

Introduction to BSS & FSS Plans

Álvaro de Vega

alvaro.devega@itu.int

BR Space Services Department

ITU REGIONAL RADIOCOMMUNICATION
SEMINAR FOR AFRICAN REGION

ITURRS JOHANNESBURG 2019

13 - 17 May
Johannesburg, South Africa

www.itu.int/go/ITU-R/seminars



Co-Organizers:



Agenda

- 1 Why We Need Plans
- 2 Plan Approach
- 3 Plans Features and Parameters
- 4 Space Plans Procedures
- 5 Summary

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 RR
- To have **equitable access** to those resources

- Article 45

- **Not to cause harmful interference** to the service operating in accordance with the RR

Radio Regulations

Mechanism to control interference

- Allocation
- Coordination / **Plan**
- Technical and operational limit

- Licensing
- Monitoring

Two Different Approaches

➤ Coordination

First come, first served
based on current
requirement

Efficient /economical

➤ Planning

Distribution of resources
based on current and future
requirement

Equitable access

late comers may not have
access to as the early users
have consumed all.

Planning Approach

- It is a distribution of some of the spectrum/orbit resources based on current and future technical requirements
- Provides equitable access as each ITU Member State gets a pre-determined allocation of part of the spectrum/orbit resources protected from harmful interference for current and future use.

Space Plans, a long HISTORY

- WARC-77 established the Region 1&3 BSS Plan
- 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 feeder-link 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
- WRC-12, WRC-15 and Revised provisions related to date of bring into use, comments for R1&3, transfer to digital emissions for R1&3....

Simplify the procedures and consider the development of technology



Planning Approach the “Space Plans”

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)

Appendices 30/30A
BSS Plan

Fixed Satellite Service Plans

- 4500 – 4800MHz
- 10.7 - 10.95 GHz
- 11.2 - 11.45 GHz

- 6725 - 7025 MHz
- 12.75 - 13.25 GHz

Appendix 30B
FSS Plan

Space Plans features (1)

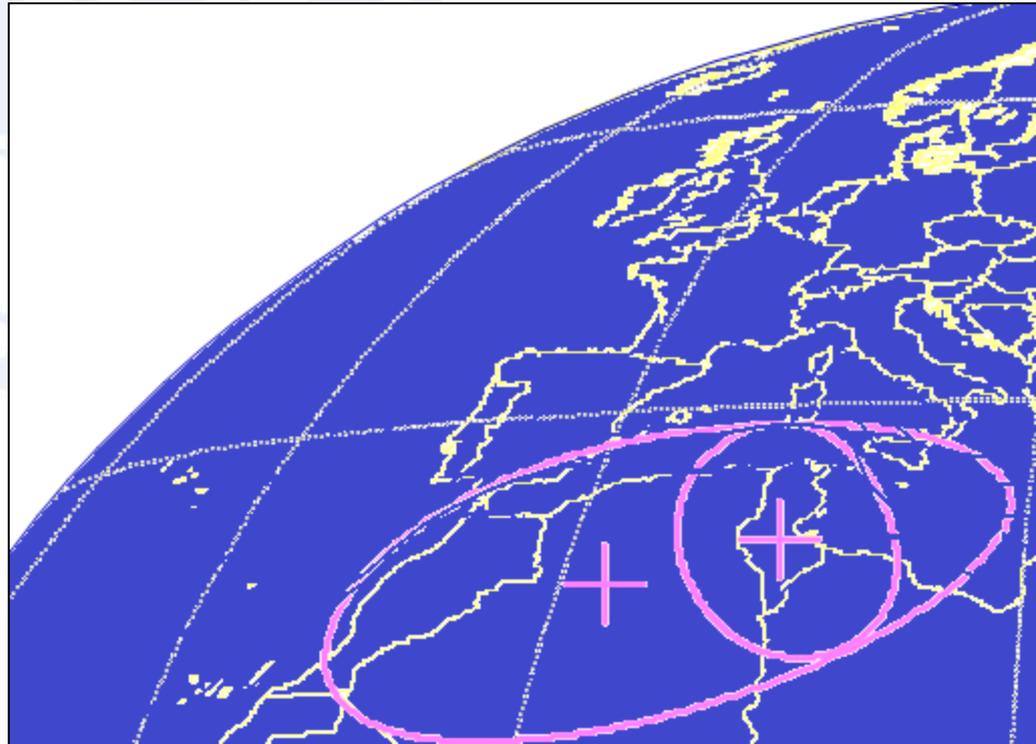
To guarantee equitable access, it is based on a reservation of capacity for future use by the ITU Member States:

- 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)

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

- National Coverage
- National service area

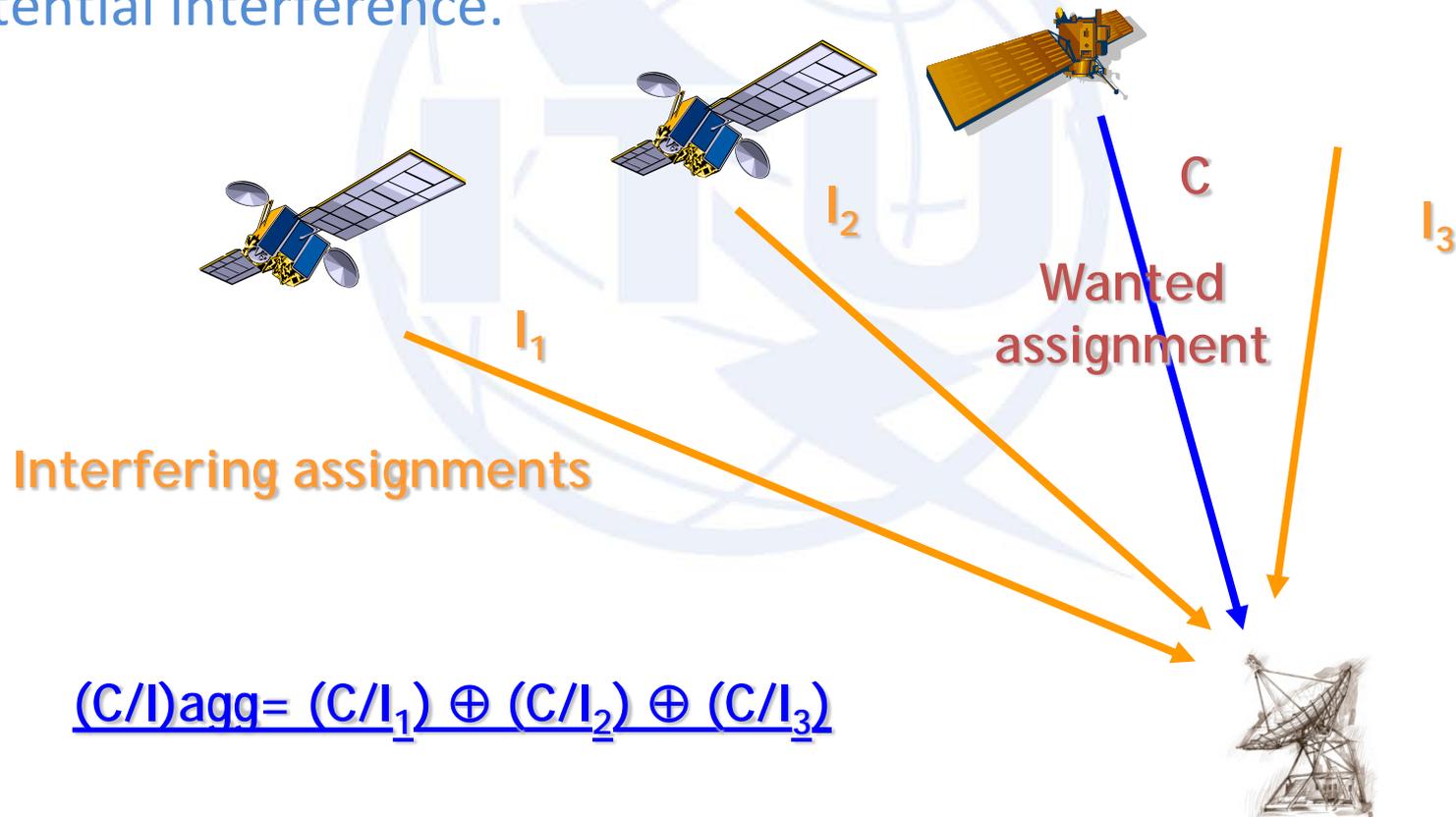


Space Plans features (3)

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)

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



Space Plans features (5)

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

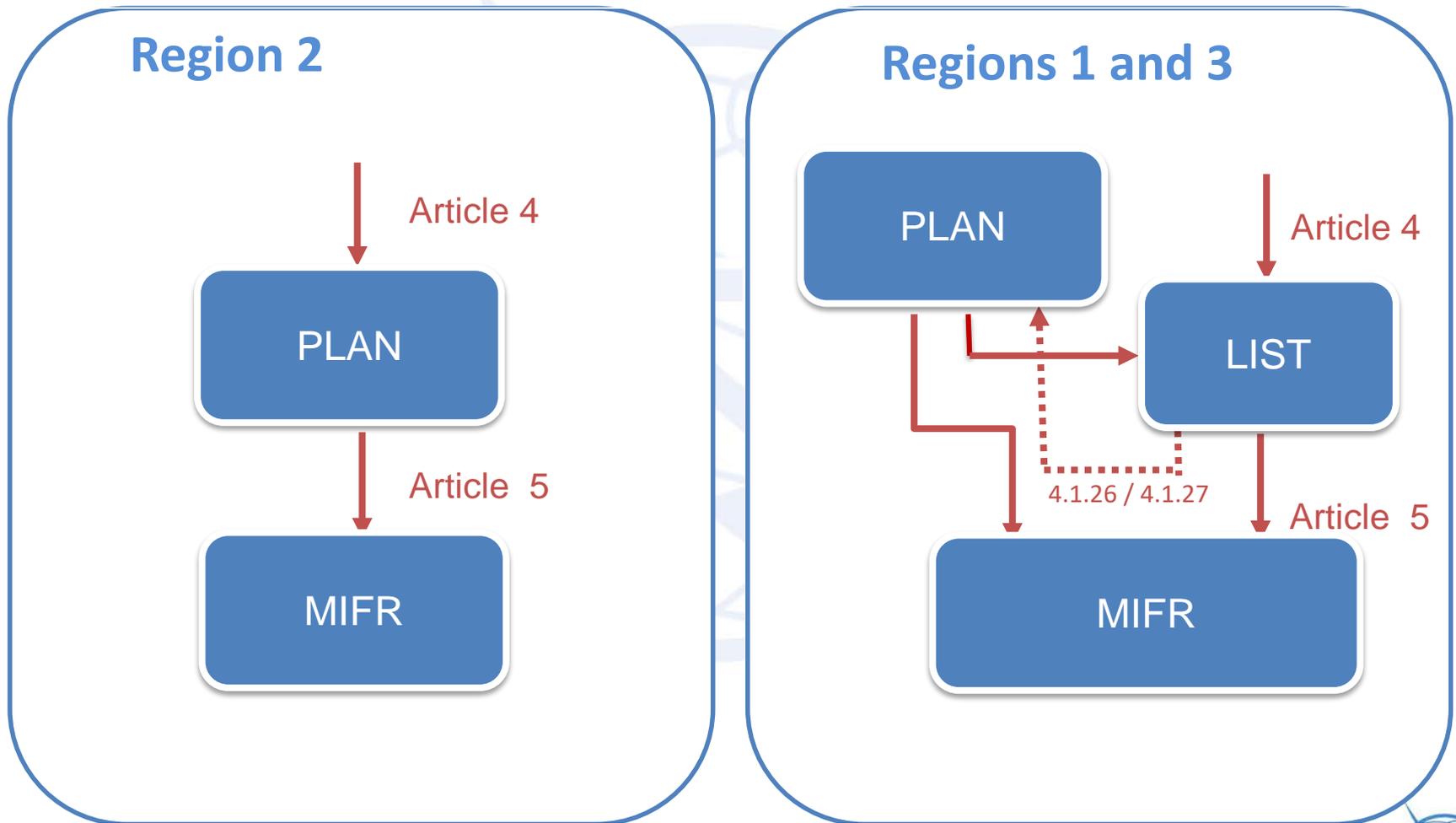
- Plans separated by Regions
- Assignments Plans
- Shared with other space services in other Regions
- Lists for R1&3 only
- Cluster concept in Region 2 Plan

APPENDIX 30B

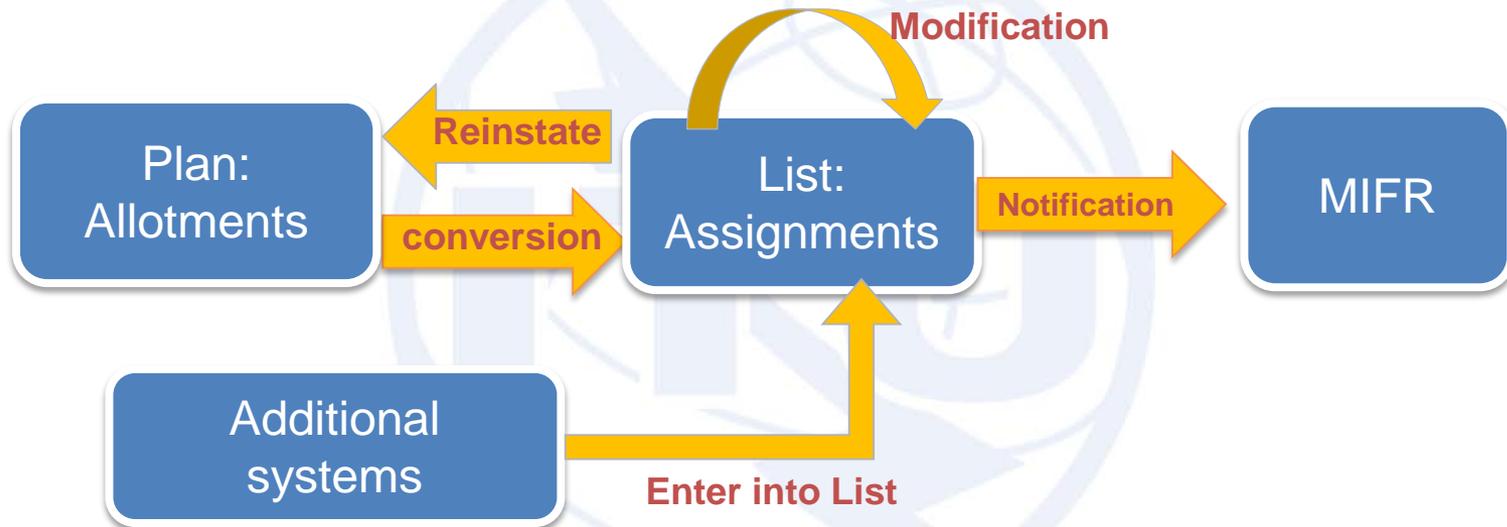
FSS Plan

- World wide
- Allotment Plans (conversion to assignments before use)
- Together with single entry criteria
- Protection based on grid points in service areas for downlinks

AP30/30A BSS Plan Procedure Summary

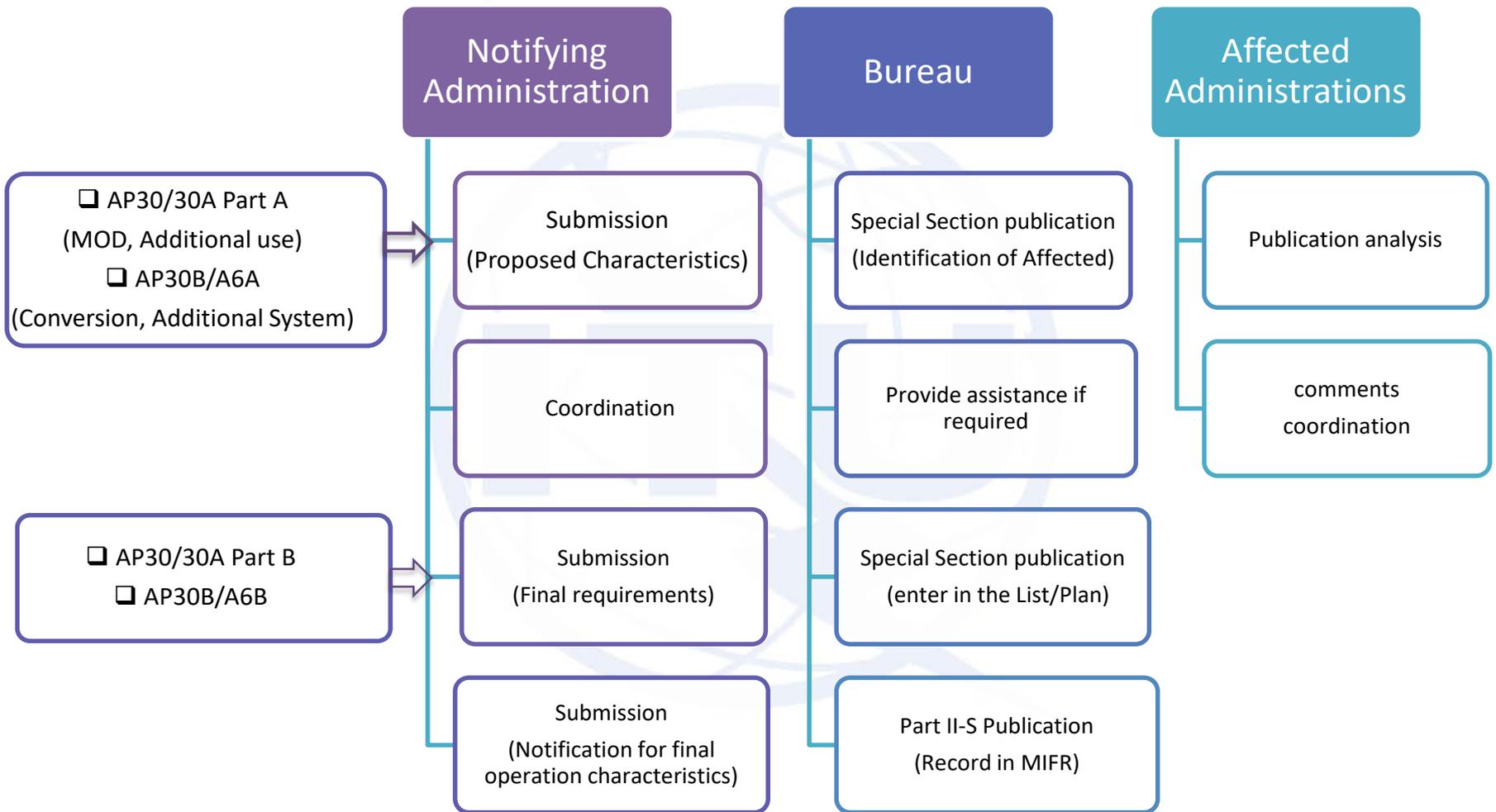


AP30B FSS Plan Procedure Summary



Article 6 of AP30B

Article 8 of AP30B



Characteristics of South Africa Plan BSS beams (AP30/30A)

E/R	Column 2	3	4	
	Beam identification	Orbital position	Boresight	
			Long.	Lat.
E	AFS02100	4.80	24.50	-28.00
R	AFS02101			
R	AFS02102			

Column 5			10	8	9
Space station antenna characteristics			Polarization	e.i.r.p. (dBW)	Remarks
Major axis	Minor axis	Orientation			
3.13	1.68	27.00	CL	59.10	
			CL	82.00	
			CR		

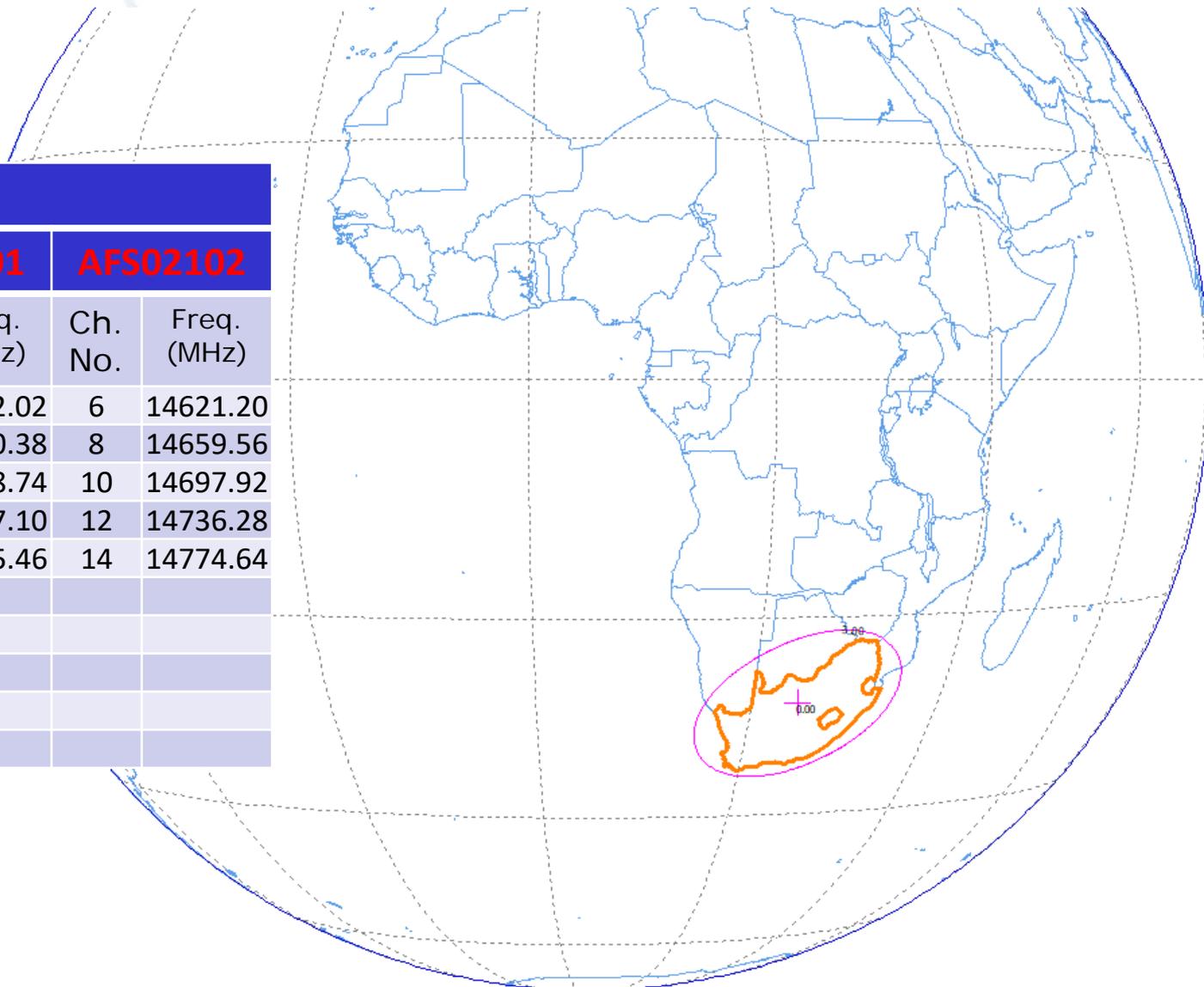
National assignments for Regions 1 & 3 in:

- BSS Plan: Table 6A of Article 11 of Appendix **30**
- Feeder-link BSS Plan: Tables 3A1 and 3A2 of Article 9A of Appendix **30A**



Characteristics of South Africa Plan BSS beams (AP30/30A)

4.8°E					
AFS02100		AFS02101		AFS02102	
Ch. No.	Freq. (MHz)	Ch. No.	Freq. (MHz)	Ch. No.	Freq. (MHz)
21	12111.08	5	14602.02	6	14621.20
23	12149.44	7	14640.38	8	14659.56
25	12187.80	9	14678.74	10	14697.92
27	12226.16	11	14717.10	12	14736.28
29	12264.52	13	14755.46	14	14774.64
31	12302.88				
33	12341.24				
35	12379.60				
37	12417.96				
39	12456.32				



Characteristics of South Africa Plan FSS beams (AP30B)

Column 1	2	3/4	5/6
Beam identification	Nominal orbital position	Geographic coordinates of boresight	Elliptical cross section half-power beam
AFS00000	71.00	27.20 -30.10	5.30 1.60

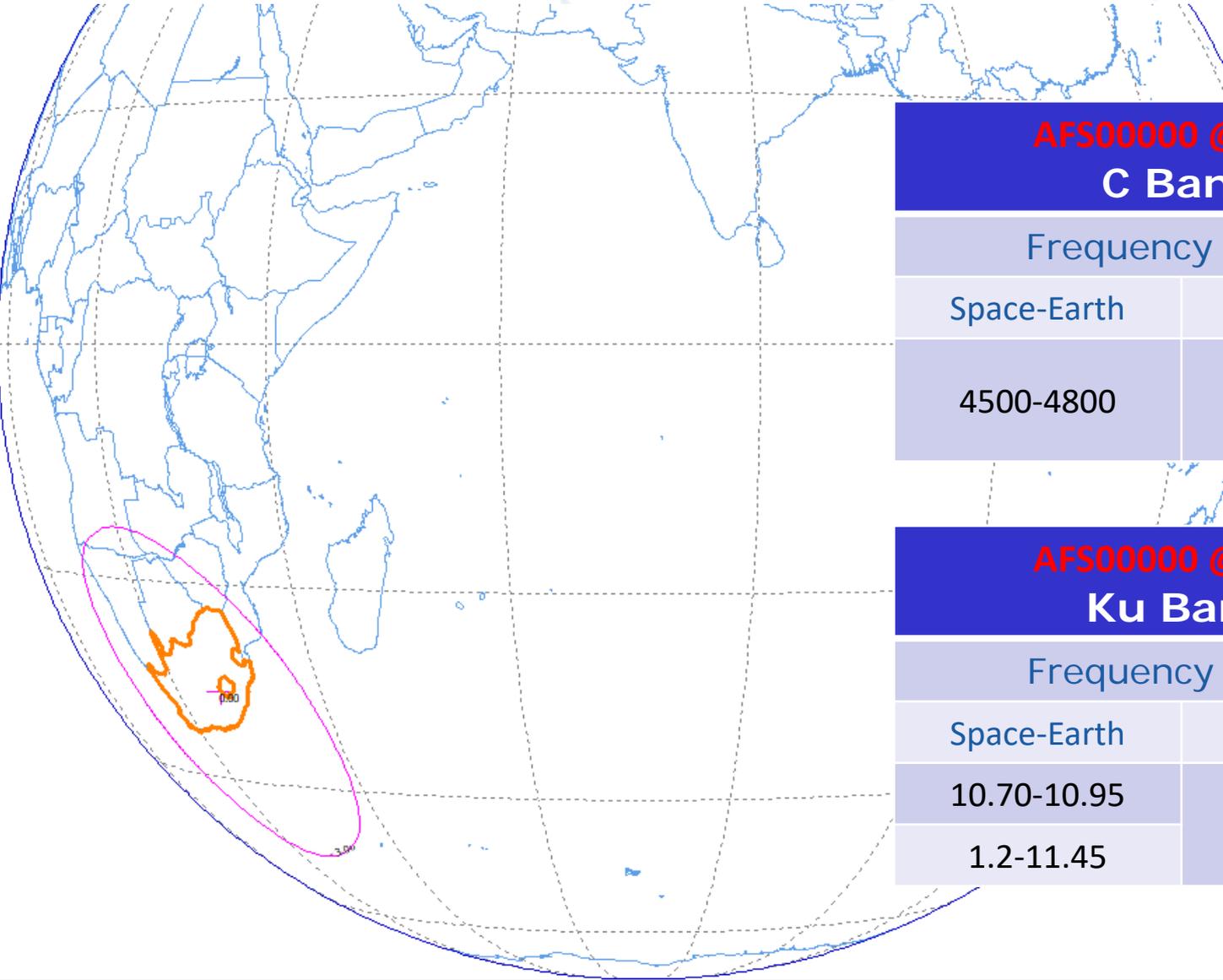
7	8	9	10
Orientation of the ellipse	Earth station e.i.r.p. density (dB(W/Hz))	Satellite e.i.r.p. density (dB(W/Hz))	Remarks
128.00	-7.8	-38.6	

National allotments in:

- Article 10 of Appendix 30B



Characteristics of South Africa Plan FSS beams (AP30B)



AFS00000 @ 71°E **C Band**

Frequency (MHz)

Space-Earth

Earth-space

4500-4800

6725-7025

AFS00000 @ 71°E **Ku Band**

Frequency (GHz)

Space-Earth

Earth-space

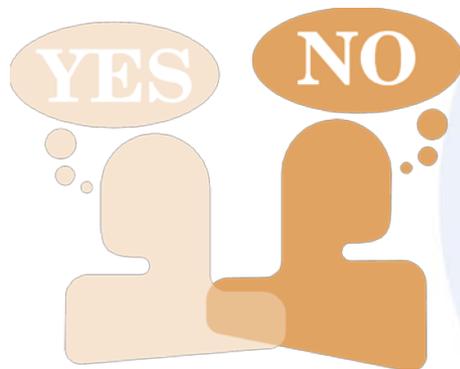
10.70-10.95

12.75-13.25

1.2-11.45



Protection of assignments/allotments



- Commenting to protect existing assignments/allotments
- Comments in AP30/30A for R2 :
no reply = agreement
- Comments in AP30/30A for R1/R3 and AP30B:
no reply = disagreement
- Assistance procedure exists for AP30B and AP30/30A
in R1/R3:
no reply = deemed to have given agreement

Plan and Non-Plan Procedures Comparison

	Non-Plan BSS/FSS GSO	APPENDICES 30/30A	APPENDIX 30B
Regulatory Period	7 years	8 years	8 years
Inclusion in the List	Not applicable	AP30/30A Part B	AP30B/A6B
API	Networks not subject to coordination	Not applicable	Not applicable
Notification	Yes	Yes, but not for protection	Yes, but not for protection
To be compatible with	Previously filed	Plan, List, previously filed	Allotment, List, previously filed
Identification	- Affecting and affected	- Affected only	- Affected only
	- Single entry criteria	- Aggregate criteria	- Single entry and aggregate criteria
No comment within 4 m	Assistance No.9.60	Agreement for Region 2	Assistance under §6.13
		Assistance for Region 1& 3 under 4.1.10a	

Regulatory deadlines for Plans

APPENDICES 30/30A

4 months for comments

8 years for bringing into use, inclusion in the Plan/List, Res.49 and not later than

3 months before DBIU for notification

3 years after suspension for Region 1&3

List assignments

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

90 days for confirmation of DBIU

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>





Thank you for your attention

Álvaro de Vega

Space Services Department

alvaro.devega@itu.int

