

## Conclusions & Wrap Up



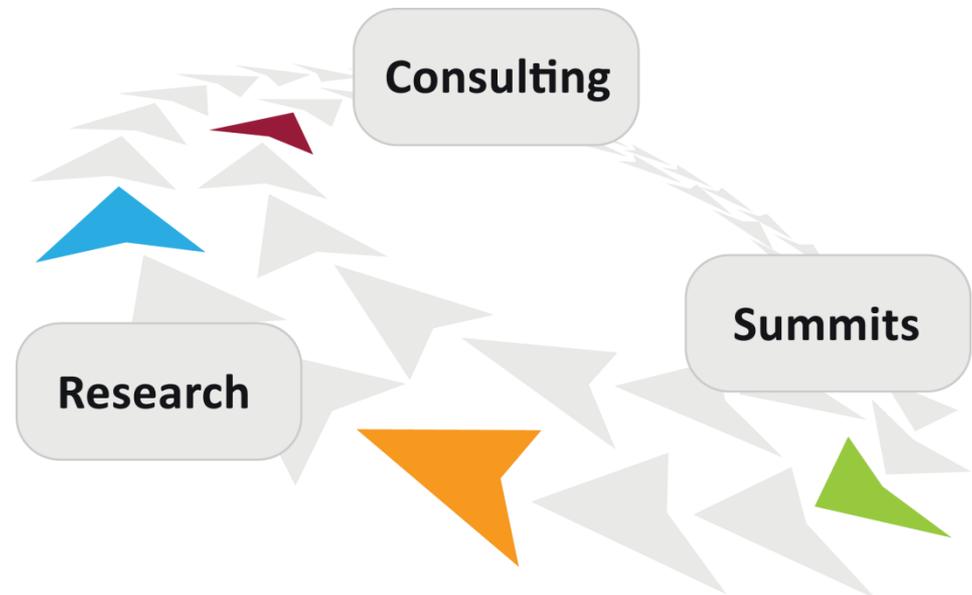
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## Who we are

- Leading global consulting firm specializing in the space, satellite communications and Earth observation sectors
- Privately-owned, fully independent firm
- More than 570 clients in over 50 countries
- Multi-cultural team of over 30 full-time experts based in Paris, Montreal, Washington D.C. and Tokyo



# Why Interference is a critical issue in the industry

## Issues and challenges

- Increasing number of satellite operators and telecom satellites in orbit
- Less orbital separation between satellites and increasingly powerful satellites (HTS)
- Ground equipment getting smaller and increasingly mobile
- Increasing terrestrial interference (and other communication industries looking at using satellite spectrum)
- Vast majority of interference is unintentional but there are also continuing cases of deliberate jamming

## Impacts

- Adverse effects on critical end-user services (can have significant security and socio-economic impacts)
- Results in reduced usability of transponders – inefficient use of spectrum
- Can cause significant revenue and reputation loss for operators and service providers
- Can take significant time and cost effort to mitigate or resolve
- Can impede free flow of information

# Deliberate harmful interference and jamming

## Issues and challenges

- Jamming is nothing new ....but a crucial issue
- Main motivation is of political nature
- Has become very sophisticated
- Debate of free flow of information/freedom of expression vs. sovereignty/control of information
- Middle East today most impacted region (peak during Arab Spring in 2012-13)
- International regulation and enforcement mechanism remains weak

## Possible solutions

- Open and transparent regulatory standards
- Creating awareness in a joint effort of all stakeholders
- Improving techniques of identification and geo-localization
- National authorities and ITU have to take actions
- ITU mandate and means to be augmented  
(MONITOR – MEASURE – IDENTIFY/LOCATE – NAME)

# Interference with terrestrial telecommunications

## What's at stake with regards to C-band

- WRC-15 agenda includes the possible allocation of C-band for terrestrial mobile telecom applications
- Resulting interference with satellite services could be substantial and would make C-band un-usable for satellite services in certain areas (Protection distances of 50 – 430 km are necessary to allow co-frequency sharing between BWA/IMT systems and FSS earth stations)
- C-band satellite services very efficient, reliable, ubiquitous, cost effective
- Studies have shown a significant socio-economic impact on government and commercial sectors with billions of end users dependent on C-band satellite today, notably in emerging economies\*
- C-band service playing a critical role for the entire TV industry, health care, education, the financial sector (ATMs, stock exchanges), natural resource & energy sectors, disaster management, civil government & administration, cellular backhaul, etc.
- ...and claims for terrestrial C-band usage is possibly only the start



\*Euroconsult studies on the usage of C-band in Asian and African countries can be downloaded at:

<http://satellite-spectrum-initiative.com/files/C-band%20usage%20in%20African%20countries%20-%20Final%20Report%202009%202014.pdf>

<http://satellite-spectrum-initiative.com/files/EC%20for%20CASBAA%20-%20C-band%20usage%20in%20Asian%20countries%20-%202010%2006%202014-update.pdf>

# Unintentional interference / governance of the GEO arc

## Issues and challenges

- More operators, more satellites, more frequency bands used
- Higher competitive pressure and increasing spectrum needs
- Interference mitigation largely still based on goodwill of stakeholders → tends to decrease with commercial pressure
- Interference still largely due to human error, lack of training, unauthorized use of spectrum, equipment issues, etc.

## Possible solutions

- Clear rules with regards to coordination & notification procedures
- Development of an accurate and comprehensive database that reflects reality
- Improvement of monitoring
- Increase of technical and regulatory assistance to the newcomers
- Better cooperation among satellite operators as well as other stakeholders
- Training programs
- Carrier ID
- Equipment certifications

## Conclusions and key take aways

- Interference remains a key topic in the satellite industry and its impacts should not be underestimated
- Creating awareness of the issue and what is at stake is essential
- The majority of interference is unintentional and there are actions to be taken along the satcom value chain to mitigate them
- Cooperation (and data-sharing) between all stakeholders in satellite communications is needed to mitigate interference issues
- Monitoring, identification and geo-localization tools must be put in place and are critical to solve the issue
- Role and Mandate of international organizations (e.g. ITU) needs to be strengthened
- The threat from terrestrial telecom industries is real and the satellite industry needs to defend its spectrum rights against other industries