

# Accessing spectrum/orbit resources: when scarcity becomes a reality!

*BR Workshop on the efficient use of  
the spectrum/orbit resource*

*Geneva, 6 May 2009*

# Outline

- Background: some facts to keep in mind
  - The resource is not only natural but depends on technical and operational trade-offs
  - Is scarcity on paper only or also in orbit?
  - Regulatory procedures are a tool to manage finite resources, not a means to increase it
- Improving regulatory procedures: what solutions?
  - Need to acknowledge what is working and what is not
  - Defining what means “bringing into use”
  - Timing considerations impact a lot
- Not only the regulatory procedures need to be reviewed but they need to be appropriately implemented.
  - Administrative procedures must be correctly applied to avoid wasting human resources.
  - ITU procedures are an integral and essential part of a satellite project and not a mere formal administrative procedure to comply with.
  - Detailed training and sharing of best practices is required to improve the application of the procedures.

# Background

## some facts to keep in mind

# Technical and operational trade-offs

- Speaking of orbit/spectrum resources shall not lead to believe that they are entirely natural. Some technical and operational trade-offs impact on the size of these resources.
- Orbital separation: size of earth stations versus orbital occupancy
  - Using large earth station antennas requires smaller orbital separations but since these earth stations are more expensive, it leads to actually deploy fewer earth stations, prohibiting de facto some applications (e.g. DTH).
  - On the counterpart, using small and inexpensive antennas increases the required orbital separation, which inherently limits the orbit usability.
- Frequency reuse: capacity versus coverage
  - Two possible approaches of in-orbit spectrum efficiency:
    - Addressing the same content to the greatest number of customers → BSS-like satellites
    - Maximising the overall throughput carried by the satellite → spot-beam based satellites for Internet access
  - Covering areas where few customers are is also an acclaimed feature of satellites
- Actual use: access to actual space capacity versus ability to use space resources in the future
  - Recent trends in satellite business have shown a consolidation into a small number of large satellite operators, with global or almost global reach.
  - This appears to lead to more efficient and profitable operations, while ensuring actual coverage of a lot of countries.
- Nothing new but making trade-offs shall continue to be the very root of satellite regulations: being too theoretical risks to overlook practical lessons from the past 40 years of actual satellite operations.

# Is scarcity on paper only?

- Orbit scarcity is often discussed as a “paperware” issue
  - while over-filing is certainly occurring, it is however essential to look in the sky to verify whether this scarcity actually occurs or not
- Some examples of real scarcity in orbit:
  - Orbital arc 81°W-101°W (Standard unplanned Ku) : at least one satellite each two degrees having North American coverage
  - Orbital arc 7°E-33°E (Standard unplanned Ku) : at least one satellite each three degrees or less, having wide European coverage
  - Orbital arc 60°E-78.5°E (Standard unplanned Ku) : at least one satellite each two degrees or less, having various spots over Asia
- Regulatory improvements must be discussed with this actual scarcity in mind.

# Orbit/spectrum resources are finite

- Actual orbit scarcity DOES occur for some coverage, in some bands and in some parts of the geostationary orbit.
- Regulatory procedures are a tool to manage a finite resource, not a means to increase it.
- Discussions about orbit/spectrum access must never be disconnected from three other aspects:
  - Is there enough spectrum allocated in the RR for the various satellite applications?
  - Are the international allocations appropriately made available in national tables of frequency allocations?
  - Are the national licensing schemes designed to favour or at least not to hinder the deployment of satellite applications?

# Improving regulatory procedures: what solutions?

## Some prerequisites

- The overall ITU process for orbit/spectrum access has been pretty successful for the past 40 years because:
  - it is a mix between a priori planning and a “first-come first-served” approach
  - it is a balance between actual operational needs of satellite operators and rules of good spectrum management,
  - it is never disconnected from technical and operational reality,
  - it is under continuous review,
  - it is backed by the international community.



# Bringing into use

- It seems that most of the controversies related to satellite filings are linked with the concept of bringing into use, either initially or after a suspension.
- The main issue on this topic is that there is no agreed precise definition in the RR about bringing into use.
- While this was certainly not an issue when the notion of bringing into use was first applied to satellite filings, the development of satellite operations has increased the number of possible scenarios for bringing into use a filing.
- Until now, such issues were dealt with bilaterally. The increase of administrations accessing the orbit may augment the willingness to have a more multilateral approach.

# Timing considerations impact a lot

- Matching filings and reality is obviously a required principle...
- ...without forgetting that satellite filings are not satellites
  - ITU filings are envelopes of coordinated parameters in which real satellites can be operated.
- Current operational plans of satellite operators can change on a short notice (two weeks to three months).
  - Either the international coordination of this change can be performed in the desired time-frame with a great level of confidence,
  - Or it must be acknowledged that satellite filings must remain in some way an envelope of parameters, negotiated beforehand.
  - Here also a trade-off is required to be negotiated within the ITU to adequately address concerns of each party.

# Implementation of the procedures

# Administrative procedures

- Human resources of both administrations and satellite operators are also limited:
  - a proper application of the regulatory procedures has the potential to improve overall access to orbits and spectrum by freeing time that would be dedicated to the crux of the procedures.
- Some examples : about 33% of the faxes received by France are either purposeless, unusable or avoidable
  - comments to an API published to update the name or the orbital position of a satellite following the submission of a coordination request
  - comments under No. 9.52 without precise indication about applicable provisions (9.7, 9.11, 9.11A, 9.21, etc) and relevant satellite networks to coordinate.
  - request that France sends publicly available data, e.g. filed frequencies or power parameters, whereas the special section has been published.

# Coordination process

- From the beginning, the ITU coordination process shall be part of the design of a satellite project, in an interleaved manner, requiring inputs and feedbacks from the technical side
  - Even if the satellite project can not be entirely designed based on a priori coordination (because of business and considerations)...
  - ... the coordination process can not, on the counterpart, be entirely driven by sole internal technical considerations.
- Coordination of existing satellites already in orbit generally tends to be much more complicated and requires to enter into detailed operational considerations.

# Training and sharing best practices

- During its biennial Seminar, the Bureau is providing to all administrations useful training about the regulatory procedures and the software tools to implement them.
- Smaller, more focused seminars could be of great interest:
  - Smaller: attended by less people so easier for the Bureau to interact with the participants and for the participants to share experience between themselves
  - More focused: a specific theme would be thoroughly addressed, e.g. filing a satellite network, managing satellite networks, applying the procedures of Appendices 30 and 30A...
  - Regional seminars could also help to focus further its theme, e.g. a regional seminar about Appendices 30 and 30A held in South America could focus on the procedures for the Region 2 BSS Plan only.
- Does the Bureau have enough resources?
- A more precise implementation of regulatory procedures is key to the successful continuation of the ITU process for accessing orbit/spectrum resources.