
  - A: Sustainable space utilization for sustainable development on earth
  - B: Space debris
  - C: Space weather
  - D: Regulatory regimes and guidance for space actors in the space arena

- **Outcome of the Expert Groups: 31 Guidelines**

Proposal for a draft report and a preliminary set of draft guidelines of the Working Group on the LTS of Outer Space Activities **(A/AC.105/C.1/L.339, 1 November 2013);** Proposal by the Chair of the Working Group on the LTS of Outer Space Activities for the consolidation of the set of draft guidelines on the long-term sustainability of outer space activities **(A/AC.105/2014/CRP.5, 11 June 2014)**

- since STSC 2014: Consolidation of the Guidelines (further Mandate by UNCOPUOS 2014)
- COPUOS 2015: Deadline for new Elementes/Guidelines or significant Restructure
- COPUOS 2016: Adoption of the Report and the Guidelines by UNCOPUOS

Mandate LTS and the Post-LTS-Process

Mandate:

“The Working Group will prepare a report on the long-term sustainability of outer space activities containing a consolidated set of current practices and operating procedures, technical standards and policies associated with the safe conduct of space activities.“ (A/AC.105/C.1/L.307/Rev.1, para. 12)

Perspectives for the Post-LTS-Process:

The LTS-Working Group has formulated „Recommended topics for future consideration“ (A/AC.105/C.1/L.339)

- „States members of the Committee should consider the scientific, technical and **legal questions** arising from active removal of space activities.“ (para.
- „States are encouraged to develop **new standards for the avoidance of harmful contamination** of outer space to promote the long-term sustainability of outer space, including celestial bodies.“ (para. 32)

Status and Content of GGE

GA Resolution 68/50 of 5 Dec. 2013

- Right of all countries to explore and use outer space
- Preventing an arms race in outer space
- Transparency and confidence-building measures
- Notice of CHN/RUS CD proposal ‚prevention of placement of weapons in outer space' and ‚no first to place weapons in outer space'
- Recognizing UNCOPUOS contribution to the promotion of ‚long-term sustainability of outer space'
- Notice of EU CoC

Subject matters:

- Basic principles of outer space transparency and confidence-buiding measures
- Enhancing transparency of outer space activities
- International Cooperation
- Consultative mechanisms
- Outreach

Perspectives for legal developments in the GGE-Report

GGE-Report (A/68/189, 29 July 2013, para. 29):

„The Group identified the following categories of transparency and confidence-building measures for outer space activities as being of relevance:

[…]

(e) Measures related to establishing **norms of behaviour** for promoting spaceflight safety, launch notifications and consultations that aim at avoiding potentially harmful interference, limiting orbital debris and minimizing the the risk of collisions with other space objects;“

Structure of the CoC

Preamble

I. Purpose, Scope and General Principles
Compliance with / Promotion of Treaties and other Commitments

II. Safety, Security and Sustainability of Outer Space Activities
Measures on Outer Space Operations and Space Debris Mitigation

III. Cooperation Mechanisms
Notification of Outer Space Activities / Information on Activities / Consultation Mechanism

IV. Organisational Aspects
Meeting of Subscribing States / Central Point of Contact / Participation of IGO‘s

The way to an overall traffic concept:

Safeguarding the ‘constitutional’ framework of the UN Space Treaties.

Filling gaps in Environmental Protection / Space Debris Mitigation.

Starting with best practice instruments and technical standards.

An international regime for key-elements for the use of orbits. Basic traffic rules.

How can Space Actors be aware of the traffic situation? Global access to SSA information.

Long-term perspective: An international organization for space traffic management.

The way forward – A realistic step-by-step approach

An complete overall space traffic management regime might last two decades or more.

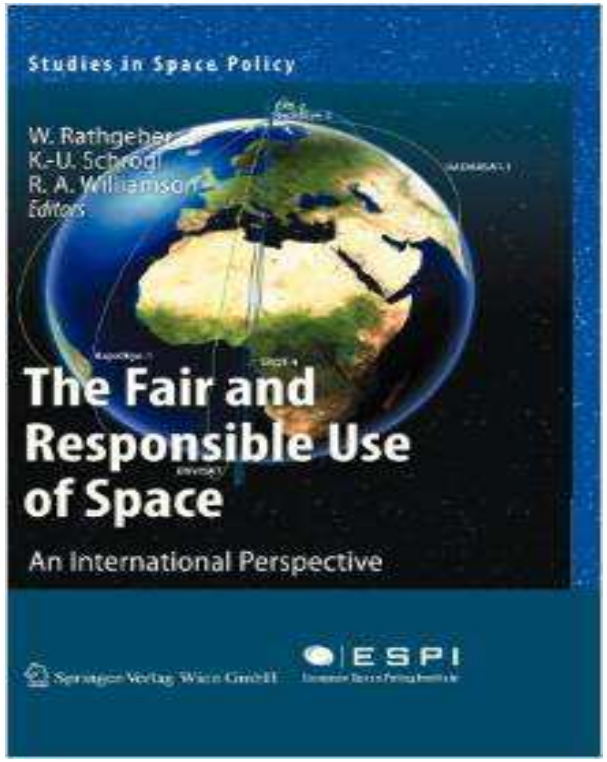
In case of major accidents – touching human lives or basic public infastructures – politicians might ask for immediate solutions.

The finalization of the Sustainable Development Work in 2016 is a good window of opportunity to start in the LSC reflections on a concept of space traffic management.

Recent Publications

2010

2011



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