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An EU Approach for Space Traffic Management
An EU contribution addressing a global challenge

1 INTRODUCTION

Given the ever-growing volume of space debris and the exponential increase of space traffic, space is increasingly congested, threatening the viability and security of space infrastructure and operations. This unprecedented population of objects is a real, concrete risk impacting routine operations in orbit every single day, **posing** a **direct threat to the safety and security for orbital traffic and space sustainability.** We now stand at a crossroads: if we do not find ways to manage space traffic, our past and present space activities will jeopardise the safety, security and sustainability of outer space and, as a result, our future ability to rely on space as enabler of key services in benefit of humankind.

Close approaches are becoming more common in Low Earth Orbit (LEO) as the number of satellites increases due to the proliferation of mega-constellations. Recently, a growing number of incidents have occurred which could have had catastrophic results. The sheer number of trackable and untrackable space objects and the rapid pace of space operations increase exponentially the risk of potential future incidents. **The potential repercussions may render certain orbits unusable for decades to come; and as a direct corollary, severely compromise or lead to failure of space operations**. The latter, considering the increasing dependence on space data and services, entails a high level of strategic risk and may disrupt key services such as communications, civil protection and emergency response. Should for instance the provision of EU global Positioning, Navigation, Timing (PNT) and Earth Observation data and services be interrupted or severely compromised, this would have a direct impact upon the security, safety, economy, and well-being of European citizens, therefore limiting our freedom of action.

In a context of an increasingly contested space environment, Space Traffic Management (STM) will contribute to the **security and defence dimensions** of the EU in space. Space services are key enablers for defence and civilian capabilities. Because of their strategic nature, space assets are thus becoming targets of various kinds of threats. Their disruption would seriously affect the ability of the EU and its Member States to defend themselves. Additionally, decreasing the risk of in-orbit collision will enhance the resilience of space infrastructure, including those satellites supporting defence and security applications. Building autonomous – yet interoperable with our main partners – EU Space Surveillance and Tracking capacities to support STM is therefore of paramount importance. A global STM effort would also contribute to transparency and confidence building in general, and help avoid misunderstandings and deescalate tensions in case of incidents.

Since the orbital environment is a globally shared resource, space operators worldwide are to varying degrees interdependent. Consequently, the establishment of STM requires a buy-in by all space-faring actors.

The EU is a major international space-faring actor with an own European Space Policy and Space Programme including Position, Navigation & Timing (PNT) and Earth Observation components. The EU has therefore a legitimate interest and obligation to actively contribute to the global debate and take a distinct stance in shaping the necessary actions for the management of space traffic. **The EU already promotes a multilateral approach to ensure the preservation of the long-term safety and sustainability of activities in outer space, with the objective of reducing threats and risks for all space systems.** The EU has been engaged

in the preservation of a safe, sustainable, stable and secure outer space for decades and remains committed to the peaceful use of outer space.

The Council, the Commission and the High Representative have recognised the need for an EU STM approach to address these global multifaceted challenges to the safety, security and sustainability of space operations, in a series of a high-level policy documents urging for action.[1]

In the absence of an international regulatory framework, several public and private initiatives seek to address safety of space operations. In the race to establish a secure environment in space to guarantee security on the ground the **EU must act now, swiftly, collectively and resolutely**.

The objective of this Joint Communication is to lay out a concrete EU approach on STM for a safe, sustainable and secure use of space, preserving EU interests in full compliance with the respective competences of the EU and its Member States.

2 THE IMPERATIVE FOR AN EU STM APPROACH

The imperative for the EU to proceed with policy-making and action in STM, given the lack of international norms and standards, rests upon some primary questions – on the boundaries of this rapidly evolving public policy domain, on the main drivers urging for action, and on how the EU could respond to the exigencies of this global challenge.

2.1 The definition of STM

The first issue to address is the **absence of a consensus** on an **internationally agreed, clear definition** of STM along with its primary objectives[2]. While a consensual definition of the term is yet to emerge at international level, the protection of space infrastructure and the guarantee of safe and sustainable use of outer space in the long term cannot wait in view of an ever-growing number of actors and objects in space.

Based on an exhaustive study of definitions and approaches[3] and in order to progress at EU level, this Communication defines **STM as the means and rules to access, conduct activities in, and return from outer space safely, sustainably and securely.**

STM relates to the following elements:

a) Space Situational Awareness (SSA) activities, including Space Surveillance and Tracking (SST); and

b) orbital debris mitigation and remediation;

c) management of space orbits and radio spectrum;

[1] On 22 February 2021, the Commission adopted an Action Plan on synergies between civil, defence and space industries, which announced the launch of intensified dialogue and development work towards an STM flagship project. The May 2021 Competitiveness Council conclusions on 'New Space for People' stressed 'the importance of developing a Space Traffic Management (STM) approach for Europe in the future and guiding global standards'. The process of the Strategic Compass, currently debated at the Council, acknowledges the importance of developing an EU approach on STM as a useful contribution to the Common Foreign and Security Policy objectives of the EU.

[2] Various definitions have been proposed in several political, academic and international fora. At the same time, the complexity for defining STM has increased with new concepts emerging, such as Space Traffic Safety (STS), Space Traffic Coordination (STC), and more recently Space Traffic Coordination and Management (STCM).

[3] Pilot Project on Space Traffic Management – The rise of importance of Space Traffic Management (STM)

d) the entire life-cycle of space operations including launch phase, in-orbit operations of spacecraft, and end-of-life de-orbit operations;

e) re-entry phase of spacecraft into the airspace (both controlled and uncontrolled).

This **working definition remains dynamic** and might further evolve during the upcoming discussions on STM at EU and international level, detailing and complementing the various phases of the above activities.

2.2 The compelling need to act

After 50 years of commercial use of space systems, the need for an EU STM approach is more **compelling.** Itis characterised by four consecutive developments in the space sector. These **drivers**, including the congestion and wider range of actors in the space environment, render STM indispensable and prompt a global policy-making response.

Firstly, the **economic aspects of space are changing with the era of "new space"**[4]. The cost of sending satellites into space is continuously decreasing, notably due to the use of re-usable launchers and the development of micro-launchers. At the same time, the development of small satellites is lowering the price tag to take payloads into space. This has attracted venture capital given that the potential return on investment is growing.

The consequence of the changing economic environment of space activities is a **strong increase in the number of satellites in orbit**, notably with the development of so-called mega-constellations. Since the beginning of the space race, about 6,000 launches have put in orbit 11,800 satellites of which 4,550 are currently operational[5]. It is estimated that more than 20,000 additional satellites will be launched in the next ten years[6]. This growing number of satellites increases the complexity of space operations and makes it impossible to safely operate a spacecraft not taking into account other spacecraft.

Secondly, the rise in number of satellites and space traffic activity increases the **volume of debris generated and the risk of collisions** (see Table 1). Already today, there are around 128 million pieces of debris smaller than 1cm orbiting Earth, and approximately 900,000 pieces between 1 and 10cm. The current count of large debris (defined as 10cm or larger) is 34,000[7].

[4] Definition of New Space: private companies, SMEs and start-ups that develop novel space technologies and applications

[5] Source: Eurospace. More than 470 spacecraft were launched every year in 2017, 2018 and 2019, while only 110 spacecraft were launched on average per year between 2000 and 2013

[6] An indicative list: Space X Starlink, Amazon Kuiper, the success of One Web, Boeing V-band, Iceye, Kepler, Telesat LEO, Spire, Theia, etc.

[7] Source: ESA

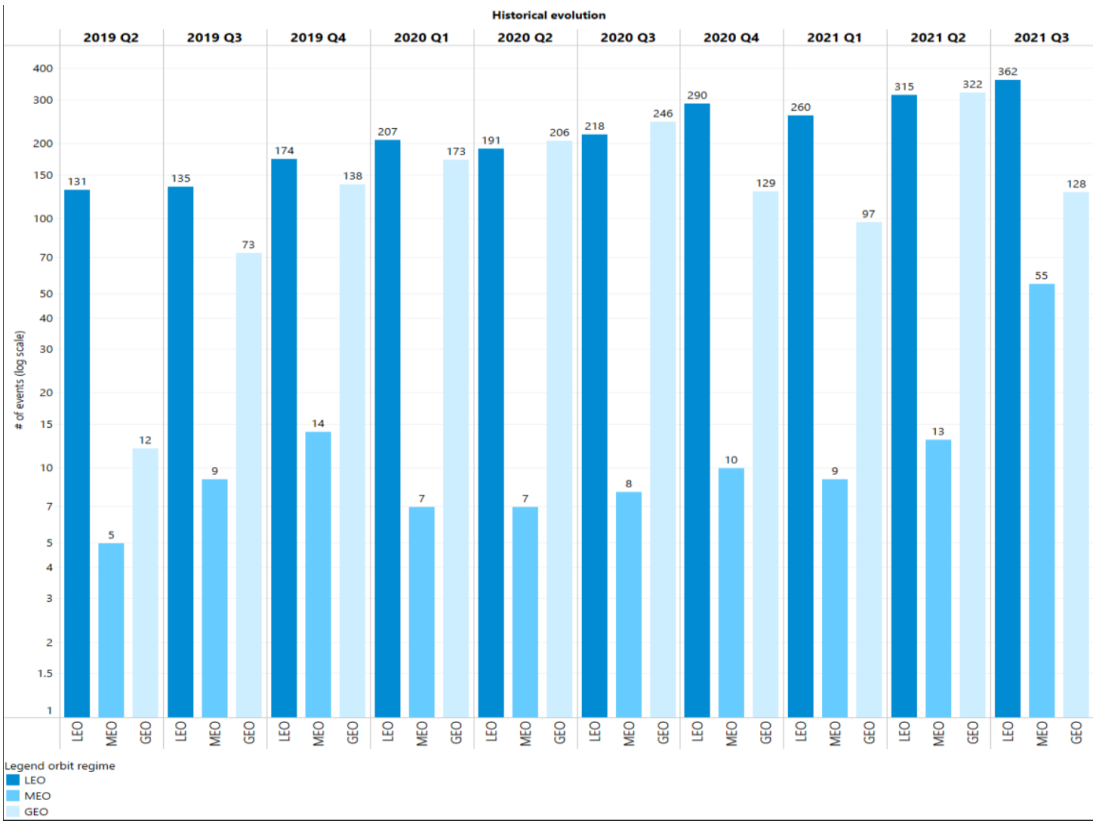

Table 1: Events = risk or high risk of collision between two space objects as detected by EU SST.

Thirdly, space is increasingly contested, **threatening the security and resilience** of the EU's and Member States' space assets and highlighting the urgent need for international discussions to agree on and implement norms of responsible behaviour in outer space by state and non-state actors. Especially, LEO, the area of outer space around Earth that includes all orbits below 2,000km, and is the home of the International Space Station and of thousands of other satellites, is rapidly becoming a hazardous area due to space debris and inoperable spacecraft orbiting at very high speeds. A cascade where each collision increases the likelihood of further collisions is increasingly becoming a real risk for the operability of LEO. [8]

Fourthly, whilst these three interlinked developments are occurring, there currently exist only **very limited global "rules of the road" on conduct in outer space**. Despite notable achievements at United Nations (UN) level[9], the development of a comprehensive approach at international level is facing considerable diplomatic and political hurdles, which add to the urgency to act.

In the light of these developments, the necessity for the EU to act and develop an EU approach on STM is compelling.

2.3 The need to act collectively

As space is global and **not confined by national boundaries**, the capacity of one country to impose its legal obligations on another in the space domain is limited, even if major space-

[8] Cascade in which each collision generates space debris.
[9] In 2018, the COPUOS developed 21 guidelines for the long-term sustainability of outer space activities.

faring nations might address the challenge of STM by adopting national guidelines, like the US with the adoption of the Space Policy Directive 3 in 2018.[10]

If Member States and the EU want to protect their space assets, it is imperative to work on a collective approach with the involvement of all EU stakeholders. This will increase EU resilience by avoiding technological dependencies, ensure strategic autonomy through the development of EU capacities, and guarantee cooperation with partners, in particular through burden sharing.

The **EU is well-positioned to act , being able to identify needs, aggregate requirements, synthesise stakeholders' views, leverage technology and coordinate external engagement.** The **EU approach on STM will build on four avenues** developed in parallel 1) assessing the STM requirements and impacts for the EU, 2) enhancing EU operational capabilities to support STM, 3) fostering the STM regulatory aspects and 4) promoting the EU STM approach at the international level.

3 ASSESSING THE STM REQUIREMENTS AND IMPACTS FOR THE EU

The EU needs a clear **understanding of the requirements and the potential impact of STM developments** on various European stakeholders. Beyond the capacity to aggregate needs and establish requirements, this entails mobilising the various stakeholders across the civilian and military communities and ensuring convergence on common level.

The Commission and the High Representative, within their respective competences, will set up a **process of consultation and discussion with all relevant EU stakeholders** to assess the needs and impact of STM on the various policy areas of the EU. For instance, in the area of transport, in particular Aviation where consistency between space and air-traffic management needs to be ensured, in order to ensure specifically the safety, security and sustainable performance of aviation, due to the increasing traffic to and from space, and from uncontrolled debris re-entering the airspace. As a result, cooperation between the different actors and authorities should be fostered. To this end, an **inclusive and transparent consultation mechanism** will be established to gather the positions of the stakeholders involved, including the EU space industry. A regular dialogue on STM will address inter alia the specific needs of the European space ecosystem.

While affirming the principle of a civilian STM under civilian control, the EU approach on STM should also **take into account the specific needs of defence and security** as an integral element of a common strategic culture for the space domain**.** The defence requirements and constraints for STM could relate to the operation of military satellites, of military payloads or of civilian satellites and services, which have military users, such as the Public Regulated Service (PRS) of Galileo. The military could also have requirements linked to specific areas of operations such as Common Security and Defence Policy missions and operations.

Capturing both the civilian and the military needs and analysing the impact of STM across the various policy areas of the Union will be carried out by the Commission and the High

[10] https://trumpwhitehouse.archives.gov/presidential-actions/space-policy-directive-3-national-space-traffic-management-policy/

Representative with the support of the European Defence Agency (EDA) for consolidating the specific military needs in question and acting as the military interface for STM.

Action 1:

By mid-2022, the Commission and the High Representative will set up a consultation mechanism with all relevant EU stakeholders. This will aggregate by early 2023 the civilian and military requirements towards an EU STM approach and maintain a regular dialogue on STM-related developments covering both civilian and military needs. As part of this mechanism, the EDA will work with Member States to consolidate military needs.

4 ENHANCING EU OPERATIONAL CAPABILITIES TO SUPPORT STM

To perform STM activities, it is necessary to be able to observe space traffic continuously. The **EU Space Surveillance and Tracking (SST) constitutes the operational pillar** for the EU STM approach. The EU SST Consortium[11] provides data, information and services related to the surveillance and tracking of space objects orbiting the Earth. It will be replaced by the EU SST Partnership in accordance with the Regulation establishing the Union Space Programme ('Space Regulation').[12] This new Partnership will include more Member States willing to join and will provide additional services for European and international users.[13]

4.1 Towards an autonomous EU Space Surveillance and Tracking of space objects

The work performed by the EU SST Consortium since 2014 has paved the way for the development of an **effective and reliable protection of space assets of the EU especially the satellites of the European Union Space Programme, its Member States and other space operators** that have registered with the service.

Today, EU SST is providing collision avoidance services[14] to more than 260 satellites distributed in Low Earth Orbit, Medium Earth Orbit and Geostationary Orbit using Member States' civil and military assets that remain under the control of its Member States and the EU as provided for in the Space Regulation. As part of the Space Situational Awareness component of the EU Space Programme, EU SST is the **key operational capability** for future EU STM. It also supports other EU policies requiring autonomous decision-making[15].

In order to face the STM challenges, the EU must further develop its SST capabilities to a sufficient level of autonomy, while taking into account ongoing work carried out by the Member States, including in the framework of the European Defence Fund (EDF). This requires:

[11] The EU SST Consortium established by Decision 541/2014/EU is the entity delivering the EU SST services. It is composed of seven Member States, France, Germany, Italy, Poland, Portugal, Romania and Spain.

[12] Regulation (EU) 2021/696 of the European Parliament and of the Council of 28 April 2021 establishing the Union Space Programme and the European Union Agency for the Space Programme and repealing Regulations (EU) No 912/2010, (EU) No 1285/2013 and (EU) No 377/2014 and Decision No 541/2014/EU, OJ L 170, 12.5.2021, p. 69–148.

[13] The Space Regulation provides a budget of EUR 200 million for SST.

[14] Article 55 1) a) of the Space Regulation defines the Collision Avoidance service provided by the EUSST as followed: the risk assessment of collision between spacecraft or between spacecraft and space debris and the potential generation of collision avoidance alerts during the phases of launch, early orbit, orbit raising, in-orbit operations and disposal phases of spacecraft missions.

[15] For example, civil protection in case of risky re-entry of space objects for instance, and CFSP/CSDP as recalled in the Strategic Compass

- *Improvement of the performance of EU SST services and development of additional SST services* – The performance of the operational capabilities needs to be reinforced to cope with future STM operational challenges; new services need to be developed in order to prepare the EU for STM operational challenges; and
- *Use of new technologies* – New technologies are already applied today; however, their use needs to be reinforced in anticipation of the new challenges raised by STM.
- *Involvement of the EU industrial ecosystem* –EU industry already contributes to EU SST; however, their potential could be leveraged further, with regard to SMEs and start-ups, building upon the public services delivered by EU SST.

4.2 Improve and extend EU SST services

EU SST provides services based mainly on the United States (US) catalogue of space objects, complementing this catalogue increasingly with its own data and national catalogues. EU SST's main value added is to provide an intermediary task in case of high-interest events, for example producing more up-to-date and precise data through the tasking of EU SST assets and the processing of data.

So far, the US have been providing data on space objects above 10cm and continue improving their catalogue. In order to increase its resilience through diversity of sources, ensure its strategic autonomy and support cooperation with partners, in particular through burden sharing, **the EU needs to increase the performance of its SST operational capabilities.** To this end, it needs to ensure that:

– the EU SST Partnership pursues the necessary activities in order to be able to detect all objects equal and above 10cm.
Activities for the development of new assets could include, for example, the development of space-based sensors in the context of the Secure Connectivity Programme, and more performant radar and telescope systems. The development of new technologies and sensors has to make best use of civil and defence synergies.

– the EU SST Partnership has access to more SST assets located outside continental Europe.
The capability to observe space objects efficiently is related directly to the geographical positioning of the assets (radars, telescopes and lasers). To date, EU assets are mostly located in continental Europe. **To the extent possible, coverage of the sky should be enhanced with EU-controlled assets located outside the European continent.**

Furthermore, the number of satellites launched and the pace of launches is increasing rapidly, which automatically increases the alerts related to collision avoidance and re-entries. The EU SST Consortium provides three services: Collision Avoidance, which supports spacecraft operators in managing conjunctions of their satellites during routine and special operations, as well as Re-entry Analysis and Fragmentation Analysis. The Space Regulation introduces two additional services: Mitigation and Remediation[16].

These new additional services and an evolution to upgrade the functionality of the existing services will be required in order to address new challenges in space, such as mega constellations. Building on the work already carried out by the EU SST Consortium, the future

[16] Space debris mitigation aims to reduce the generation of space debris in the future and space debris remediation aims to develop methods to manage the existing space debris.

EU SST Partnership should develop the additional services related to the EU STM approach. These services could serve to **support mitigation operations, and complement remediation and in-orbit servicing operations**, by increasing the safety of critical operations, by developing platforms for communication and coordination of satellite operators registered as users of EU SST, and by providing in-orbit contingency and anomaly support etc.

4.3 Develop new technologies to tackle STM requirements

The development of automatic collision-avoidance services and the use of artificial intelligence and quantum technology should be accelerated to cope with the increased number of space objects and EU SST users. In addition, the surge of operators in general will require for the EU to ensure that the false alarm rate (number of false collision warnings) decreases in order to focus on the most problematic conjunctions. The EU will address these technological challenges through research and development activities that are key to foster the quality of SST services provided.

This will require **mobilising available funding opportunities at Commission and Member States level**, including synergy funding or blending of EU and national funds. This could potentially be complemented by funds of the European Space Agency (ESA) in support of EU policy, provided that the security interests of the EU and its Member States are protected.

In addition, synergies between research activities supported under Horizon Europe[17] and activities under the **European Defence Industrial Development Programme (EDIDP) and the European Defence Fund (EDF)** need to be ensured.

4.4 Making the most of the EU industrial ecosystem

EU industry is directly involved in the development of the current SST operational capabilities: EU companies are participating in calls for tenders published by the members of the EU SST Consortium. As a result, up to **75% of the funds provided by the EU to the EU SST Consortium are sub-contracted to EU industry**.[18] This has already created a European industrial ecosystem around SST that should be in a position to contribute to the EU STM approach.

It is necessary to **ensure that all the potential offered by EU industry, including New Space, is exploited building upon the public services delivered by EU SST**. SST Data could constitute a real opportunity for EU industry. **The Space Regulation foresees the development of an EU SST catalogue[19] by end of 2024 using EU SST sensors.** This catalogue[20] will be based on the work performed in recent years with the establishment of an EU SST data-sharing platform (EU SST database[21]). The development of improved SST operational capabilities and additional assets located outside continental Europe will further improve the quality of the future EU catalogue. Some layers of this catalogue and the related data-sharing platform will

[17] The term 'Horizon Europe' in this document refers to the Specific programme implementing Horizon Europe and the European Institute of Innovation and Technology; activities carried out under them have an exclusive focus on civil applications.
[18] The remaining 25% are consumed by the participating national entities of the EU SST Consortium itself.
[19] A consistent record and history of traceable data (e.g. object information, measurement data, orbit data, uncertainty) that are maintained by a unique system.
[20] The EUSST Catalogue should be available by end of 2024.
[21] The EU SST Database is the platform for sharing, storing and disseminating data and information within EU SST (e.g. object information, measurement data, orbit data, tasking requests, national and EU SST catalogues) and connects to the Operations Centres of the Member States.

be made available to EU companies for research activities related to the development of added-value derived STM services in Europe and at the international level.

In addition, the dialogue with the EU's SST-related industry needs to be intensified. The aim is to **make the best use of the EU's capabilities and innovation in the field of SST**. This should take the form of actions initiated by the EU SST Partnership to reap the benefits of the EU industry's innovation potential. Specific measures could include for example regular **Industry Days** where companies have the opportunity to present the new technologies and innovations, or as within the framework of the **CASSINI initiative**,[22] dedicated hackathons for SMEs and start-ups, calls, grants, prize, etc.

These measures, while stimulating innovation, will feed the EU SST Partnership with the latest technological developments.

Action 2: The Commission, with the support of the EU SST Partnership, will

a) improve the performance of existing services:

- by mid 2023 (preparation phase) elaborate an architecture analysis of the future STM needs including identification of the necessary resources for a more efficient and performant EU SST system, able to detect all objects above 10cm; and

- by 2025 (implementation phase), start the deployment of additional assets.

b) develop new services:

- by mid-2023, propose new services to address forthcoming challenges raised in STM;

- by 2025, validate the new services that will become operational.

c) foster technology:

- by end of 2023 liaise with the EU industry to establish a specific forum on technological and innovation cross-fertilisation;

- by end of 2023, prepare a detailed research plan targeting new technologies; and

- by end of 2025, assess its implementation process.

Action 3: The Commission will initiate specific actions in the framework of CASSINI to reap the full innovation potential of start-ups.

Action 4: The Commission, in coordination with the EU SST Partnership, will make accessible to industry:

- by 2023 parts of the data sharing platform; and

- by 2025 parts of the future EU SST catalogue.

[22] https://ec.europa.eu/defence-industry-space/eu-space-policy/space-research-and-innovation/cassini-space-entrepreneurship-initiative_en

5 FOSTERING STM REGULATORY ASPECTS

The EU STM approach also addresses the regulatory aspects of STM. It will comprise non-binding measures (standards and guidelines) and, as well, binding obligations (legislation) at EU level.

5.1 Monitoring the development of STM standards and guidelines

The **benefits of standards** for European industry are broad[23]. STM standards developed by space stakeholders aim to ensure interoperability and safety, reduce costs and facilitate space manoeuvers. Standards help manufacturers reduce costs, anticipate technical requirements, and increase productivity, innovation and efficiency.

The space sector is highly technical and requires the use of standards at every stage of the value-chain. National, European and international standardisation bodies adopt space standards. Other UN technical agencies play an important role in the establishment of sectorial world standards. **Beyond the traditional standardisation bodies[24]**, **several specific actors exist in** the space sector[25]. Space related guidelines are also developed within the UN framework, the latest example are the UN's "Long Term Sustainability guidelines".[26] The STM standards and guidelines have a direct impact on the safe and sustainable use of outer space.

The EU should foster an EU common approach towards standards because they have a tangible effect on the shaping of the future global STM system. **A specific forum** aiming at ensuring a holistic EU approach on STM in international standardisation fora dealing with STM will be established in close cooperation with the Member States. All other EU actors will have the opportunity to participate, such as the EU SST Partnership, EU industry, etc.

5.2 Development and promotion of STM standards and guidelines

The EU should facilitate the development of STM standards and guidelines aiming at ensuring the safe and sustainable use of space.

For that reason, the EU should be **at the forefront of the development of STM guidelines and standards**. The EU should **be pro-active** at ensuring the development of international standards where feasible and needed, and developing its own EU standards whenever appropriate. In addition, the EU should prioritise the most impactful standards and guidelines, and **promote their implementation** through a toolbox and recommendations.

The Commission intends to **develop a toolbox** based on identified STM standards and guidelines, which could help Member States when they grant licences for the provision of services requested by satellite operators over their territory. The objective is to ensure that risks related to space traffic (interference and collision avoidance in particular) are identified and mitigated. The approach would be similar to the EU toolbox for 5G security[27].

[23] On 2 February 2022, the Commission adopted an EU Strategy on Standardisation: Setting global standards in support of a resilient, green and digital EU single market, COM(2022) 31 final, which underlines the link of standardisation with projection of values, industrial leadership, the changing geopolitical landscape, and the EU's role as trusted actor for developing global standards.
[24] National Standardisation Bodies, CEN/CENELEC and the International Standardisation Organisation
[25] Such as the European Cooperation for Space Standards (ECSS), the Consultative Committee for Space Data and Systems (CCSDS), and the Inter-Agency Space Debris Coordination Committee (IADC).
[26] Guidelines for the Long-term Sustainability of Outer Space Activities, A/AC.105/2018/CRP.20, 27 June 2018.
[27] The EU toolbox for 5G security | Shaping Europe's digital future (europa.eu)

While working closely with Member States in the standardisation field, the Commission could support the selection of STM standards and guidelines, which should be promoted at EU level. These standards could for example concern the use of active devices to facilitate the tracking of satellites, the warning of any major incident or re-entry, as well as the development of guidelines for special cases of STM, such as non-manoeuvrable satellites or constellations.

5.3 Incentivise STM standards and guidelines

In order to foster the use by EU operators of the guidelines and standards recommended at the EU level, **incentive measures will be put in place**. For instance, the EU will consider:

- use a **'safe space' label** similar to the concept of the eco-label. Those companies and operators using the label could increase their share in the market by acceding to clients sensitive to safe and sustainable space operations;
- adapt **award criteria** to promote the use of recommended guidelines and standards within relevant EU instruments (Horizon Europe, Space Programme Regulation, InvestEU, European Defence Fund, and other space initiatives, etc.),
- establish a **list of companies and operators** which implement STM guidelines or standards.

Any incentive tool would require establishing a **mechanism to supervise the implementation of the recommended guidelines and standards**. The EU, in close cooperation with Member States, will consider the development of **a certification mechanism for STM** in order to be able to verify the implementation by companies of the recommended guidelines and standards.

5.4 Towards STM obligations

In the short term, certain limited obligations involving limited costs for the industry should be envisaged. The steep increase of traffic to and from space and of the number of satellites in the different orbits of space and the necessity to avoid the generation of debris through further collision compels to impose certain obligations to every satellite operator. Therefore, a legal proposal should impose that all satellite operators providing services within the EU should **register with a collision avoidance service** that offers at least a similar level of performances as the current services offered by EU SST.

In addition, the entities in charge of collision avoidance services should have communication mechanisms and contacts (i.e. operators' directory) at their disposal for managing conjunction events with other service providers to ensure timely responses and coordinated collision avoidance manoeuvres.

In the medium term, a more comprehensive regulatory approach on STM should be developed, in consultation with Member States, to identify relevant areas for legislation while preserving the competitiveness of the EU industry, in line with the respective competences of the EU and its Member States.

Some Member States have adopted national legislation regarding STM. Others are considering the possibility to adopt national measures. A fragmented approach to space at EU level not only prevents the emergence of a well-functioning internal market important to the development of EU goods and services associated with the use of Space, but can also have negative repercussions on other Union policies such as climate, environment and transport, and in particular in aviation, where efforts to reduce fragmentation of European airspace are ongoing.

A coherent approach at the EU level appears to be necessary. To that end and based on the **EU stakeholders'** needs and the identified rules and standards, and after having duly associated the Member States to the consultation process, the EU should make a **legislative proposal covering STM rules**.

This legislative proposal should aim at developing of a common level playing field at the EU level, which would ensure that the most virtuous operators are not be penalised. It should also guarantee that the EU operators do not suffer from distortion of competition by operators established outside the EU benefiting from less stringent standards, for instance by imposing equal treatment to EU operators and to any satellite operator intending to provide services within the EU.

On the substance, the potential proposal could be limited to the establishment of essential STM requirements taking into account existing EU level requirements for air traffic management. Subsequently, the European standardisation organisations could develop the relevant technical requirements for STM in the form of harmonised standards or guidelines, which in turn would allow manufacturers and operators to prove compliance with these essential requirements.

Action 5: The Commission and the High Representative depending on the EU competence involved and in close collaboration with the Member States, will:

- by end of 2023 establish the necessary forum to ensure that effective information and coordination regarding the standards and guidelines developed at the international level is in place in the EU.

That forum will with the support of the EU SST Partnership, EU industry and ESA:

a) develop new European and international standards;

b) promote selected standards and guidelines at the EU level; and

c) create a toolbox to assisting Member States in licensing requests by satellite operators.

Action 6: The Commission, in close collaboration with Member States, will:

- by end of 2023 identify possible incentive measures and a certification mechanism towards the implementation of STM standards and guidelines and

- by end of 2024 establish a certification mechanism and implement incentive measures.

Action 7: The Commission, in close collaboration with Member States, will

- by end of 2023 propose an initial, limited set of obligations;

- by mid-2024 identify possible areas for an EU STM legislation and

- by end of 2024 make a proposal for an EU STM legislation.

6 PROMOTING THE EU STM APPROACH GLOBALLY

The **EU STM approach aims to contribute to a global endeavour**, pairing existing regional capabilities and tools with an overall ambition for global cooperation. This constitutes the

'external avenue' of the EU STM approach, which will actively promote pragmatic and concrete solutions towards a more global STM. This would meet the EU's core principles and values regarding outer space while preserving its diplomatic, economic and political interests as well as those of its Member States.

6.1 Promoting a multilateral STM

The EU STM approach aims at contributing to a global STM to be managed at international level. The EU already:

- promotes the **preservation of a safe, secure and sustainable space environment** and the peaceful use of outer space on an equitable and mutual acceptable basis;
- stresses the importance of **transparency and confidence-building measures;** and
- advocates **responsible behaviour in outer space** in the framework of the United Nations.

Building upon these principles, the EU approach on **STM will favour a multilateral STM approach in the framework of the UN**. As part of the EU STM approach, the Union will seek to foster the discussion on STM in the relevant UN fora in particular the Committee on the Peaceful Use of Outer Space (COPUOS), but also in the Conference of Disarmament with the objective to table a discussion at the UN General Assembly. The EU will identify and engage with the relevant UN bodies, which could support or contribute to such activities. The International Telecommunications Union, for instance, is already involved in the management of orbits and filing of frequencies, and routinely handles standardisation activities in various areas. The International Civil Aviation Organisation is also involved in the development of standards in the areas where space operations interact with civil aviation.

Acceptance by the EU of the relevant United Nations Treaties and Conventions on outer space, which Member States have repeatedly called upon, would help enhance EU credibility regarding the promotion of the sustainable use of and responsible behaviours in space, as well as strengthen its position and the legitimacy at international level. The international rules applicable to space activities are included in five international conventions, commonly referred to as the "five United Nations treaties on outer space", which currently do not recognise the participation of international organisations. The Rescue Agreement, the Liability Convention and the Registration Convention allow that participation, although not at equal footing with State parties. Considering the parallel competence that the Union enjoys in the area of space alongside its Member States, actions should be undertaken to explore EU participation in the Rescue Agreement, the Liability Convention and the Registration Convention while safeguarding the specific interests of the Union related to the implementation of the Space Programme.

6.2 Towards regional STM contributions to a global effort

A future STM regime would ideally be organised globally. Today very few countries in the world can independently deploy a globally performing SST system capable of processing the necessary services to perform STM, as described in chapter 4, or define and oversee STM Regulatory aspects described in chapter 5. Thus, forging partnerships and sharing the STM burden through complementary capabilities and norms is a practical solution in everyone's interest.

Furthermore, STM relies on certain level of trust among space-faring nations and requires redundant systems. **An approach made of regional contributions is a pragmatic, bottom-up way** to build this confidence and ensure the necessary redundancy. Once the various regional elements of STM are mature enough and sufficiently convergent, and there is sufficient consensus on the various rules and standards described in chapter 4, the STM regional components could then form part of a global STM, with an appropriate governance still to be determined.

The development of the EU approach on STM within the Union is only the first step of a more general process. The aim will be to extend the EU STM approach from the Union and its Member States to a Europe-wide approach, and on that basis initiate a process at the international level both in the UN and bilaterally. It is therefore important to promote to external partners the concept of a multilateral approach with regional contributions.

6.3 Privileged discussion with the US

The US is the most advanced actor upon STM, having invested billions of USD in the last 20 years in SST capabilities. As a result, it has the most performant SST capability in the world, sharing its data worldwide. Through Space Policy Directive 3, it has started to develop a dedicated approach in the STM field.

While the EU first needs to develop its own STM approach, it must do so in close cooperation with the US. At the EU-US Summit in June 2021, both sides agreed to **exchange on respective approaches to STM**. In this respect and against the background of the increasing US activities on STM, the Commission and the High Representative will **explore ways of ensuring closer cooperation** and mutual interoperability and complementarity on STM with the US.

6.4 Dialogues with other third countries

The EU will pursue an **active diplomacy related to STM**. Discussions with international partners should focus on civil matters (e.g. operations, standardisations, etc.) but also highlight related security and defence aspects of STM. In particular, this should involve the promotion of the EU STM approach on **relevant perspectives such as operational safety and long-term sustainability** of the orbital environment, including by **encouraging interest in EU services** available to a wider global community (e.g. EU SST).

Action 8: The Commission and the High Representative, depending on the EU competence involved, in collaboration with the Member States will engage with the UN to identify or help create specific bodies for STM with a view to implementing concrete STM solutions at global level.

Action 9: By mid-2022, the Commission will explore possible ways by which the EU could participate in the UN Rescue Agreement, in the Liability Convention and in the Registration Convention while safeguarding the interests of the Union. To this end, the Commission will analyse and work on possible measures needed in order to implement the obligations enshrined in these Conventions.

Action 10: The Commission and the High Representative, depending on the EU competence involved, in close cooperation with the Member States will:

- promote a regional approach on STM with third countries and relevant regional fora partners in order to prepare the future establishment of a global STM system based on regional contributions,

- further engage with the US with a view to ensuring closer cooperation and mutual interoperability on STM related matters,

- systematically address STM in the space dialogues with third countries.

7 CONCLUSION

As an EU contribution to a global public policy challenge, this Joint Communication aims at initiating an articulated coherent and coordinated EU STM approach for the EU and its Member States, and at promoting an EU position on STM in international and multilateral fora.

The EU must act now – swiftly, collectively and resolutely to ensure a safe, secure and sustainable use of space. The Joint Communication proposes a dynamic and evolving EU approach with several concrete actions on STM, with a view to preserving EU and Member States' interests in full compliance with the competences of the EU and its Member States.

These actions comprise assessing the STM civil and defence requirements for the EU, enhancing EU operational capabilities to support STM in terms of services and technologies, fostering STM regulatory aspects culminating in relevant legislation, and promoting the EU STM approach globally.

These efforts will enhance the resilience of EU and Member States' space infrastructure our societies and economies depend on, provide greater certainty for operators, support the competitiveness of European industry, and, together with our partners, make a concrete contribution to the global endeavour of sustaining space services and applications in the coming decades.