

ESPI 12th Autumn Conference

Security in Outer Space: Rising Stakes for Civilian Space Programs

PRESENTED BY
Rob HERON

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SES and Government Satellite Communications

- ▲ *Why is SES interested in Space Traffic Management?*
- ▲ Satellite communications is ever more important!
 - Most people don't realize how dependent we are on satcom
- ▲ SES is investing heavily in satellite communications systems for Governments and Institutions
 - We recently launched our first satellite specifically aimed at governments with transponders in X and mil-Ka bands
- ▲ There is great interest in Europe to provide secure, reliable satellite communications at much lower prices than for military satellites
- ▲ These services will be based on commercial satellite capacity (C, Ku and Ka) as well as governmentally controlled (X and mil-Ka) bands
- ▲ One of the key areas of concern is resilience and reliability
 - Hence space traffic management is very important
- ▲ *SES is building a new business infrastructure to provide secure, reliable and resilient services for Governments and Institutions*

Government Satellite Communications

▲ Some of the G&I areas of operation:



Border surveillance
& migration monitoring



Maritime surveillance
& crisis management



Police missions



Civil protection
& crisis management



Humanitarian Aid
& crisis management



EU External Action Service
communications



Humanitarian
development



Critical infrastructure
protection

Government Satellite Communications

Services:

▲ **Safety Critical**

▲ **Military**

▲ **Police, Fire, Ambulance**











▲ **NGOs**

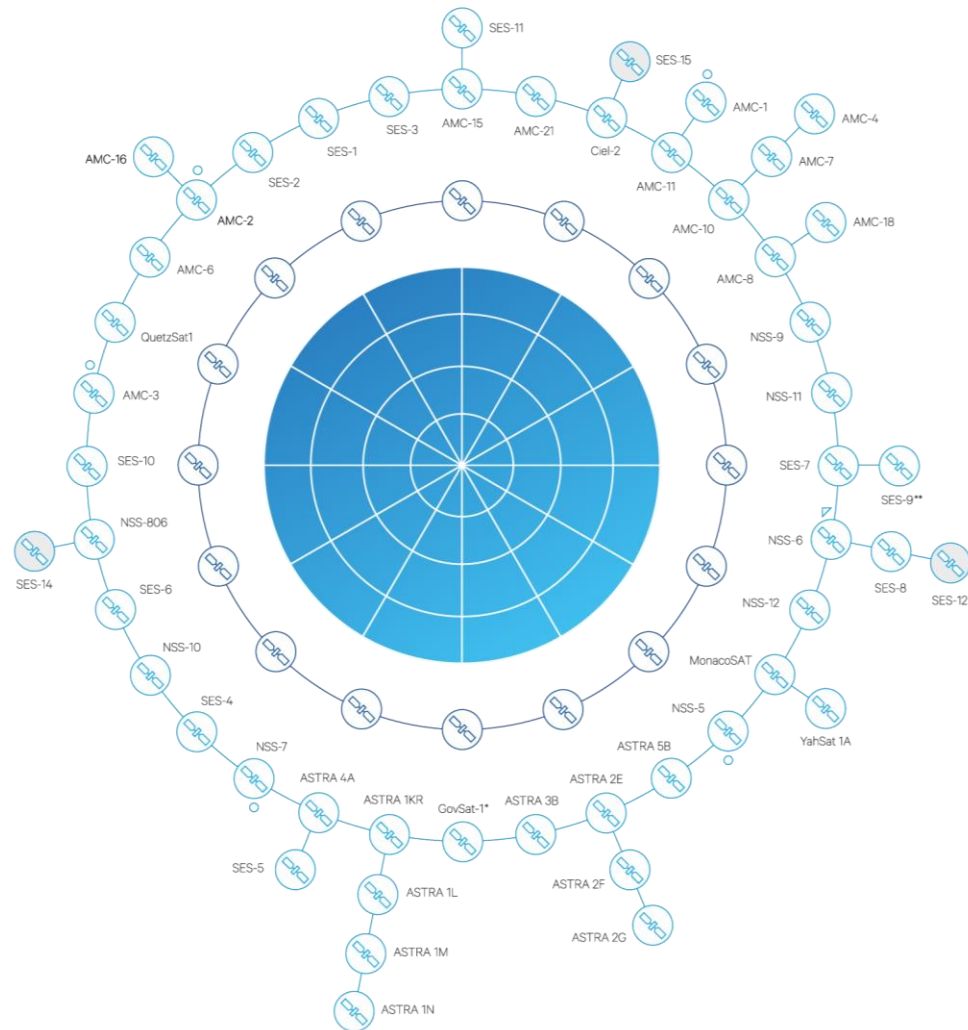
Our Vision

- ▲ **Guaranteed Access...*for years to come***
- ▲ **Secured...*built according to national and EU security legislation***
- ▲ **Resilient...*through complementarity of ground, space and terminal assets***
- ▲ **Affordable...*utilizing existing and upcoming assets in space and on the ground***
- ▲ **Flexible...*platform-based pooling & sharing system and innovative connectivity packages***
- ▲ **Service oriented...*with a modular range of managed services, customer defined SLAs and KPIs***
- ▲ **Independent...*from non-European technology and non-European service providers***
- ▲ **Scalable...*from Regional (Europe) to Global***

SES Satellite Fleet

▲ The current satellite fleet...

-  In Orbit
-  In Orbit GEO HTS Satellite (High-throughput satellites)
-  Future Launch
-  Future GEO HTS Satellite (High-throughput satellites)
-  MEO HTS Satellite (Low latency, high throughput satellites)
-  Inclined
-  Expected orbital position
-  To be relocated
-  Geostationary Orbit (36,000km from Earth)
-  Medium Earth Orbit (8,000km from Earth)



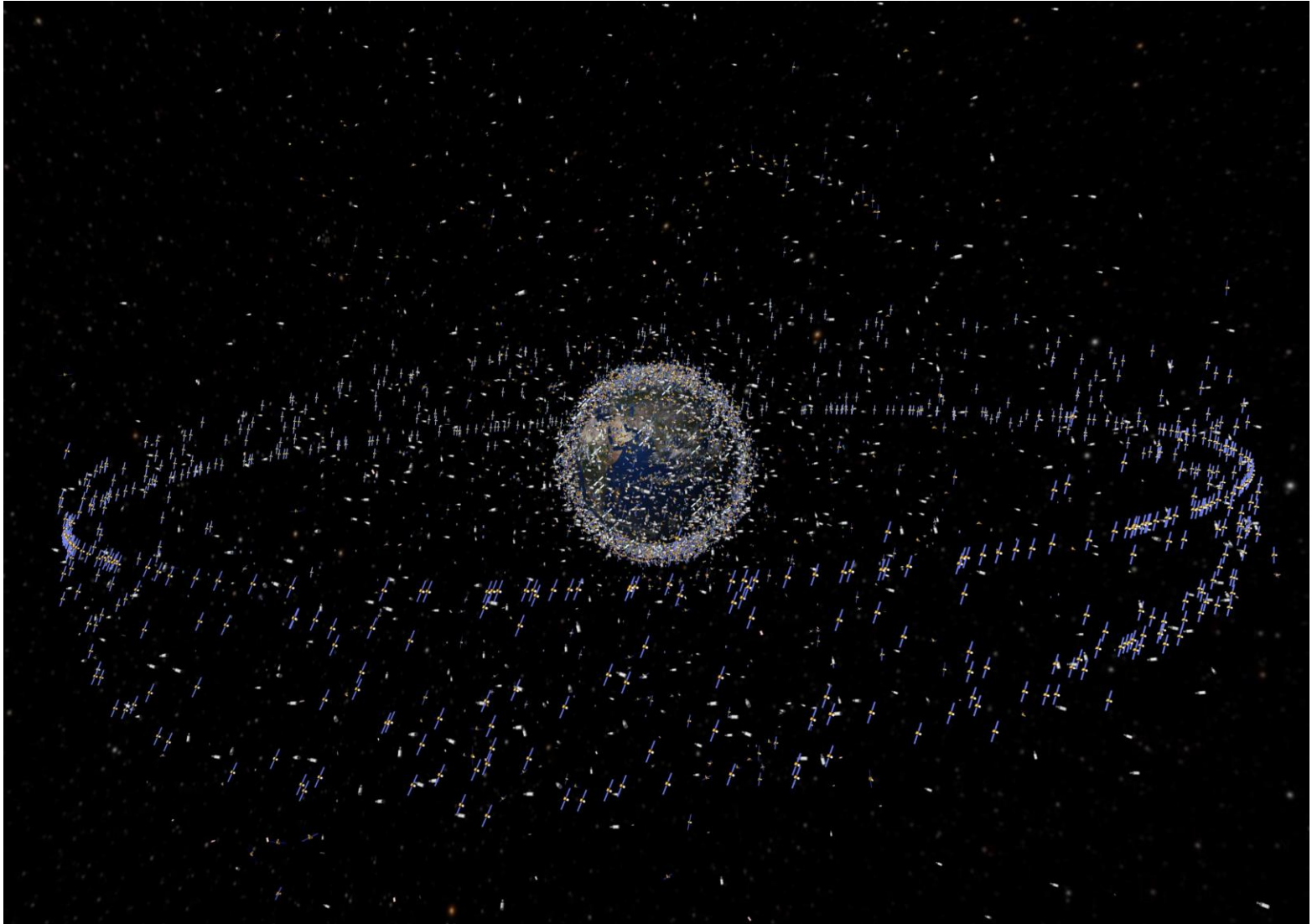
Additionally, we have nine satellites flying secondary missions:
 ASTRA 1D, ASTRA 1F, ASTRA 1G, ASTRA 1H, ASTRA 2A, ASTRA 2B,
 ASTRA 2C, ASTRA 2D, ASTRA 3A.

Fleet configuration is based on current planning and is subject to change. SES holds a 70% interest in Ciel Satellite Limited Partnership and a 100% ownership interest in QuetzSat. Yahsat 1A's Ku-band payload is owned by YahLive, where SES holds a 35% ownership interest. MonacoSAT is a partner satellite with transponders onboard TurkmenAlem at 52°E. SES-17 will be launched in 2020.

* Procured by LuxGovSat
 ** SES-9 at 108.2E vicinity

.. and there is more to come

The crowded space environment



Why we need Space Traffic Management

▲ Space Traffic Management* These issues matter!

- Behavior Guidelines (Code of Conduct)
 - Establishing common standards for behavior, based firmly upon empirical data and evidence, will **help satellite operators avoid misunderstandings, conform to safety constraints, plan for reasonable operating envelopes, and anticipate and practice procedures for dealing with normal and emergency situations**. Potentially, this could be developed under the auspices of ISO3 activities and the Union of Concerned Scientists (UCS)⁴
- Oversight Organization or Body
 - Establishment of a body or organization responsible for **monitoring, oversight, coordination, and enforcement (including incident management)** will greatly benefit design and operation of a successful and sustainable space traffic management system. This body must incorporate the concerns of the affected parties while balancing the need for effective control as policies and procedures are developed.
- Communication Strategy
 - Ultimately, a space traffic management program could involve a large number of agencies, companies, universities, and technologies. **The efficient and secure sharing of information amongst this group will be vital for managing traffic in a congested space**. As such, a communication strategy that includes policies and procedures for who to contact, when to initiate, how to format, how to assess and assign urgency, and expected responses will be required. In addition, communications have to be secure and reliable.

*Space Traffic Management (STM): Balancing Safety, Innovation, and Growth. A Framework for a Comprehensive Space Traffic Management System. An Institute Position Paper, November 2017

Rob HERON

Senior Manager, Global Government
and
MD, SES Defence UK Ltd



rob.heron@ses.com

T +352 710 725 9344

M +352 621 269 629



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