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Registration of Space Objects with the Secretary-General

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Brief Historical Overview of Space Law & Space Objects

1961: General Assembly resolution 1721B (XVI)

- Established a public registry of objects launched into outer space as a means to promote international cooperation in the exploration and use of outer space

1967: Outer Space Treaty “Magna Carta of Outer Space”

- **Codified obligations of States with regard to space objects**
 - **Article VII:**
 - a State that launches or procures the launching of an object into outer space is “internationally liable for damage”
 - **Article VIII:**
 - a State of registry shall “retain jurisdiction and control over such object”
 - Ownership of object is “not affected by their presence in outer space or on a celestial body or by their return to the Earth”.
 - Recovered space object should be “returned to that State Party” which is the State of registry.



Brief Historical Overview of Space Law & Space Objects

1968: Rescue Agreement

- Expanded on Article V & VIII, Outer Space Treaty
- Article V: recovery and return of space objects

1972: Liability Convention

- Expanded on Article VII, Outer Space Treaty: States internationally liable for damage

1976: Registration Convention

- Expanded on Resolution 1721B (XVI) and the Outer Space Treaty
- Established under treaty the United Nations Register of Objects Launched into Outer Space

2007: GA Resolution 62/101

- Result of LSC's work from 2005-2007
- Recommended means for States to improve registration practices



General Assembly Resolution 1721B (XVI)

- First Register established in 1961 in accordance with GA resolution 1721B (XVI) of 20 December 1961
- Voluntary submission of information by States to the Secretary-General.
- Information disseminated under UN document series A/AC.105/INF/.
- As of 1 April 2016, UNOOSA has issued 428 documents under GA resolution 1721B (XVI) registering nearly 6,000 functional and non-functional space objects.
- Still used to disseminate information received from Member States who are not party to the Registration Convention.
- Since 1976, voluntary registration information has been provided by Algeria, Azerbaijan, Brazil, Egypt, Israel, Italy, Luxembourg, Malaysia, Nigeria, the Philippines, Saudi Arabia, Thailand, Turkey and Venezuela.
- The most recent submission was from Azerbaijan (A/AC.105/INF/428 of 7 December 2015).



Registration Convention

- Built upon registration practices of States under resolution 1721B (XVI) and evolution of international space law.
- Adopted by the UN General Assembly: 12 November 1974 (resolution 3235 (XXIX)).
- Opened for signature on 14 January 1975, entered into force on 15 September 1976.
- As of 1 April 2016, there were **62 States Parties** and 4 Signatories.
- Most recent ratification by Kuwait in April 2014.
- Three international organizations have also declared their acceptance of rights and obligations: ESA, EUMETSAT & EUTELSAT.





Complementary Nature of the two UN Registers

- Two separate, yet complementary, registers of objects launched into outer space maintained by the Secretary-General exist:
 - “Resolution Register” (A/AC.105/INF/ series documents)
 - “Convention Register” (ST/SG/SER.E/ series documents)
- After its entry into force, States Parties began providing information under the Registration Convention on space objects instead of resolution 171B (XVI).
- “Overlap” between the two Registers: i.e. registration under resolution 1721B (XVI), date of re-entry under the Registration Convention.
- Some States have re-registered all their space objects under the Registration Convention. Example: France in ST/SG/SER.E/445 of March 2004.
- In such cases, the space objects are removed from the Resolution Register and placed in the Convention Register. A notation that the object was formerly registered in the Resolution Register is made.
- Information required under the Registration Convention similar to that voluntarily provided by States under resolution 1721B (XVI).



Registration Convention: Treaty Requirements

- **Article I:** definition of terms
 - launching State
 - space object: “includes component parts of a space object as well as its launch vehicle and parts thereof”
- **Article II:** establishment of a national registry. Multiple launching States.
 - National registry: notification to Secretary-General
 - Multiple launching States: “shall jointly determine which one of them shall register the object”
- **Article III:** establishment of the Register by the Secretary-General.
 - “Open and full access”
- **Article IV:** types of information to be provided “as soon as practicable”
 - Paragraph 1: Specific core set of information
 - Paragraph 2: “may, from time to time, provide....additional information”
 - Paragraph 3: notification when a space object is no longer in Earth orbit.

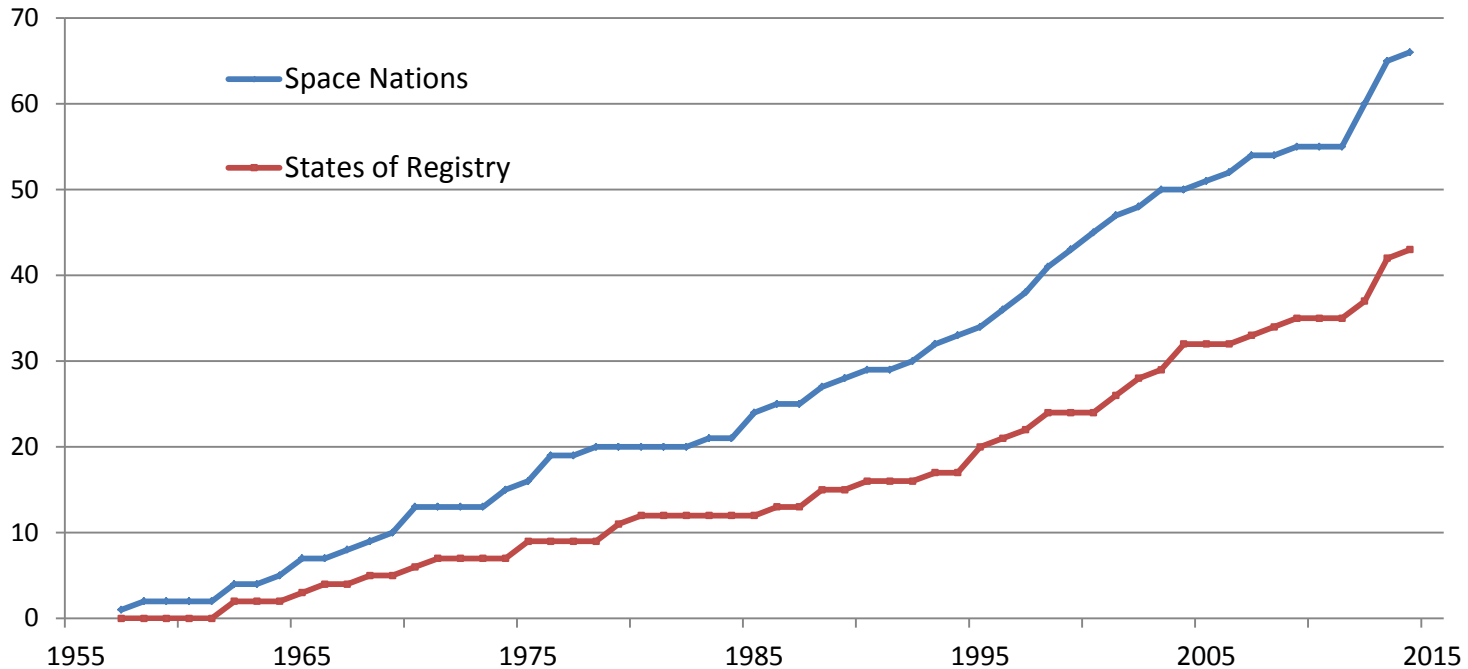


Registration Convention: Treaty Requirements

- **Article V:** notification to the Secretary-General when a space object is “marked with the designator or registration number” prior to launch.
- **Article VI:** requirement for States, particular those with tracking capabilities, to respond to the greatest extent feasible” to requests in the identification of a space object “which has caused damage to it or to any of its natural or juridical persons, or which may be of a hazardous or deleterious nature”.
- **Article VII:** allows international intergovernmental organization which conducts space activities to declares its acceptance of the rights and obligations provided for in the Convention.



Space Nations vs. States of Registry



- Of all “space nations”, **74%** have provided the Secretary-General with information on their space objects.
- Growing divergence between “space nations” and “States of registry”.
- Driving factors: launcher costs, cubesat technology, developing nations, private sector.



Registration of Space Objects: Status

- Between the two Registers, **92% of all functional space objects** have been registered.
- As of 1 April 2016, **6,772 functional space objects** have been registered under the Registration Convention and resolution 1721B (XVI) since 1961.
- Most recent registration submission from Japan (ST/SG/SER.E/766).

State of registry		State of registry		State of registry	
Algeria	2	Greece	1	Poland	2
Argentina	9	Hungary	1	Republic of Korea	19
Australia	14	India	66	Russian Federation (incl. USSR)	3,445
Austria	2	Indonesia	5	Saudi Arabia	12
Azerbaijan	2	Israel	2	South Africa	2
Belarus	1	Italy	25	Spain	9
Belgium	3	Japan	189	Sweden	14
Bolivia	1	Kazakhstan	2	Thailand	1
Brazil	17	Lithuania	2	Turkey	6
Canada	32	Luxembourg	23	Ukraine	4
Chile	3	Malaysia	6	United Arab Emirates	7
Czech Republic (incl. Czechoslovakia)	6	Mexico	12	United Kingdom	71
Democratic People's Republic of Korea	1	Nigeria	4	United States of America	2,264
Denmark	1	Norway	9	Venezuela	2
Egypt	1	Pakistan	3	ESA	65
France	137	Peoples Republic of China	204	EUMETSAT	7
Germany	55	Philippines	1		



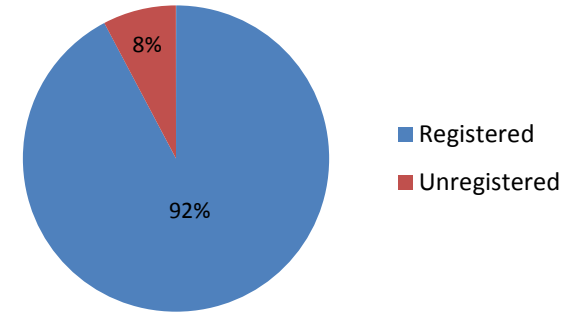
Registration of Space Objects: Status

- Since the establishment of the first UN Register in 1961:
 - 89% of functional space objects that are presently in Earth orbit or beyond have been registered.
 - 96% of functional space objects that were in Earth orbit were registered.
 - 87% of functional space objects that are/were in GSO have been registered.
 - 90% of functional space objects that are in LEO/MEO have been registered.
- Space objects on deep space/planetary missions have been registered.
- All space objects carrying nuclear power sources have been registered.
- Crewed spacecraft are customarily registered.
- Space station flight elements (including modules and robotic arms) are registered.
- With the exception of one State Party, all States Parties register space objects that perform national security missions.

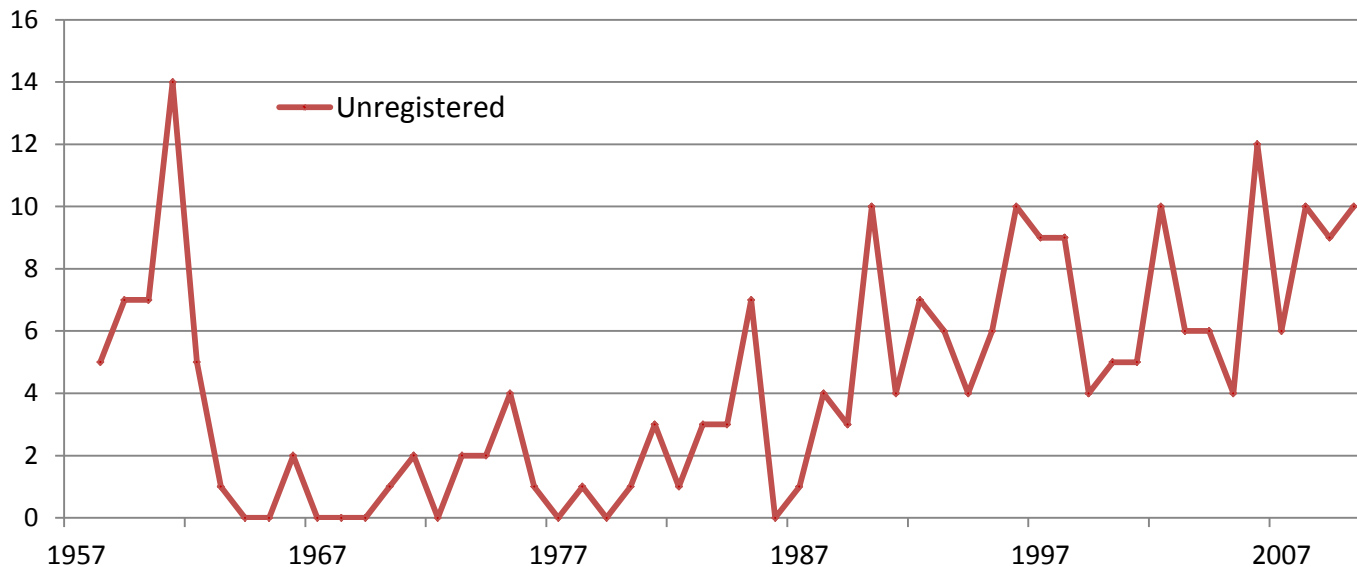


Unregistered Space Objects: 1957-2010

- Only **8%** of functional space objects have not been registered since 1957 to present.

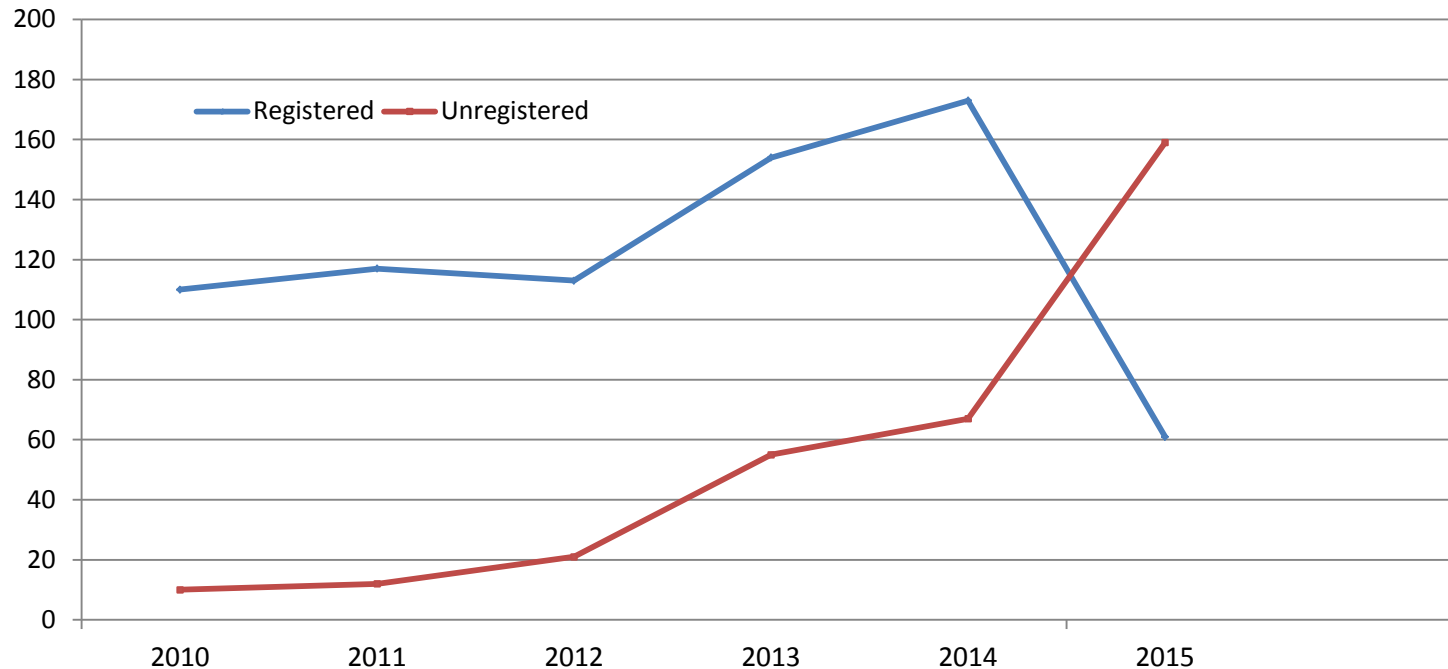


- Between 1957 and 2010, only a few functional space objects were not registered per year.





Registered & Unregistered Space Objects: 2010-2015



- In 2010, 120 functional space objects were launched. In 2014, the number rose to 240.
- 29% of the functional space objects launched in 2014 are no longer in orbit.
- Non-registration of functional space objects rose from 8% in 2010 to 27% in 2014.
- In 2010, 21 States and IGOs launched space objects. In 2014, 34 States and IGOs launched.



Registered & Unregistered Space Objects: 2015

- In 2015, 220 functional space objects were launched by 22 States and 3 IGOs.
- 72% of functional space objects launched in 2015 remain unregistered.
- However, several States have informed UNOOSA that they are finalising registration submission for the majority of these objects.
- UNOOSA expects non-registration to drop to 7% after receiving submissions.
- Some new “space nations” have indicated that they are working on registration of their space objects.



Reasons for Space Nations not registering

- Not Party to the Registration Convention.
- Multiple launching States involved. State of registry not agreed upon (Article II, Registration Convention).
- Activities carried out by private sector without national regulation (Article VI, Outer Space Treaty).
- Party to the Registration Convention but national regulation and/or registration legal mechanisms not complete.
- Party to the Registration Convention but national policy is to only register space objects launched after Convention's entry into force.
- Party to the Registration Convention but space object not "claimed" by a launching State.
- Intergovernmental organisations that do not meet criteria for declaring acceptance of the rights and obligations provided for in the Registration Convention (Article VII):
 - “a majority of the States members of the organization are States Parties to this Convention and to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.”



Online Index of Objects Launched into Outer Space

- Web-based treaty monitoring/verification tool developed by UNOOSA in 2001 allowing States to identify whether a space objects has been registered and who is the State of registry.
- Fusion of official and unofficial data. Includes all registered and unregistered satellites/probes/spacecraft/space station flight elements from 1957 to present.
- Functional space objects only. Space debris and non-functional objects are not included.
- Each space object record contains (when available) information from the State of registry:
 - Initial registration document (Article IV, para. 1)
 - Documents containing additional information (Article IV, para.2)
 - Document containing date of decay/re-entry/deorbit (Article IV, para.3)
- Links to documents by other States containing information related to the space object are also provided (i.e. mentioned in a State providing launch services)
- Links to documents provided by States under other treaties and principles (Outer Space Treaty, Rescue Agreement, NPS Principles)
- Search could be performed using different parameters (name, international designator, launching State, date of launch, orbital status, etc.)

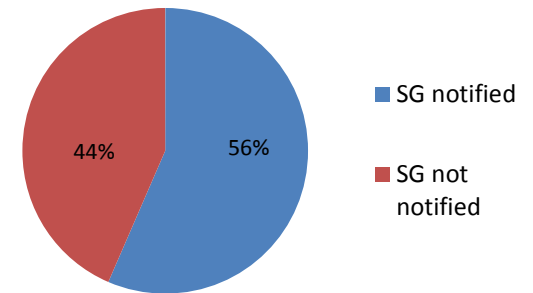
<http://www.unoosa.org/oosa/osoindex/index.jspx>



National Space Object Registries

- Registration Convention Article II requires “[w]hen a space object is launched into earth orbit or beyond, the launching State shall register the space object by means of an entry in an appropriate registry which it shall maintain. Each launching State **shall inform the Secretary-General** of the United Nations of the establishment of such a registry.”
- Often overlooked by States Parties.
- The information is disseminated as a document in the ST/SG/SER.E/INF. series.
- 56% of Parties (including IGOs) who have space objects have notified the Secretary-General of the establishment of national registries.
- Several Parties have informed UNOOSA that they are in the process of establishing national registries and informing the Secretary-General.
- Most recent notification from Chile (ST/SG/SER.E/INF/33 of March 2016).

Article II national registry notifications





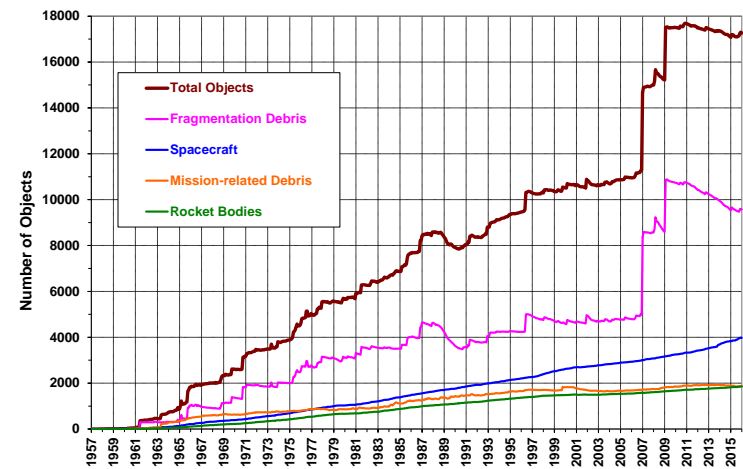
Registration Practices: Overview

- All States of registry provide information on their functional space objects.
- Some States of registry provide information on non-functional space objects.
- Most States provide information on when their space objects cease to exist in orbit.
- Most States provide the geostationary position of functional space objects.
- With the adoption of resolution 62/101 “Recommendations on enhancing the practice of States and international intergovernmental organizations in registering space objects”, there have been substantial changes to registration practices of States of registry.
- A growing number of States have begun using the model registration form developed in accordance with resolution 62/101.
- More States are providing information on:
 - Transfer of ownership/supervision
 - Mission termination
 - In-orbit disposal
 - Re-entry of space objects



Registration Practices: Space Debris

- Only 23% of all space objects presently being tracked in Earth orbit are satellites, manned spacecraft or space station flight elements.
- Approx **2,100 objects** are rocket-stages & related.
- The remaining approx **11,400 objects** are non-functional objects: “space debris”
- Presently, no State of registry reports all its identified non-functional objects.
- Some States and IGOs that have indigenous launch capabilities do register rocket stages, shrouds and inter-satellite structures that reach Earth orbit.
- Non-functional space objects that are submitted for registration are included in the United Nations Register of Objects Launched into Outer Space.
- Non-functional objects registered by India, France, United States & ESA.



Source : NASA



Registration Practices: Resolution 62/101

- Article IV, Registration Convention allows for States to provide additional information on their space objects. Resolution 62/101 recommends what type of information could be provided.
- Resolution 62/101 based upon “best practices” of States in registering space objects. Aims to:
 - Enhance adherence to the Registration Convention
 - Harmonize types of information provided
 - Suggest additional types of registration information
- Since the adoption of resolution 62/1010 in 2007, UNOOSA has noted substantial changes and improvements in States’ registration practices.
- States are actively working on improving their registration practices.
- States are also making efforts to harmonize data provided.
- Twenty States of registry presently use the model registration form developed in accordance with resolution 62/101.



Registration Practices: Additional information provided by States of Registry

- Transfer of ownership/supervision
 - Recently provided by Azerbaijan, the Republic of Korea, United Kingdom & ESA.
- Mission termination
 - Recently provided by France, Japan, Russian Federation & the United Kingdom.
- In-orbit disposal
 - Transfer of space objects to graveyard orbits have been recently reported by France, Russian Federation, United Kingdom.
- Re-entries
 - Most States now provided actual dates of decay/re-entry/deorbit for space objects.



Provision of information on space objects outside the registration mechanism

- There is a growing trend of providing information on space objects outside the mechanisms of the Registration Convention or resolution 1721B (XVI).
- The customary mechanism for providing such information is Article XI, Outer Space Treaty.
- Information is submitted by a State that wishes to provide information on a space object for which it is not the State of registry.
 - Example: the United Kingdom regularly provides information on Inmarsat satellites that were launched by Inmarsat IGO prior to its satellite operations being privatised as a company incorporated in the United Kingdom.
- Types of information are comparable to that provided under the Registration Convention.
- Other information such as changes in GSO location. Supervision and disposal are also provided.



Registration of Space Objects: Future Outlook

Negatives:

- Divergence between “Space Nations” and “States of Registry” will continue to increase
 - Number of LEO “satellite operators” (studentsats/corpsats) will continue to increase dramatically.
 - Number of GEO “satellites operators” will also continue to increase but at a lower rate than LEO.
 - Some States may not recognise private sector/academic satellites as their responsibility
- Non-registration of satellites will continue to increase
- Increasing trend of transfer of ownership/supervision may create confusion on which State bears “international responsibility”.



Registration of Space Objects: Future Outlook

Positives:

- Most existing States of registry have or are implementing regulatory mechanisms for licensing and registration of space objects.
- Awareness of international legal obligations concerning space objects is increasing amongst States and the private/academic sectors.
- Relevant organizations within the UN System are working together to raise awareness amongst States and private/academic sectors.
- Goodwill of States in recognising the need for effective governance of activities in Earth orbit or beyond.



UNISPACE+50 and stronger notification procedures

- UN treaty-based mechanism for information exchange and notification procedures under the treaty obligations of the Secretary-General, including the Registration Convention and resolution 62/101 on registration practice, provide the legal basis under international law for enhanced information exchange and notification procedures of objects launched into outer space;
- GGE-report (A/68/189) recommendations on risk reduction notifications and relevant proposed requirements under the draft set of guidelines on the long-term sustainability of outer space activities to be assessed under the UNISPACE+50 process with the aim of improving overall information exchange and notification procedures on space objects;
- UNISPACE+50 thematic priority on enhanced information exchange on space objects and events to take stock of current notification and registration regime and analyse requirements to meet recommendations on risk reduction notifications, taking into account the need for safety, security and sustainability of outer space activities;
- Agreement in 2018 on concrete time-bound measures to be taken on establishing necessary requirements for enhanced information exchange/notification/registration platform under the established long-standing UNOOSA authority in discharging the responsibilities of the Secretary-General under the legal regime on outer space.



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