



EU-Japan Space Forum

Satellite Industrial Cooperation Panel

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THALES ALENIA SPACE IN A NUTSHELL

Science

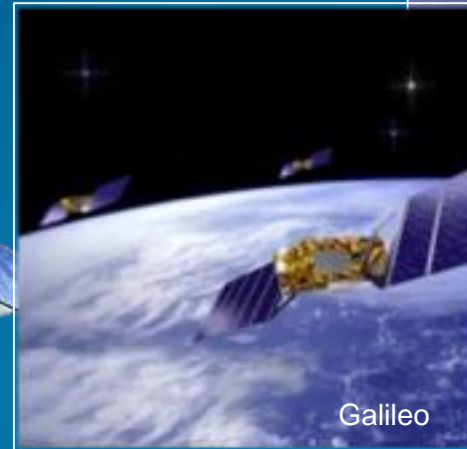
Telecoms

Navigation

Observation



Pleiades



Galileo



Spacebus



Huygens



Alma

Exploration

A joint venture between two European aerospace leaders

A unique combination of expertise covering the full value chain

- Equipment
- Payloads
- Satellites
- Systems
- Services

Thales : 67%
Finmeccanica : 33%

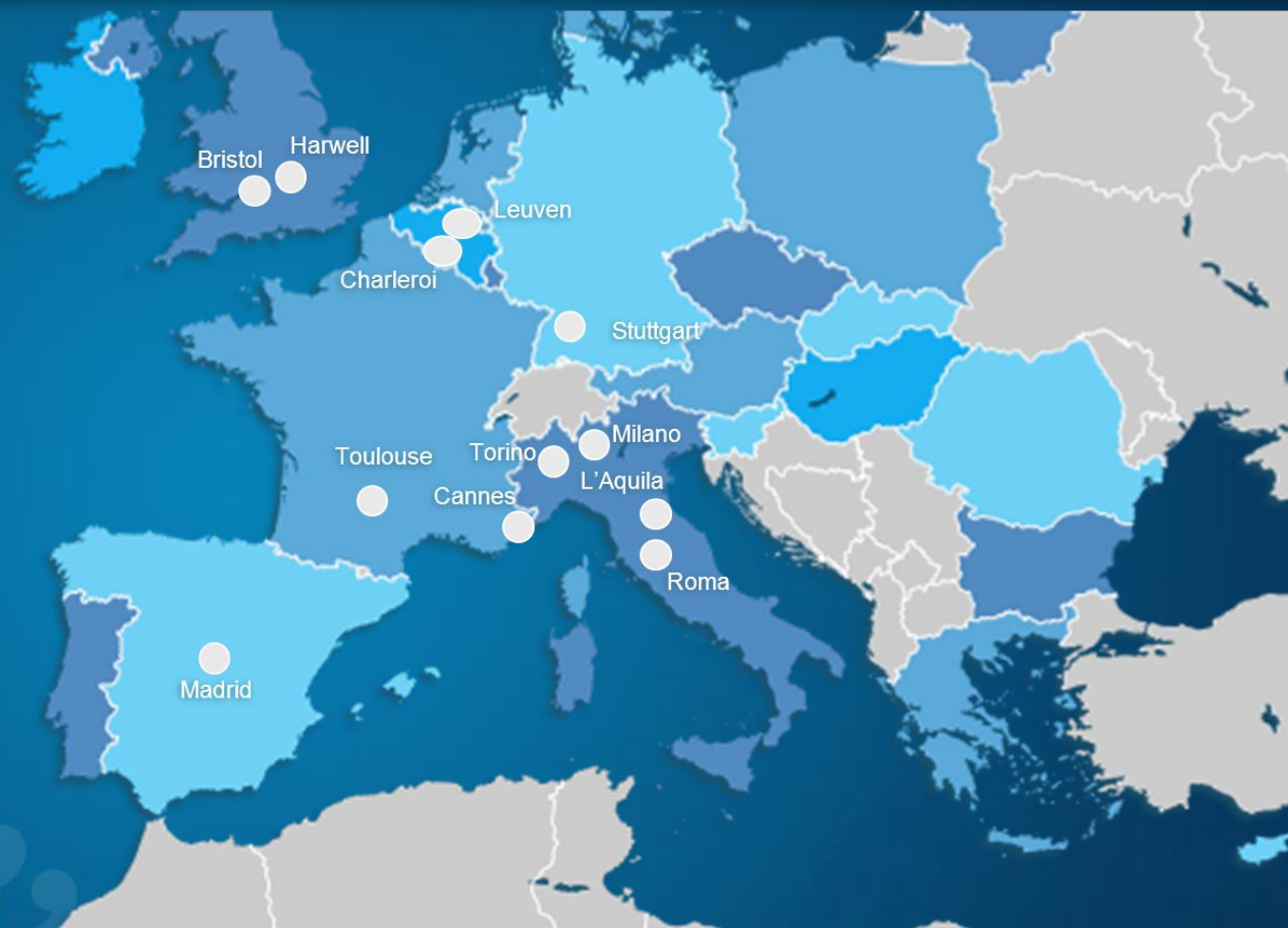


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Key figures

- 7 500 Employees
- 12 sites in 6 countries
- More than 2 Bn€ Sales in 2013

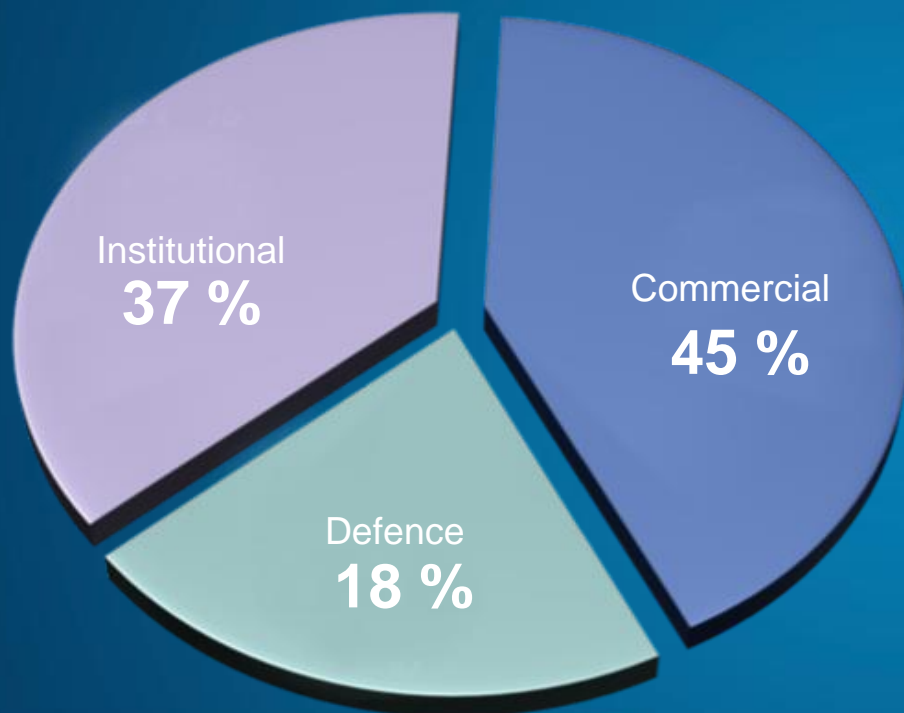


*Strong industrial presence in Europe
Commercial representation in
multiple countries*

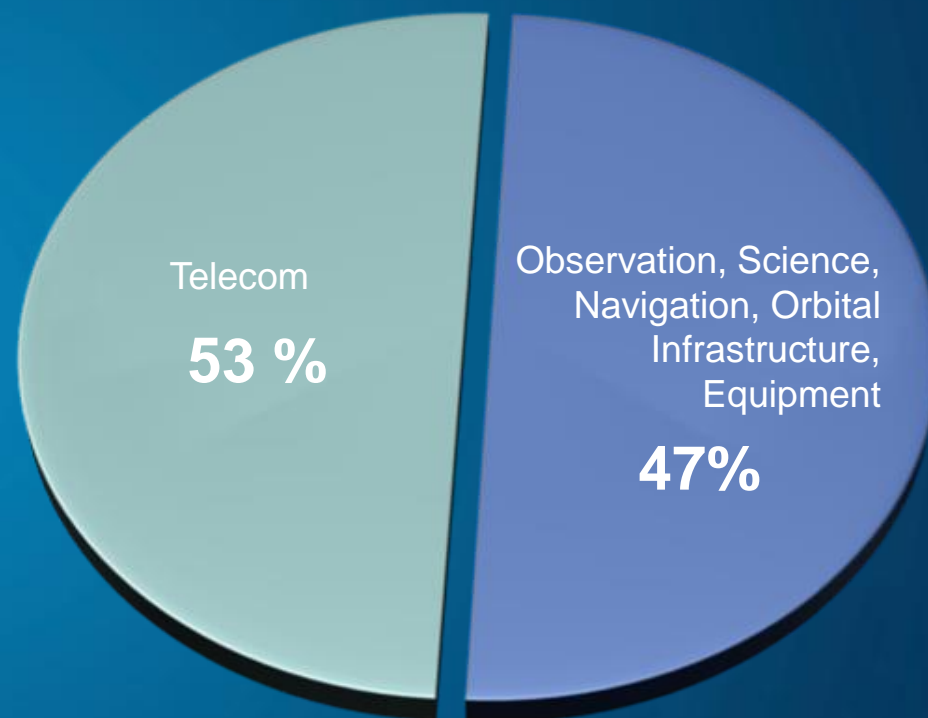
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Business breakdown 2013

Breakdown per market



Breakdown per activity



A balanced portfolio of competence addressing a large customer base

A committed partner to deliver cutting-edge solutions

Telecommunications



- Spacebus NEO: full chemical, hybrid or full electrical GEO bus for telecom payloads (up to 20kW)
- Flexible payload: in-orbit configuration of coverage, power and frequency
- High Throughput Satellites

Observation



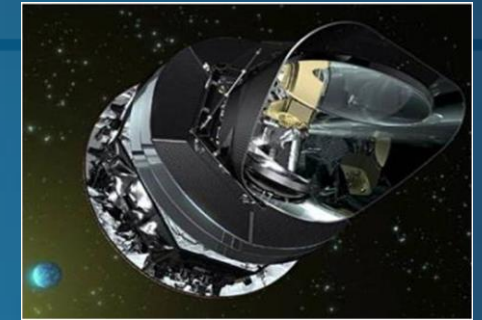
- Radar: COSMO-SkyMed, X-SAR, SAR-Lupe
- Electro-Optical: Helios I&II, Pleiades & Gokturk
- Environment monitoring: Meteosat series prime, Sentinel-1 & 3 (Copernicus), Jason altimeter

Navigation



- GALILEO: End-to-end system design and Ground Mission Segment prime
- EGNOS prime
- Future Air Traffic Management System

Exploration/Science



- Huygens, Rosetta, Mars & Venus Express
- Herschel & Planck
- ExoMars
- ESA atmospheric re-entry technology demonstrator
- ISS largest industrial provider after Boeing

A world player in each of the space markets

Worldwide leader for constellations

Globalstar



GLOBALSTAR 2
24 Satellites ordered
Orbit: 1414 km

3b
Networks



O3b Networks
12 Satellites ordered
Orbit: 8069 km

iridium



IRIDIUM Next
81 Satellites ordered
Orbit: 780 km

Thales Alenia Space has been flying or is developing 127 Low Earth Orbit Satellites in the decade for telecom, observation and navigation

EXAMPLE OF POTENTIAL EU-JAPAN SATELLITE COOPERATION:

=> MARITIME SURVEILLANCE CONSTELLATION

Science

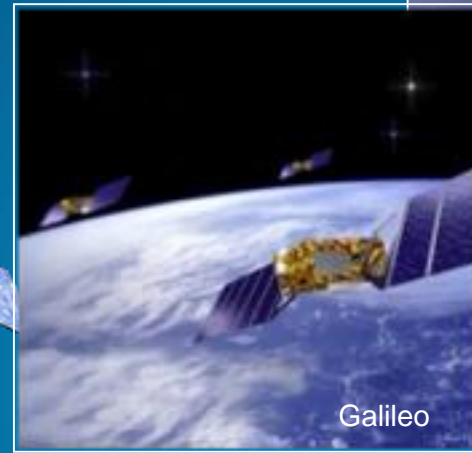
Telecoms

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Exploration

Maritime Surveillance: What for?

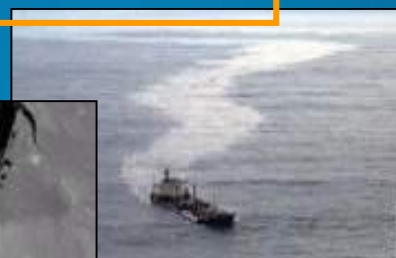
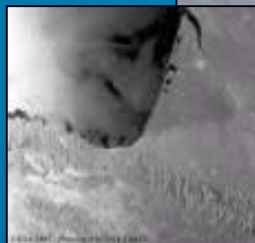
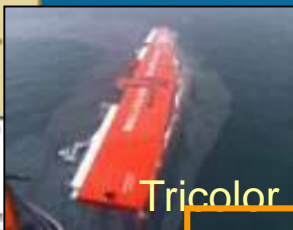
Navigation Hazards



Terrorist Threats



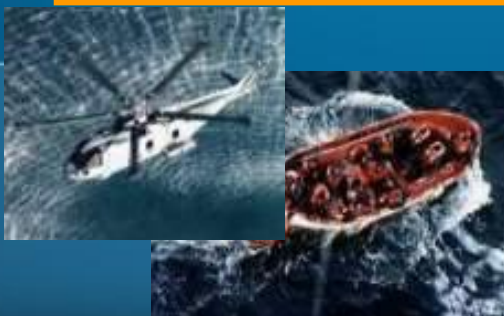
Pollution



Illegal Immigration

Safety at Sea

Illegal Fishing



- ✓ Geopolitical tensions: protection of EEZ and national interests
- ✓ Piracy
- ✓ Offshore platforms surveillance
- ✓ Trafficking, Smuggling
- ✓ Harbour Protection

What are the worldwide needs ?

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▶ Area Size to be covered

- Deep Sea areas are not properly covered

▶ Permanent / Persistent Observation

- No 24/7 operational surveillance service is available as of now
- Need to detect everywhere, anytime, first anomalies

▶ Track vessels from one port to another port

- Even non cooperative vessels
- The maritime surveillance stake is global

▶ 3 main domains to cover

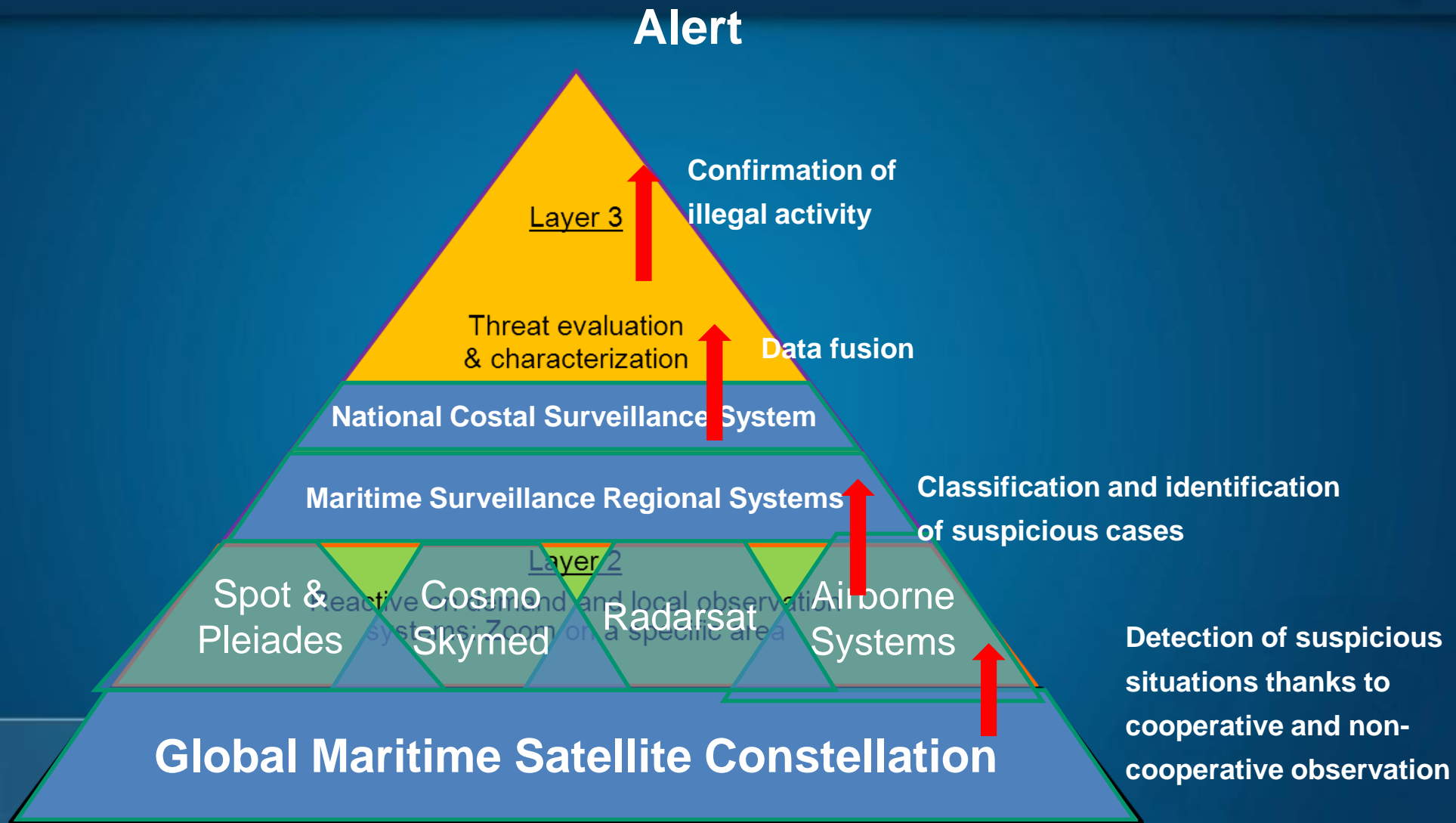
- Permanent Monitoring and Survey (Layer 1)
- Intelligence to focus on a specific area (Layer 2)
- Data fusion & threat evaluation (Layer 3)

While existing systems provide Layer 2 and Layer 3 services, no system currently delivers Layer 1 service



Ad-hoc Satellite Constellation with Radar & AIS payloads for Layer 3

Maritime Domain Awareness: need of a global and permanent monitoring



Way Forward

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▶ European Maritime Surveillance Programs

- BlueMassMed, Safeseanet, Cleanseanet, Marsuno, Seabilla, Cise..

▶ Thales Alenia Space experiences in Maritime domain:

- **Oceanography**: leader in radar altimeters (Topex, Poseidon, Jason, Cryosat, ERS1/2, altimeters Nadir in development (France, Europe, Russia and US)
- **Data Collection** : 15 years of experience ARGOS and SARSAT
- **Observation** for Marine services
 - Envisat payload (ASAR, MERIS), SAR (Cosmo-Skymed, Sentinel 1), sensors (SST, Ground segment (Sentinel 2)
- **Ocean and maritime GMES services**
 - Cores services: My Ocean, Limes,
 - Downstream services: Marcoast 1 & 2, Polarview, Mariss 1 & 2, Aquamar

▶ Japan has also shown a keen interest in Maritime Awareness Constellation

To address this worldwide issue, Thales is open to explore potential cooperation with Japanese partners in the following areas:

Context and market analysis, operational needs and scenarios, system architecture definition, cost evaluation and business plan analysis