



**INTERNATIONAL
ASTRONAUTICAL
FEDERATION**

IAF Space Traffic Management Working Group and Technical Committee

ISO-TC20\SC14\WG3-WG7
May. 26, 2020

Context

Ever increasing orbital population

- 20,655 catalogued objects

- Less than 12% active spacecraft

- Very early concerns: Space Traffic Control (Nagatomo, 1971)

Concerns over near future

- Large number of small spacecraft with no collision avoidance capacity

- Very large number of medium size spacecraft constellations

- New radar capacities leading to increased size of catalog

Decision to organize a dedicated Working Group

- between IAA (International Academy of Astronautics), IISL (International Institute of Space Law) and IAF (International Astronautical Federation)

 - ⇒ *Comprehensive approaches and proposals for STM in order to promote the safe use of outer space*

- Dedicated IAF sub-Working Group



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MEMORANDUM OF UNDERSTANDING

between

The International Astronautical Federation (IAF)

and

The International Institute of Space Law (IISL)

and

The International Academy of Astronautics (IAA)

Building on the specific competences of the three organizations as IAA's individual multi-disciplinary talent and experience, IAF's extended network of agencies, industry, operators and users, and IISL's global expertise in legal and regulatory matters;

IAF, IISL and IAA join in a cooperative initiative to develop comprehensive approaches and proposals for STM to be addressed to decision-makers on national and international level in order to promote the safe use of outer space.

International
Astronautical
Federation

Jean-Yves le Gall
President

International
Institute of
Space Law

Kai-Uwe Schroggl
President

International
Academy of
Astronautics

Peter Jankowitsch
President

Connecting @ll Space People



Knowledge of orbital population

Improvement of existing means

- Need for new sensors, radars, telescopes, including private networks
- Study and promote new systems: orbited sensors, laser detection, ...
- Improving the trackability and identification of small spacecraft
- Data fusion: merging of information from various sensors

Improvement of the orbital data accuracy

- Improved computation means and filters
- Use of star background in optical observations
- Laser ranging from ground of orbit

Improvement of the UN registration (convention of 1974)

- Potentially systematic pre-registration before mission

Regional SSA databases/catalogs

- Numerous hurdles, legal, political, military...

Operations

Improvement of collision avoidance process

- Need for new methodologies to face the increase in size of catalog

- Shared methodologies for probability computations and associated thresholds

Specificities of future operations

- Optimization of ascent and descent; preferable strategies

- Dedicated index

- Space tugs, In-Orbit-Servicing, refueling...

- Suborbital activities?

Preparation of future activities

- ADR: Active Debris Removal to avoid statistical collisions

- JCA: Just-in-time Collision Avoidance by nudging a large debris to avoid predicted collision with another debris

- LDTM: Large Debris Traffic Management, light nudging of debris to maintain a stable situation



Mitigation guidelines

Good current set of Debris Mitigation texts

IADC, UNCOPUOS, ECSS, ISO

National or Agency Standards, Guidelines, Recommendations, Best-practices, Charters, Laws...

Very low compliance level to current rules and guidelines

Need for more education, systematic inclusion of ISO in any contract

Compliance file systematically prepared before any space operation?

Naming & Shaming at COPUOS level?

Not yet adapted to new practices

On-going actions, mainly at Agencies, IADC and ISO level

Dedicated charter among operators (Space Safety Coalition)



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IAF Space Traffic Management Committee

SPACE TRAFFIC MANAGEMENT COMMITTEE (GA APPROVAL PENDING)

DOCUMENTS CATEGORIES

Add category

- 1 - Terms of Reference
- 2 - Membership
- 3 - Meeting Minutes
- 4 - Annual Reports
- 5 - Highlight in Space
- 6 - Working Documents
- 7 - Other
- 8 - Templates

See also: [the committee participants](#)

<https://iafastro.directory/iac/folder/tc/spacetraffic/>



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Terms of Reference under consolidation - Membership is open

Not the place to “invent” new things:

- No duplication with Standardization efforts, ISO, ECSS, ...
 - No duplication with on-going WG at AIAA, IAASS, ESPI, SWF, AAE, ...
 - No duplication with on-going actions OOS, RPO, EOF, CPO...
- ↳ Objective is to prepare a synthetic view of the topic for wide distribution

Work structured under small groups dedicated to one topic

- Typically 10 members maximum, from all over the world
- Initial topics: terminology, orbit accuracy, data fusion, space capacity management, COLA process...

Starting soon, stay tuned...😊

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Thanks for your attention !



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