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**ITU, the Radio Regulations
and satellite networks**

Per Hovstad, Telenor Satellite Broadcasting AS

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Do we want ITU?

- Satellites are expensive
- Satellites generally need to serve many countries to be economically viable
- It is desirable to have harmonized rules and regulations within the countries in the coverage of a satellite to enable efficient operation
- Interference and access to spectrum resources generally is of an international nature for satellite networks
- National legislation alone normally cannot handle satellite interests in a satisfactory manner

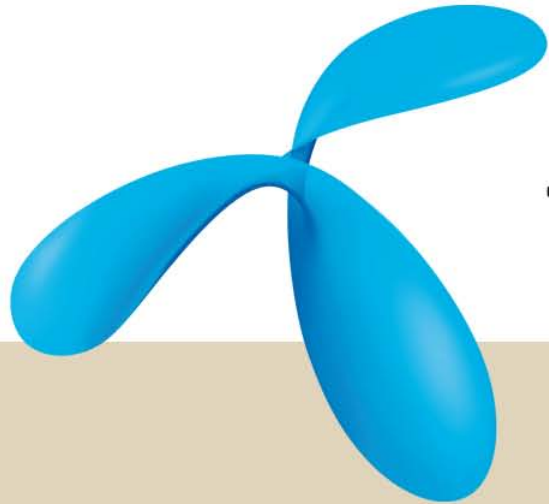
⇒ **Satellite operators want an ITU that has an impact!**

Future coordination outside ITU?

- Formally, access to spectrum capacity is obtained through application of the procedures of the Radio Regulations
- **As of today, the procedures of the Radio Regulations are generally seen to be applied**
- As the orbit resources becomes more and more congested, getting access to spectrum capacity becomes more and more difficult
- Some networks brought into use without due coordination interfere with (and are interfered by) operational systems
- In a congested situation, practical, detailed coordination is conducted;
 - only with respect to really affected networks
 - formally affected networks and “paper satellites” are less taken into account
- “Unreasonable” requirements of the Radio Regulations and the need to protect “paper satellites” may complicate rather than facilitate access to spectrum resources while providing little gain for satellite operators
- **Satellite operators may be forced to conduct practical coordination directly between practical satellites, (outside the Radio Regulations (with no guarantee that the objectives of ITU are observed))**

How can ITU retain an impact on spectrum usage?

- To ensure that spectrum usage is in line with the objectives of ITU, it should be in the interest of ITU to ensure that the Radio Regulations are such that;
 - **The procedures are seen as facilitating and assisting for satellite operators**
 - **It is possible for satellite operators to implement commercial, profitable, satellite networks following the provisions of the Radio Regulations**



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The Radio Regulations

and procedures for obtaining access to, and protection of spectrum resources for satellite networks

Why do we have overfiling?

- Congestion in the arc
 - ⇒ uncertain outcome of coordination
 - ⇒ Multiple filings to enhance chance of success
- Commercial value for administrations leads to more filings
- Filings to block coordination of competitors
- No incentive to keep amount of spectrum resources within a filing low

Is overfiling a problem?

- Because of overfiling, many satellite systems operate without having completed all coordination
- It is likely that practically all new satellite networks will have to enter into operation without having completed all coordination
- Satellite operators will discuss directly between themselves and find ways to operate
- **Satellite operators have learned to live with overfiling**
- **Overfiling may be a serious threat to ITU's capability to reflect and regulate real satellite usage**

BR's initiative

- To remove “paper satellites”;
 - CR 301 (May 2009) requests administrations to remove unused assignments and satellite networks
- To remove “virtual satellites”;
 - BR has challenged orbit locations where due diligence information has been submitted, but according to public information and databases, no satellite exist
 - BR has sent letters to administrations having submitted due diligence information for Ka-band networks, but where, according to public information and databases, no such frequency usage has taken place
- The initiatives of BR has led to;
 - New interest in suspension of filings to make it more difficult to challenge the filings (for another 2 years)
 - Stronger interest in reshuffling placeholder satellites between orbit locations

BR's initiative

- The initiatives of BR;
 - Existing satellite operators may lose some old, unused filings
 - Reduces the number of “paper satellites” and “virtual satellites”
 - Suspended filings needs to be brought back into use within 2 years (this can be difficult in many cases and more filings are likely to be cancelled)
 - Improves ITU's capability to reflect and regulate access to spectrum resources
 - Facilitates coordination of new satellite networks
 - For new satellite operators
 - For existing satellite operators

⇒ **Satellite operators welcome BR's initiatives!**

Will filing fees help?

- The motivation for filing fees was to cover the cost of processing the filings
 - ⇒ Still, filing fees has had the side effect of somewhat reducing the number of filings
- Countries have one free filing per year
 - Countries with only one satellite operator at an advantage
 - Countries without a satellite operator can submit a free filing and sell it to the highest bidder
 - ⇒ Free filings encourage overfiling
 - ⇒ Free filings are against the principle of equitable access
 - ⇒ Free filings are encouraging commercialization of access to satellite spectrum resources
 - ⇒ Remove free filings?

Improve due diligence procedures?

- Purpose:
 - Remove “paper satellites”
 - Remove “virtual satellites”
- Resolution 49
 - (Planned) date of launch
 - No obligation to renew information when satellites are relocated or deorbited
 - No information on frequency assignments, only frequency bands
- **Improved due diligence procedures**
(ideas of SES, Luxembourg)
 - Information submitted after launch (exact date)
 - Requirement to renew information whenever changes occur
 - Specific ID of satellite, submitted by administrations, to allow tracking of location of satellite in time and avoid same satellite recorded as operational in several locations simultaneously
 - Specific information on assignments implemented in the satellite

Should there be a deadline for completion of coordination filings that are in use?

- Current coordination procedures expect completion of coordination within 7 or 8 years
- Overfiling, “virtual satellites”, over protection, speculative filings etc. lead to large number of “unreal” coordination requirements
- The Radio Regulations cannot distinguish between “real” and “unreal” coordination requirements
- Bilateral coordination is time consuming
- Coordination has to first focus on “real” coordination cases
- Completion of a large number of “unreal” coordination cases is not possible within 7 (8) years
- Satellites are often forced to be brought into use without having yet completed all the coordination
- Practically all new satellite networks will be forced to be brought into use without completion of all the coordination

⇒ **Radio Regulations need to allow for coordination beyond the regulatory deadline**

⇒ **Radio Regulations should not encourage or reward skipping coordination**

Allowing coordination to continue beyond expiry date in the case of operational networks

- To enjoy such privileges, it is a requirement that the network has been implemented at the time of the regulatory deadline
- RR § 11.41 allows for entering into the Master Register with outstanding coordination requirements.
- AP30/30A § 4.1.18 and AP30B § 6.25 allows for entering into the List (and Master Register) with outstanding coordination requirements in respect of assignments other than those of the Plan
 - Entering into the List with outstanding coordination agreements (both with respect to the List and the Plan)?
 - Expiry of filings associated with bringing into use, but not entering into the List?
 - Notification submissions accepted at the same time as submissions for entering into the List

Status of networks under coordination

- RR § 11.41 and AP30/30A § 4.1.18 and AP30B § 6.25 allow for provisional recording of networks with outstanding coordination requirements
- Such networks operate on a “non-interference, non protected” basis in respect of networks with which required coordination is not completed
- Under a current practice for RR § 11.41 in respect of terrestrial services, assignments provisionally recorded will be automatically deleted if the administration claiming interference claim that the interference persist at the end of the 4 month period associated with RR § 11.41, with no requirement for the complaining administration to substantiate or document their claims
- Without any directives, the same practice could be applied for satellite networks
- Coordination of satellite networks, the time scale and the impact of losing a filing is significantly different between satellite and terrestrial networks

⇒ **No automatic cancellation of assignments to satellite networks**

⇒ **Use of Article 15 procedures (or something to that effect) in the case of claimed interference during and after the period of provisional recording**

Should there be an expiry date for filings that are in use?

- Building, launching and operating a satellite is a significant financial commitment
- Building up a satellite location takes several satellite generations
- The typical life of a satellite is around 15 years
- Today, Appendix 30 and 30A sets a maximum life time of 15 (+ 15) years for a satellite system that is in use
- After that date, all filing rights are lost, even if the satellite is operational
- Even if the filings are lost, the satellite will still be there and it is highly unlikely that a commercial operator can afford to cease operation
- Satellite operators are forced to make arrangements outside the provisions of the ITU
- Since the satellite is still operational, other countries cannot bring in other satellites to use this capacity
- The ITU databases will not reflect the actual situation

⇒ **Applying hard expiry dates for filings that are in use will:**

- Be detrimental for commercial satellite operation
- Not provide access to usable spectrum for other users
- Be a threat to ITU's ability to observe, control and regulate use of spectrum resources for satellite networks
- **No hard expiry dates for filings in operation!**
(remove AP30/30A § 4.1.24)

Explicit agreements for inclusion of a country in the service area?

- To be economically viable, satellite systems normally need to be able to provide services in several countries
 - connections between widely separated areas using large beams sometimes covering the entire visible landmasses
 - countries where services are to be provided will change over time
 - disaster relief may require rapid changes to locations where services are to be provided
- The service area defines the area wherein the satellite is protected against interference from other satellites
- Administrations pulling out of the service area will disrupt the interference protection
- It is practically impossible to obtain the explicit agreement for inclusion in the service area of each and every administration within a large coverage area
- Being included in the service area or not;
 - no obligation to license operation within its country or protect such services
 - no implications on the coverage of that country
 - no implications on the ability to restrict a service within a country

Explicit agreements for inclusion of a country in the service area?

- ⇒ Requiring explicit agreements for inclusion in the service area provides no apparent benefit for the administrations to be included
- ⇒ Notifying administration entitled to define international service areas to obtain the required interference protection
(remove RR 23.13B and AP30B § 6.6)
- ⇒ No provisions for administrations to pull out of the service area at a later stage
(remove RR 23.13C and AP30B § 6.16)

Remove unnecessary coordination and the advantage of using speculative parameters to block coordination?

- Protection criteria in most relevant unplanned bands are based upon a coordination arc
 - Coordination is always required inside the coordination arc
 - If $\Delta T/T > 6\%$ into an assignment of an assignment outside the coordination arc, coordination can be demanded
- Protection criteria in planned bands are based upon a coordination arc
 - Pfd limits to protect networks outside the coordination arc
 - No criteria that allows inclusion in the coordination for networks outside the coordination arc
 - Criteria to get out of coordination inside the arc if the interference is negligible
 - C/I above a given threshold
 - Pfd below a given threshold
- Current protection criteria in unplanned bands
 - Leads to unnecessary many coordination requirements
 - Is vulnerable to speculative filings aimed at blocking coordination of other filings

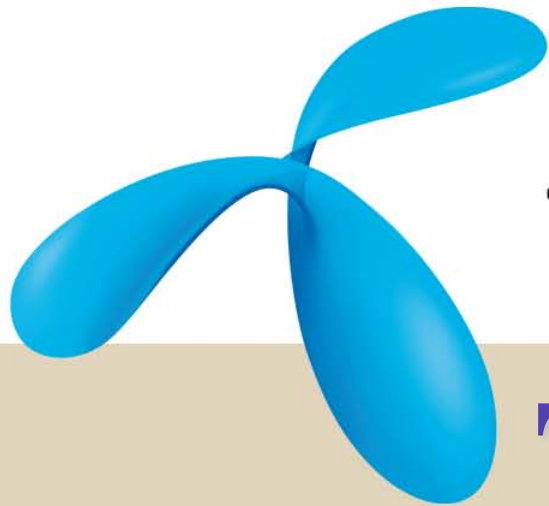
Remove unnecessary coordination and the advantage of using speculative parameters to block coordination?

- Restructure protection criteria in selected unplanned frequency bands with matured technical parameters (e.g. C- and Ku-band) along the same lines as planned bands?
 - Coordination requirements based upon a coordination arc
 - Pfd limits to protect networks outside the coordination arc
 - No criteria that allows inclusion in the coordination for networks outside the coordination arc
 - Criteria to get out of coordination inside the arc if the interference is negligible, e.g.
 - C/I above a given threshold
 - Pfd below a given threshold

Remove API for satellite networks subject to coordination?

- Coordination request (CRC) under RR Art. 9 not receivable until 6 months after the Advance Publication Information (API) at the earliest
- Filing priority is given by the CRC date
- API publishes a desire for a given orbit location and frequency band, but gives no protection
- Speculative APIs can be submitted around the arc to be in a position to submit CRCs with higher priorities to block coordination for new networks
- APIs for satellite networks subject to coordination adds no value to the process

⇒ **Remove API for satellite networks subject to coordination?**



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Thank you!