Activities of the United Nations Programme on Space Applications in Support of Space Education and Space Technology Development

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“Missions and Enabling Technologies towards Future”
Tokyo, Japan, 20-22 November 2013
Presentation Outline

- United Nations and Outer Space
- Regulatory Issues
- UN/UAE Symposium 2013
United Nations and Outer Space Activities
The United Nations and Outer Space

- Beginning of the space age with the launch of Sputnik I on 4 October 1957
- Rising concerns over an arms race in space, the fair sharing of space benefits and the need for rules to regulate activities of states in outer space
- United Nations General Assembly establishes the Committee on the Peaceful Uses of Outer Space in 1958
- Serviced by the United Nations Office for Outer Space Affairs (UNOOSA)
Committee on the Peaceful Uses of Outer Space

- Establishment of two Subcommittees in 1961:
  - Scientific and Technical Subcommittee (STSC)
  - Legal Subcommittee (LSC)
- One of the largest UN Committees with 74 Member States and 30 organizations with permanent observer status
- Reports to the Fourth Committee of the General Assembly
- Adopts an annual resolution on “International cooperation in the peaceful uses of outer space” (latest A/C.4/68/L.3/Rev.1)
United Nations Office for Outer Space Affairs

- Originated as a small expert unit in the UN Secretariat to service the Ad Hoc COPUOS meeting
- Eventually transformed into the United Nations Office for Outer Space Affairs (UNOOSA)
- Relocated from New York to the UN Office at Vienna (UNOV) in 1993
- 25 staff members (scientists, lawyers, political scientists), plus several seconded staff and interns
- Offices in Vienna (Austria), Bonn, (Germany) and Beijing (China)
Programme on Space Applications

- Established in response to recommendations of the first UNISPACE conference in 1968
- United Nations Expert on Space Applications
- Operational since 1971 and implemented by UNOOSA
- UNISPACE’82 in 1982, and UNISPACE III in 1999, further expanded the mandate of the Programme

Programme on Space Applications Mandate

- Promote International Space Cooperation
- Contribute to Capacity Building in Space Technology and its Applications
- Exchange Information on Space Activities
- Provide Technical Advisory Services as Requested by Member States

Programme on Space Applications Activities

271 Expert Meetings/Seminars/Workshops/Conferences
67 countries, 18,251 participants
Basic Space Technology Initiative (BSTI)

- Launched 2009 to support capacity building in basic space technology development, particularly in the field of small satellites
- Annual United Nations space technology symposiums
- Long-term fellowship programme
- Space engineering education curriculum

**Basic Space Technology Initiative (BSTI)**

**Mission:** Enhance access to space application tools for sustainable development through building capacity in basic space technology

1. Respond to the growing interest in establishing indigenous space technology development capacities
2. Support capacity-building in space technology development, in particular through small-satellite activities
3. Promote relevant standards and adherence to legal and regulatory frameworks
4. Promote international cooperation and information exchange
Basic Activities: UN/Austria/ESA Symposiums

- Series of three Symposiums held in Graz, Austria
- Co-sponsored by the Austrian Government and the European Space Agency
  - 2010: “Payloads for Small Satellite Programmes” (A/AC.105/983)

Basic Activities: Technical Assistance

- Special sessions on Capacity Building in Space Technology Development at the
  - VI Space Conference of the Americas, held in Pachuca, Mexico, 15-19 November 2010
  - Fourth African Leadership Conference on Space Science and Technology for Sustainable Development, held in Mombasa, Kenya, 26-28 September 2011

- Technical assistance to Member States on regulatory issues such as
  - Registration of space objects
  - Frequency coordination (in cooperation with International Telecommunications Union)
United Nations Space Technology Symposiums

- Symposiums held in the regions that correspond to the United Nations Economic Commissions
  - 2012 Tokyo, Japan (Asia and the Pacific)
  - 2013 Dubai, UAE (Western Asia)
  - 2014 Baja California, Mexico (Latin America and the Caribbean)
  - 2015 TBD (Africa)
Education Curriculum on Space Engineering

- Remote Sensing and Geographical Information Systems
- Satellite Communications
- Satellite Meteorology and Global Climate
- Space and Atmospheric Sciences
- GNSS
- Space Law

Long-Term Fellowship Programmes

- United Nations/Japan Long-term Fellowship Programme, hosted by the Kyushu Institute of Technology at its Center for Nanosatellite Testing
- Post-graduate study on Nano-Satellite Technologies (PNST)
- 3-year PhD and 2-years Masters programme, up to 6 students/year
- All cost (tuition, living cost, travel) covered
- Application deadline for 2014 round is 27 January 2014
Regulatory Issues: Registration and Debris Mitigation
Five United Nations Treaties on Outer Space

- **Outer Space Treaty**, 1967 (102 ratifications, 26 signatures)
  - Peaceful Uses of Outer Space
  - Freedom of Exploration
  - Non-Appropriation of Outer Space
  - Responsibility of State Parties for national space activities

- **Rescue Agreement**, 1968 (92 ratifications, 24 signatures)
  - Assistance in search and rescue
  - Return of astronauts and equipment

- **Liability Convention**, 1972 (89 ratifications, 22 signatures)
  - Liability for damage caused by objects launched into outer space

- **Registration Convention**, 1976 (60 ratifications, 4 signatures)
  - Registration of space objects

- **Moon Agreement**, 1984 (15 ratifications, 4 signatures)
  - The Moon and its natural resources are common heritage of mankind
States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty.

The activities of non-governmental entities in outer space, including the moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty. (…)

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United Nations Office for Outer Space Affairs
Outer Space Treaty – Article VII

Each State Party to the Treaty that launches or procures the launching of an object into outer space, including the moon and other celestial bodies, and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the Earth, in air or in outer space, including the moon and other celestial bodies.
National Space Law

- Your country may have national space law that may establish a legal/regulatory framework for how space activities are to be conducted (e.g. liability issues, insurance requirements, licensing...)
- The law may also apply if you conduct space activities outside the borders of your country
- This list may not be complete and you may wish to check with the law-making/implementing bodies in your country!
- Also see http://www.unoosa.org/pdf/limited/c2/AC105_C2_L289E.pdf
Registration of Space Objects

1. UNGA 3235 (XXIX). Registration Convention (1976)
2. UNGA 1721 B (XVI). International co-operation in the peaceful uses of outer space (1961)

The General Assembly, (…)

1. Calls upon States launching objects into orbit or beyond to furnish information promptly to the Committee on the Peaceful Uses of Outer Space, through the Secretary-General, for the registration of launchings;

2. Requests the Secretary-General to maintain a public registry of the information furnished in accordance with paragraph 1 above; “

- UNGA 1721 B (XVI) is also applicable to Member States that have not yet ratified the Registration Convention.
- Both registers are maintained by UNOOSA
Registration Submission Form

United Nations Register of Objects Launched into Outer Space

Section A: Instructions for completing the form

2. Do not enter or submit any data until the form is complete. If in doubt, please email oosa-register@un.org.
3. Submit the completed form by sending it through official government channels to the United Nations Office for Outer Space Affairs or email the completed form to register@unoosa.org.

Section B: Definition of terms

Launching States: States that have launched objects into space, as listed in the United Nations Register.

State of registry: The country where the object was registered.

Other Launching States: States that have participated in the launch but are not the primary originator.

Launch operator: The entity that controls the launch of the object.

Object: An object launched into space, including satellites, rocket stages, and debris.

Space debris: Objects in space that are no longer functioning and present a risk to other spacecraft.

Space object: An object launched into space, regardless of its function.

Information provided in conformity with the Registration Convention or General Assembly resolution A/RES/71/291 (Rev. 20).

Part A: Information relating to the change of supervision of a space object, as recommended in General Assembly resolution A/RES/71/291.

Change of status in operations

Date when space object is no longer functional: The date the object ceased to function.

Date when space object is moved to a disposal orbit: The date the object was moved to a disposal orbit.

Part B: Information relating to the United Nations Register of Objects Launched into Outer Space, as recommended in General Assembly resolution A/RES/71/291.

Change of status in operations

Date when space object is no longer functional: The date the object ceased to function.

Date when space object is moved to a disposal orbit: The date the object was moved to a disposal orbit.

Additional information

Web site: http://www.unoosa.org/oosa/SORegister/resources.html

Part C: Additional information for use in the United Nations Register of Objects Launched into Outer Space, as recommended in General Assembly resolution A/RES/71/291.

Change of status in operations

Date when space object is no longer functional: The date the object ceased to function.

Date when space object is moved to a disposal orbit: The date the object was moved to a disposal orbit.

Additional information

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Space Debris Situation

- Study published by the US National Research Council (1 September 2011)
- Space debris situation may already have reached a tipping point (Kessler Syndrome)
- Even without adding new debris Kessler Syndrome may become reality
- Active debris removal may be necessary
Space Debris Mitigation Guidelines

- Space Debris Mitigation Guidelines of COPUOS (A/62/20, paras. 117 & 118 and Annex)
- Based on the Inter-Agency Space Debris Coordination Committee (IADC) Space Debris Mitigation Guidelines
- These guidelines are – at the present - voluntary in nature and not legally binding under international law, however adherence is strongly advised!
Observations and Recommendations of UN/UAE Symposium 2013
United Nations/UAE Symposium 2013

Overall Theme
- Small Satellite Missions for Developing Space Nations

Objectives
- Review status of capacity building in basic space technology - focus on Western Asia;
- Examine issues for the implementation of small satellite programmes: organizational capacity building, development/testing infrastructure, launch opportunities;
- Elaborate on legal and regulatory issues;
- Continue the development of an education curriculum for aerospace engineering;
- Discuss the way forward for the Basic Space Technology Initiative (BSTI).

Recommendations – Long-Term Sustainability

- **Took note** of the discussions in COPUOS under the agenda item on the long-term sustainability of outer space activities and of the establishment of a Working Group.

- **Took note** that the Working Group will develop a set of voluntary guidelines for States, intergovernmental organizations, non-governmental organizations and private sector entities to promote the safety and long-term sustainability of outer space activities.

- **Recommended** that those involved in small-satellite activities should establish contact with their Member States’ representatives in the Working Group and its expert groups to ensure that the interests and inputs of the small-satellite community would be taken into account in the preparation of the guidelines.
Recommendations – Frequency Coordination

- **Took note** of the necessity to timely notify to the ITU about planned satellite projects to avoid harmful interference.
- **Took note** of that the studies to be prepared in response to ITU Resolution 757 (COM6/10) of WRC-12 on regulatory aspects for nano- and pico satellites were conducted under ITU-R working party 7B (WP7B).
- **Recommended** that members of the small satellite community should actively engage with WP7B on the review of the procedures for notifying nano and pico satellites through their respective administrations or by joining ITU as an academia member, with a view to contributing to the study from the perspective of the small satellite community/industry.
Recommendations – Capacity Building

- **Recommend** to set up a network of universities promoting space education by cooperating on joint research projects, education and research issues.
- -> UNISEC-Global Meeting, 23-24 November 2013
United Nations/Mexico Symposium 2014

- Ensenada, Baja California, México, 20-24 October 2014
- Theme “Space Technology Accessible and Affordable”
- Hosted by CICESE Research – leader in space technology in Mexico
- Supported by the Mexican Space Agency
- Points of contact: bsti@unoosa.org, pacheco.enrique@aem.gob.mx
- Please consider joining us in Mexico in 2014!
Thank you for your attention!

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