



**EU SST**  
Space Surveillance and Tracking

Ensuring space safety  
and sustainability

# European Union Space Surveillance and Tracking State of play for CA service

Monique MOURY (CNES), Cristina PEREZ (AEE)  
EU SST Partnership

May 15<sup>th</sup>, 2024 – SSA OPERATORS' WORKSHOP - BOULDER USA  
Sensitive unclassified

Funded by the European Union. This message reflects only the SST Cooperation's actions and the European Commission and the European Health and Digital Executive Agency are not responsible for any use that may be made of the information it contains

**#EUSpace**



PROGRAMME OF THE  
EUROPEAN UNION

# Overview

1. What is EU SST?
2. Governance
3. Priorities
4. Operations
5. Data sharing
6. Service provision
7. Opening of EU SST CA service
8. What's next ?



# What is EU SST?

**SST became a component of the current European Union Space Programme, adopted in April 2021**

## Our goals:

- Ensure **resilience of European space infrastructures**
- Higher level of **strategic autonomy**
- Global **SSA** burden-sharing

## We:

- are **operational**: sensor network, database, services, users
- perform **research and innovation** activities to improve the level of performance: upgrades of sensors, architecture studies, etc.
- are **security** relevant: security and data sharing
- are mature and expand inside **EU Space Programme**

# Governance

**Inherently dual governance** structure in place in which civilian, military and security actors collaborate, which enables to operate taking into account the **security** dimension.

## EU SST Partnership:

15 EU Member States

- Austria, Czech Republic, Denmark, Finland, France, Germany, Greece, Italy, Latvia, the Netherlands, Poland, Portugal, Romania, Spain, Sweden



Since July 2023  
**EUSPA** as  
Front Desk



Overseen by  
**European Commission**



# Strategy – our priorities

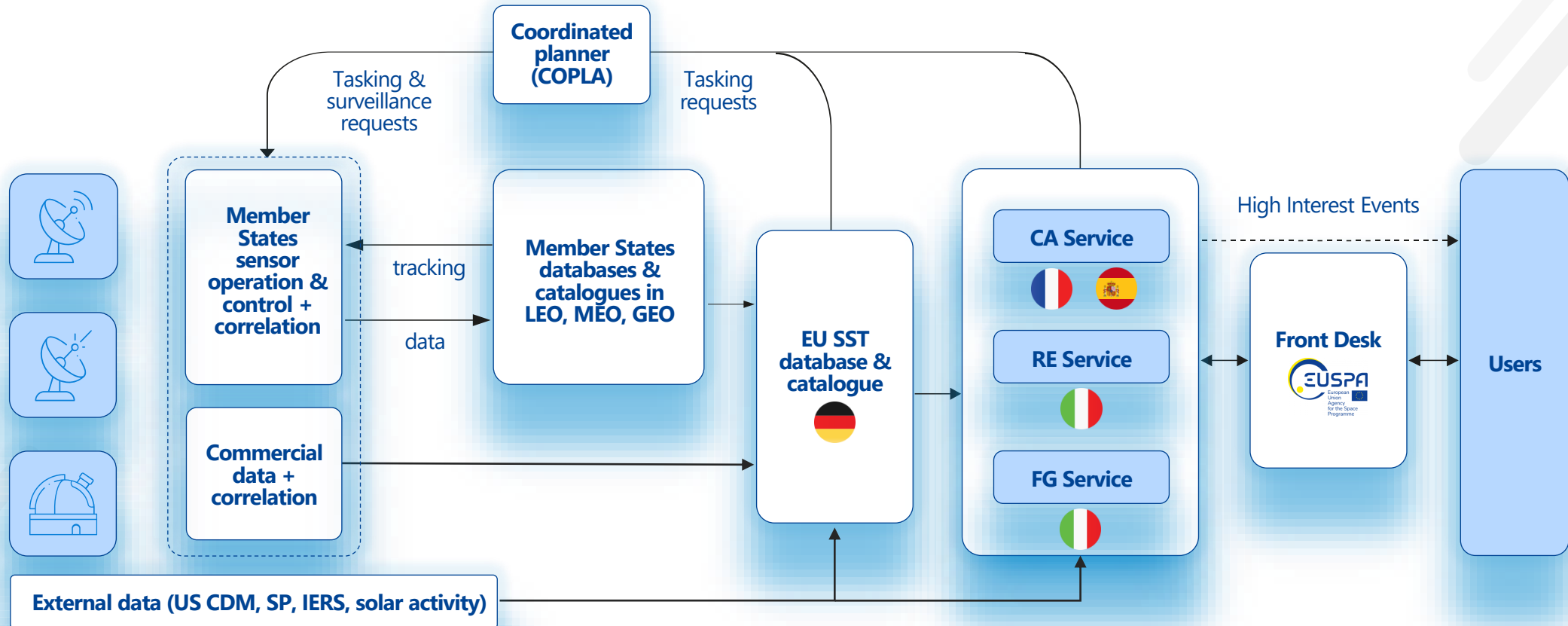
- Build and run an **operational SSA system** 24/7 to provide public services in collision avoidance, reentry and fragmentation analysis to ensure a minimum level of space safety and sustainability
- Perform research and development of SST capabilities to improve the level of performance and **strategic autonomy**
- Foster innovation and **competitiveness** of the European industry and start ups, support the consolidation of a commercial ecosystem around SSA, strengthening strategic autonomy in Europe
- Exploit **synergies between civil and defense**, avoid unnecessary duplications, and join forces in order to improve the level of European strategic autonomy
- Engage with **international partners** and contribute to the global burden sharing of the SSA domain through a regional SSA approach

# Operations - Overview

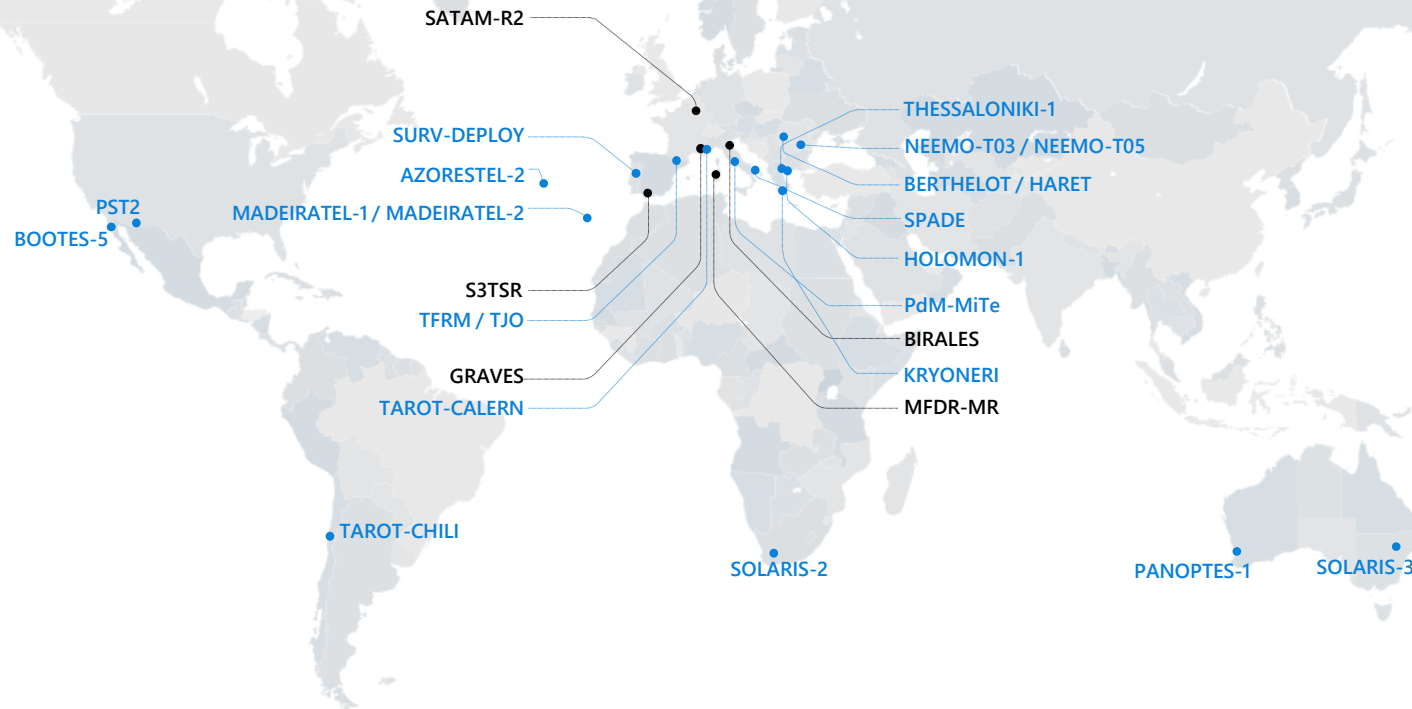
## Sensor network

## Data processing

## Service provision



# Operations - Sensors



- **5 Radars**  
(2 surveillance, 3 tracking)
- **22 Telescopes**  
(11 surveillance, 11 tracking)

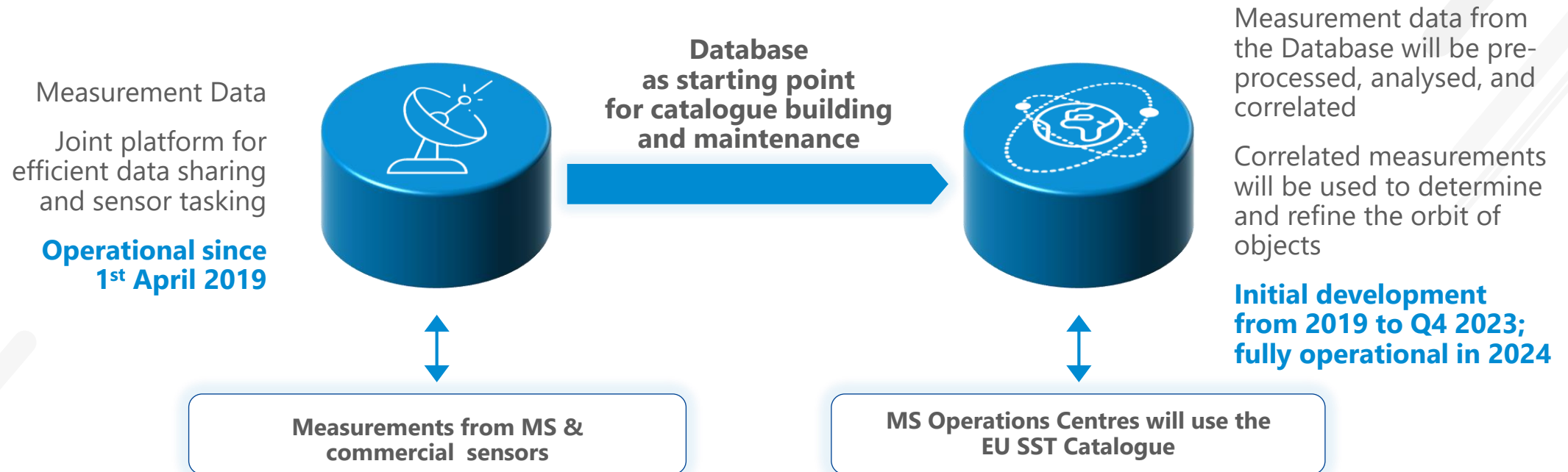
Dual approach which enables the use of sensors of different origins: **scientific, military and commercial**

Commercial data Acquisition process in final stage => measurements from July 2024 onwards

# Data sharing - Towards a European catalogue

## EU SST Database

## EU SST Catalogue





# Service provision - 3 operational & added value services



## Collision Avoidance (CA)

Risk assessment of collision and generation of collision avoidance alerts

## Fragmentation Analysis (FG)

Detection and characterisation of in-orbit fragmentations

## Re-entry Analysis (RE)

Risk assessment of space objects re-entry into the Earth's atmosphere

### Key features

- **User-tailored** service (SCD)
- Hot redundancy scheme involving ES (S3TOC) and FR (FR-SSA) with harmonised service level and single service provider per registered user
- Enhanced **Analysis & Risk Mitigation** support (e.g. covariance estimations, HBR estimations, PoC sensitivity analysis, CAM support)

- Provided by IT (C-SSA)
- Short-term notification to **confirm quickly an FG event**
- Medium-term FG analysis based on the orbital parameters of the **catalogued fragments** e.g. Gabbard Diagram
- Long-term FG analysis (**with simulations with breakup model**)

- Provided by IT (C-SSA)
- Long-term (within 30 days) **re-entry predictions**
- Short-term (a few days) overflight predictions with **ground tracks over customisable areas of interest**



# Service provision - SST Front Desk

## SST Partnership

Responsible for generating the SST services and their information



## SST Front Desk

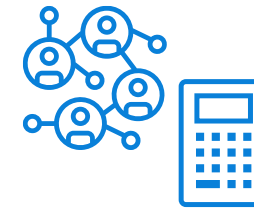
Interface for the delivery of the SST services in accordance with the Data and Information Policy



Operational  
support &  
reporting



SST platform,  
software development  
and security



User uptake and  
communication



## SST users

SST services to be provided to:



- all Member States;
- the EEAS;
- the Commission;
- the Council;
- the EUSPA;
- spacecraft owners and operators established in the EU;
- other public and private entities established in the EU;
- international SST users.

# Service provision ▪ Users



**200**  
ORGS  
25 EU MS

Collision  
Avoidance

**74**  
ORGS

Fragmentation  
Analysis

**152**  
ORGS

Re-entry  
Analysis

**159**  
ORGS

 **491**  
Satellites



# Service provision ▪ User feedback

**8.4/10**  
Overall  
feedback

**8.4/10**  
Front Desk

**8.5/10**  
Collision  
Avoidance

**8.2/10**  
Re-entry  
Analysis

**8.6/10**  
Fragmentation  
Analysis

*"The Collision Avoidance service is very responsive. Its personnel is highly attentive and the on-call team is excellent."*

**ICEYE**

*"The smooth integration of the Sentinel-6 and Sentinel-3 missions proves the excellent level of scalability of the SST services."*

*"The flexibility to adjust the services to the operator's needs, as for Sentinel-6 acquisition and Metop-A end-of-life operations, is very useful."*

*"The Front Desk provides good visibility of what is happening. Looking forward to the upcoming communication platform."*

 **EUMETSAT**

*"The improvements on the Re-entry Analysis service are very welcome. Please keep up the good work!"*



Department of Civil Aviation – Cyprus

*\*Feedback obtained at the latest User Feedback Campaign (March 2022)*

# Opening of EU SST CA service

In Europe, it is considered that there is a need for a fundamentally public collision avoidance service to prevent avoidable collisions in order to **ensure a minimum level of safety in space**. One major catastrophic collision in orbit would generate thousands of new debris and would therefore endanger all space activities over a long period of time.

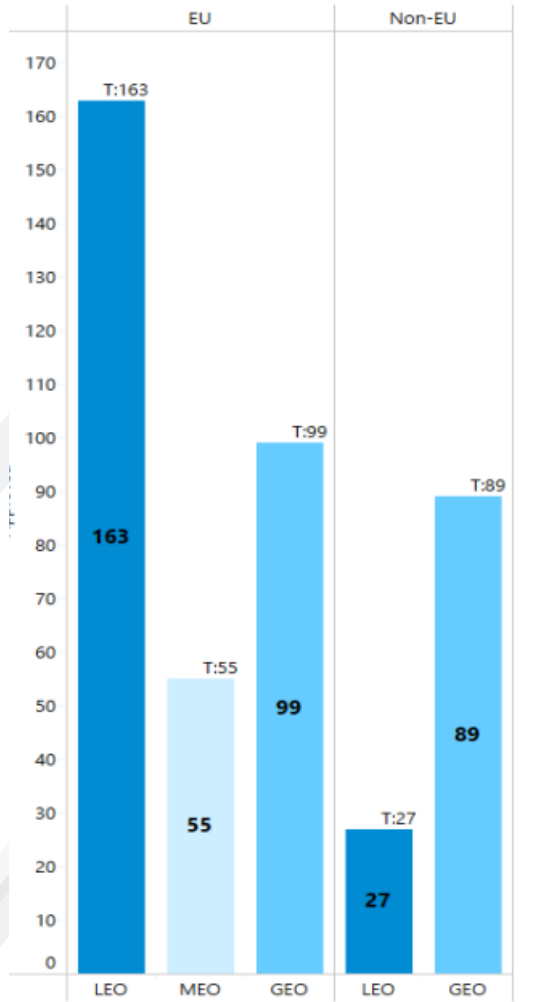
The **opening of the Collision Avoidance service to operators worldwide from 1 January 2023 onwards**, is meant to ensure that minimum level of safety.

- The opening follows a **progressive and ramp up approach**.
- It is a political decision made by the 27 Member States of the European Union, along with European Parliament, Council of the European Union and European Commission.
- It follows the footsteps of the United States which, in 2010, decided to inform all spacecraft operators in the world on their risks of collision following the 2009 collision between an operational Iridium-33 and a defunct Kosmos-2251.
- EU SST Operational Centers already rely on European commercial ecosystem to provide the public CA services, for operational activities as well as software maintenance.

\*Joint Communication of the European Commission and the EU's HR/VP "An EU Approach for Space Traffic Management"



# What's next?



- EU SST CA service is a public service, opened world-wide, 24/7 operational for nominal operations in all the phases of the mission.
- This public service is meant to ensure the safety of the space flight operations.
- EU SST is working closely with the OSC to ensure a common understanding of both systems.
- Due to the increased number of users EU SST is working in the evolution of the CA service to accommodate those requests ensuring the technical excellence of the service

Updated as of 01/02/2024



**EU SST**  
Space Surveillance and Tracking

Ensuring space safety  
and sustainability

# Thank you

  
@EU\_SST

  
EU-SST

  
EUSST

**#EUSpace**



PROGRAMME OF THE  
EUROPEAN UNION