



# 2020 SSA/STM DATA OPERATORS EXCHANGE WORKSHOP (VIRTUAL)

September 22, 2020, AMOS Conference

Key Findings

## **SSA/STM AMOS Workshop (virtual) September 22, 2020**

### EXECUTIVE SUMMARY

The long-term sustainability of space is an issue critical to the global community. The increasing congestion of space due to on-orbit debris poses a risk to active satellites that underpin much of the world's activity. Acknowledging this issue, a virtual international workshop (the 5th such event) consisting of space subject matter experts was held in September 2020 to identify priority areas that need to be addressed by the international community to promote the responsible use of space to mitigate this risk.

The five priority areas identified at the event in 2019 regarding development of STM best practices were reviewed, updated, and revalidated. The highest priority recommendation is the need for a regulatory framework pertaining to the safe and responsible operation of satellites licensed at a national level as part of a wider Space Traffic Management (STM) initiative. Action is required from policymakers to enable the development of a national STM regulatory framework that can evolve into an international framework. Any industry driven voluntary, consensus-based STM standards may be necessary, but they are not sufficient to fully mitigate the risk of unintentional collisions on orbit that pose greatest risk to the sustainability of space.

The organizers stand ready to support the international community to progress on establishment of STM frameworks along with the other recommendations from this workshop. In parallel we will build upon these findings and engage with the wider space community at Space Symposium 2021.

### BACKGROUND

The Maui Economic Development Board (MEDB) and the Aerospace Corporation led the 5th Annual International SSA Data Operator Exchange Workshop on 22 September 2020. This was the fifth invitation-only International SSA Data Operator Exchange workshop held in conjunction with the Advanced Maui Optical and Space Surveillance Technologies (AMOS) Conference, on the Hawaiian island of Maui. This year's workshop was held virtually due to the COVID-19 pandemic but still included government, industry and non-governmental organization (NGO) representatives from Australia, Canada, ESA, EU, France, Germany, Japan, NASA, NATO, Republic of Korea, Thailand, the United Kingdom, and U.S. government representatives from the Department of Commerce, the Federal Aviation Administration, the U.S. Space Force.

The enduring goal of the International SSA Data Operator Exchange workshop is to provide an opportunity to develop and advance relationships and share insights among key international SSA data stakeholders including military, academic, civil, and commercial entities. To accomplish this, the workshop chooses timely topics relevant to the global SSA community and allows each participant time to present their views. This year's session was cohosted by the UK Defence Science and Technology Laboratory (DSTL), the Deutsches Zentrum für Luft- und Raumfahrt (DLR) and the Centre National d'Etudes Spatiales (CNES).

## PURPOSE

The 2020 SSA Data Operator Exchange workshop's purpose was to keep the momentum going within the SSA operator community toward collectively informing and shaping national and international activities from an SSA operator's view. Desired outcomes included (1) relationship building across the international SSA operator community, (2) deciding if the top 5 priorities for development of SSA/STM standards, guidelines and best practices that emerged from the AMOS operators forum last year remain relevant\* (3) discussing what progress has been made in the last 12 months in addressing those priorities, and (4) identifying any new priorities. Ultimately, the workshop's goal was to provide insights to policymakers on operator perspectives.

## KEY FINDINGS

There was general consensus that the 2019 priorities list remains true, provides a common denominator and reflect UNCOPUOS Long Term Sustainability (LTS) Guidelines. While progress is being made in the five areas, communities are still stove-piped. There needs to be better crossflow of information and cross-pollination of ideas regarding existing mechanisms. Also, a military or security dimension should be reflected in the priorities since they may look different when viewed through a defense/security lens. In addition to continuing work on the five broad priority areas for development of STM of SSA/STM standards, guidelines and best practices identified in 2019, the community should renew efforts in the following areas:

- Establish data sharing mechanisms and norms within a coalition of the willing. Consider using universal design language (UDL) as a distribution of data mechanism.
- Consider building the sharing of maneuver planning information into satellite manufacturing and acquisition contracts for a quick and automatic tool because it is too difficult and expensive to add sharing requirement to contract later.
- The harmonization of several on-orbit safety standards (issued by JAXA, ESA, NASA) is sometimes lacking which highlights the stovepipes. Better collaboration is needed.
- To build consensus for establishment of STM/SSA voluntary standards and norms to better inform stakeholders on what standards, norms and mechanisms already exist and where the greatest need is for new standards and mechanisms.
- Any mechanism for future information sharing must be flexible, secure, precise and anticipate the problems of the future now.

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\* 2019 priorities for development of SSA/STM standards, guidelines and best practices

1. Operationally useful, consensus-based standards for timely, transparent, trustworthy, secure, SSA/STM data sharing (data base/data repository/data exchange) that is capable of automation.
2. A reliable, 24/7/365 system of rapid communication among operators that enables transparency and coordination for the operational community.
3. A national SSA/STM regulatory framework that can evolve into an international framework.
4. Operationally useful standards for on-orbit operations.
5. Methods for incentivizing positive behavior.

- Sponsor an exercise in maneuver data sharing to gain insight on low-risk, high yield changes that can be made quickly. This also improves trust.
- Identify a tangible end state: an international organization, a database, a coalition?

#### CONTINUED CHALLENGES

- Data fusion is a challenge because it comes from various sources such as different states, the commercial sector, and scientific/academia sources
- Universal standardization still has its challenges
- Expansion of the space enterprise to cislunar and beyond will complicate sharing further
- No unified voice from industry exists on what the standards should be, and industry continues to resist as a whole
- STM connotes regulation, monitoring, enforcement, penalization to some; may need to change the narrative to Space Traffic Coordination and Management (STCM).
- Priorities may look different when viewed from a military/security lens instead of a commercial/civil lens.

#### OTHER NOTES

- Issues in sharing maneuver planning can be overcome based on the experience of Iridium. The risk of collision is judged higher than the risk of sharing maneuver information.
- Consider how the EU shares data with the EU collision avoidance center but not its member states.
- Consider how the Space Data Association (SDA) receives maneuver data in order to send out cautions or collision warnings but uses filters to avoid sharing raw data.
- There are opportunities for commercial and partner augmentation of Space Domain Awareness (SDA), which incorporates intelligence, intention and tracking, especially for underrepresented geographies and orbits and that will also increase resiliency of the architecture.

#### POSSIBLE THEMES FOR NEXT YEAR

- Improve crossflow across existing mechanisms.
- Identifying tomorrow's problems to start working on them now.
- Improving sharing of collision warning data.
- Where to invest in science and technology for SSA/STM and how investments should be prioritized
- Better coordination of emerging on-orbit servicing standards across stakeholders
- Protecting sensitive or classified information.

#### PROGRAM ON 22 SEPTEMBER 2020

Welcome remarks

Leslie Wilkins – President (MEDB)

Ed Swallow – Sr VP, Civil Systems Group (The Aerospace Corporation)

Overview of AMOS workshop 2019

Mick Gleason – Center for Space Policy and Strategy (The Aerospace Corp)

US Civil STM Status

Kevin O’Connell – US Department of Commerce

US Space Force Pivot SDA

Peter Bernstein – US Space Force

EU SST Status

Pascal Faucher – CNES

NATO Status

Daniel Gallton – NATO

Japan Status (pre-recorded)

Hiroshi Yamakawa – JAXA President

Roundtable Discussion “*Updating/Re-validating the 2019 Top 5 Priorities*”

Moderators: Mick Gleason (Aerospace) & Andrew Ash (DSTL)