

# “Have We Got a Slot?”

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# Overview

- I want to argue that the access to satellite spectrum and slots is posing serious limitations and risks to satellite projects...
- I will tell you about:
  - The International Telecommunication Union and how it regulates access to spectrum and orbit
  - The problem of accessing slots and spectrum
  - The risks that this imposes on satellite projects
  - Some thoughts on the way forward??

# ITU

- ITU is the “leading UN agency for information and communication technology issues”
  - Membership includes 191 Member states and over 700 Sector Members and Associates
  - ITU has a broad ICT remit, but a key function is regulating access to satellite spectrum and orbit slots



Source: ITU Photo Library

# Access to Spectrum / Orbit

- World Radiocommunication Conferences
  - Define spectrum allocations
  - Define the “rules”
- International Treaty: Radio Regulations
  - 2,200 pages of legal and technical rules

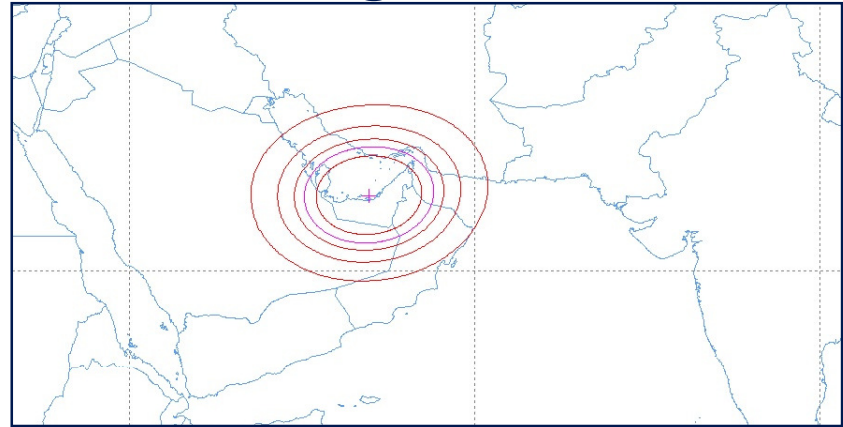


Source: ITU Photo Library



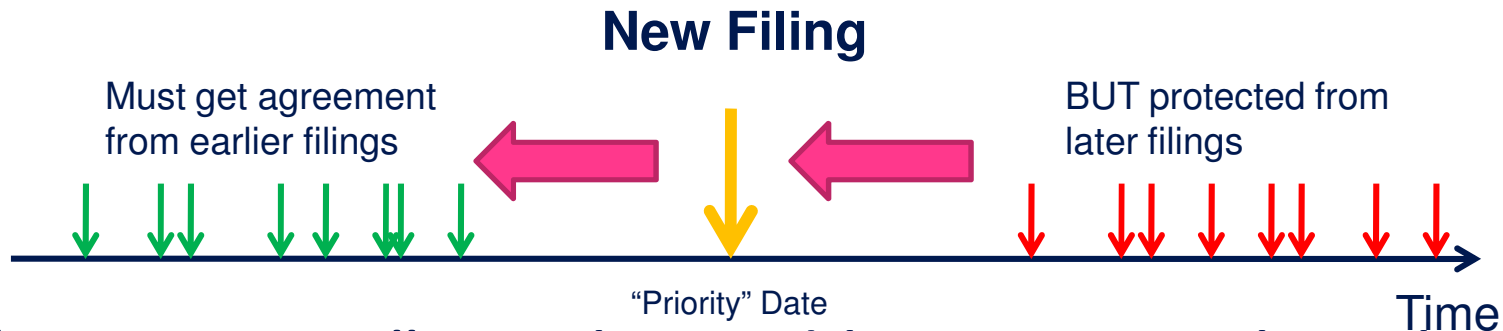
# How Spectrum is Assigned

- Limited planning: reserves something for all
  - BSS and FSS Plans
  - One coverage per country
  - Not very useful?
- Mostly “First-come First-served” through filings
  - Something of a free-for-all!
  - Apply for what you want by submitting filings
  - “Priority” date of filing is key



# Why priority matters

- Systems with an earlier date can block you...



- “Agreement” is achieved by proving that there is no unacceptable interference
  - This requires some orbit and/or coverage separation, so the orbit can get “full”
- Filings are protected for **7 Years** if not BIU

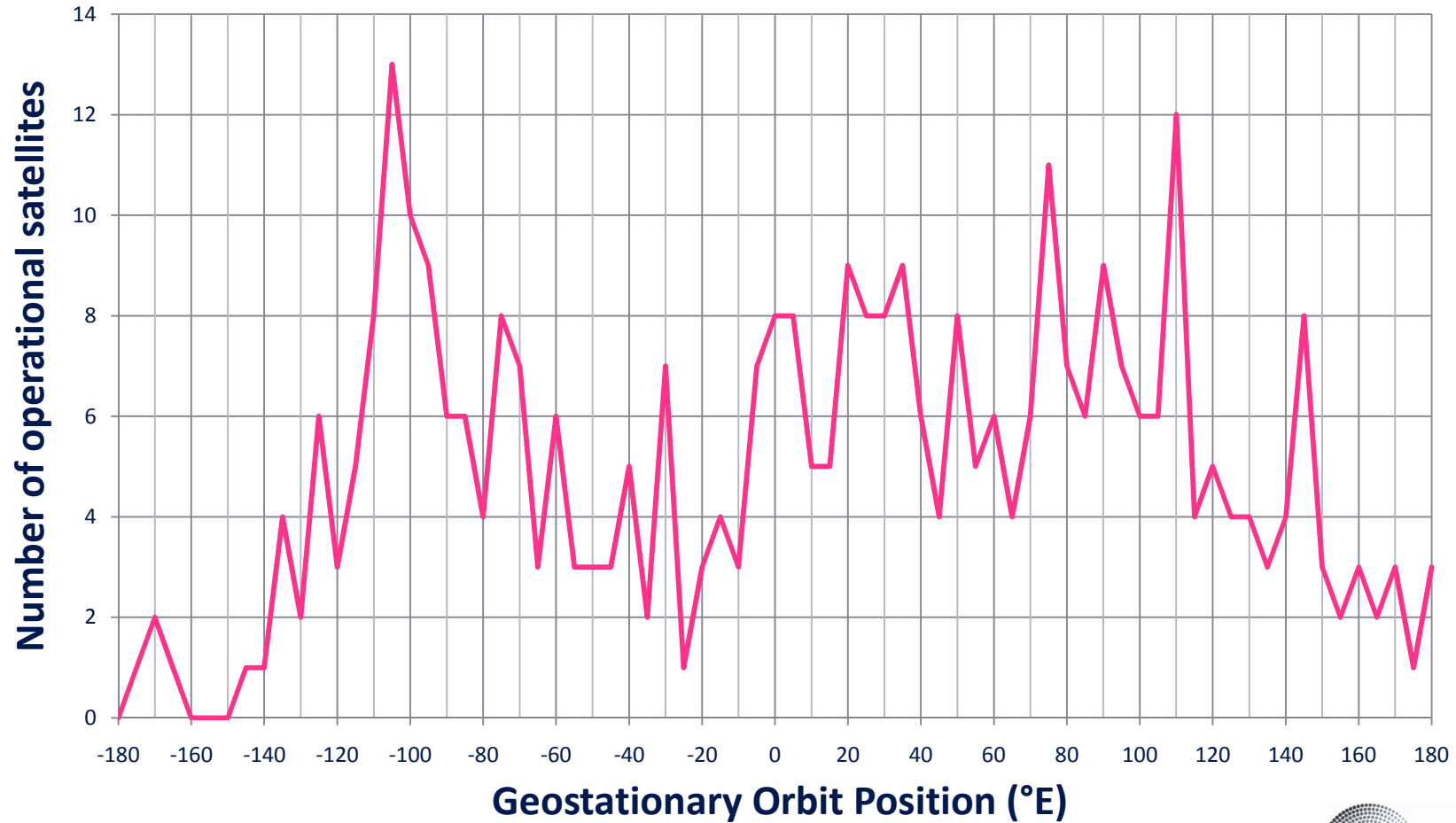
# Agreement by “Coordination”

- The process of getting agreement is through frequency coordination
  - Earlier system proves technical interference
  - New system proposes means to remove it
  - Earlier system *may* give some protection to new system
  - Both sides sign a “coordination agreement”
- Older systems have “blocking” power
- Agreement cannot be forced (except “no reply”)

# The GSO: The Physical Problem...

Total: 359 satellites

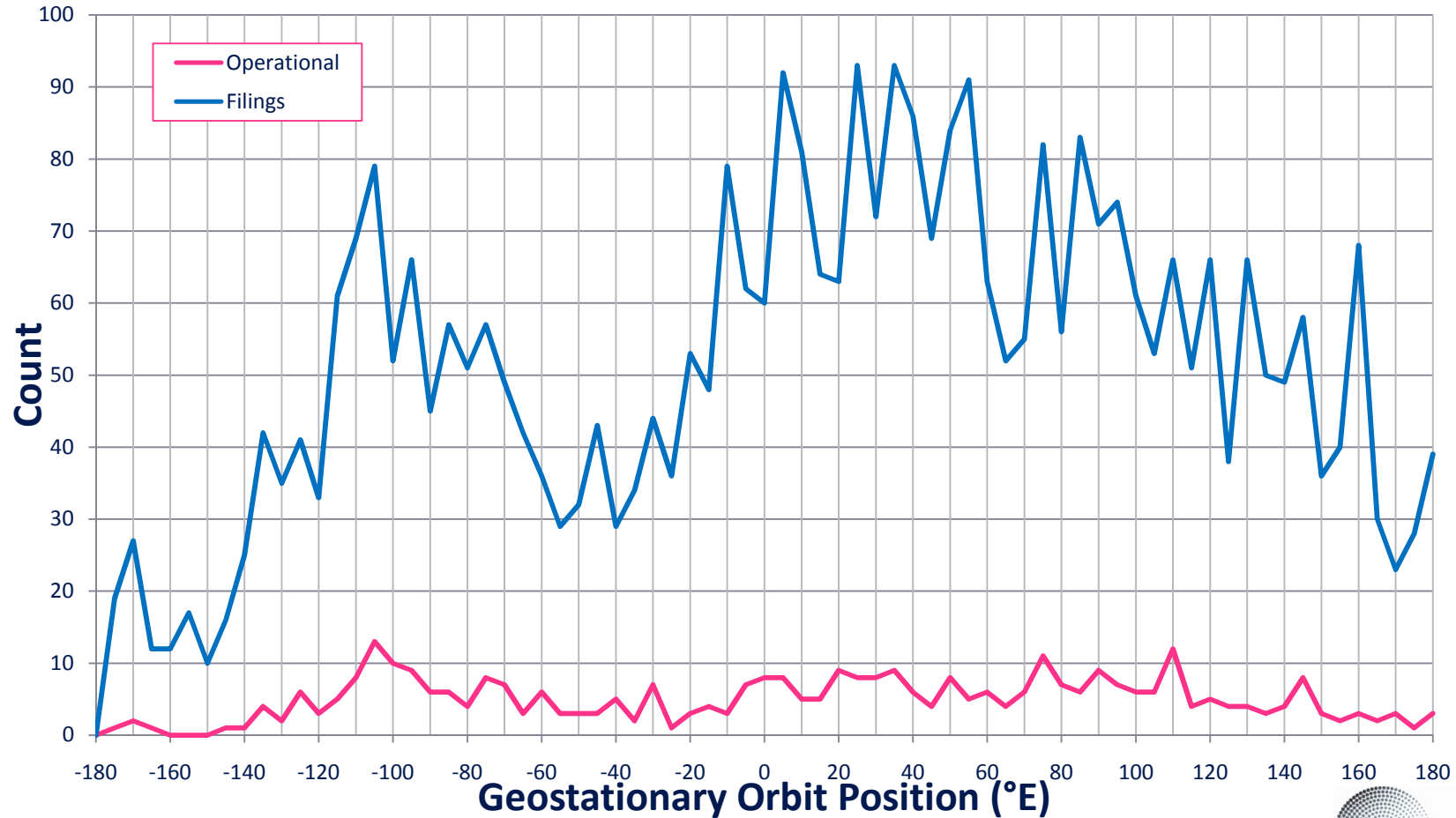
5 degree bin size  
Data as of 01/2010



# The GSO: The Paper Problem...

Total Filings  $\approx$  3700

5 degree bin size  
Data as of January 2010

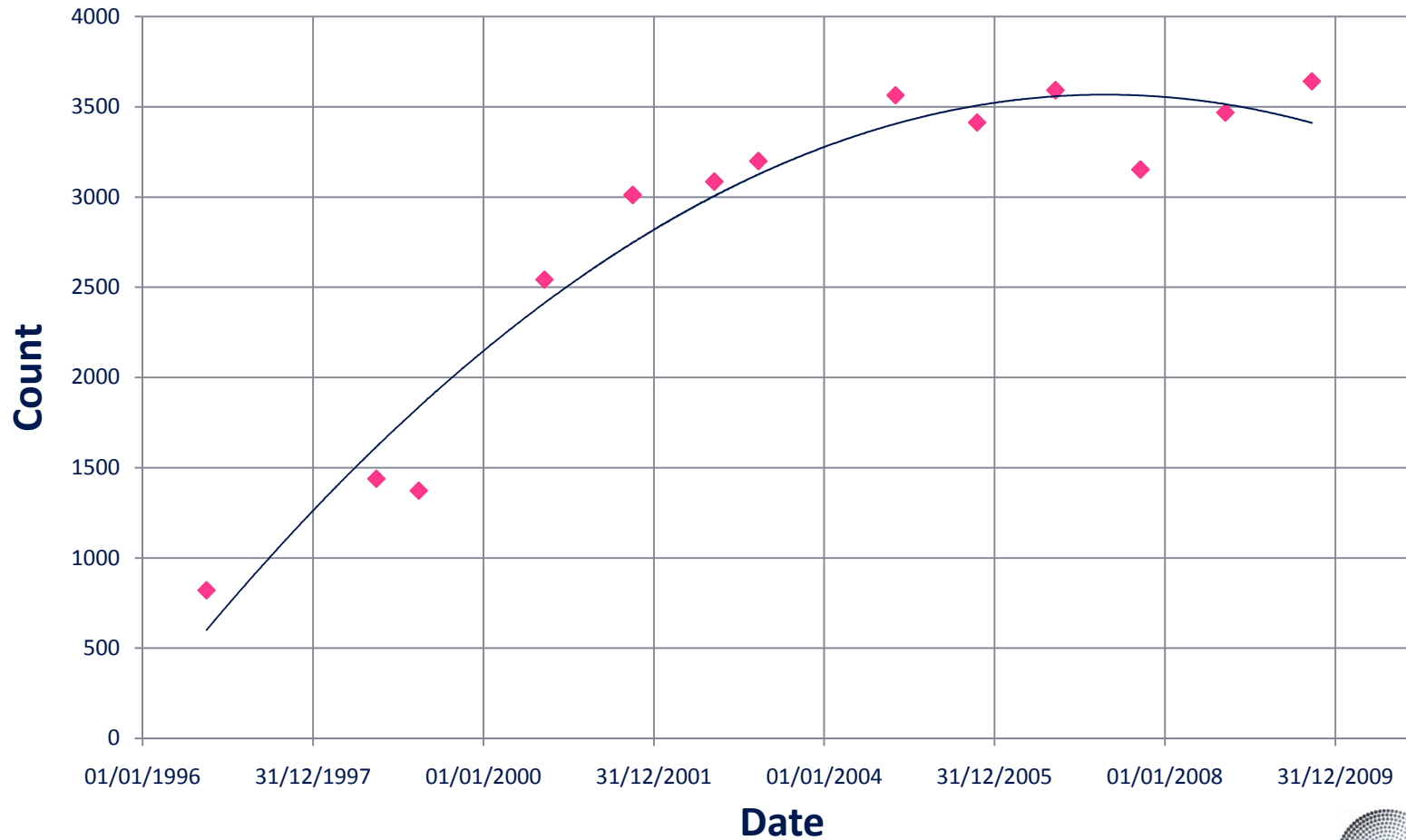


# Key issues...

- Far more filings than can ever be implemented
  - Most are incompatible with each other
- New systems must seek agreement with prior systems, many of which are not real
  - Paper satellites
  - “Dead” systems
- Huge burden on operators making and coordinating filings
- Some slowdown but still far too many filings!

# Number of Filings

Data as of 01/2010



# Economical With the Truth?

- The reality in orbit is often very different from the information registered with ITU...
- Example: GSO arc 25E to 30E in the Ku-Band
- 4 Operational Slots
  - Using 5 GHz of Ku-band spectrum
- 9 Recorded Slots (Notified to ITU)
  - Claiming use of 15 GHz of Ku-band spectrum
- Spectrum is clearly being reserved (hoarded?) without actual use

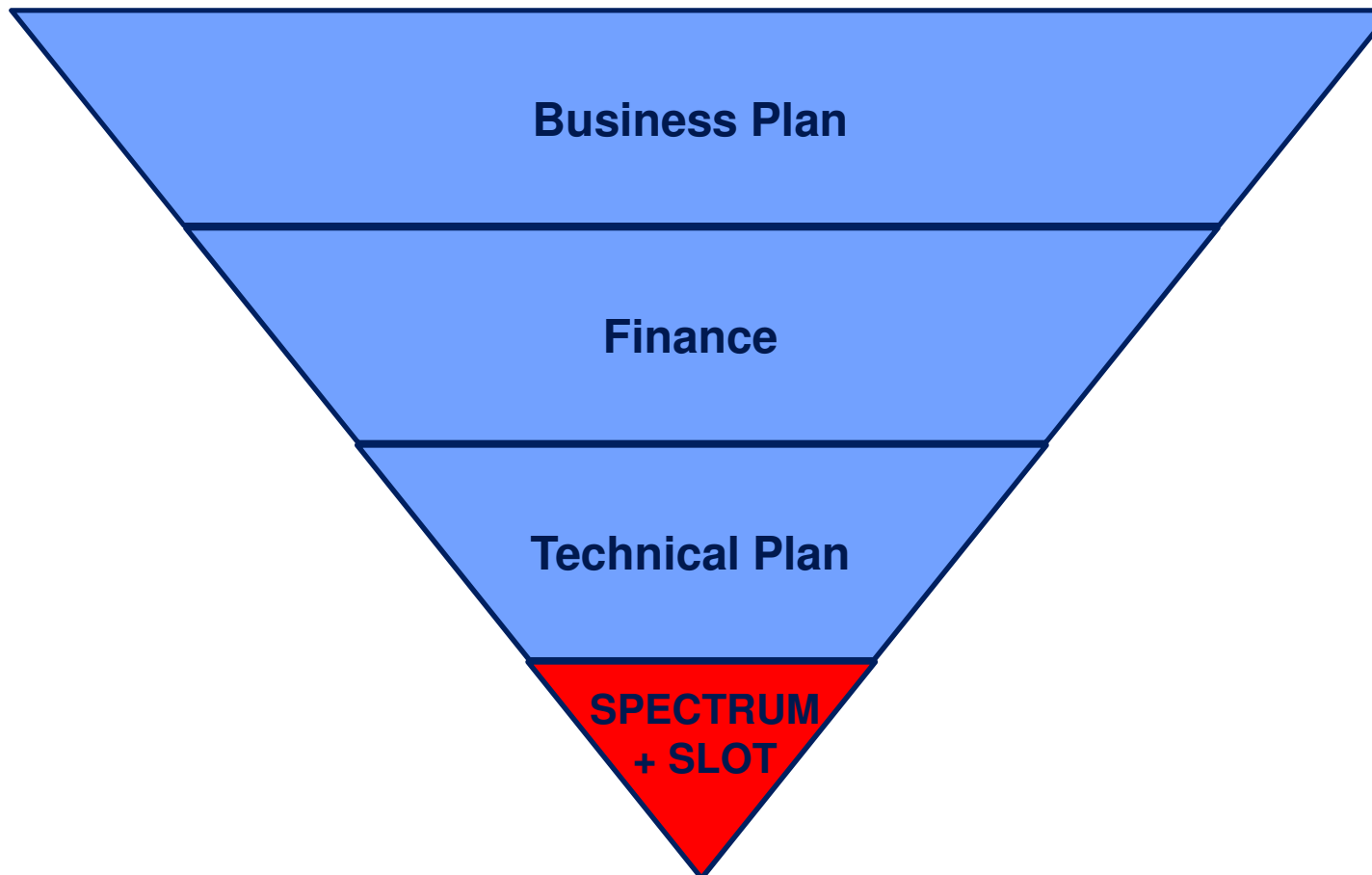
# Impact on Operators

- Very hard to get slots for new projects!
- New operators find it almost impossible to get coordination agreements
  - Even if the proposed use is compatible with the “real world” implemented satellites
- Existing operators are tempted to “hoard” slots and spectrum for expansion
- Lack of clarity and certainty on slot/spectrum
  - Severe risk factor in planning new networks

# Slot Risks

- Uncertainty about usable spectrum
- Uncertainty about usable coverage
- Uncertainty about blocking from “paper satellites”
- Uncertainty about interference environment
- Recent experience shows that slot and spectrum access can kill projects
- “Have we got a slot?” – Maybe not!

# ITU Coordination is Thus Critical...



# The Way Forward?

- Probably something must be done
  - BUT... existing spectrum-holders might disagree!
- ITU secretariat is trying to be pro-active
  - Comparing recorded information with reality
  - Building consensus around more accurate recording of satellite networks
  - Addressing spectrum and coverage “hoarding”
- BUT there is a lot of inertia in ITU Membership

# A Personal View

- Some administrations and operators will support tougher rules
  - Those trying to access spectrum
- Some will oppose it
  - Those with an existing spectrum “hoard”
- There is a risk of nothing being done
  - Maybe cosmetic changes only?
  - We have seen this before!

# A Personal View

- BUT, if nothing is done this may have serious implications for the satellite industry
- SO, minimum necessary must be done
  - Stop spectrum retention without actual use or plans
  - Address differences between registered and actual spectrum use
  - Maybe address differences between registered and actual coverages (more difficult)
- These changes could free spectrum for new systems and give more certainty to all

# Conclusions

- Competition for slots and spectrum is imposing constraints and risks on new projects
- Problems with the ITU process are making things more difficult
- Satellite operators and ITU administrations need to work together to fix the system
- ITU and coordination may seem arcane and specialist, but ignore it at your peril!
- “Have we got a slot?”

Thank you.

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Dubai 1-3 March 2010



# Mark C J Posen: CV

- B.Sc. Electrical and Electronic Engineering (Bristol, UK, 1983)
- M.Sc. Satellite Communications Engineering (Surrey, UK, 1986)
- Chartered Engineer and Member IET & IEEE
- Various satcom roles in BT, 1983 – 1990
- Director, Reed Posen Consultants, 1990 – 1993
- Managing Director and Principal Consultant, RPC Telecommunications, 1993 – present
  - Consulting to satellite operators and ITU administrations
- Director Telecom and Networks, SYNERGY MOON, 2009 - present

# RPC Telecom: Introduction

## Consulting ([www.rpctelecom.com](http://www.rpctelecom.com))

Satellite and radio engineering; ITU Radio Regulation, filing and frequency coordination; ITU representation and negotiation; System modelling and studies.

## Training ([www.satellite-training.com](http://www.satellite-training.com))

Satellite Communications Masterclasses; Software training; Custom training.

## Software ([www.sat-software.net](http://www.sat-software.net))

Sat-Coord: ITU Coordination Software; “Slot-Finder” tools; Online tools; Custom software.