



ESA's contribution to Space and Security in Europe

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The Brussels Space Policy Roundtable
3 November 2011



The European institutional context for space and security

- Intergovernmental agency created in its current form in 1975
- Purpose of ESA
“To provide for and promote, **for exclusively peaceful purposes**, cooperation among European states in space research and technology and their space applications.”

Article 2 of ESA Convention



EU / ESA / EDA Member States



Bulgaria
Cyprus
Latvia
Lithuania
Malta
Slovakia



Denmark
Austria
Belgium
Czech Republic
Finland
France
Germany
Greece
Ireland
Italy
Luxembourg
Netherlands
Portugal
Spain
Sweden
United Kingdom
Romania
Hungary¹
Poland¹
Slovenia¹
Estonia¹

Norway
Switzerland
Canada²



1. *ESA Cooperating States*
2. *Cooperating State*

2004: ESA/EC Framework Agreement

Progressive development of overall European Space Policy by providing a common basis and appropriate operational arrangements for efficient and mutually beneficial ESA/EC cooperation.

Creation of Space Council (SC), High-Level Space Policy Group (HSPG) and ESA/EC Joint Secretariat.

- ❑ Under the EU – ESA Framework Agreement:
 - Seven Space Council meetings and related resolutions provided directions and guidelines
 - Two **flagship programmes: Galileo and GMES**
 - The **European Space Policy**

The Framework Agreement was further extended in May 2011, until 2016.

The EU new space competence



- The **Lisbon Treaty** of December 2009 reinforces the case of space in Europe by putting it on the political agenda at the highest level.
- **Article 189** of the Treaty provides that the EU:
 - has a **shared/parallel space competence** with Member States,
 - has a mandate to elaborate a **European space policy** and take related measures,
 - should establish appropriate **relations with ESA**.
- The EU Council has established a **space** sub-formation of the Competitiveness Council and the **Space Working Party** where it will discuss space matters with its Member States; ESA may be invited as observer.
- The EC has published on 4 April 2011 its **Communication** on Space which sets the basis for the EU space programme and on June 29 its Communication on its Future **Multi-annual Financial Framework for 2014-2020**.



A grey rectangular box containing the text 'The political mandate' in white, bold, sans-serif font. The background of the slide is a photograph of the Earth's horizon from space, with a large, dark, cratered celestial body (likely the Moon) in the upper right quadrant against a deep blue sky.

Strategic objectives of space for Europe:

- develop space applications to serve Europe's public policies, enterprises and citizens;
- **meet Europe's security and defence needs;**
- foster competitive and innovative industries;
- contribute to the knowledge-based society;
- secure access to technologies, systems and capabilities for independence and cooperation.

In May 2007, 29 European countries (17 Member States of ESA and 27 Member States of the EU) adopted a Resolution on the **European Space Policy**, adding a new dimension to European space activities.



- As called for during the 4th Space Council, a **Structured Dialogue on Space and Security** was established in order to guarantee coordination and to foster synergies.

It gathers the European Commission, the EU Council/EEAS, EDA, the EU Satellite Centre (EUSC) and ESA.

- An EDA/ESA Administrative Arrangement was signed on 20 June 2011

“Towards a Space Strategy for the European Union that benefits its Citizens”

April 2011 Communication



The Communication sets out the main priorities for the EU, which include ensuring the success of the EU two flagship space programmes Galileo and GMES, the protection of space infrastructures, and space exploration.

Making Space Infrastructure Secure

Space infrastructure is critical infrastructure on which services that are essential to the smooth running of our societies and economies and to our citizens' security depend. **It must be protected and that protection is a major issue for the EU** that goes far beyond the individual interests of the satellite owners.

Such infrastructure is at risk of damage or destruction by natural phenomena, such as solar radiation and asteroids, and by other spacecraft and their debris. It is also under threat from electromagnetic interference, be it intentional or otherwise.

Some Member States have the resources to respond in part to these risks. However, these resources are inadequate because of their technical shortcomings and the absence of sufficient coordination mechanisms. Consequently, in order to ensure the protection of its space infrastructure, the EU is largely dependent on the resources and the good will of non-Member States.

In 2008, the fifth Space Council meeting confirmed that Europe must "develop a European capability for the monitoring and surveillance of its space infrastructure and of space debris". It also confirmed that the Union needs to play an active role in the implementation of the Space Situational Awareness (SSA) system and its governance mechanisms.

Implementing this system involves gathering existing resources, making good any shortfalls and maintaining and operating the system. The Industrial Policy Communication states that "the Union should define the organisation and governance of such a system taking into account its dual nature and the need to ensure its sustainable exploitation." The SSA system should be organised according to a structure, yet to be defined, that would take account of the level and extent of participation of each Member State and of the other bodies involved, depending on the missions to be accomplished and constraints to be respected.

14. **RECOGNISES the need for an effective Space Situation Awareness (SSA) capability as an activity at European level**, inter alia, in order to enhance the safety of European space assets and of its future launches from space debris and other objects in space as well as space weather phenomena; to this end, the Union should make the widest possible use of assets, competences and skills that are already existing or being developed in Member States, at European level and as appropriate internationally;
15. Recognizing the dual use nature of such a system and taking into account its particular security dimension, **CALLS UPON the European Commission and EEAS, in close cooperation with ESA and Member States**, which own such assets and have capacities and in consultation with all actors involved, **to come forward with proposals to fully exploit and build on these assets and capacities in order to develop a Space Situational Awareness (SSA) capability as an activity at European level** and in that context, **to define an appropriate governance and data policy** taking care of the high sensitivity of SSA data;



Towards a European SSA system

A system developed in close cooperation among various organisations and communities



In the framework of the Structured Dialogue:

- The EC and EEAS together with ESA and EDA have drafted a document **aggregating civil and military user requirements** for a European SSA capability. The document will be submitted to the Council for endorsement by the Political and Security Committee (PSC).
- The EC and EEAS are working with Member States on defining a future SSA **data policy** and reflecting on potential **governance schemes**. The Space Working Party will lead this work and will invite the Security Committee to provide recommendations on security aspects.
- ESA is managing the **SSA Preparatory Programme**, making use of existing national assets so as to avoid duplication, foster improved technical coordination, share expertise and jump-start precursor services.
In addition, SSA includes cooperation and coordination with existing European organisations such as EDA, EMSA and EUSC.

Core element (SST, SWE and NEOs)

- SSA Mission and Customer Requirements completed
- SSA System Requirements Review on-going (May – November 2011) will result in:
 - Set of System Requirements Documents
 - High-level SSA architectural design
 - Cost estimate of the full SSA system (development and exploitation)
- SSA Architectural Design planned in the period October 2011 – August 2012
- Progressive Test & Validation (T&V) of the SST segment is in progress making use of existing radar and telescope European assets (e.g. sensors include Tenerife (ESA), La Sagra (Spain), Chilbolton (UK), MONGE (France), Graves (France), etc.), as well as of SSA PP Pilot Data Centres.

Radar element

- The development of two demonstrator surveillance radars (monostatic and bistatic) has been agreed, however the location for these radars is still to be finalised; assessment of potential sites is ongoing

Pilot Data Centres are being deployed for initial T&V of SSA Precursor Services at:

- ESAC (SST)
- Space Pole Bruxelles (SWE)
- ESRIN (NEO)
- ESOC (Tasking Centre)

Consultation with Participating States

- An exploitation approach and data distribution policy of the breadboard surveillance radars (demo radars) is under discussion with SSA Participating States is at this stage related to the SSA-PP only, covering the short term needs
- This approach includes the establishment of an ad-hoc mechanism (Programme Security Instruction), specific to the SSA PP, that would address the required data policy aspects
- The EU activities related to the definition of the governance and data policy of the future European SSA System remain essential for its long-term implementation and exploitation.

To continue putting in place pre-operational services required for the European SSA System, as well as initiating a few focused developments, i.e:

- The consolidation of the activities initiated during the preparatory phase in the three segments (SST, SWE, NEOs), in line with the agreed data policy for the critical components (e.g. radars).
- Networking relevant European and National assets in each of the SSA Segments (SST, SWE, NEO).
- Laying the bases for future infrastructure developments (radars, telescopes, SWE space segment) compatible with the resources and priorities of the Participating States.
- Provision of pre-operational services in the three segments of SSA (SST, SWE and NEO)