

Introduction to the Space Data Association



Secure World Foundation

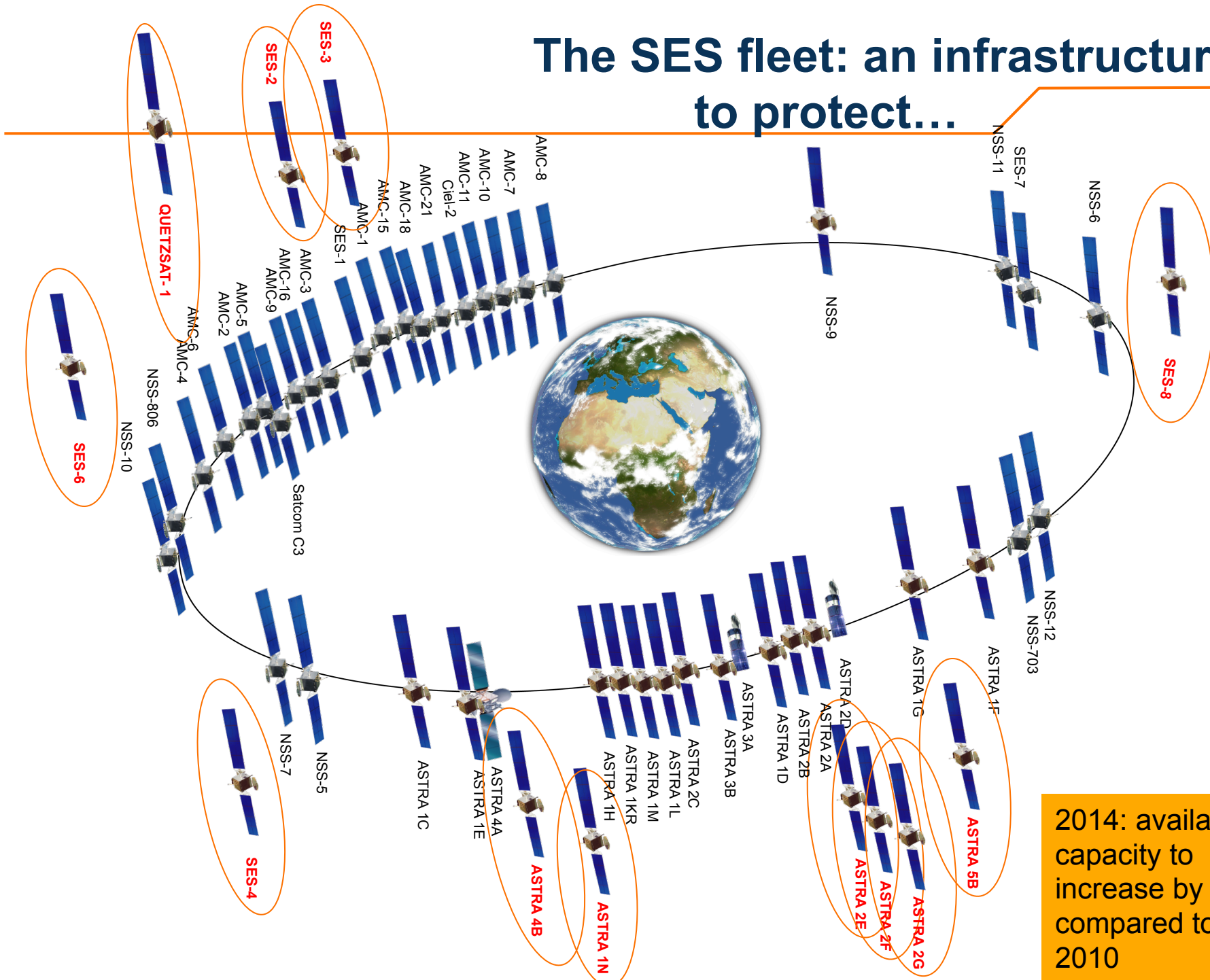
Christine Leurquin
VP, Institutional Relations
3 Novembre 2011



SES – who we are

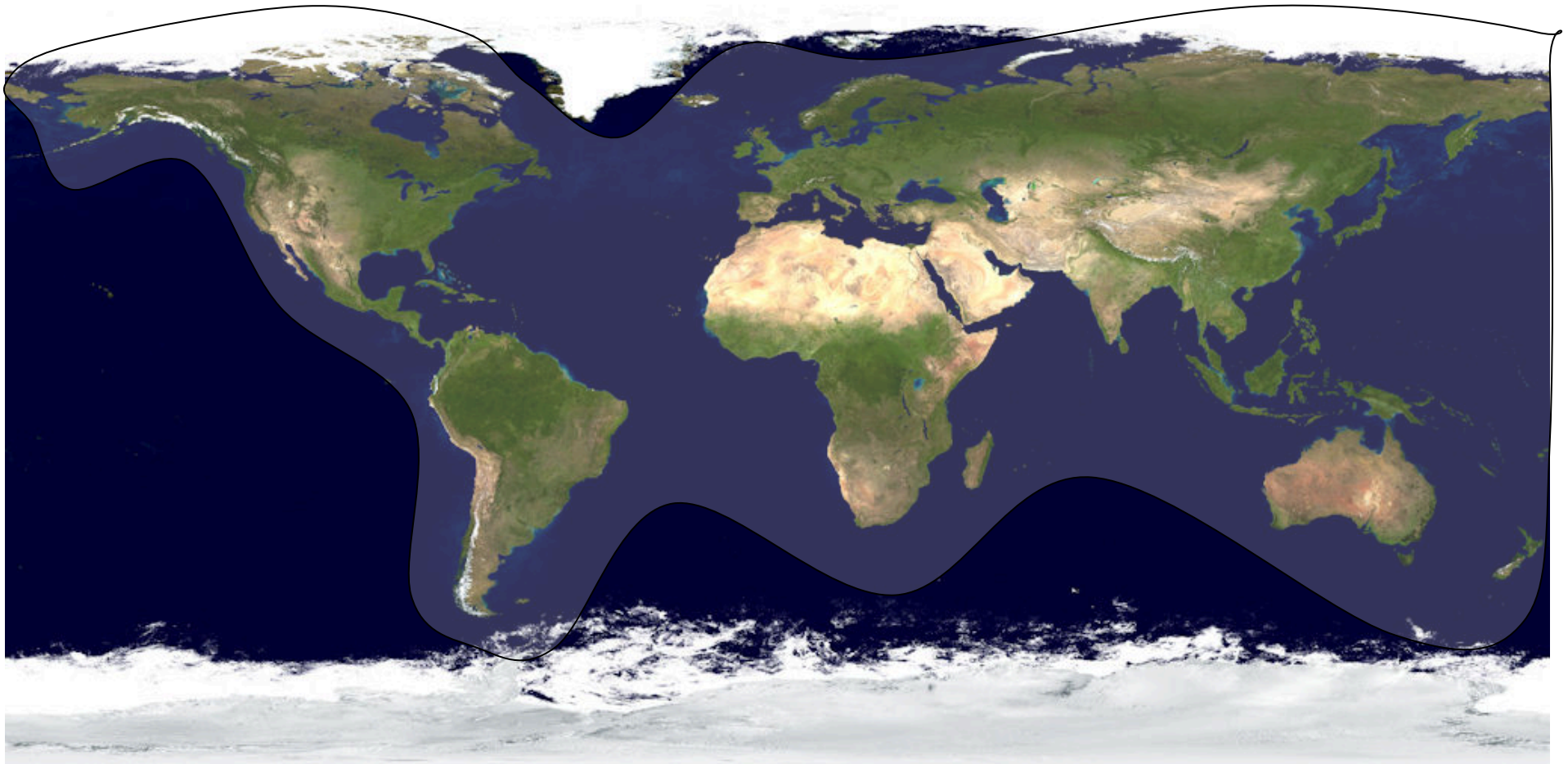
- ▲ The world's pre-eminent satellite group
- ▲ 45 satellites: global fleet with optimal look angles and comprehensive landmass coverage, operated through our
 - fully-owned operating companies SES ASTRA, SES WORLD SKIES
 - Partially-owned CIEL, QuetzSat, O3b Networks
- ▲ Premier provider of transmission capacity
 - media distribution
 - connectivity
- ▲ Advanced satellite-based platforms and services for
 - media and government organisations
- ▲ Created in 1985 and based in Luxembourg, Europe
- ▲ 1,269 staff around the world
- ▲ Traded on Euronext Paris and Luxembourg stock exchanges (SESG)

The SES fleet: an infrastructure to protect...

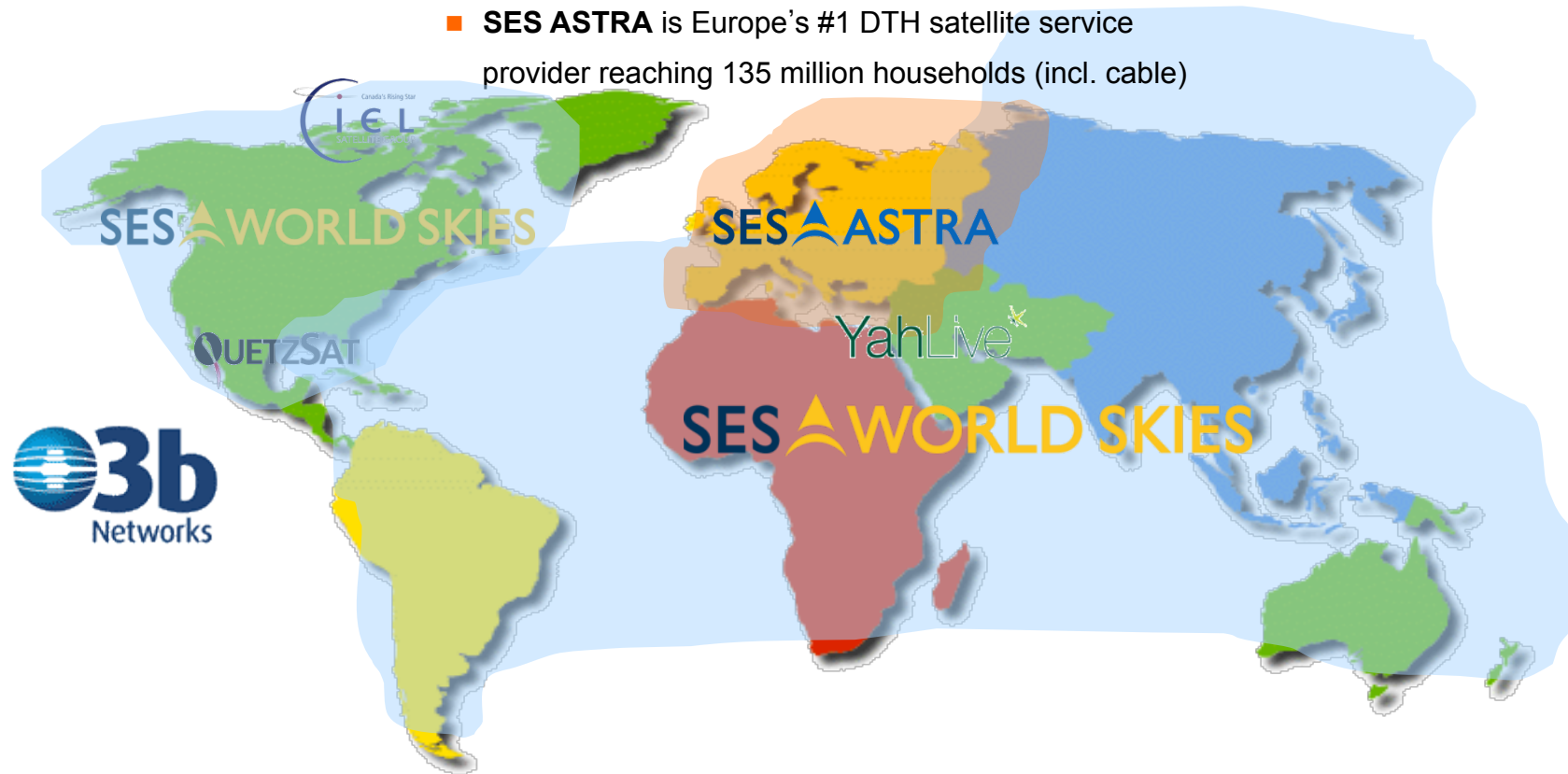


2014: available capacity to increase by 23% compared to YE 2010

... which gives SES unrivalled global coverage...



Global reach, regional market focus



- SES WORLD SKIES is a major player in broadcasting for US cable services reaching some 80 million US households.
- **SES WORLD SKIES** is also the premier provider of satellite communications services with more than 250 customers based in 80 countries. SES WORLD SKIES reaches 145 million DTH/cable households in the world.

What is the Space Data Association?

- ▲ **The Space Data Association (SDA) is a not-for-profit association formed by and for satellite operators to provide reliable and efficient data-sharing critical to the safety and integrity of the space environment and the Radio Frequency spectrum.**
- ▲ **The SDA was founded by Inmarsat, Intelsat and SES — three of the leading global satellite communications companies. These three companies, plus Eutelsat, now form the Executive Board of the SDA.**

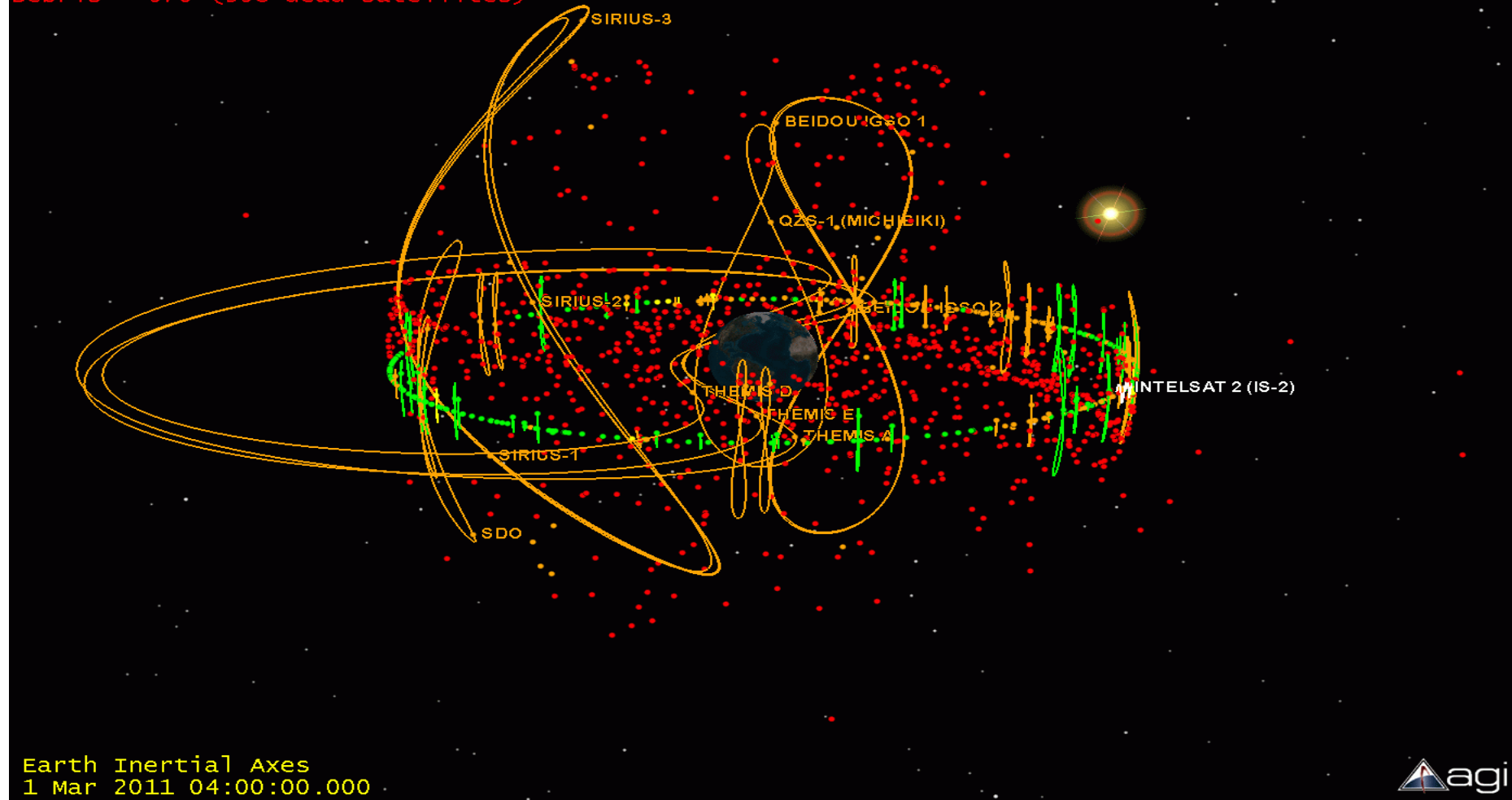
In-Orbit objects as of March 2011

Legend:

SDA Member satellites = 197 (12 with TLEs)

Non-Member satellites = 195

Debris = 970 (398 dead satellites)



Shared Motivations for SDA's Creation

▲ Enhance “Safety of flight”

- *Definition: The condition where satellites are positioned and operated in a manner that preserves their long-term operational viability and the preservation of the orbital regime's involved*

▲ Efficient, timely, accurate conjunction assessments

- Reduce false alarms, missed events
- Minimize Member time and resources devoted to Conjunction Assessment

▲ Common SSA / Format Conversions / Data Repository

- Minimize confusion, potential for conflicting decisions

▲ RFI Geolocation and Resolution Support

- More rapidly find and address interference sources

▲ Encourage evolution of best practices for Members

Conclusion: SDA Enhances its Members' Satellite Operations

SDA and Geolocation

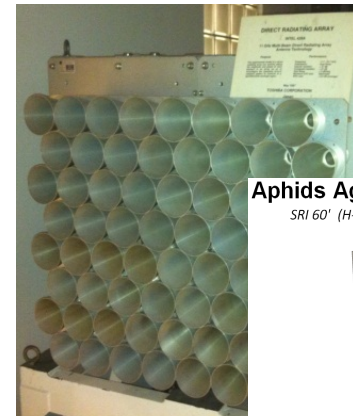
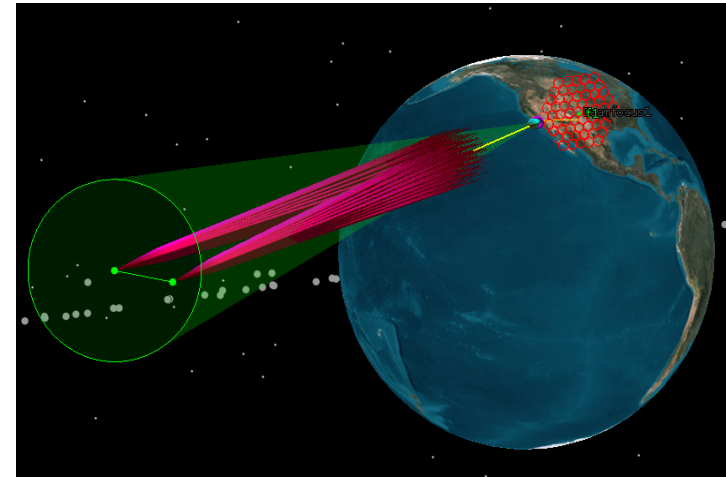
▲ Without SDA

- Multiple phone calls required
- Hours/days required to locate viable solution set and data
- Data formats = anyone's guess

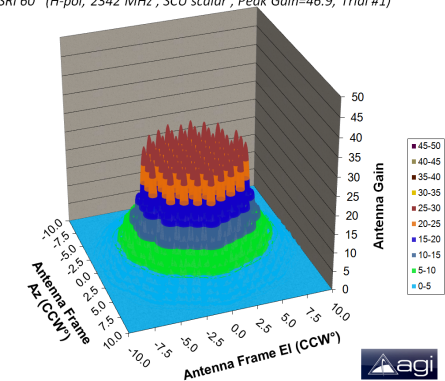
▲ With SDA

- Solution sets immediately available
- All necessary data centralized and in consistent format
- Better data = more accurate results

Geolocation error reduced two orders of magnitude using SDA-on-SDA quality ephemeris



Aphids Aggregate Multi-Spot Beam (AstroHD)
SRI 60' (H-pol, 2342 MHz, SCU scalar, Peak Gain=46.9, Trial #1)



SDA enables faster, more accurate geolocation results

SDA Charter

- ▲ **Seek and facilitate improvements in the safety and integrity of satellite operations through wider and improved coordination between satellite operators**
- ▲ **Seek and facilitate improved management of the shared resources of the Space Environment and the Radio Frequency Spectrum**

SDA Status

- ▲ SDA established as a legal entity in the Isle of Man
 - Provides necessary legal framework for sharing and protection of data
- ▲ Space Data Center (SDC) system built by Analytical Graphics, Inc. (AGI)
 - System has now achieved Full Operations Capability, providing Conjunction Assessment service to its members
- ▲ Growing membership of
 - Approximately a dozen satellite operators from Geosynchronous and LEO orbital regimes
 - Conjunction Assessment Processing for more than 65% of all GEO satellites

Multinational, open to all space operators

Space Data Center (SDC)

- ▲ SDC – Three Key Mission Areas:
 - Collision avoidance monitoring (Conjunction Assessment)/ Manoeuvre Planning Validation / Flight Safety
 - Radio Frequency Interference mitigation / Geolocation support
 - Contact information (operations center) for SDA Member objects
- ▲ SDC reliable and secure operation:
 - Tertiary, geographically separated redundancy
 - High level data security and encryption
 - Best practice Information Assurance (IA) based on standards for high level computing systems

How does SDA Protect Member Data?

- ▲ Strict legal agreements between Members and SDA
 - Defines permitted uses for SDC data/products
 - Prohibits misuse of SDC data/products
 - Retransmission to third parties prohibited
 - Obligations for member data contribution
 - Legal liability issues are addressed by enforceable contract

- ▲ Multiple technical / security controls within SDC

Potential Future SDA Capabilities

- ▲ Collect, process, store & disseminate RF Interference (RFI) details to support investigation
- ▲ Automatically provide solution sets for performance of geolocation measurements
- ▲ Develop & maintain RFI mitigation capabilities, procedures and techniques to ensure continuity of operations
- ▲ Collate and disseminate Space Weather data
- ▲ Host databases of deployed equipment for industry's RFI 'Carrier ID' project

Contacts – Directors of the SDA

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Thank you!

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