Space FSS & BSS Plans

ITSO/ITU/CTU WORKSHOP ON SATELLITE COMMUNICATIONS

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Presentation by:

ITU (International Telecommunication Union)

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ITU Constitution

Article 44

- Radio frequencies and any associated orbits are limited natural resources.
- Must be used rationally, efficiently and economically in conformity with the Radio Regulations.
- To have equitable access to those resources.

Article 45

- Not to cause harmful interference to the service operating in accordance with the Radio Regulations.

International Telecommunication Union

The mechanism to control interference is within

the Radio Regulations (RR) which contains:

- ✓ The allocation of frequency bands and services.
- ✓ The process of Coordination / Planning.
- ✓ The technical and operational limits to apply to avoid interference.

It is used during:

- ✓ Licensing of frequencies and orbital locations.
- ✓ Monitoring the frequency emissions over a territory.

Planning Approach the "Space Plans"

The Space Plans have been established for certain space services and frequency bands in order to facilitate equitable access to a certain part of the frequency/orbit resource.

Broadcasting-Satellite Service and feeder-link Plans

11.7-12.2 GHz (Region 3),
11.7-12.5 GHz (Region 1),
12.2-12.7 GHz (Region 2),
17.3-18.1 GHz (Region 1&3),
17.3-17.8 GHz (Region 2),
14.5-14.8 GHz (Region 1&3 except Europe)

Cf. RR book 2 **Appendices 30/30A**

(So called BSS Plan or AP30/30A)

Fixed Satellite Service Plans

4.5 - 4.8 GHz,
6.725 - 7.025 GHz,
10.7 - 10.95 GHz
11.2 - 11.45 GHz,
12.75 - 13.25 GHz

Cf. RR book 2 **Appendix 30B**

(So called FSS Plan or AP30B)

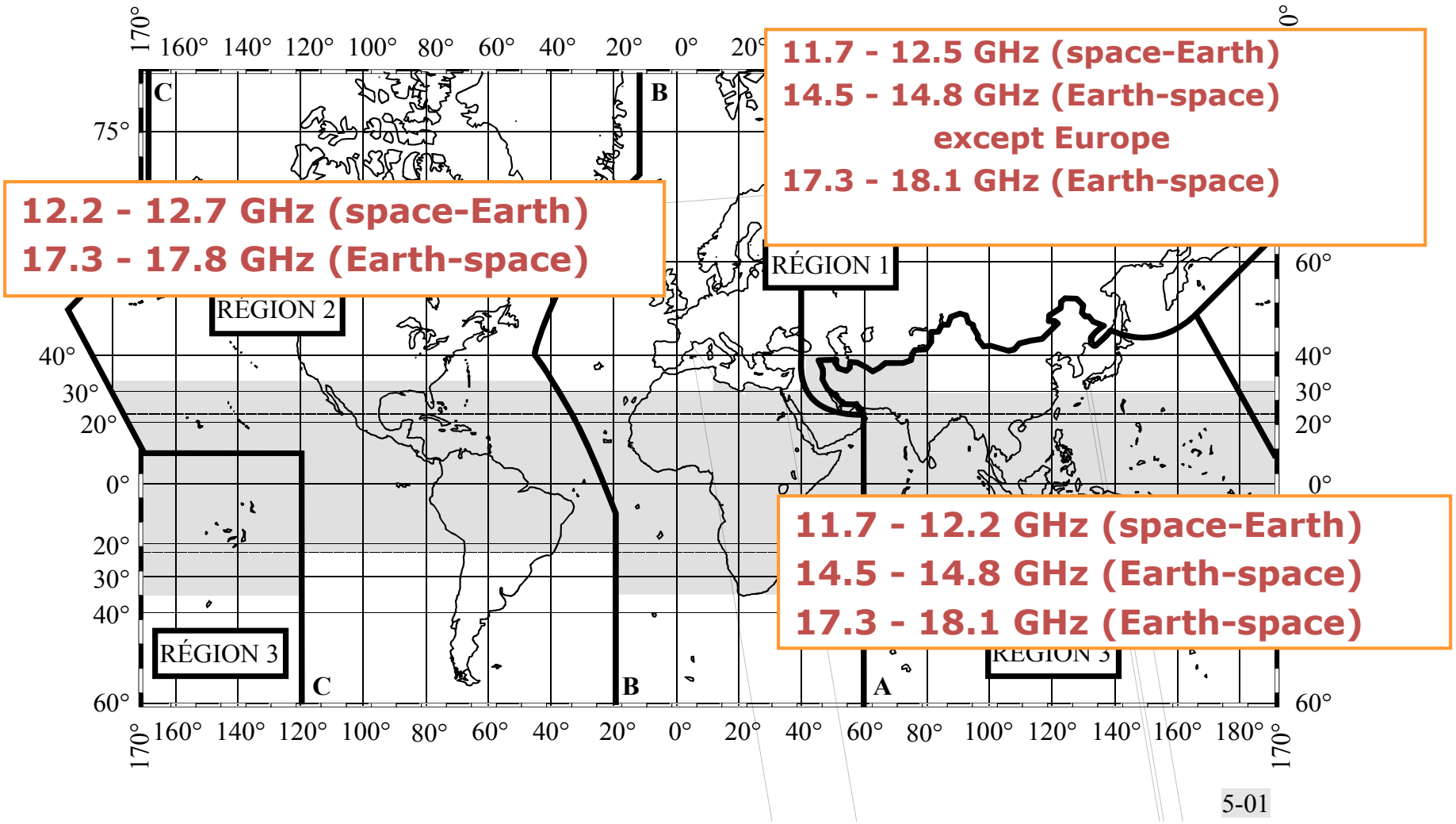
Space Plans, a long HISTORY

Several World Radio Conferences between 1977 and 2007 were held to establish and revise the Space Plans:

- **WARC-77 established the Region 1&3 BSS Pla**
- **RARC-83 established the Region 2 BSS and associated feederlink Plan**
- **WARC ORB-85 included the Region 2 BSS and associated feederlink Plan into the Radio Regulations**
- **WARC ORB-88 established the FSS Plan and Region 1 &3 BSS feederlink Plan**
- **WRC-97 revised the Region 1&3 BSS and associated feederlink Plans**
- **WRC-2000 revised the Region 1&3 BSS and associated feederlink Plans**
- **WRC-07 revised the FSS Plan**

More documents about conferences are available at the ITU History Portal:
http://www.itu.int/en/history/Pages/ConferencesCollection.aspx

Frequency bands
BSS and associated Feeder-link Plans/Lists coverage



Space Plans Features (1/4)

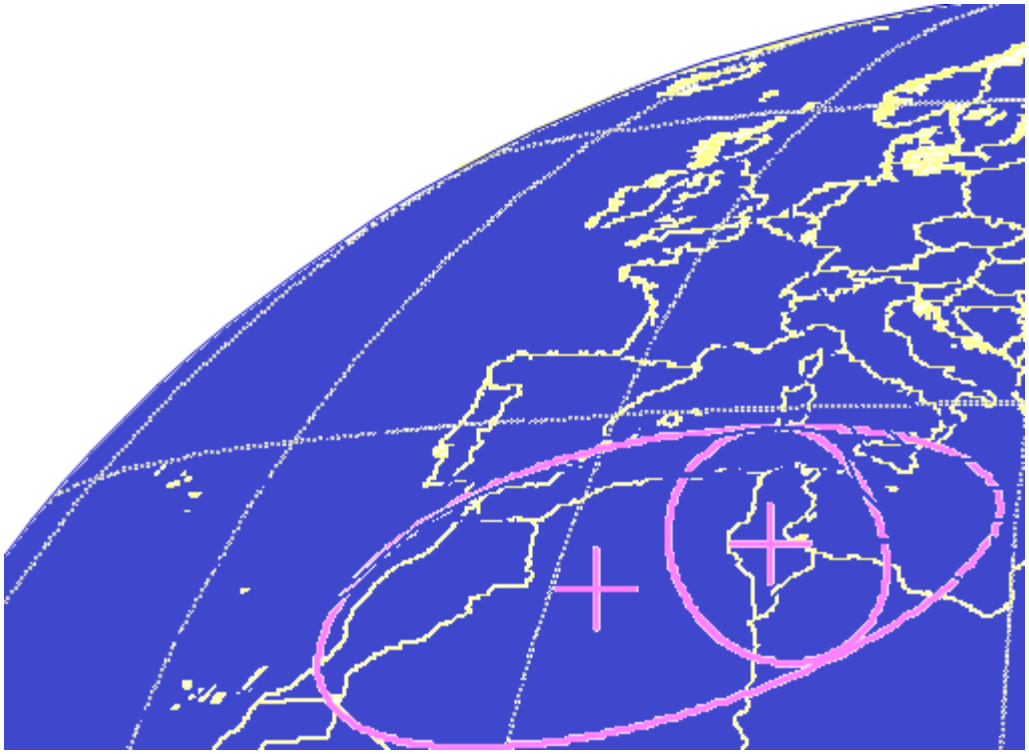
To guarantee equitable access, it is based on a reservation of capacity for future use by the ITU Member States:

- Not all Plan assignments are currently in operation BUT will not be cancelled and are protected from harmful interference from other networks

- Standard parameters (assumptions) are required to ensure equity amongst Administrations and possible future use

Space Plans Features (2/4)

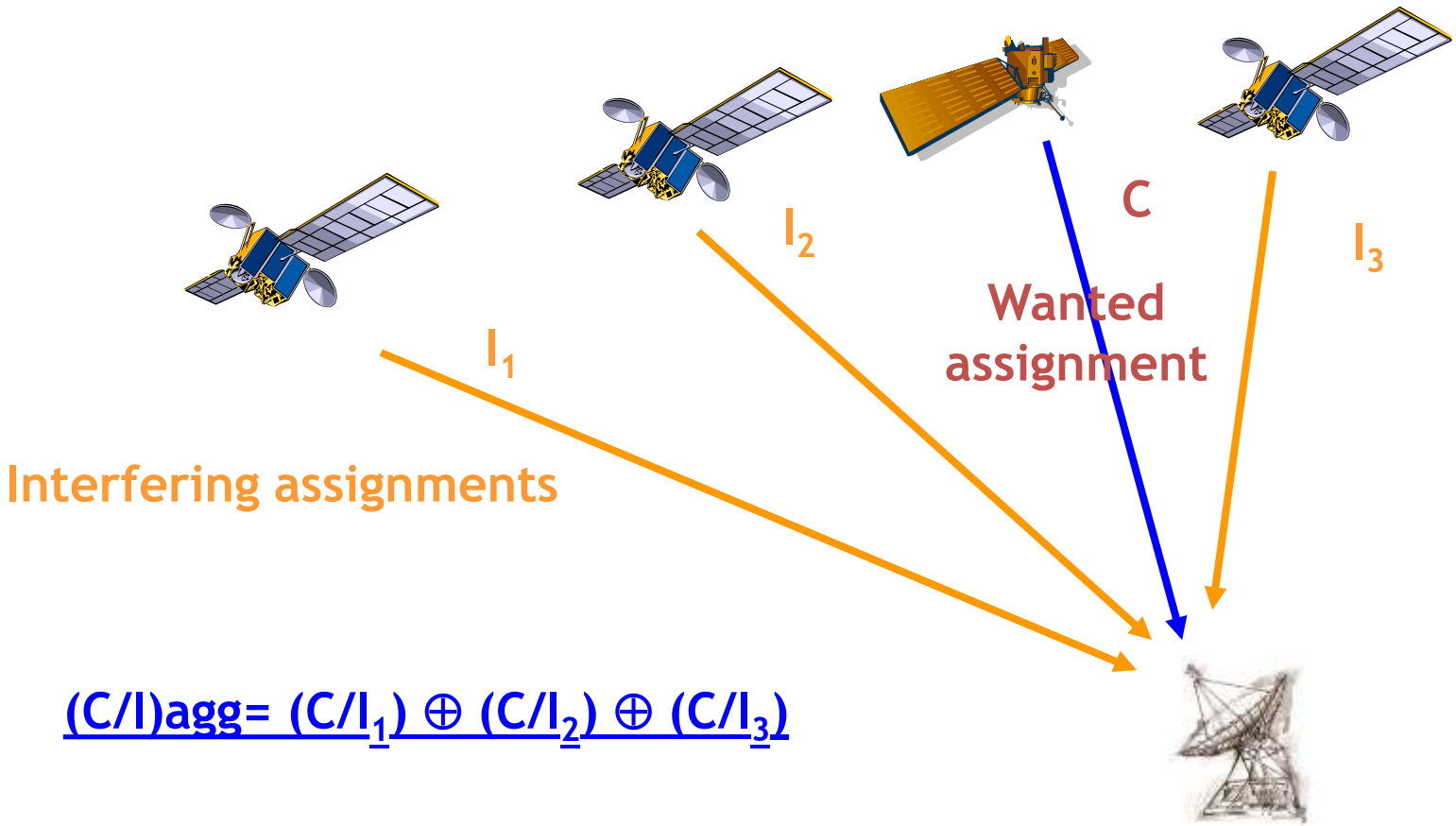
To guarantee equitable access, the beams cover the national territory of each Administration



Space Plans Features (3/4)

Protection from harmful interference is provided based on the Plan characteristics and NOT on the characteristics entered into the Master Register at notification stage. This is different for networks operating in the non-plan frequency bands.

Space Plans Features (4/4)



$$(C/I)agg = (C/I_1) \oplus (C/I_2) \oplus (C/I_3)$$

To use the space resources rationally, efficiently and economically, the Aggregate C/I method is used to identify potential interference.

Standard Parameters

Main assumptions (with some exceptions)

- **Same amount of frequency band for each beam**
- **National coverage**
- **Elliptical beam using defined space station antenna pattern**
- **Defined C/N**
- **Same values of system noise temperature**
- **Similar power level**
- **Defined earth station antenna size and pattern**
- **Defined Aggregate C/I**

BSS Plan and FSS Plan Some Distinct Features

APPENDICES 30/30A – BSS Plan

- Plans separated by Regions
- Shared with other space services in other Regions
- Coordination Arc, Lists for R1&3
- Cluster concept in Region 2 Plan

APPENDIX 30B – FSS Plan

- **World wide**
- **Allotment (conversion to assignment)**
- **Together with Single Entry criteria**
- **Protection based on grid points in service areas for downlinks**

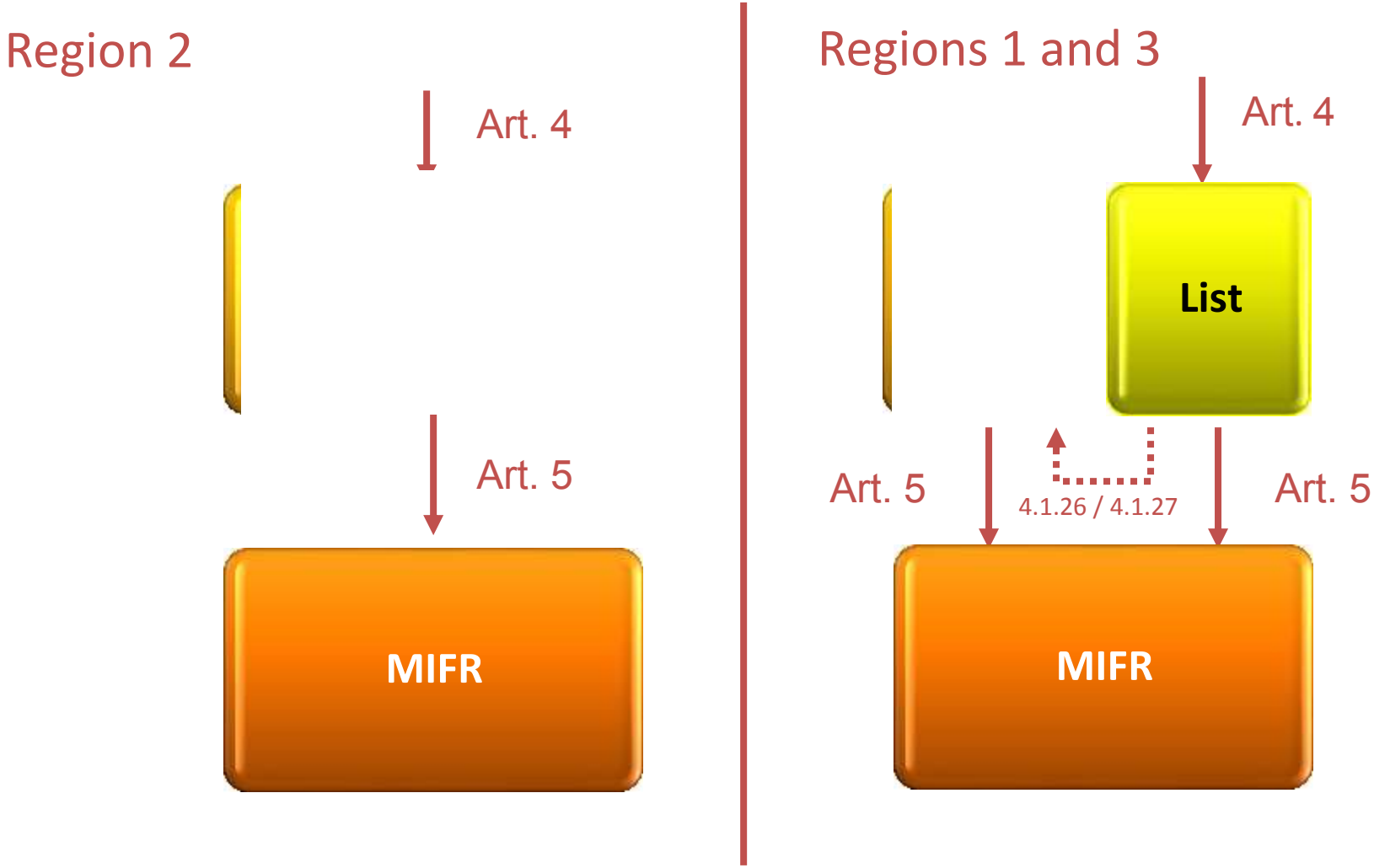
Space Plans Procedures

Space Plans and operational systems

3 status possible for the frequency

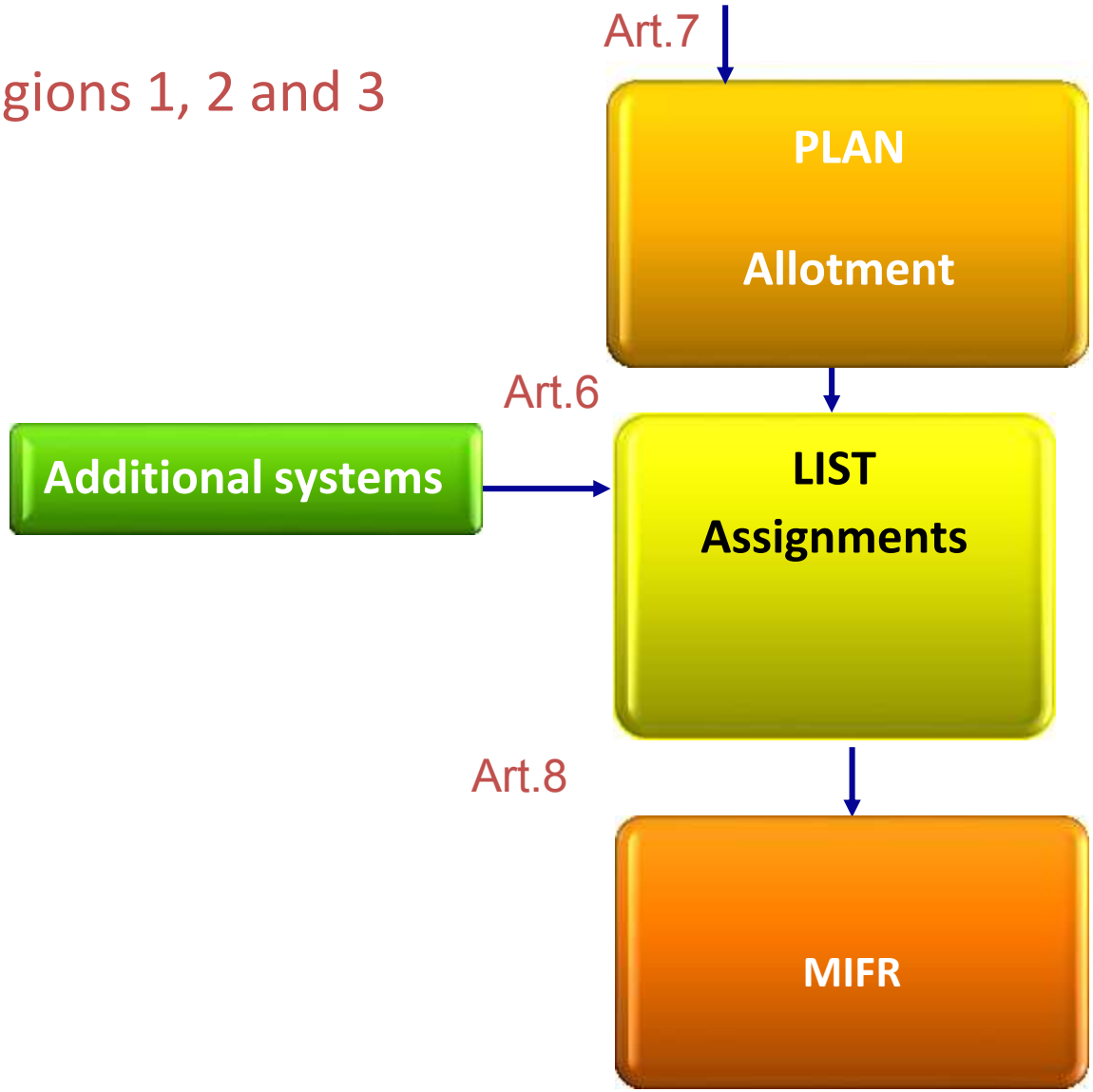
The Articles and the Appendices of the Radio Regulations establish the procedures to fulfil in order to enter the allotments/assignments in the Master Register (MIFR) whenever they are brought into use.

AP30/30A BSS Plan Procedure Summary



AP30/30A FSS Plan Procedure Summary

Regions 1, 2 and 3



Space Plans Procedure Highlights

Deadlines to track

Commenting to protect existing assignments

Tracking Regulatory Deadlines for Plans

APPENDICES 30/30A

4 months for comments

8 years for bringing into use, inclusion in the Plan/List, Res.49 not later than **3 months** before DBIU for notification

3 years after suspension for Region 1&3 List assignments (Rev.WRC-12)

90 days for confirmation of DBIU

15 years for R1&3 List

APPENDIX 30B

4 month for comments

30 days after §6.13 assistance

8 years for bringing into use, inclusion in the List, notification, Res.49

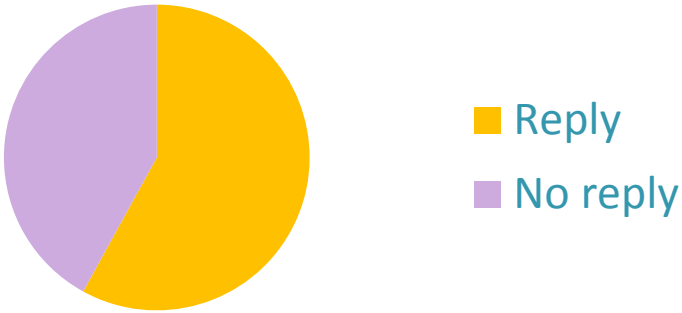
3 years after suspension (Rev. WRC-12)

90 days for confirmation of DBIU

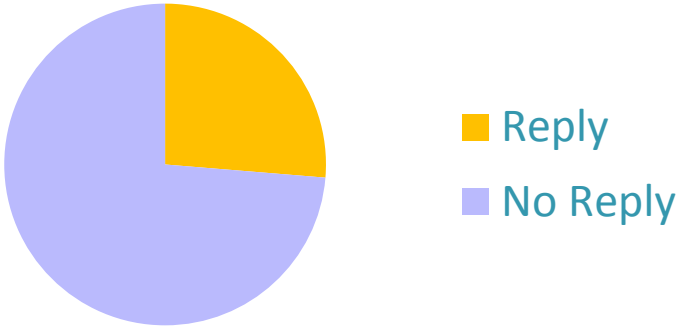
Importance of Making Comments

How many administrations respond?

- Response rate for AP30/30A after Part A Special Sections



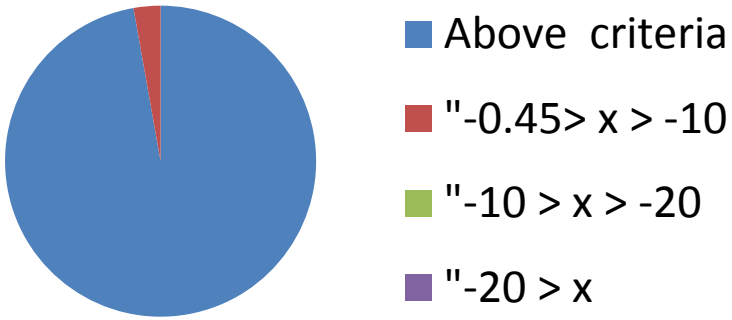
- Response rate for AP30B after BR assistance under § 6.13



Importance of making comments

- Consequence of non-response
  - Reference situation of AP30/30A Plans for R1&3

WRC-2000



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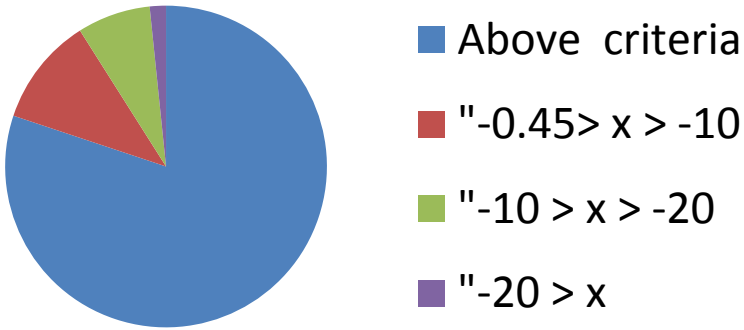
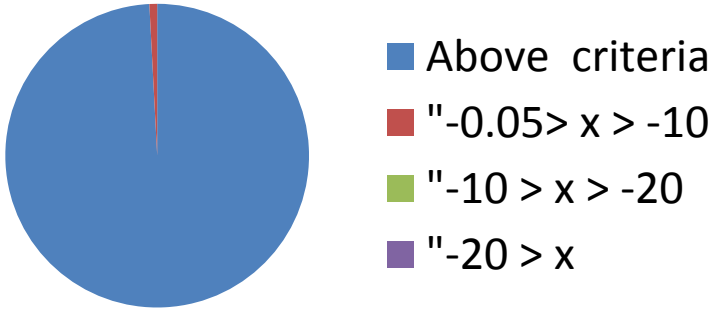


  - Reference situation of AP30B Plans

WRC-07



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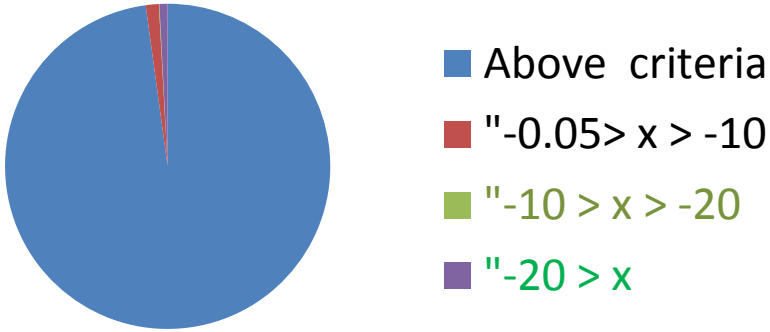
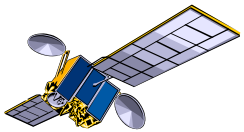


5 Key Points to Remember

- Plans ensure equitable access and equitable use of frequency and orbital resources



- Plan and non-plan procedures have similarities and differences

- In the Radio Regulations, Appendices 30/30A/30B contain the Plan/List/MIFR processes and definitions

- Processing deadlines should be carefully tracked
- It is important to comment when your Administration is identified as potentially affected by new assignments

General information relating to Space Plan services

http://www.itu.int/ITU-R/go/space-plans/en

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