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Regulations, WRC 2019: Challenges and Opportunities ahead

ITU International Satellite Symposium 2017

San Carlos de Bariloche

Overview

- Increasing Customer Demand
- Satellite Global Infrastructure
- International and National Satellite Regulations
  - Access to Harmonized Spectrum
  - Predictable and Flexible Regulatory Framework
- WRC-19 Agenda Item – Impact on Satellite Services

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Increasing Demands for satellite broadband from End-users

- Satellites provide communications to underserved as well as urban areas and support critical public safety and military communications
- Exponential Growth in expectations for satellite broadband services in motion, e.g. in-flight passenger connectivity and enhanced aviation services
- Migration to cloud based applications require connectivity
- In order for all citizens and businesses to fully benefit from the services that satellites provide it is necessary that:
  - Sufficient Spectrum is available
  - International and national regulations keep pace with evolving satellite services
  - Licensing regimes must provide flexibility

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Growing Satellite Infrastructure to meet Increasing Consumer Demands

- Satellite Operators are developing and investing in new satellite networks and technologies that will result in a more robust satellite global infrastructure - it is forecasted that over 2,000 satellites are expected to launch during the next decade
- Implementing Technologies that expand traditional Fixed-Satellite Service (FSS) applications include:
  - Steerable High Capacity Beam – allows delivery of broadband satellite services anywhere anytime
  - Tracking earth stations - allow mobility operations in the Fixed-satellite service bands to complement those offered in the Mobile-satellite service
  - Flat panel antennas allow satellite services to be delivered in more locations
  - Coding rates allow increases in availability and delivery of more information per Hz

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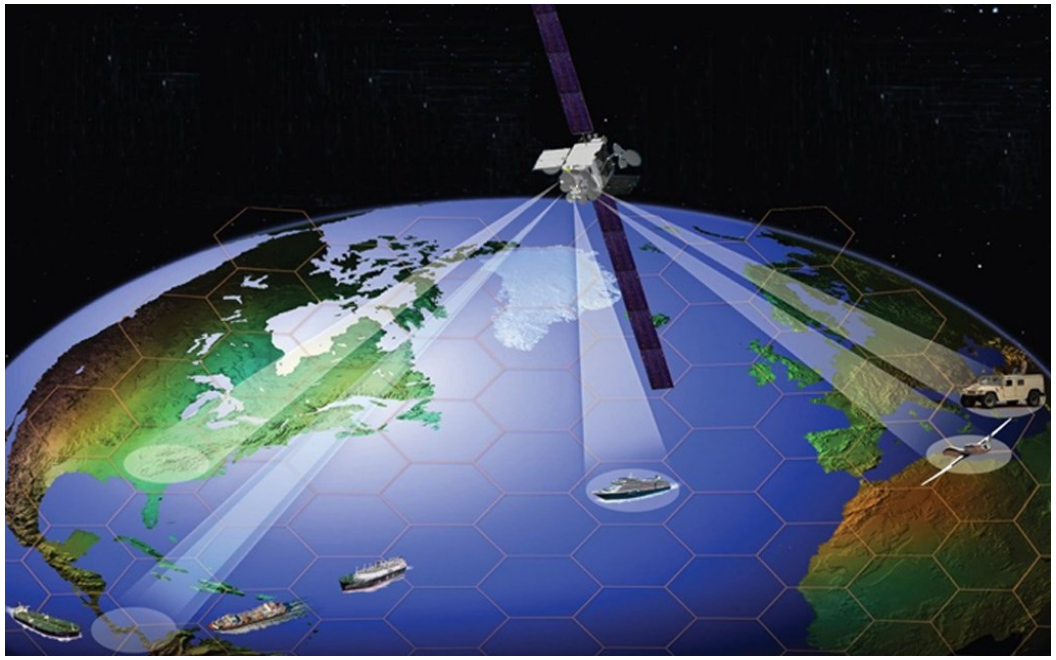
Technologies Expand Traditional FSS Applications

Steerable High Capacity Beams



Tracking Aero and Maritime Terminals

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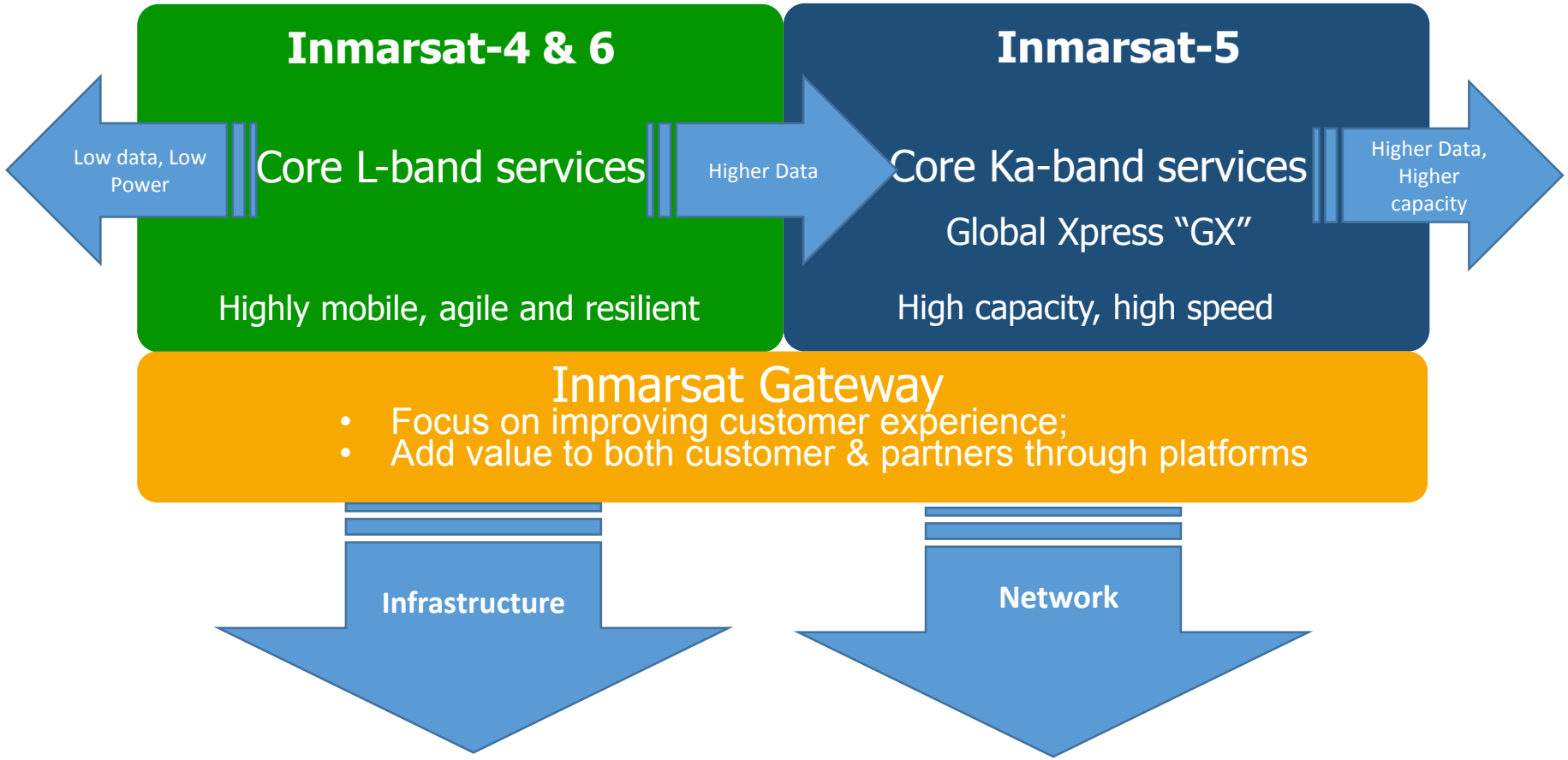
Satellite Operators Pushing Limits for Delivery of Satellite Broadband Services to Consumers



Satellite Service Regulations

A risk factor in our business

- Satellite service areas cover relatively large geographic areas and are required to meet international and national regulations
- Regulations need to keep pace with satellite technologies so that consumers may benefit from new satellite services
- International framework - ITU Radio Regulations (RR) treaty that regulates access to the orbit & spectrum resources – modifications only take place at WRCs (occurs every 3-4 years)
- National regulatory regimes are established by each country - ideally harmonised at least on a regional level
- Provision of satellite services are impacted by regulatory regimes in individual countries

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Satellite Service Regulations

Regional Situations

- In Europe regulation for satellite services are generally harmonized
- In the Americas regulation for satellite services typically vary on a country-by-country basis; there are differences in licensing satellite services by sector, e.g. maritime vs aeronautical and differences with respect to domestic versus foreign terminals
- CITEL has adopted Recommendations that would foster more robust deployment of satellite services in the Americas, for example
  - PCC.II/REC.52 (XXVII-16) – Licensing Regimes for Ubiquitously Deployed Satellite Service Earth Stations
  - PCC.II/Rec.50 (XXVII-16) – Authorization of Earth Stations in Motion Communicating with Geostationary Space Stations in the Fixed Satellite Service in the Frequency Bands 19.7-20.2 GHz/29.5-30.0 GHz in the Americas

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WRC-19 Agenda Items (1/2)

Opportunities for satellite services to consumers

- ***AI 1.5 – Earth Station in Motion (ESIM) -*** *consider ESIM operations in the bands 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space), while ensuring protection of and not imposing constraints on other services allocated in the bands.*
  - Adoption of a Regulatory framework in these bands similar to that adopted at WRC-15 for the 29.5-30.0/19.7-20.2 GHz band will allow satellite operators to meet the growing demand for satellite broadband services for users on the move, e.g. aircraft and ships
- ***AI 1.6 – NGSO FSS in Q/V bands*** *- consider development of a regulatory framework for non-GSO FSS satellite systems that may operate in the 37.5-39.5 GHz (space-to-Earth), 39.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) bands with respect to GSO FSS network*
  - Adoption of technical criteria that protects GSO FSS networks from NGSO FSS networks, i.e. quantify No. **22.2**, similar to Ku/Ka-band would provide regulatory clarity for NGSO FSS operations that will facilitate deployment of NGSO systems

WRC-19 Agenda Items (2/2)

Opportunities to facilitate increased deployment of broadband satellite services to consumers

- **AI 9.1.9 - New FSS (E-s) allocation in 51.4-52.4 GHz** *conduct studies relating to spectrum needs and possible allocation of the frequency band 51.4-52.4 GHz to the fixed-satellite service (Earth-to-space) GSO feeder links, Including the protection of the Radio Astronomy Service, as appropriate;*
  - Sufficient FSS spectrum is to key to growth in the satellite services that can be provided to end users
- **AI 7 - ITU satellite filing procedures** *consider possible changes, and other options, in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, an advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Resolution **86 (Rev.WRC-07)** to facilitate rational, efficient, and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit.*
  - Improvements in satellite service regulations can facilitate deployment of new FSS applications in new sectors.

WRC-19 Agenda Items

Challenges to Satellite Services

- ***AI 1.13 – IMT Studies*** *- consider identification of frequency bands for the future development of International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis (Resolution 238 WRC-15)*
  - Over 33 GHz of spectrum are under study for potential identification of frequency bands for operations by IMT. The vast majority of these bands are allocated on a primary basis to satellite services so that bands identified at WRC-19 for IMT may no longer be available for satellite operations

- ***AI 1.14 – HAPS Studies*** *- consider appropriate regulatory actions for high-altitude platform stations (HAPS), within existing fixed service allocations (Resolution 160 WRC-15)*
  - Similar to studies under agenda item 1.13 some of the bands being examined under agenda item 1.14 for potential identification High Altitude Platform Systems under the fixed service are also allocated to satellite services and HAPS operation may impact use of this spectrum by satellite services

- ***AI 1.16 –*** *consider issues related to wireless access systems, including radio local area networks (WAS/RLAN), in the frequency bands between 5 150 MHz and 5 925 MHz, and take the appropriate regulatory actions, including additional spectrum allocations to the mobile service, (Resolution 239(WRC-15);*
  - The studies under this agenda item is also examining bands that are partially allocated to satellite services

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Summary

- **Satellite Infrastructure is Critical**:
  - it should be understood and supported as a long-term enabler of communication services that allows users to enjoy broadband services anytime/anywhere as well as providing critical communication capabilities for rescue and relief efforts during emergencies and disaster events
  - satellite beams cover large areas and therefore satellite operators market to customers in all locations

- **Satellite Policies and Regulation**:
  - policies should recognize, enable and leverage satellite services to ensure that user needs, based on market expectations, can be met
  - satellite regulations that are predictable and harmonized as wells as adaptable to keep up with technological advances is essential for users to fully realize and benefit from satellite services
  - spectrum access enables growth of the provision of broadband satellite services

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Thank you

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