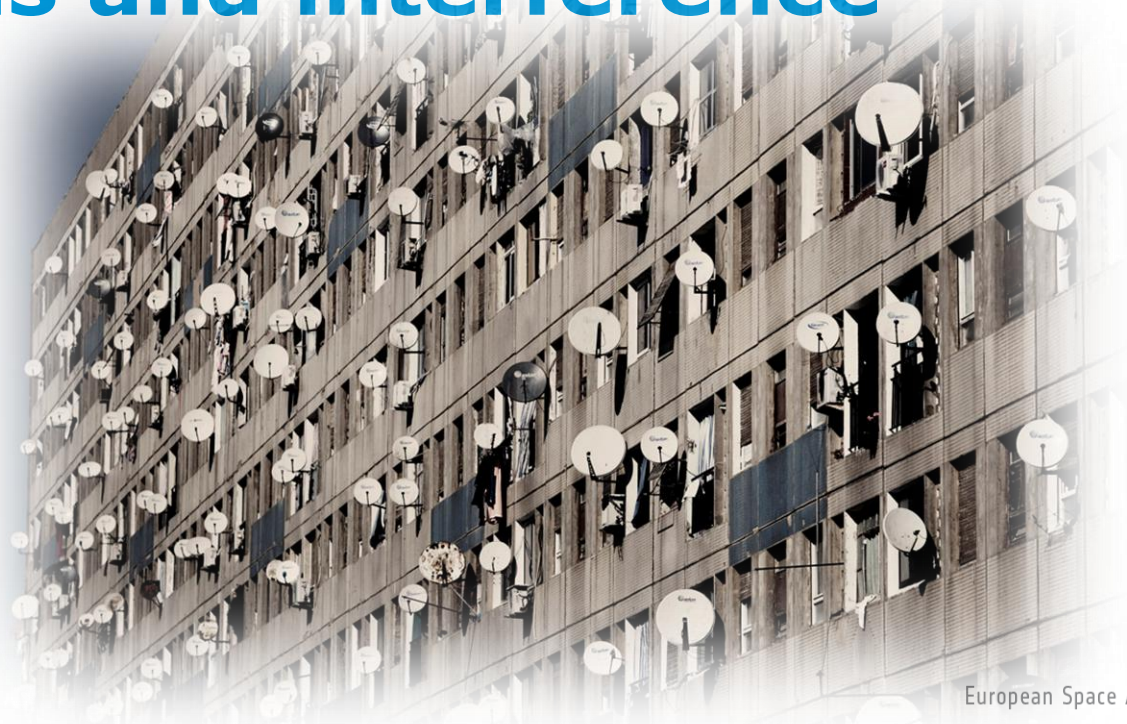
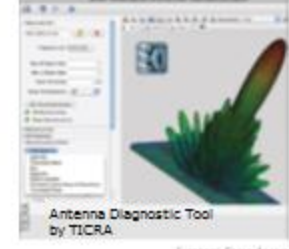
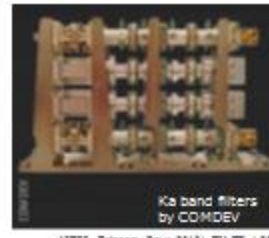
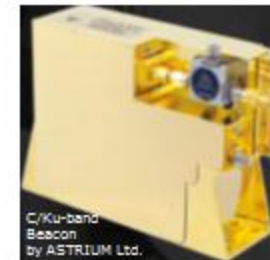
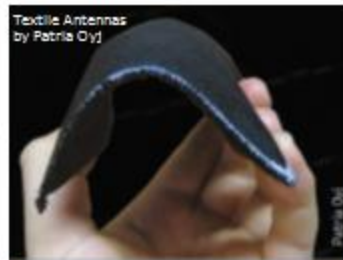


ESA actions supporting to World Radiocommunication Conference (WRC-15) preparations and interference mitigation



Frank Zeppenfeldt
ESA Telecommunications

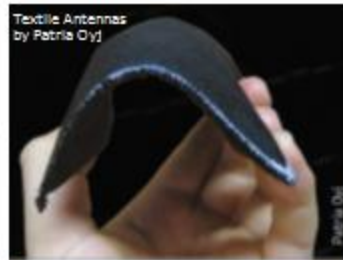
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ARTES Telecom Days 2013 TIA-TT | 2013 | Slide 2

ESA UNCLASSIFIED - For Official Use

European Space Agency



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Support for the development of innovative and competitive satellite communication products by **European and Canadian Industry** for the **world market**.

→ ARTES (advanced R&D in satellite communication systems)

System development on-going with private partners



A number of space systems are being developed with European industry:



Hylas – flexible payload for Ku/Ka-band



Inmarsat/Alphasat – just launched – improved L-band and technology demonstrator for Q/V-band and optical



EDRS – optical data relay for earth observation satellites and RPAS/UAS -




SmallGEO – a new smaller sized telecommunication satellite



Satellite with full-electric propulsion



1. The World Radio Conference 2015 will decide upon important issues for the satellite telecommunications industry
 2. Some decisions will be **threats**, e.g. less radio frequency spectrum
→ **No spectrum, no satcom** 
 3. Some decisions can be **opportunities**, e.g. for new satellite systems or access to new spectrum
 4. To counter threats and exploit opportunities, each national administration should be lobbied for a satellite-favourable position
- ESA would like to support in this effort by increasing **awareness** and **technical** support

1. C-band is used for many services which need **high availability** (e.g. tropical or equatorial regions that suffer from heavy rainfall).
2. C-band carries **critical services** such as emergency communications, meteorological services, the Global Maritime Distress & Safety System (GMDSS), Air Traffic Management,....
3. C-band allows **large global beams** to cover large regions.
4. C-band is extensively used for **backhauling services** from e.g. Africa to Europe.
5. More than 283 satellites in-orbit carry C-band transponders. 2000 C-band transponders in operation, representing a yearly turnover of **several B€** for the satellite communications industry.

1. An ESA-funded activity supports the European satellite industry in their overall preparation for WRC-15: the activity allows for **coordination** between satellite industry and operators and **preparation of contributions** to regulatory meetings.

→ This includes contributions **to avoid new agenda items** for mobile spectrum in satellite bands



2. The spectrum needs of the mobile industry are based on **excessive traffic demands**.

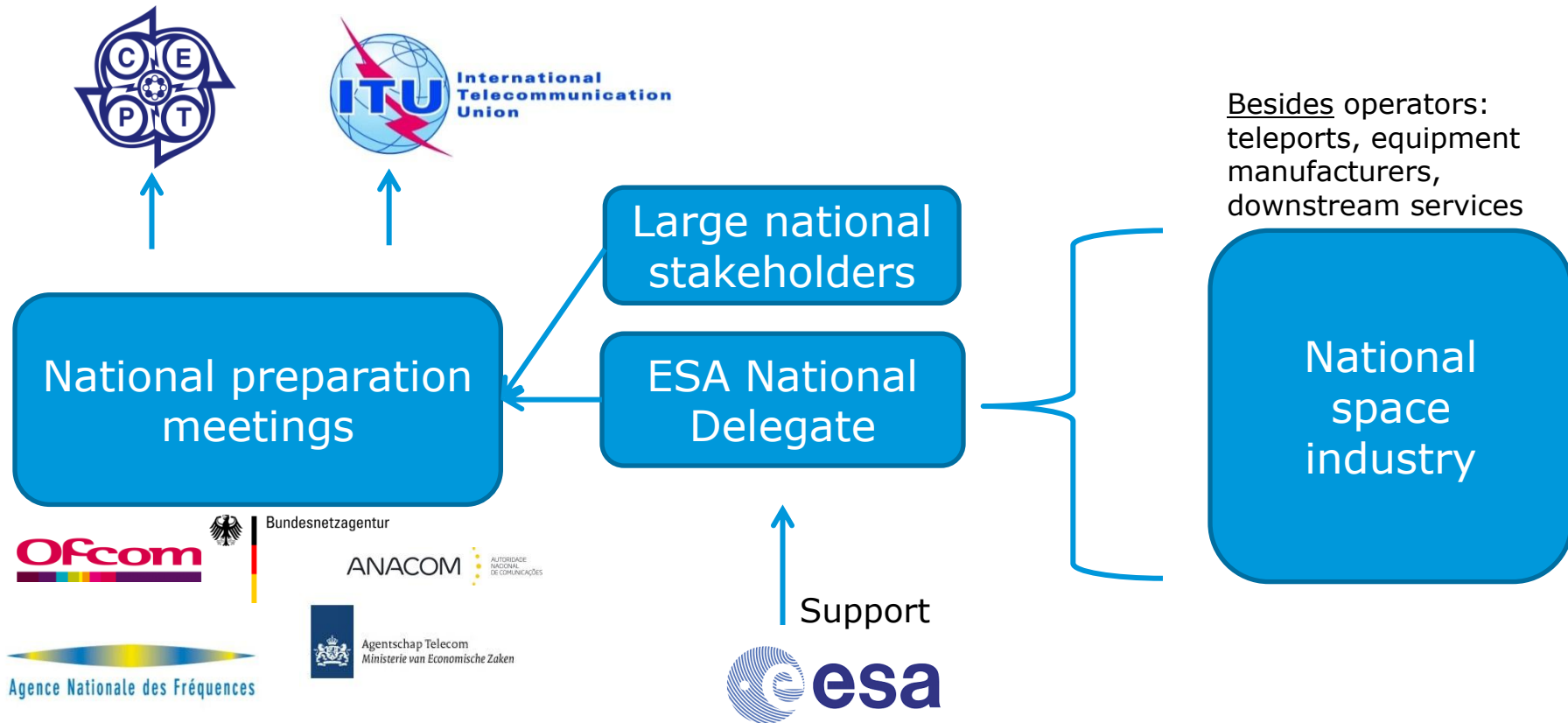
→ ESA, in cooperation with ESOA (European Satellite Operator Association), and GVF (Global VSAT Forum) supporting an activity to counter these demands and corresponding spectrum claims.

3. Study on **C-band importance in Africa**, by Euroconsult, see satellite-spectrum-initiative.com

More awareness is required.....



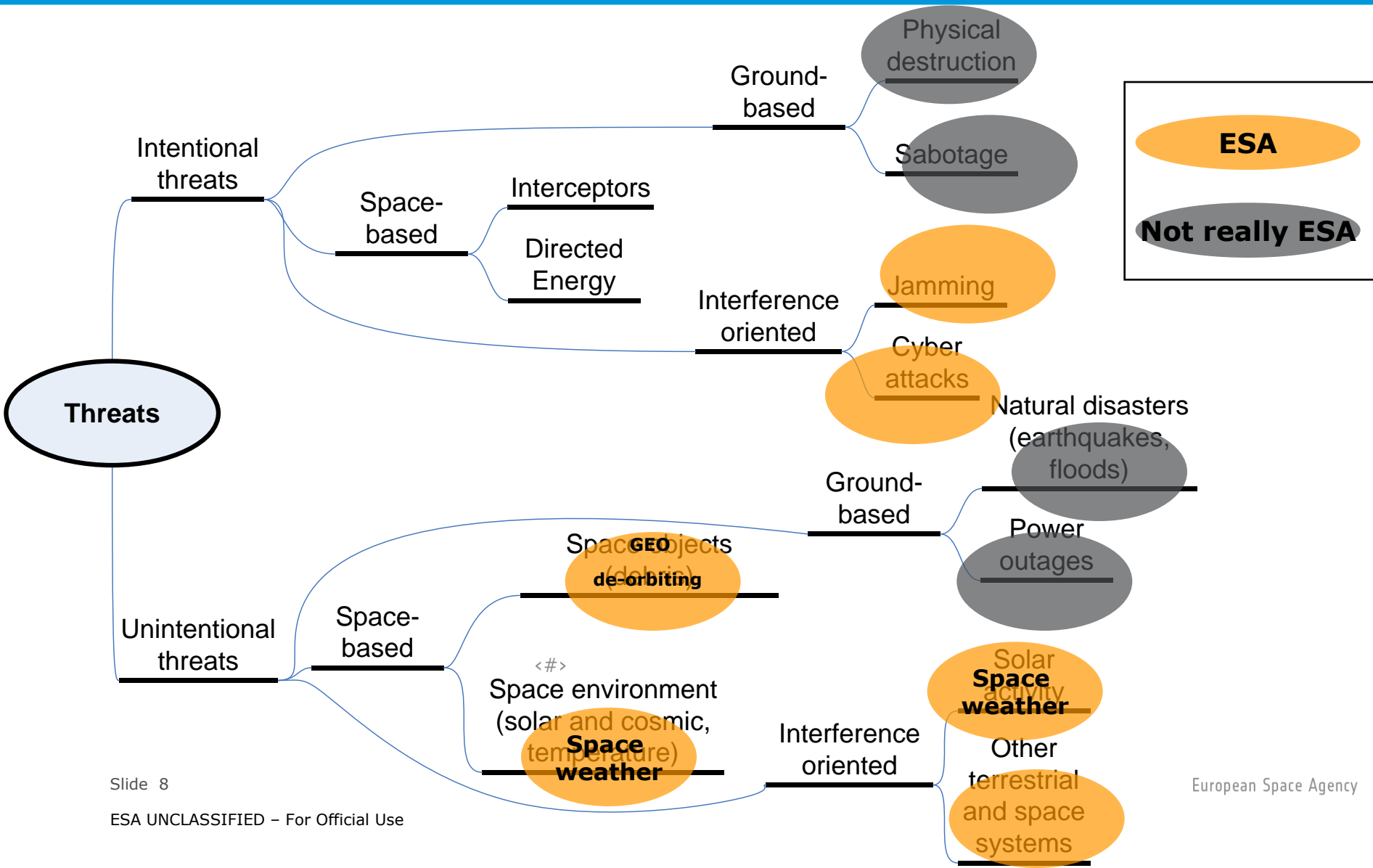
At the World Radiocommunication Conference (WRC-15) only administrations have decisive power



Besides operators:
teleports, equipment
manufacturers,
downstream services



Taxonomy of threats



Ongoing ESA actions with regards to interference - 1



1. Develop **technical sharing solutions** for C-band and Ka-band: e.g. what will be the cost impact on consumer Ka-band terminals?
2. Assessment whether **commercially feasible** to embark **anti-jamming solutions** on the satellite
3. Support the development and **in-orbit flight** heritage of products to counter uplink jamming

BBC JAMMED IN WEST ASIA, EUROPE

London, Oct. 18: The BBC said on Thursday its services in West Asia and Europe were being deliberately jammed, along with those of other broadcasters. The jamming affected television and radio services in English and Arabic, the British Broadcasting Corporation said. "The BBC, together with a number of other broadcasters, is experiencing deliberate, intermittent interference to its transmissions to audiences in Europe and the Middle East," said a spokeswoman. "Impacted services include the BBC World News and BBC Arabic television channels and BBC World Service radio services in English and Arabic. Deliberate interference such as the jamming of transmissions is a blatant violation of international regulations concerning the use of satellites and we strongly condemn any practice designed to disrupt audiences' free access to news and information." Previous attempts to jam BBC services in recent years have been traced to Iran. The BBC did not say who or what it thought was behind the jamming this time, which affected Eutelsat satellites. — AFP

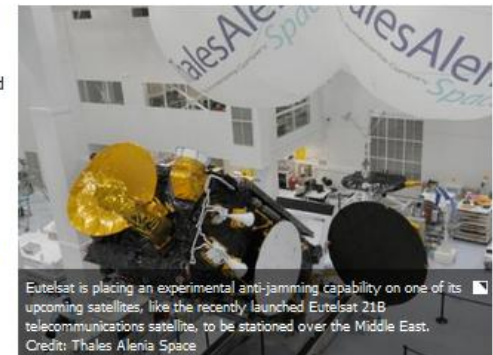
Eutelsat To Field Test New Anti-jamming Capability

By Peter B. de Selding | Jan. 28, 2013

PARIS — Commercial satellite fleet operator Eutelsat is placing an experimental anti-jamming capability on one of its upcoming satellites to be stationed over the Middle East, a decision prompted by increased intentional interference in the region and made possible by a program financed by the French and European space agencies.

If the technology works as designed, it could facilitate wider adoption of interference-mitigation technology by commercial fleet operators, especially those operating in regions, such as the Middle East, where intentional signal interference has been a growing problem, industry officials said. The cost of anti-jamming technology up to now has been prohibitive, they say.

Some operators concede they have been loath to accept the idea that interference may be more than a temporary phenomenon.



Eutelsat is placing an experimental anti-jamming capability on one of its upcoming satellites, like the recently launched Eutelsat 21B telecommunications satellite, to be stationed over the Middle East. Credit: Thales Alenia Space

Ongoing ESA actions with regards to interference - 2



- 4. Improvements to ground-based geo-location products and **On-board spectrum monitoring** equipment development

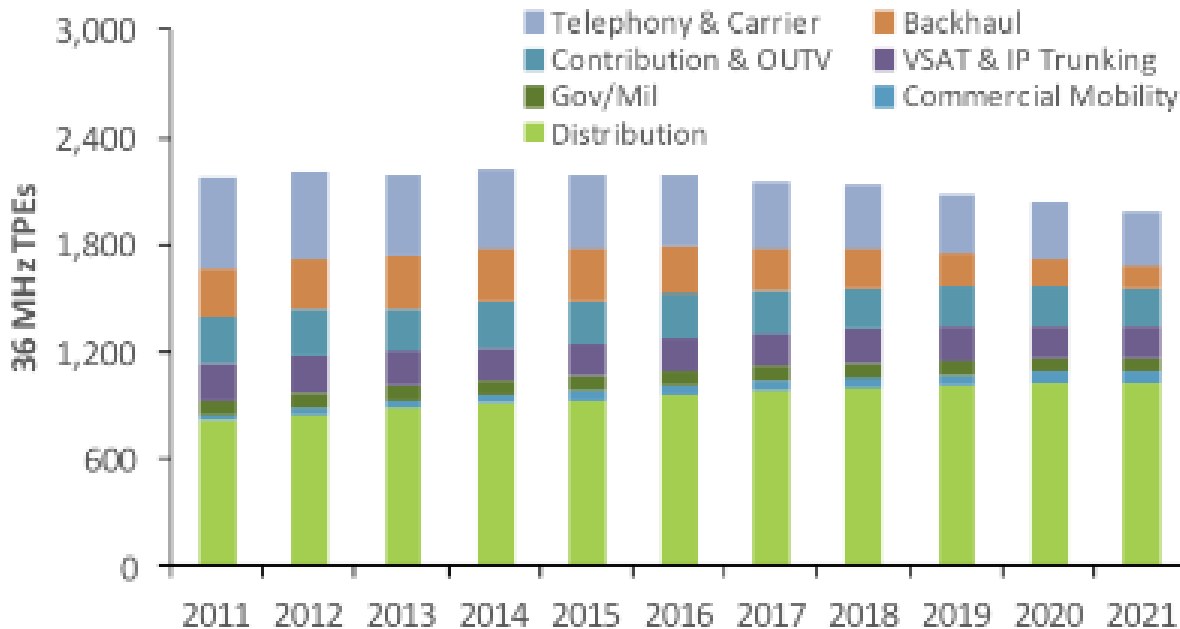


- 5. Development of equipment for **future frequency bands** (Q/V-band)
- 6. DVB Carrier ID equipment developments
- 7. Small (and many) LEO satellites....
- 8. A small satellite-based spectrum monitoring/measurement mission ?



1. Sustained demand for C-band satellite services
2. A large number of C-band carrying satellites are in the pipeline

Global C-Band TPE Demand by Application



Source : NSR