Receivability

Request for Coordination

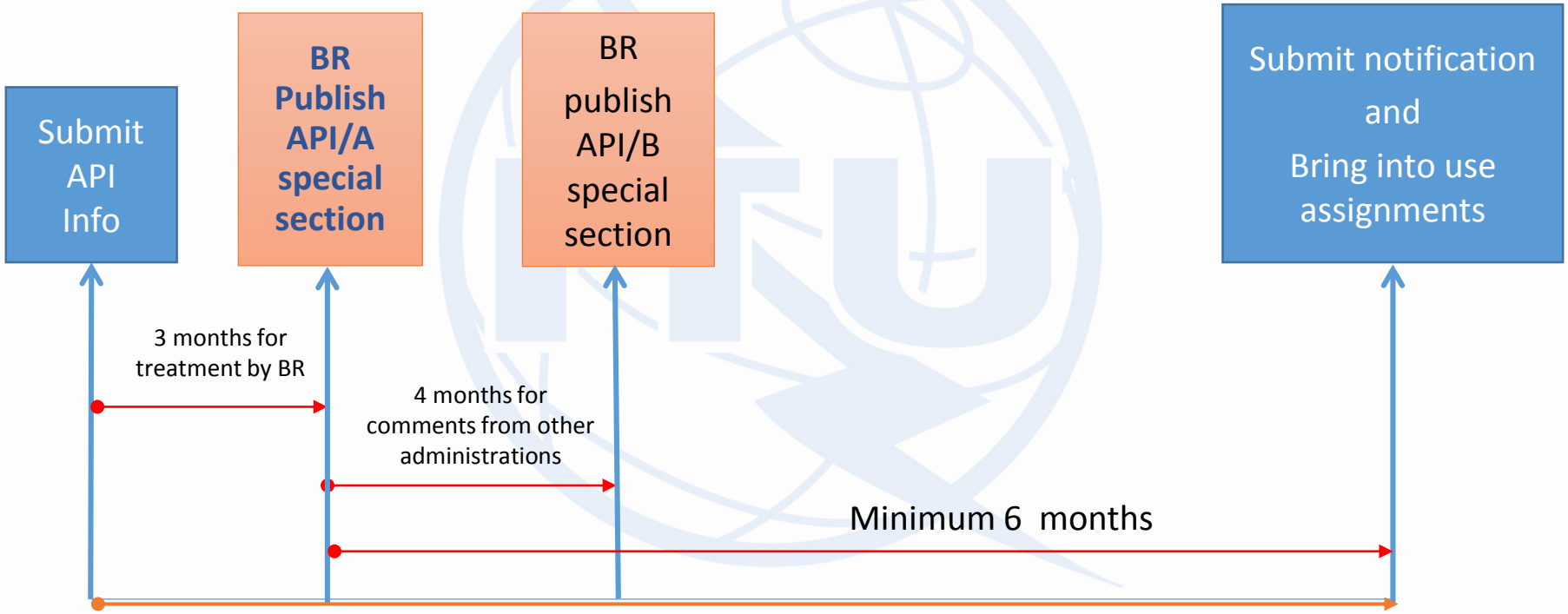
Chuen Chern Loo

CHUEN-CHERN.LOO@ITU.INT

BR/SSD/SPR

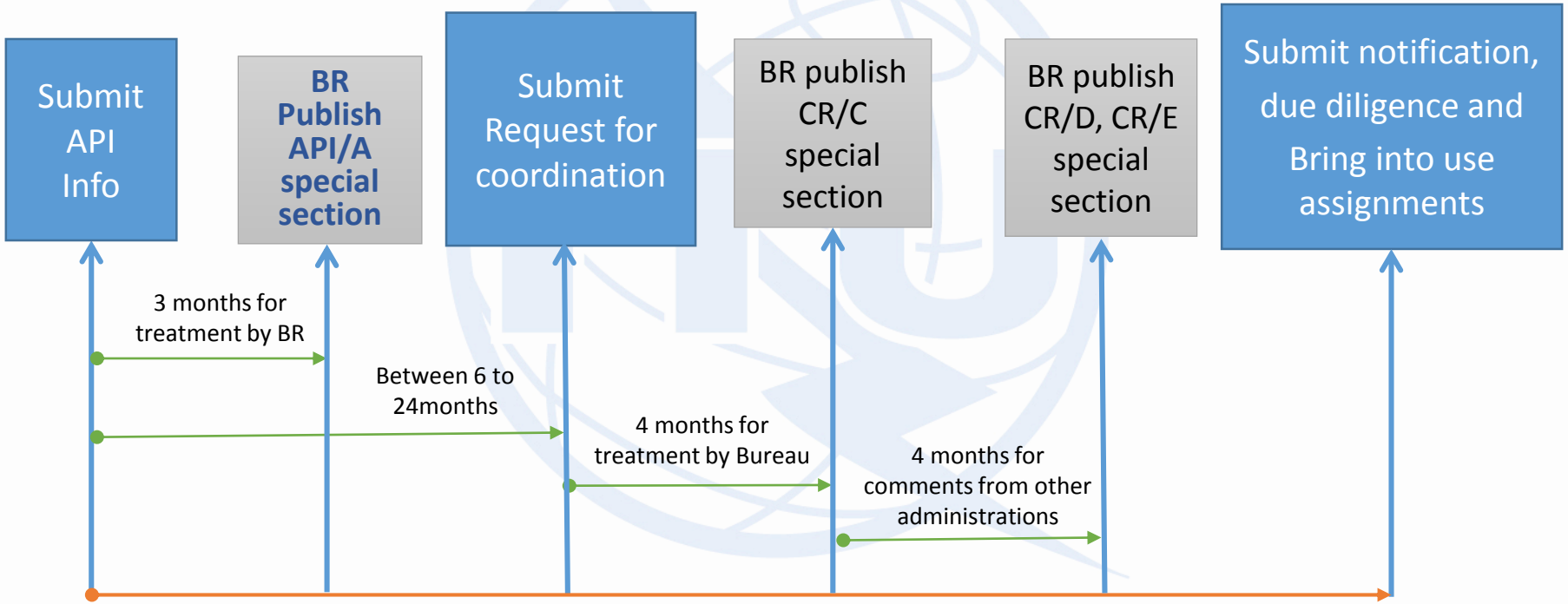
International Telecommunication Union

Timeline for satellite networks not subject to coordination



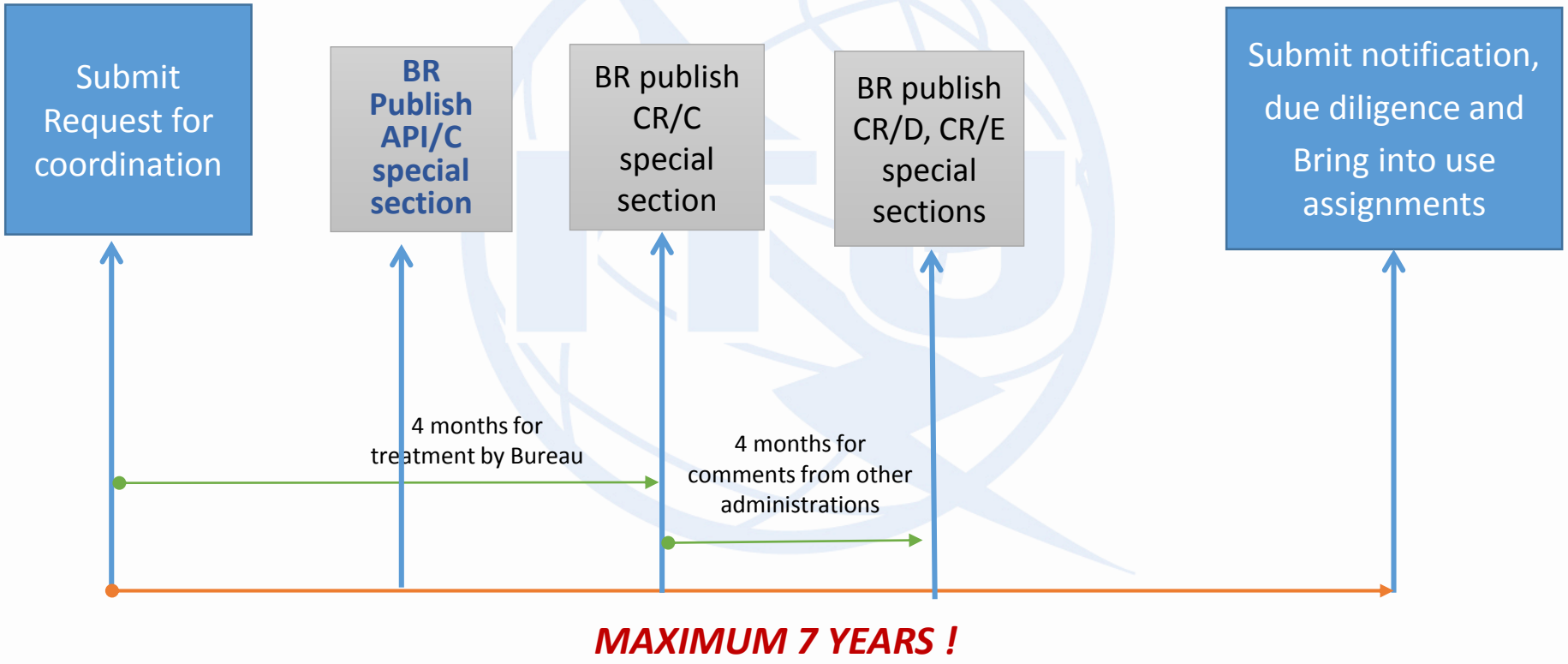
MIN 9 MONTHS, MAX 7 YEARS!

Timeline for satellite network subject to coordination (up to 31.12.2016)



MAXIMUM 7 YEARS !

Timeline for satellite network subject to coordination (from 1.1.2017)



MAXIMUM 7 YEARS !

Radio Regulations relating to completeness of Request for Coordination

No. **9.34**

- On receipt of the **complete** information sent under No. **9.30** or No. **9.32** the Bureau shall promptly:
  - No.**9.35** a) examine that information with respect to its conformity with No. **11.31** ……..

AP4

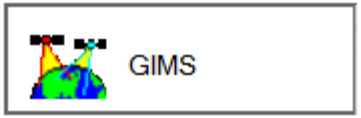
No. **9.40A**

- If the information is found to be **incomplete**, the Bureau shall immediately seek from the administration concerned any clarification required and information not provided.

Completeness and Correctness

- **In order to establish a formal date of receipt for the purpose of treatment of the Submissions, the Bureau shall examine the completeness and correctness of the information submitted by ADM as defined in Annex 2 of Appendix 4.**
- **ADMs are encouraged to run SpaceVal including Cross-Validation with Gims mdb file to make sure :**
  - No fatal errors
  - No mandatory info missing
- **Submit SNS format mdb + Gims format mdb to BR together with any other attachments**
- **A confirmation by either telefax or mail is required to be sent within 7 days of the date of the email (ROP)**

AP 4



Checking of completeness

- **Missing any mandatory information required under Appendix 4**
  - will be returned to the Administration
- **Frequency bands subject to AP30/30A/30B procedures**
  - ➢ will be returned to the Administration
- **For NGSO, frequency bands not subject to coordination and GSO with inter-satellite links operating with NGSO using bands not subject to coordination**
  - ➢ will be returned to the Administration
- **From 1.1.2017, no more checking whether CR/C is covered by an API!**
- **Withdrawal within 15 days possible without cost recovery fee**
- **When checking under No.9.34/9.40A for completeness, any clarifications needed will be carried out in accordance with Rule of Procedures relating to receivability**
  - 30 days to response
  - Response within the scope of Bureau's enquiry – retain original date of receipt
  - Not within the scope of Bureau's enquiry - new date of receipt

Regulatory date limits

- **BR will extract information from CR/C to publish an API/C**
  - For new CR/C, all frequency bands will be given the regulatory start date same as the date of receipt of CR/C
  - Regulatory date limit under No.11.44 will be 7 years from the regulatory start date
- **For Modifications of CR/Cs,**
  - No change in orbital position
    - *If there are new frequency bands, these new bands will be extracted and published in an API/C with the regulatory start date same as the date of receipt of the CR/C Mod*
  - Change in orbital position
    - *All frequency bands will be extracted and published in an API/C with the regulatory start date same as the date of receipt of the CR/C Mod*
- **To check regulatory dates**
  - SNS online
    - *http://www.itu.int/sns/index.html*
  - BRSIS SpaceQry software
    - *Quick Query*
    - *Requires SRS database from the BRIFIC*

Database for CR/C

Data items defined in Appendix 4

2 mdb files are required:

SNS format:

- Contain the alphanumeric data

Station information Space Station, associated earth stations

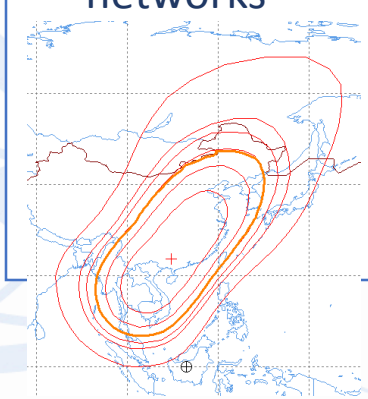
Power values

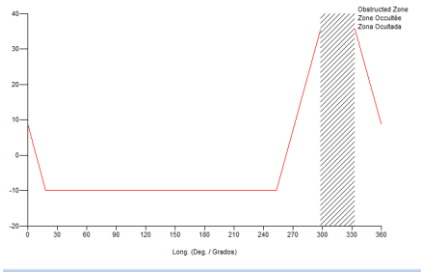
Emissions information

Other information

GIMs format (for GSO networks):

- Contain the graphical data for GSO networks





Cross validation to validate the consistency between the 2 databases

Graphical Data for GSO networks

- GIMS format mdb
  - *CR/337: only GIMS mdb format shall be receivable.*
    - *If diagrams are created in GXT format, they must be imported to a GIMs mdb for submission to BR*
  - *In SNS V7 and earlier, attachment numbers were required to be captured with SpaceCap*
- Attachment numbers:
  - *From SNS V8, attachment numbers no longer required to refer to gain contour, AGGSO or service area diagrams*
  - *Ensure that satellite names, orbital position, beam names, direction of transmissions, service area numbers etc. are entered correctly in both mdbs*
  - *For MOD notices, need to indicate if any of these diagrams have been modified with respect to the original notice*
  - *Run SpaceVal with cross-validation option - fatal errors will be identified if the diagrams in GIMs mdb do not correspond to those captured in the SNS mdb.*

Graphical Data (GSO)

Antenna Gain Contour

Service Area

Antenna Gain towards GSO orbit (AG-GSO)

Common errors for GIMs diagrams

- Service area/contours created at another orbital location, and then diagram orbital position changed (as a result the Service areas/contours no longer aligned properly with the new position)
- Service area diagram and service area name do not match
- Contours not labelled correctly (dB contours out of order, for example 0 dB on the horizon and -2 dB inside)
- Diagrams submitted for a beam, but no SNS data included for the beam

Antenna Gain Contour

AP4 Annex 2 No. B.3.b.1

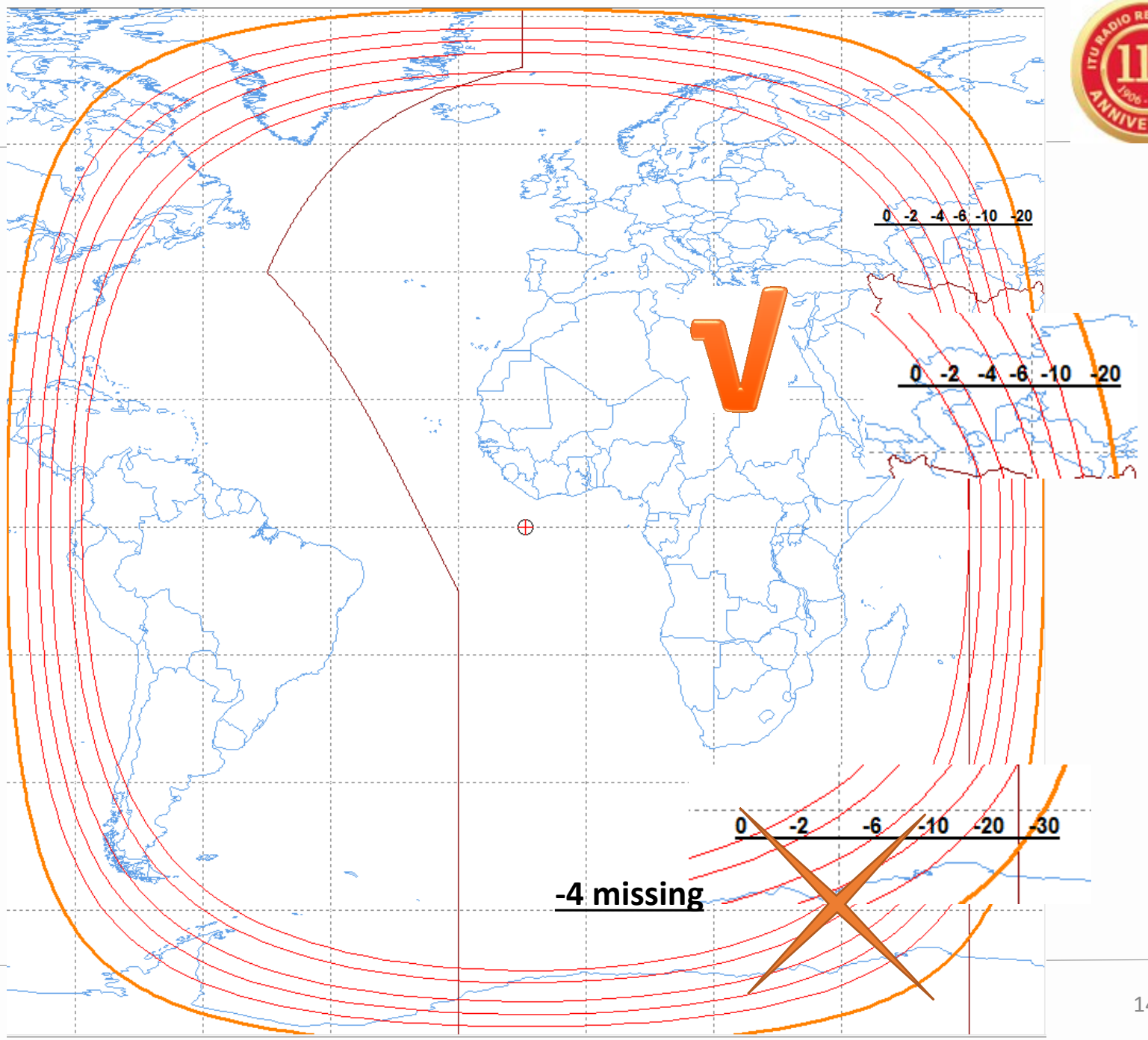
at least for -2, -4,-6, -10 and -20 dB and at 10 dB intervals thereafter, as necessary, relative to the maximum antenna gain, when any of these contours is located either totally or partially anywhere within the limit of visibility of the Earth from the given geostationary satellite

For steerable beam (No.**1.191**), if the effective boresight area is less than the global service area, the contours are the result of moving the boresight of the steerable beam around

… …

shall also include the 0 dB relative gain isoline

Check each gain contour diagram individually!


0 -2 -4 -6 -10 -20
0 -2 -4 -6 -10 -20
0 -2 -6 -10 -20 -30
-4 missing

Service area for a group of frequency assignments

Capture of service area

- Captured as graphical diagram in Gims mdb
  - *Ensure that the area number captured in GIMs mdb corresponds to the area number captured in SNS mdb!*
- Can alternatively be captured as country symbols in SNS mdb
  - *If captured as country symbol in SNS mdb, do not capture any area number, since there are no corresponding diagrams in GIMs mdb.*
  - *BR will create the service area diagram in GIMs based on these symbols and insert the appropriate area number.*

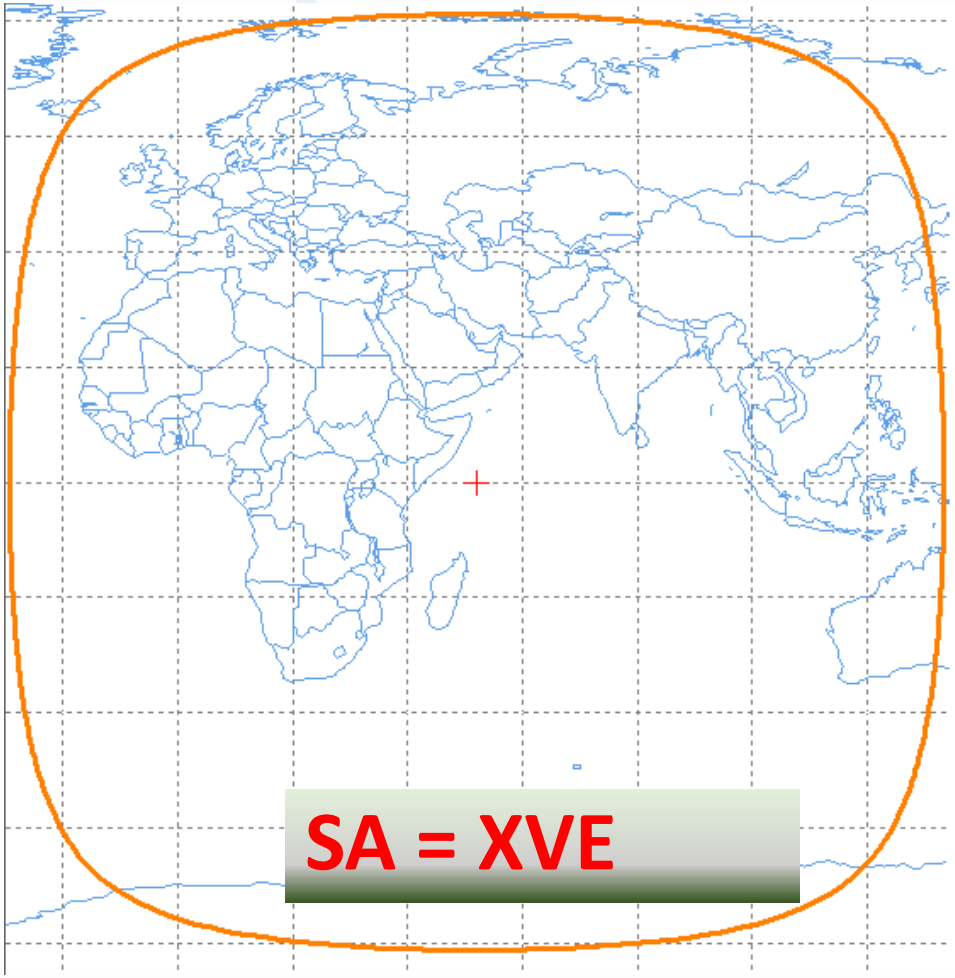
Service Area

Regional limitations under Article 5

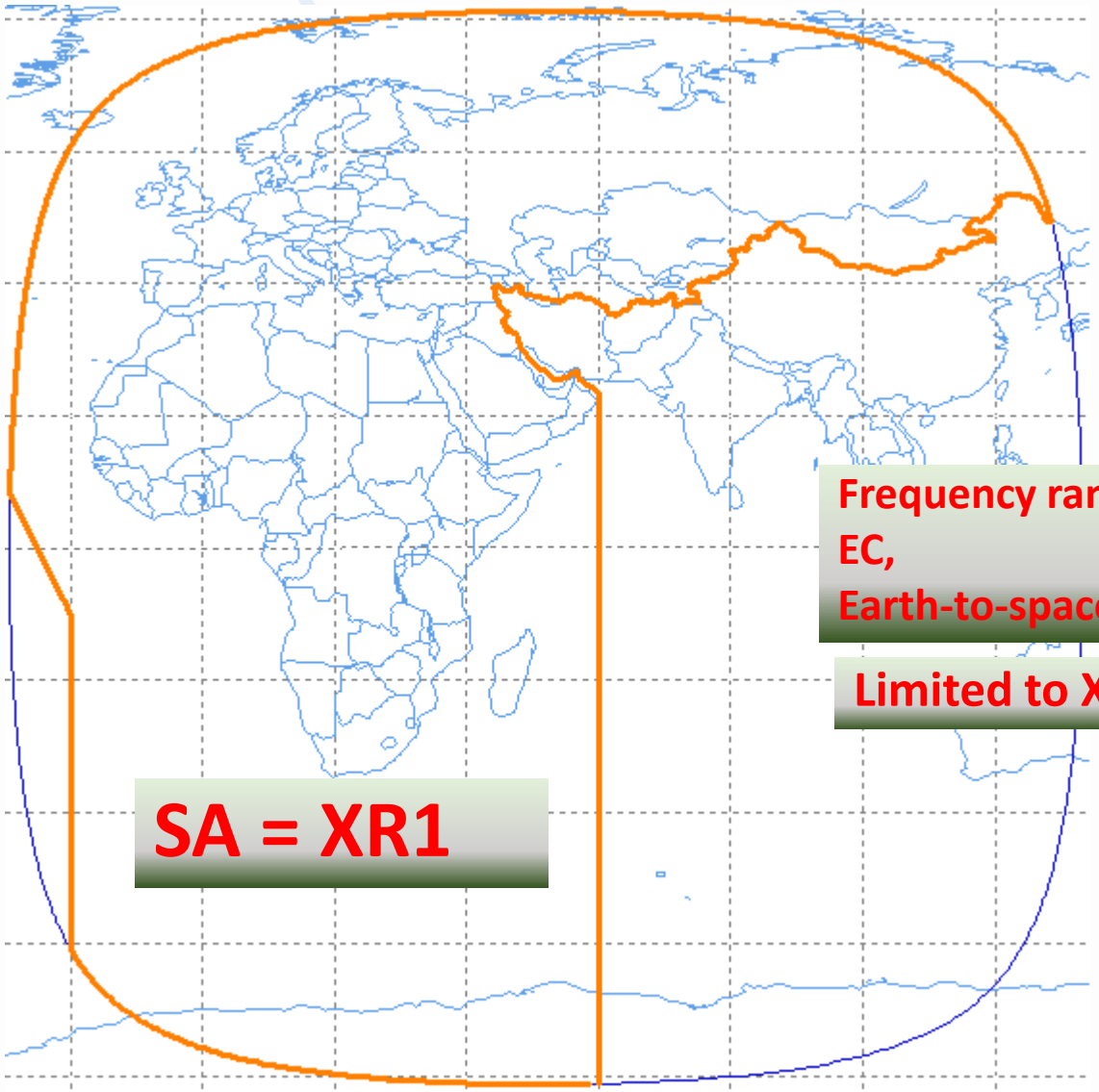
- If service area submitted is **larger than** what is allowed for under Article 5,
- BR will **split** the service areas, retain the part that has an allocation, and remove the part that has no allocation.
- BR will inform the notifying administration through a telefax.

- If service area submitted is **smaller or equal to** what is allowed for under Article 5,
- BR will **retain** the service area as submitted

Split of Service Area - 1



Split of Service Area - 2

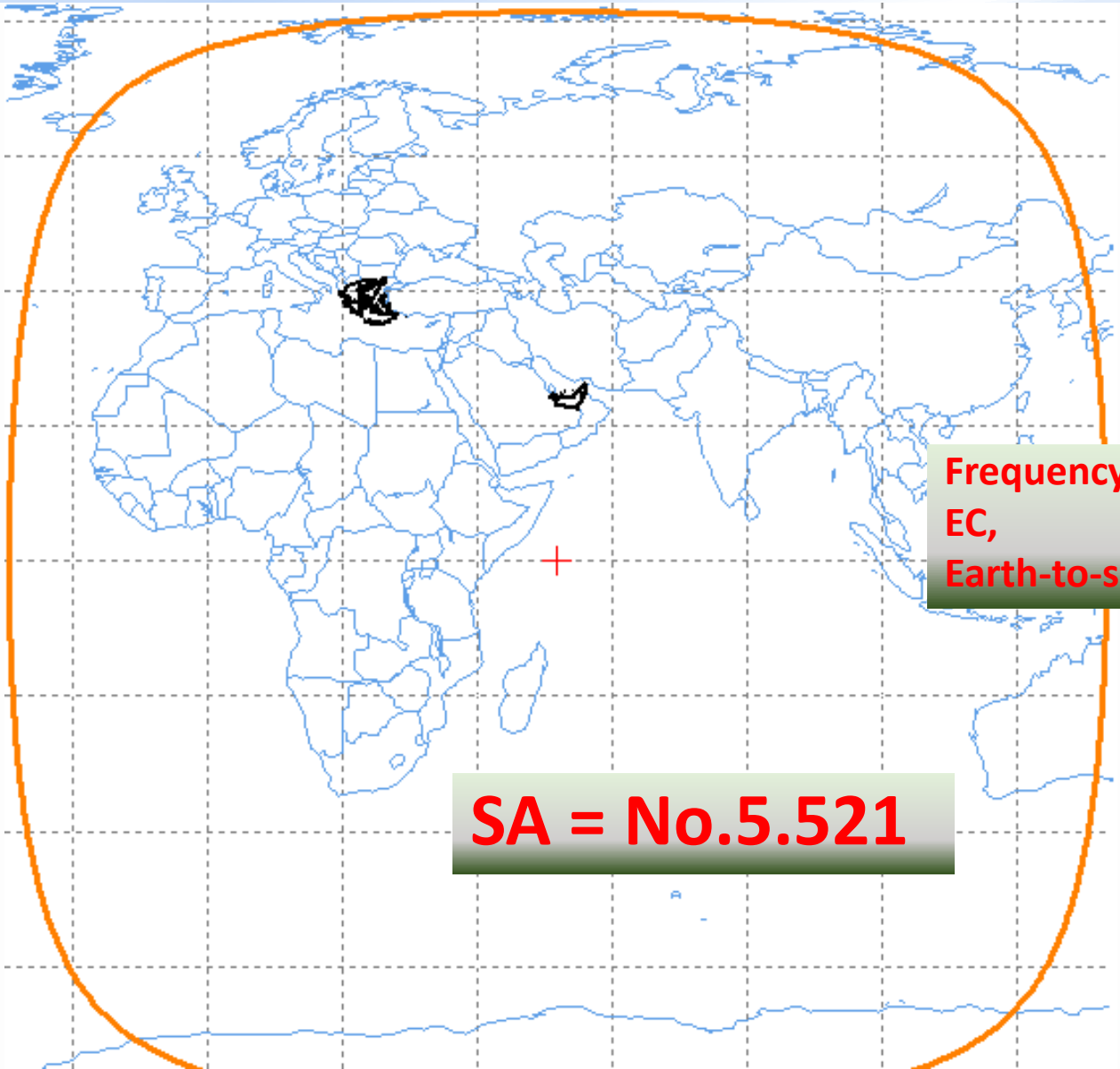


SA = XR1

Frequency range: 5725 – 5850 MHz
EC,
Earth-to-space

Limited to XR1

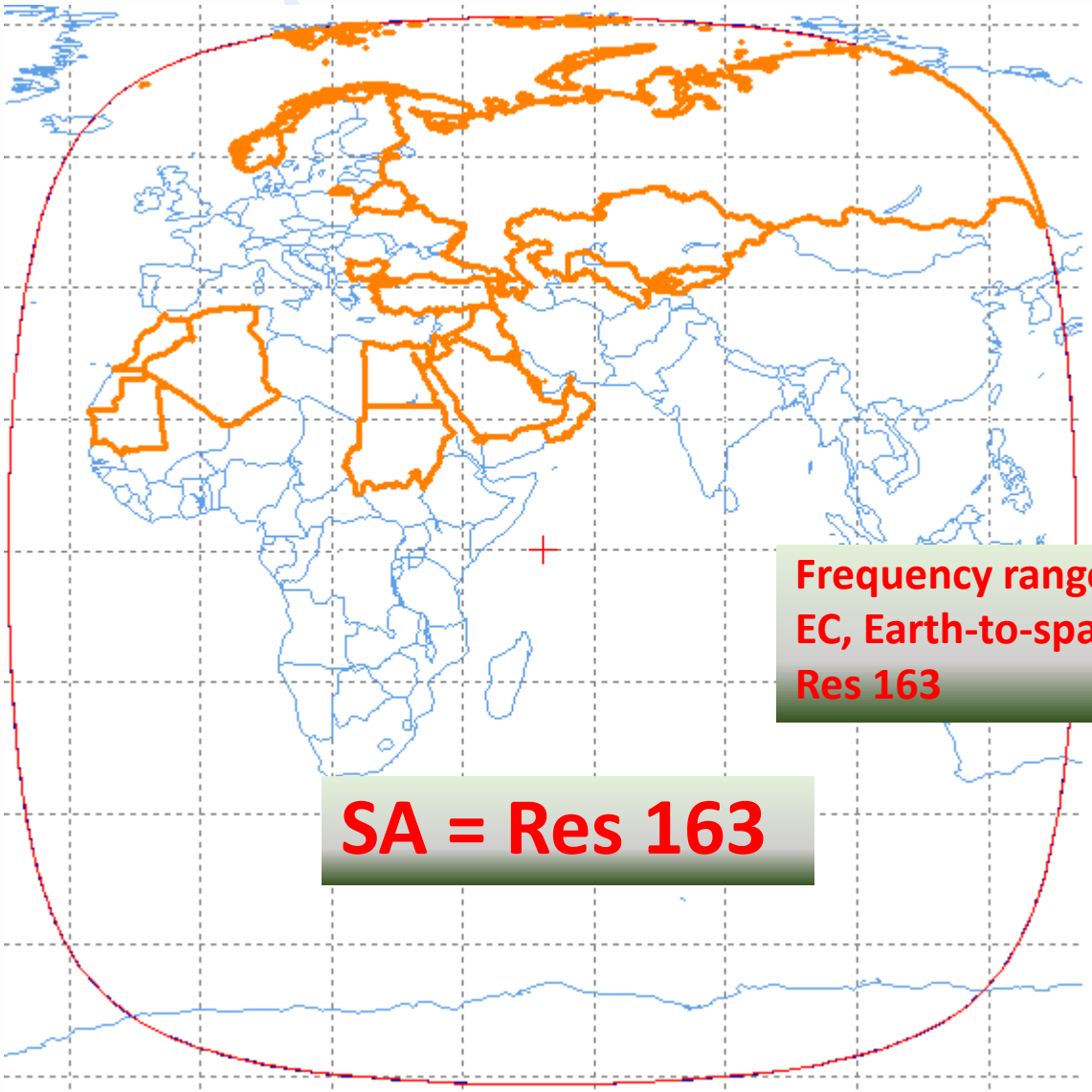
Examples of Service Area: No.5.521 (WRC-15)



Frequency range: 18.1-18.4 GHz
EC,
Earth-to-space

SA = No.5.521

Examples of Service Area: Resolution 163 (WRC-15)



Frequency range: 14.5-14.75 GHz
EC, Earth-to-space,
Res 163

SA = Res 163

Antenna Gain towards GSO orbit (AG-GSO)

Requirement for AG-GSO diagrams
AP4 Annex 2 No. B.3.e

- if the space station is operating in a band allocated both in the Earth-to-space direction and in the space-to-Earth direction

- Check validation rules for reference
- Validate using the SpaceVal cross-validation feature
- If required diagram is missing, fatal errors will be reported

- By running SpaceVal with Cross-val option, if the diagram is required but missing in the notice, fatal errors will be reported

SNS format database

SNS Format database

- Must be in conformity with SNS V8 format defined in Preface
- If not in conformity, will be returned to the administration
- SpaceVal v8 will detect non conforming structure and give a fatal error

Earth Station Antenna Diameter

Associated earth station antenna diameter in meters (AP4 Annex 2 No. C.10.d.7)

- **required for fixed-satellite service networks (EC) operating in the frequency bands**
  - *13.75-14 GHz,*
  - *14.5-14.8 GHz (not for feeder link for the BSS, in accordance with Resolutions 163/164)*
  - *24.65-25.25 GHz (Region 1) and*
  - *24.65-24.75 GHz (Region 3)*
- **required for maritime mobile-satellite service networks (EG) operating in the frequency band 14-14.5 GHz**
- **Take note of the restrictions on earth station diameters in the footnotes to the Table of Frequency Allocations**

Space Operation Service

Space operation -- ET(EK, ER, ED)

RoP No.1.23

2 space operation functions

the assigned frequency (and the assigned frequency band) must lie in a frequency band allocated to the:

- **space operation service, or**
- **the main service in which the space station is operating (e.g. FSS, BSS, MSS).**

Split of Groups

Different allocation ⇔ Different findings

- **Do not include different main services in the same group, such as :**
  - EC and EB
  - EC and EV
  - EC and EI
  - … …
- **Due to the potentially different findings for different allocations, the group should be split into their individual main service**
- **Sub-services**
  - E.g. EI = EU+EJ+EG
  - Do not repeat them in one group e.g. (EI EG) should simply be submitted as EI
  - If characteristics are different for the sub-service, then submit as 2 separate groups:
    - *E.g. EU EJ in one group, EG in another group*

BSS in 21.4 - 22 GHz

- **Special procedure Res 553, or normal procedure under No.9.7**
  - Special procedure under Res 553 is published as CR/F
  - Since 2012, the portion with 21.4-22 GHz is split into separate notice, with a name appended with "_1" and published in a CR/F
- **from 1.1.2017,**
  - for request under No.9.7, will no longer be split from main notice i.e. entire notice will be published as CR/C
  - For request for special procedure under Res 533, continue to be treated separately and published as CR/F
- **SRS V8**
  - All notices under No.9.7 previously published in CR/F will be merged with the main notice under No.9.7

FSS in 14.5-14.8 GHz

- **Feeder link for BSS**
- **Not for feeder link for BSS**
  - Resolution 163 (14.5-14.75 GHz) – specific countries in Regions 1 and 2
  - Resolution 164 (14.5-14.8 GHz) – Specific countries in Region 3
  - Use GIMs software to capture these countries as a service region with the symbols Res.163 or Res.164
  - Specific data requirements when used under Res 163/164:
    - *A16c commitment must be provided*
      - *will meet the separation distance as specified in No. 5.509E and the power flux-density limits that are specified in No. 5.509D*
    - *Antenna diameter must be provided*
      - *Minimum 6m (No.5.509C)*

New classes of stations

- **Resolution 156**
  - UF
    - *earth station in motion communicating with a geostationary satellite orbit station in the fixed-satellite service in the frequency bands referred to under No. **5.527A***
    - *Commitment under resolves 1.5 of Resolution 156 required in the submission*
- **Resolution 155**
  - UG
    - *Earth station on board unmanned aircraft communicating with a space station of a geostationary-satellite network in the fixed-satellite service for the control and non-payload communications of unmanned aircraft systems in non-segregated airspaces in the frequency bands listed under resolves 1 of **Resolution 155 (WRC-15)***
    - *the Bureau will not process satellite network filing submissions with UG earth stations before resolves 1-12 and 14-19 of resolution 155 are implemented*
- **AMS(R)S**
  - E5 - space station in the aeronautical mobile-satellite (R) service
  - E6 - space station in the aeronautical mobile-satellite (OR) service
  - T5 – aircraft earth station in the aeronautical mobile-satellite (R) service
  - T6 – aircraft earth station in the aeronautical mobile-satellite (OR) service

Antenna Patterns for associated earth stations

- **Standard patterns**
  - APL library
  - http://www.itu.int/en/ITU-R/software/Pages/ant-pattern.aspx
- **Non-standard patterns**
  - Diagrams not acceptable by BR's examination software, will default to AP8 antenna pattern
  - Equations describing the pattern should be provided
  - Gain values must be provided for all off-axis angles (0 to ±180°)

ROP relating to No. 21.16 – PFD limits for steerable beams

- ROP relating to No.21.16 requires the following for steerable beams:
  - Administration should state that the applicable PFD limits will be met by applying a method with descriptions
    - *One possible example of such a method is described in the Annex to the Rule relating to No. 21.16.*
    - *Following changes in WRC-15 to B.3.b.1 of Appendix 4, V8 software has been modified such that user just need to tick a check box to indicate compliance with PFD limits using, as a default, the method described in Annex to ROP 21.16.*
    - *If other methods are used, description of the method should be provided as an attachment*
  - Note that even with the method specified, there are other conditions specified in the ROP to be satisfied.

Reminders before submission of CR/C

- **Reminder to change the file extension from .mdb to .ITU before sending them to the BR**
- **As far as possible, submit one notice in one mdb file**
- **Ensure that all SNS format mdb, GIMs format mdb and all relevant notes have been included in a zip file to be submitted to BRMAIL@ITU.INT**
- **Submit a confirmation fax/letter within 7 days**
- **From 1/1/2017**
  - Do not split 21.4-22 GHz out to separate notice, submit only one notice please
  - Structure of the mdb must pass validation for SpaceVal V8 for compliance with SNS V8 structure, otherwise it will be returned
  - Run SpaceVal V8 with cross validation option before submission to ensure that there are no fatal errors

Questions ?

EMAIL: CHUEN-CHERN.LOO@ITU.INT