

# Collaborative information exchange for safety and sustainability of space operations

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Meeting hosted by Switzerland on possible further work on the long-term  
sustainability of outer space activities

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## LTS Follow-up: The way ahead

LTS WG (2011-2018) reached consensus on the preamble and the text of 21 guidelines, while the text of 7 additional guidelines remained under discussion.

### LTS-Preamble

**21. The relevant United Nations body serving as the principal forum for continued **institutionalized dialogue** on issues related to the implementation and review of the guidelines is the Committee on the Peaceful Uses of Outer Space. States and international intergovernmental organizations are encouraged to share their practices and experiences in the Committee regarding the implementation of the present guidelines.**

## LTS Follow-up: The broader context

- Group of Governmental Experts (GGE I) on **transparency- and confidence-building measures** (TCBMs) with important contributions in 2013 to LTS
- Limited progress of related initiatives today (e.g. PAROS, GGE II)
- The COPUOS challenges:  
Defining the institutionalized dialogue to ensure the adequate implementation of the Guidelines and to develop a common understanding on the real operational topics

**National implementation and the institutionalized international dialogue are the two sides of the same medal.**

**GGE I UNGA A/68/189 29 July 2013**

**A. Nature and purpose of outer space transparency and confidence-building measures**

20. In general terms, transparency and confidence-building measures are a means by which Governments can **share information with the aim of creating mutual understanding and trust**, reducing misperceptions and miscalculations and thereby helping both to prevent military confrontation and to foster regional and global stability.

With GGE I the subject of TCBM reached COPUOS  
Today LTS is related to the broader picture of space security  
Information exchange is a core element of TCBM

## TCBMs in outer space activities

25. The Group recognized that the need for transparency and confidence-building measures in outer space activities has increased significantly over the past two decades. It is generally acknowledged that such measures can augment the **safety, sustainability and security of day-to-day space operations** and can contribute both to the development of mutual understanding and to the strengthening of friendly relations between States and peoples.

27.(d) **Specific information-exchange measures** aimed at expanding the availability of information on objects in outer space and their general function, particularly those objects in Earth orbits;

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

## LTS-Guidelines with elements of information exchange

- A.5 Enhance the practice of registration
- B.1 Contact information on objects and orbital events
- B.3 Space Debris monitoring: data products / research
- B.4 Conjunction assessment during controlled flights
- B.5 Pre-launch conjunction assessment
- B.6 Share operational space weather data and forecasts
- B.7 Develop space weather models and tools
- B.9 Uncontrolled re-entry of space objects
- C.2 Share experience related to LTS activities
- C.3 Promote and support capacity-building
- .- In-advance information exchange related to ADR
- .- Assessment/ Information-exchange related to proximity operations

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To be analysed under the perspective  
of required activities and the relevant addressees

National implementation? International dialogue?  
Necessary interaction between space actors and institutions...  
Role of COPUOS and UNOOSA

## LTS Guideline A.5 - Enhance the practice of registering space objects

**Excerpt:** „States and [IGOs] should...harmonize and sustain...such registration practices on the widest international basis [and] ... provide timely information that contributes to the [LTS] of outer space activities and should consider also providing information on space objects, their operation and their status... The launching States and, where appropriate, [IGOs] should request all necessary information from space launch service providers and users under their jurisdiction and/or control...”

**Required activities:** Harmonize registration practices; provide timely and comprehensive registration information (as appropriate); adapt registration practices to new developments (e.g. multi-cluster small satellite missions, future separations of objects, etc.)

**Addressees:** (Launching) States and IGOs, UNOOSA



## LTS Guideline B.1 – Contact information and information sharing

**Excerpt:** „States and [IGOs] should exchange...regularly updated contact information on **their designated entities** authorized to engage in exchanges of appropriate information on on-orbit spacecraft operations, conjunction assessments and the monitoring of objects and events in outer space...[and] should establish appropriate means to enable timely coordination to reduce the probability of and/or to facilitate effective responses to orbital collisions, orbital break-ups and other events.”

**Required activities:** **Establish points of contacts** to facilitate communication/coordination, exchange relevant information (as appropriate) on space objects and events

**Addressees:** States and IGOs

## LTS Guideline B.5 – Pre-launch conjunction assessment

**Excerpt:** „States and [IGOs] are encouraged to exchange their analytical assessment of the trends in the change of the risk of collision of space objects to be launched with other space objects operating near the planned insertion orbit...[and] are encouraged to consider providing information on launch schedules..., pre-launch notifications..., and notices for mariners and pilots on restricted zones at sea and in airspace.”

**Required activities:** Conduct assessments of the risk posed by the launch of objects into space and inform those potentially affected (both in space and on Earth)

**Addressees:** States and IGOs, launch service providers

## LTS Guideline B.9 - Uncontrolled re-entry of space objects

**Excerpt:** „States and [IGOs] should have in place procedures for furnishing...information on the forecasted uncontrolled re-entry of potentially hazardous space objects...and communicating and coordinating the mitigation of risks associated with such events. ...If a State or [IGO] has early information on forecasted uncontrolled re-entry of potentially hazardous space objects that are under the jurisdiction and control of another State or [IGO], it should share such information with that State or [IGO].”

**Required activities:** Prepare designated communication channels and procedures to facilitate reacting to the forecasted uncontrolled re-entry of space objects

**Addressees:** States and IGOs, UNOOSA

## LTS Draft Guidelines 20, 21 and part of 22 – Procedures for active debris removal

**Excerpt:** „States and [IGOs] should be encouraged to provide information on such operations at the international level in advance, through [UNOOSA] and/or other appropriate channels. ...It should be a general principle that the greater the probability of side effects from such an operation, the more detailed should be the information made available at different stages of the operation’s preparation and implementation. ...Other States and [IGOs], if requested, should, as feasible, provide information and analytical support for such operations.

**Required activities:** Ensure that ADR missions are as transparent as possible in order to minimize the safety risks of such missions and to avoid misunderstandings about the intent of such missions

**Addressees:** States and IGOs, UNOOSA, spacecraft operators

## LTS Draft Guideline 8 - Measures for the safe conduct of proximity space operations

**Excerpt:** „States and [IGOs] should be open to discussing and identifying possible approaches that could lead to the development of viable internationally approved safety criteria for close-proximity operations...[and] are encouraged to share... their assessment of the situation in outer space from the perspective of safety of space operations. They are also encouraged to share analyses of events which might affect the safety of space operations.”

**Required activities:** Ensure that proximity space operations are as transparent as possible in order to minimize the safety risks of such missions and to avoid misunderstandings about the intent of such missions

**Addressees:** States and IGOs, spacecraft operators

## **LTS-Guidelines with elements of information exchange Conclusions**

The implementation of the LTS-Guidelines needs an institutionalized dialogue.

The analysis of the Guidelines indicates the necessary cooperation and interaction.

Attention to the specific role of UNOOSA should be made.

There are valid open issues to be discussed, with relevance to space operations of today.

LTS Informals Topic 1: Collaborative information exchange for safety and sustainability of space operations

## LTS- Guidelines with information-exchange Additional Slides



### **LTS Guideline B.3 - Collection, sharing and dissemination of space debris information**

**Excerpt:** *„States and [IGOs] should...promote the sharing and dissemination of derived data products and methodologies in support of research and international scientific cooperation on the evolution of the orbital debris population.“*

**Required activities:** Greater cooperation on research and development activities related to space debris monitoring

**Addressees:** States and IGOs



## LTS Guideline B.4 - Conjunction assessment during controlled flight

**Excerpt:** „States and [IGOs] should develop and implement...approaches to and methods for conjunction assessment that may include...sharing information on the *proper interpretation* and usage of the conjunction assessment results...[and] share knowledge and experience related to the interpretation of conjunction assessment information...[and] share their expertise by, inter alia, providing *training opportunities* for emerging spacecraft operators and disseminating best practices, knowledge and experience.”

**Required activities:** Harmonize assessment methods of close conjunctions between manoeuvrable space objects and distribute that knowledge to relevant actors/entities

**Addressees:** States and IGOs, spacecraft operators, service providers

## LTS Guideline B.6 - Share operational space weather data and forecasts

**Excerpt:** „States and [IGOs] should support and promote the...sharing...and dissemination of critical space weather data and space weather model outputs and forecasts...[and] should also consider sharing real-time and near-real-time critical space weather data and data products in a common format...[and] should also encourage their space weather service providers to...[u]ndertake coordinated dissemination of space weather forecasts among space weather service providers and to operational end users.”

**Required activities:** Harmonize and distribute (as appropriate) operational space weather data and forecasts to operational end users

**Addressees:** States and IGOs, space weather service providers

## LTS Guideline B.7 - Develop space weather models and tools

**Excerpt:** „States and [IGOs] should...encourag[e] the collection, collation and sharing of information relating to ground- and space-based space weather-related impacts and system anomalies, including spacecraft anomalies...[and] policies promoting the sharing of satellite anomaly data related to space weather-induced effects...[and] **work towards the development of international standards** and the collection of established practices applicable for the mitigation of space weather effects in satellite design.”

**Required activities:** Engage in greater cooperation on research and development efforts related to the detection and mitigation of space weather effects

**Addressees:** States and IGOs, spacecraft manufacturers

## LTS Guideline C.2 - Share experience related to the LTS of space activities

**Excerpt:** „States and [IGOs] should share...experiences, expertise and information relating to the [LTS] of outer space activities, including with non-governmental entities, and develop and adopt procedures to facilitate the compilation and effective dissemination of information on the ways and means of enhancing the [LTS] of space activities. When further developing their information-sharing procedures, States and [IGOs] could take note of existing data-sharing practices used by non-governmental entities.”

**Required activities:** Share experiences in implementing LTS activities and study those by other actors in order to develop best practices in promoting the LTS of space activities

**Addressees:** States and IGOs, non-governmental entities

## LTS Guideline C.3 - Promote and support capacity-building

**Excerpt:** „States and [IGOs] should coordinate their efforts in space-related capacity-building and data accessibility...[which] include...sharing of appropriate experience, information, data, tools and management methodologies and techniques, as well as the transfer of technology...[and] should also undertake efforts to make relevant space-based information and data accessible to countries affected by natural disasters or other catastrophes.”

**Required activities:** Encourage greater cooperation on capacity-building efforts to assist interested actors to become involved in space activities, provide space-based data to assist in disaster management

**Addressees:** States and IGOs