Receivability
Request for Coordination

By Xiuqi WANG (Ellie)
ITU/BR/SSD/SPR
December 2018

Rules concerning Receivability

- Submit notice in electronic format
- Using the ITU web interface "e-Submission of satellite network filings" available at

  https://www.itu.int/ITU-R/go/space-submission

  – To do so, you need **TIES** account as a prerequisite in order to hold an ADM Manager, ADM User, Operator Manager or Operator User role.
  – Any seperate confirmation by either telefax or mail is **not** required to be sent via "e-Submission of satellite network filings" system
  – Notice submitted using "e-Submission of satellite network filings" shall be recorded as received on the **actual date of receipt**, irrespective of whether or not that is a working day at the ITU/BR's offices in Geneva.

RoP (Edition of 2017 Rev.2); **RES 55, RES 908** (Rev.WRC-15); **CR/427**(2018)

Rules concerning Receivability

- **Receipt of notices**
  - It is incumbent on all administrations to **meet deadlines** established in the Radio Regulations and, accordingly, to take account of **possible mail delays, holidays or periods during which ITU may be closed**[2].

2 The Radiocommunication Bureau shall inform administrations by **circular letter** at the beginning of each year, and as appropriate, about holidays or periods in which ITU may be closed in order to assist them in meeting their obligations.

- **Correspondence related to submission of notices**

a) **Postal Mail** shall be recorded as received on the **first working day** on which it is delivered to the ITU/BR's offices in Geneva. Where the mail is subject to a regulatory time limit that occurs on a date on which the ITU is closed, the mail should be accepted if it has been recorded as received on the first working day **following the period of closure**.

b) **E-mail and telefax** documents shall be recorded as received on the **actual date of receipt**, irrespective of whether or not that is a working day at the ITU/BR's offices in Geneva.

RoP (Edition of 2017 Rev.2); **RES 55, RES 908** (Rev.WRC-15); **CR/427**(2018)

Rules concerning Receivability

- Submit **Notice Database + Diagram Database** to the BR together when necessary

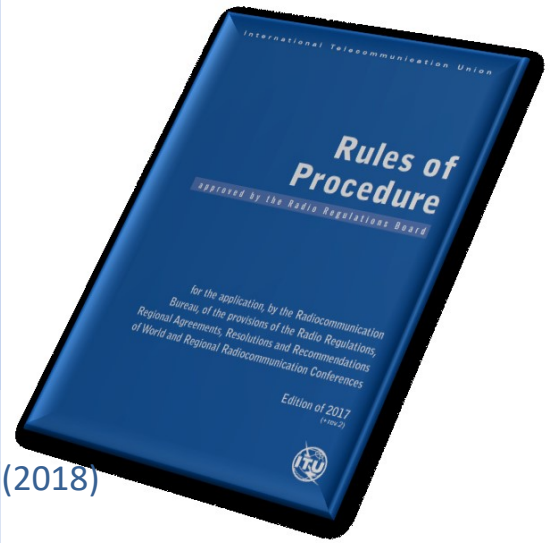
- Notice MDB: Compatible with the BR software (**SpaceCap**)
- Graphical data is encouraged to be created by using the BR software (**Gims**)

CR/337: **only GIMS mdb format** shall be receivable for GSO.

SpaceCap

AP 4

GIMS



RoP (Edition of 2017 Rev.2); **RES 55, RES 908** (Rev.WRC-15); **CR/427**(2018)

Completeness and Correctness

- In order to establish a formal date of receipt for the purpose of treatment of the Submissions, the Bureau shall examine *inter alia* the **completeness** and **correctness** of the information submitted by ADM as defined in **RR 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

RR (Edition of 2016), **Rop** (Edition of 2017 Rev.2)

Checking of completeness

RR 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** ……..

AP 4

RR 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.

30 days to respond!
complete info
within the scope

RR (Edition of 2016), **Rop** (Edition of 2017 Rev.2)

Checking of completeness

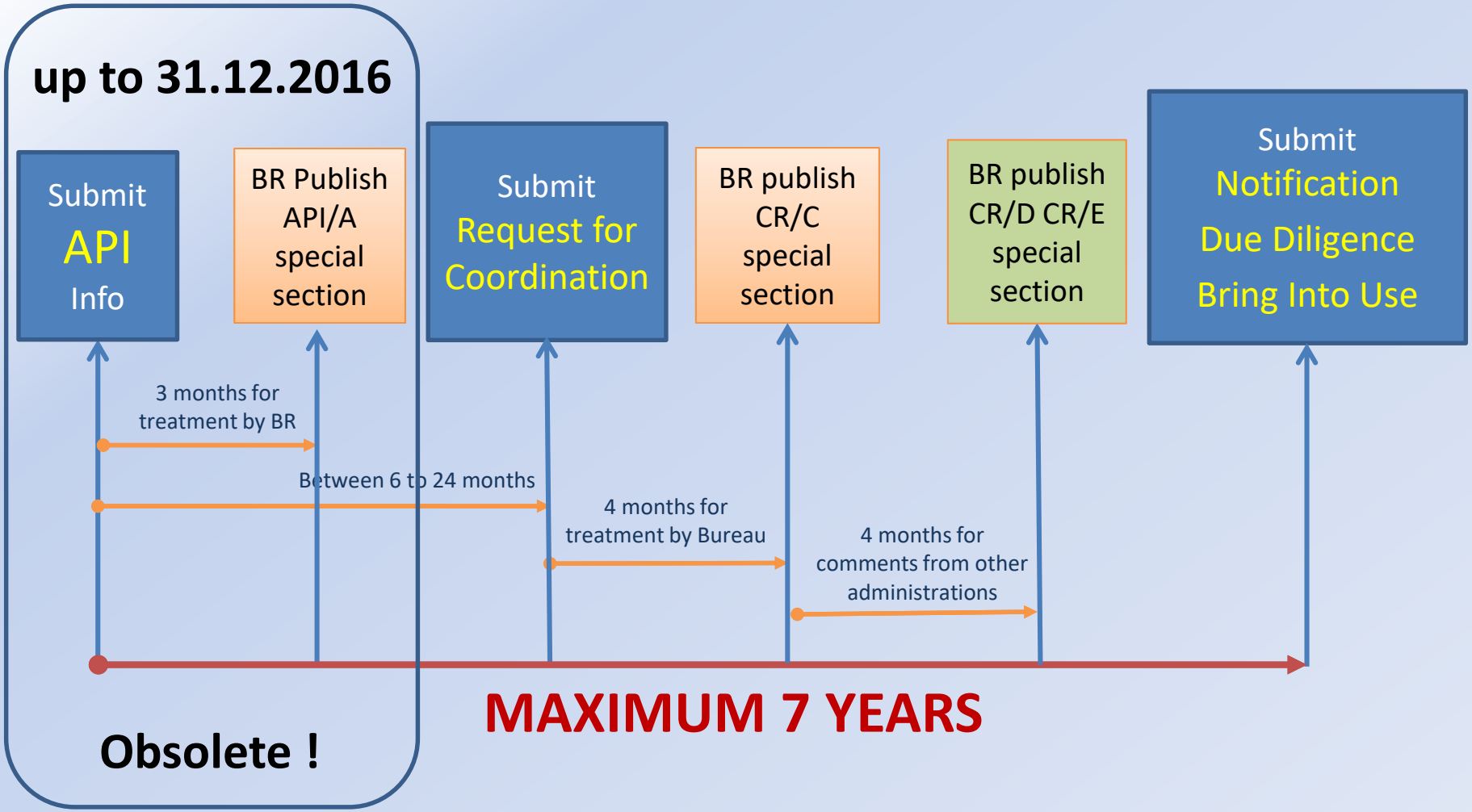
- When checking under RR No.**9.34/9.40A** for completeness, any clarifications needed will be carried out in accordance with Rule of Procedures relating to Receivability
  - **30 days** to respond
  - Response **within the scope** of Bureau's enquiry – retain original date of receipt
  - **Not within** the scope of Bureau's enquiry - **new date** of receipt
  - when checking Receivability/completeness, the BR has not examined yet under No.**11.31**

- 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

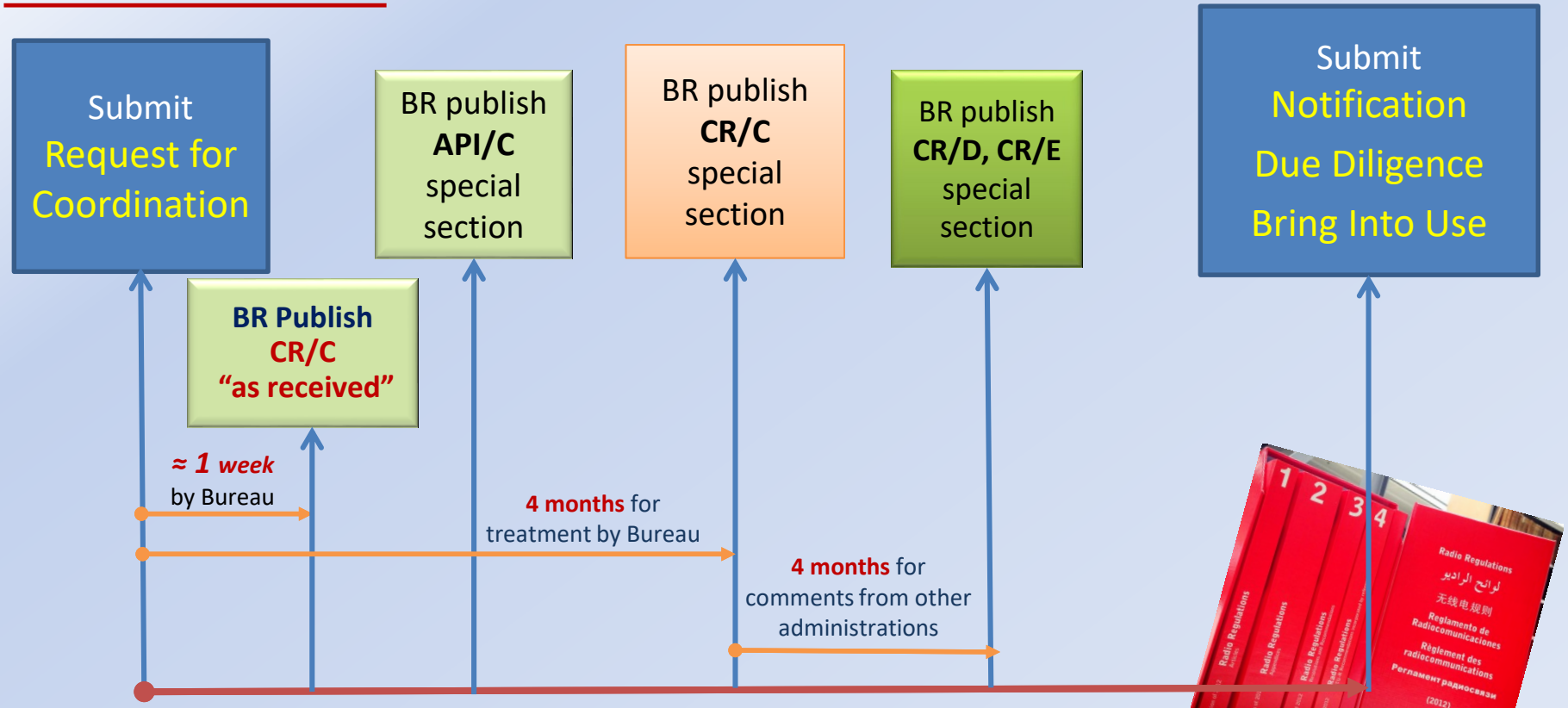
RR (Edition of 2016), **Rop** (Edition of 2017 Rev.2)

Timeline for satellite network subject to coordination



Timeline for satellite network subject to coordination

From 1.1.2017



RR (Edition of 2016)

Regulatory date limits

For **ADD** CR/C notice:

- BR will extract information from **CR/C** to publish an **API/C** **(No.9.1A)**

  – 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

Regulatory date limits

- For **Modifications** of CR/C notice:
  - **No change in orbital position**
    - Only new 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
  - **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

Regulatory date limits

- **To check regulatory dates**
  - BR SpaceCap software (MDB + TSUM)
  - BRSIS SpaceQry software
    - Quick Query
    - Requires SRS database from the BRIFIC
  - SNS online
    - http://www.itu.int/sns/index.html

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
E/S stations

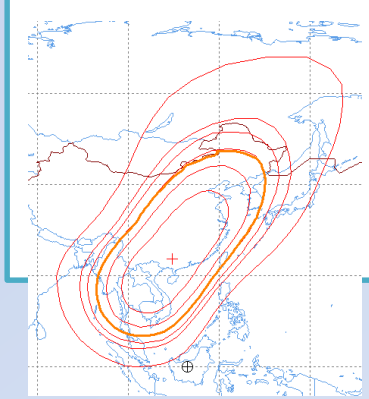
Commitment
Power values
Antenna size

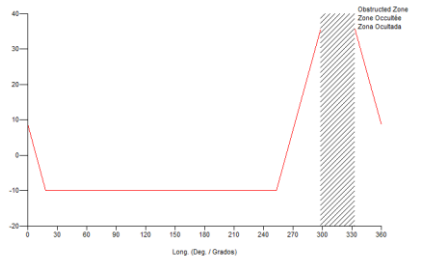
Emissions
attach numbers

Other
information
… …

GIMs format (for GSO networks):

- Contain the graphical data for GSO





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*
  - *Only GXT files, not receivable*

Graphical Data for GSO networks

- Attachment numbers:
  - In SNS V7 and earlier, attachment numbers were required to be captured with SpaceCap
  - From **SNS V8** (1.1.2017), attachment numbers no longer required to refer to gain contour, AG/GSO or service area diagrams
  - Ensure that satellite name, 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

Validation of Graphical Data

Antenna Gain Contour

Service Area

Antenna Gain towards GSO orbit (AG-GSO)

Antenna Gain Contour

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

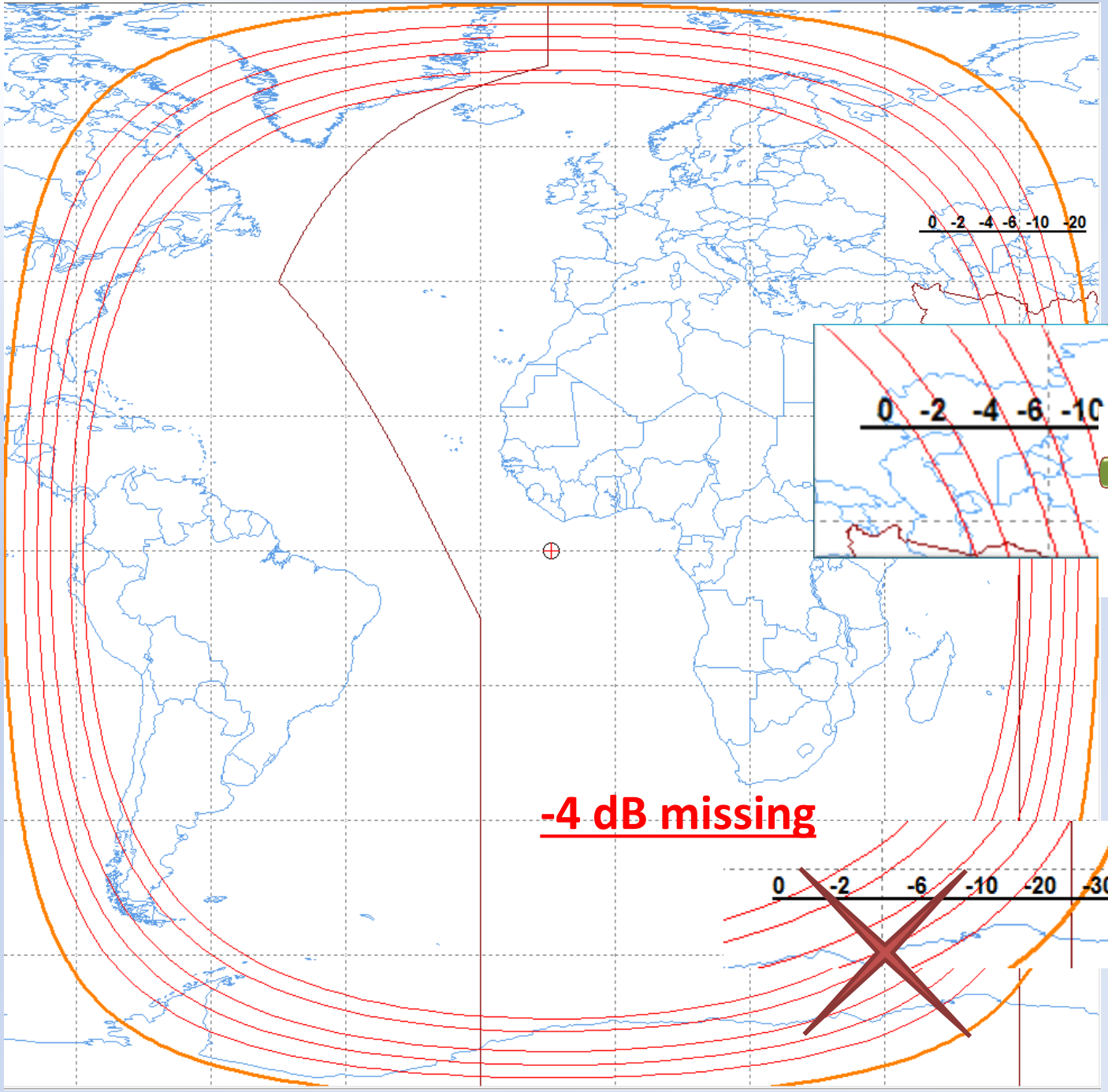
at least for **-2, -4, -6, -10 and -20** dB and **at 10 dB intervals thereafter**, as necessary, relative to the maximum antenna gain, when any of these contours is located either totally or partially anywhere within the limit of visibility of the Earth from the given geostationary satellite

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**

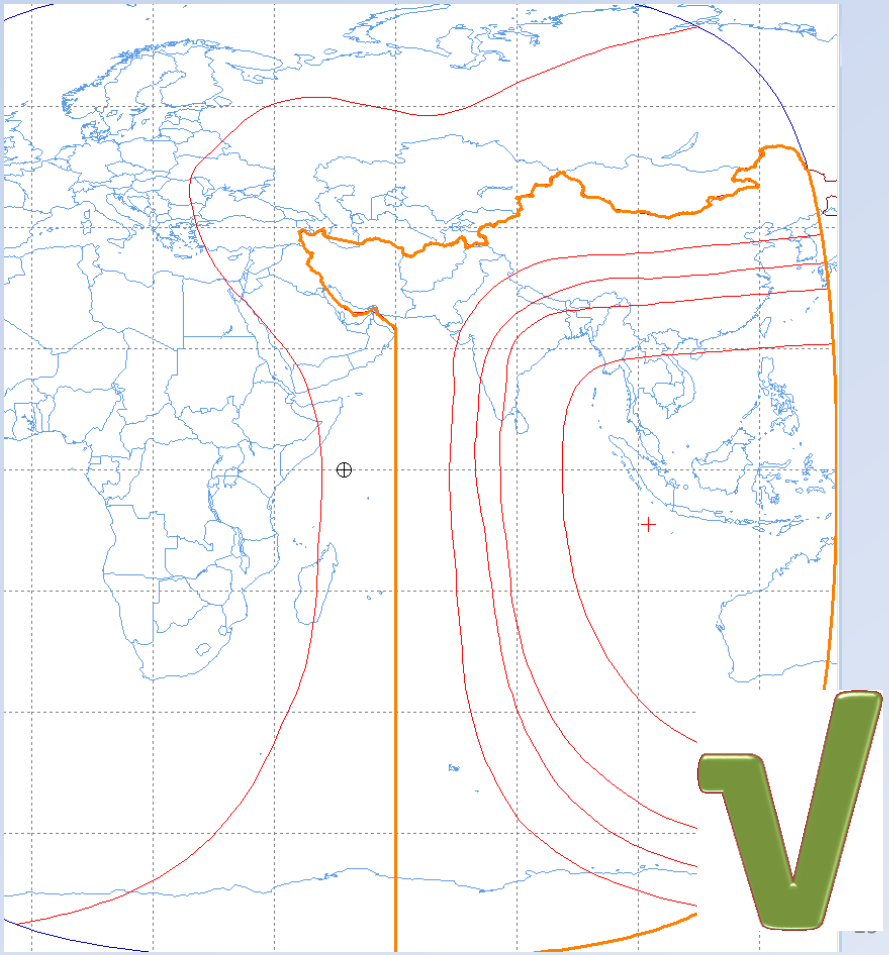
- For gain contours, please check manually.


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

Antenna Gain Contour

AP**4** Annex **2** No. **B.3.b.1**

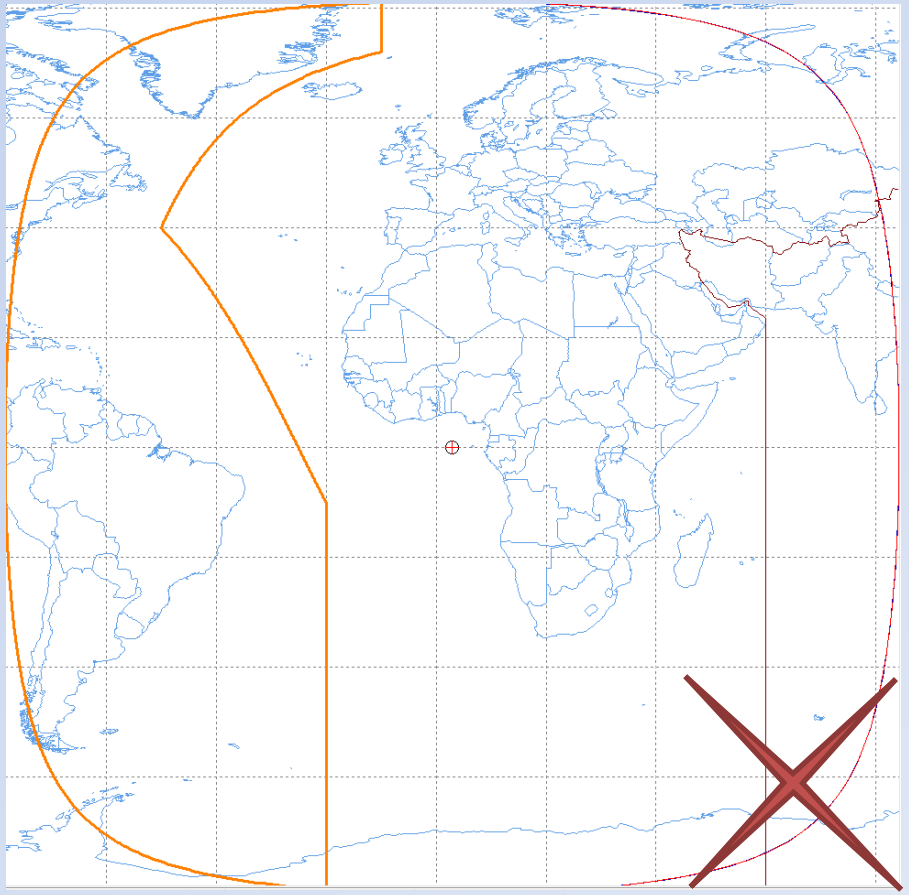
Note ---
"*administrations should, to the extent practicable,* ***align the areas*** *the satellite steerable beams could cover with the service area of their networks with due regard* ***to their service objectives.***"



Antenna Gain Contour

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

The Bureau would therefore request that your Administration **consider providing revised effective gain contour diagrams** for these beams, **more closely aligned with the service area concerned**, which may result in reduced coordination requirement for your network as well as improve the efficiency of the utilization of spectrum and orbit resources.



Service Area

Regional limitations under Article 5

ADM is encouraged **to split SA into different Regions**, for example:

The Planned bands involved:

- 11.7-12.2GHz, EC (S-to-E):
  Limited to XR2
- 12.2 – 12.5 GHz, EC (S-to-E):
  Limited to XR3
- 12.5 – 12.75 GHz, EC (S-to-E):
  Limited to XR1 XR3
- **12.5 – 12.7 GHz, EC (E-to-S):**
  Limited to XR1
- **12.7 – 12.75 GHz, EC (E-to-S):**
  Limited to XR1 XR2

  … …

Same bands in different regions have different allocations :

- 19.7 – 20.1 GHz, EI (S-to-E):
  XR2 : PRIMARY
  XR1 and XR3 : secondary
- **29.5 – 29.9 GHz, EI (E-to-S):**
  XR2 : PRIMARY
  XR1 and XR3 : secondary

  … …

Service Area

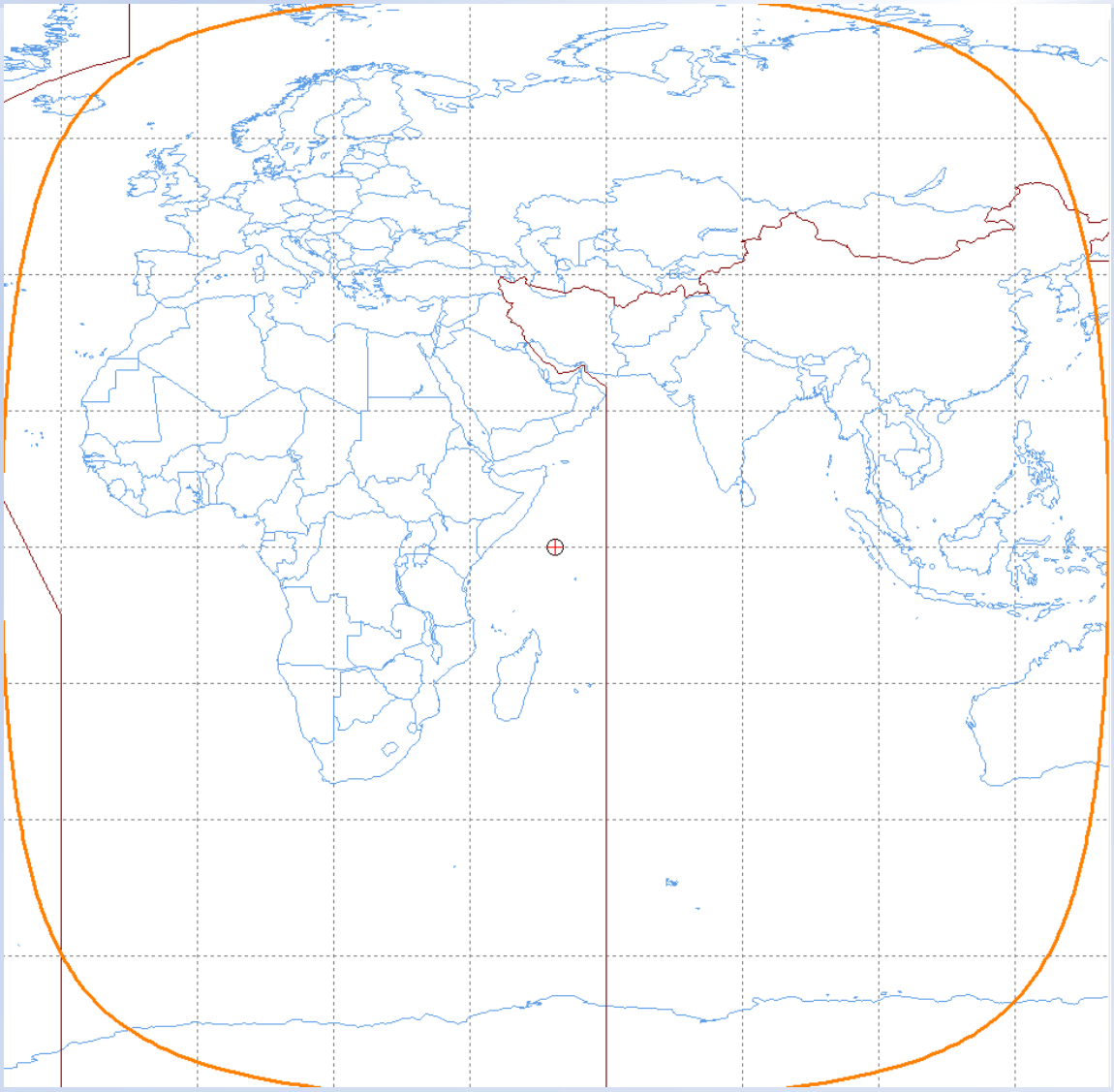
Regional limitations under Article 5

- If service area submitted is **larger than** what is allowed for under **Article 5**
- BR will **split** the service area, to the part that has an allocation, and another part that has no allocation.
- Administrations are encouraged to **remove** the part that has no allocation to facilitate the further treatment and publication.

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

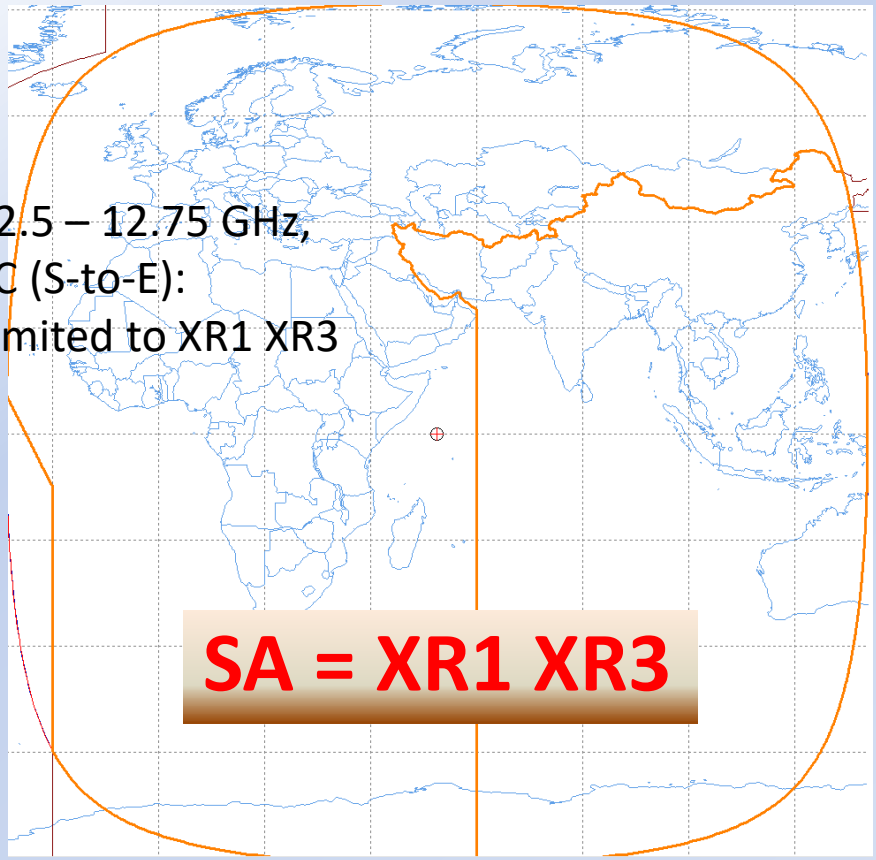
Example for split of Service Area

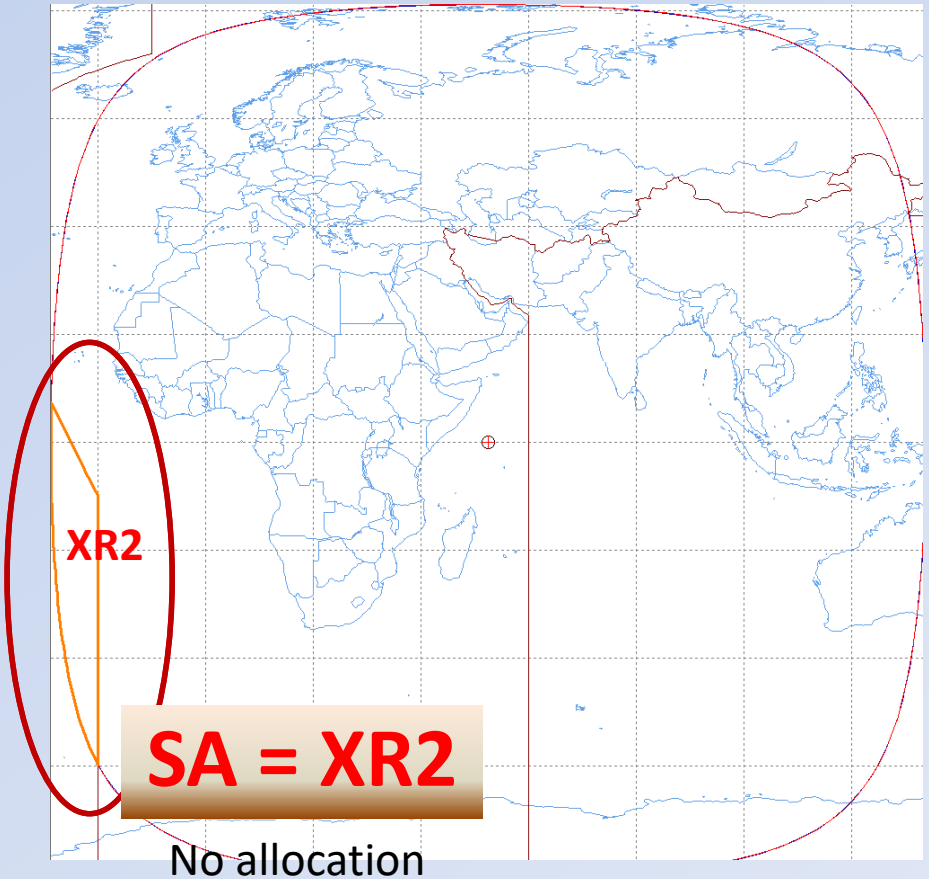
12.5 – 12.75 GHz,
EC (S-to-E):
Limited to XR1 XR3



Example for split of Service Area

12.5 – 12.75 GHz,
EC (S-to-E):
Limited to XR1 XR3





No allocation
Unfavourable

Service Area

- 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 for GSO in GIMs based on these symbols and insert the appropriate area number.

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

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

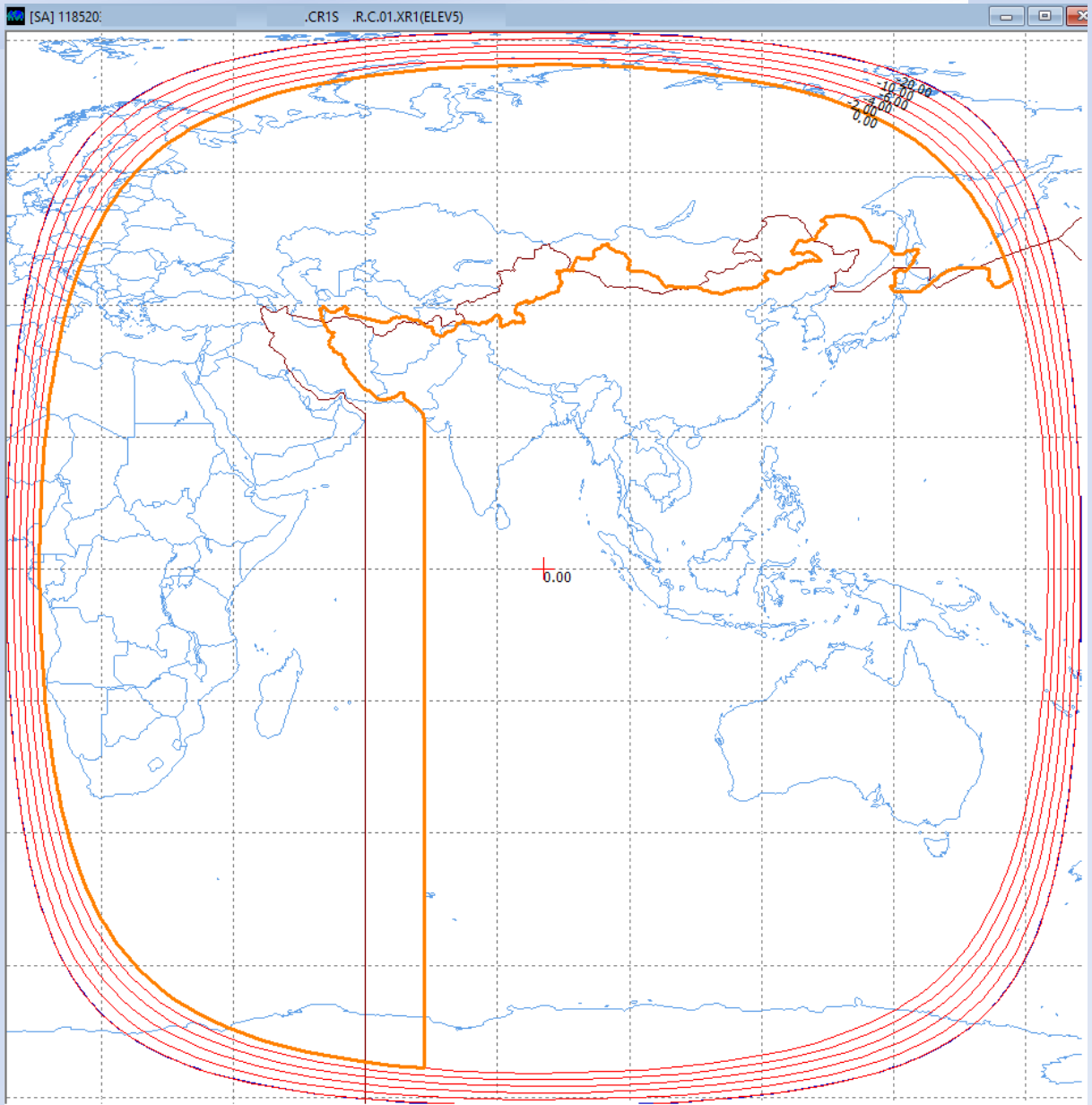
Common Errors for GIMs diagrams

- 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 each other
- Service area number should be renumbered starting from 1 for each beam (SA numbers often appear with No.4 or 5 directly without 1,2,3 for the same beam)
- 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

Common Errors for GIMs diagrams

- **For example:** Service area name:

  = XR1
- Service area diagram and service area name do not match



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°**)

SNS format database

- SNS Format database
  - Must be **in conformity with SNS V8 format** defined in **Preface**
  - **Is compatible with** BR Software **SpaceCap**
  - If not in conformity, will be returned to the administration
  - **SpaceVal v8** will detect non-conforming structure and give a fatal error

Split of Groups

Different allocation ⇔ Different provision ⇔ Different finding

- Do not include different main services in the same group, such as :
  - EC and EB, EV
  - EI and EB, EV
  - EC and EI
  - EH and EW … …

  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 ; EJ = E5 + E6
  - Do not repeat them in one group e.g. (EI EG) should simply be submitted as EI or EG only
  - If characteristics are different for the sub-service, then submit as separate groups:
    - E.g. EU EJ in one group, EG in another group
    - E5 in one and E6 in another … …

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

Space Operation Service

Space operation: ET ≠ EK, ER, ED

RoP No.1.23

2 In the No. **11.31** examinations, notices concerned with space operation **functions** will be considered in conformity with the Table of Frequency Allocations (favourable Finding) in the case where the assigned frequency (and the assigned frequency band) lies 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).

3 In the case where the assigned frequency concerning space operation **functions** lies in a frequency band allocated to a **service** in which the space station has **no operating function** the No. **11.31,** finding will be unfavourable.

Space Operation Service

Space operation: ET ≠ EK, ER, ED

For example:

SpaceVal results:

Fatal Errors: 1 Warnings:

Beam	E/R	Grp id	Table	Field	Value	Row	Valerr	Rule	F/W	Ap4 Ref	Error Message
CRL	R	102	srv_cls	stn_cls	ET		631	7	F	C.4.a	There is no allocation for the space operation service (ET) for this band. Please use ED, EK, ER as appropriate (see No.1.23 and its related Rules of Procedure) for the space operations function

F	C.4.a	There is no allocation for the space operation service (ET) for this band. Please use ED, EK, ER as appropriate (see No.1.23 and its related Rules of Procedure) for the space operations function

Earth Station Antenna Diameter

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

- required for fixed-satellite service (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)
  - 24.65-24.75 GHz (Region 3)
- required for maritime mobile-satellite service (EG) operating in the frequency band 14-14.5 GHz
- Take note of the restrictions on earth station diameters in the **footnote** to the **Table of Frequency Allocations**

FSS in 14.5-14.8 GHz

- Feeder link for BSS under 5.510
- 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)*

BSS in 21.4 - 22 GHz

- For **special procedure** under **Res 553**
  - Is published as **CR/F**
  - Continue to be treated as a **separate Notice**
  - Separate **cost recovery fee**
  - **No Res 49** but instead with **Res 552**

BSS in 21.4 - 22 GHz

- For **normal procedure** under **No.9.7**
  - 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**
  - When submitting notification for recording, all previously published CR/F could be notified together with the CR/C in one single notice.

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.

Request for Coordination

GSO

Inclination ≤ 15°

- No. 1.185 + Article 9 Footnote A.9.6A

GSO

Station keeping / Tolerance of space stations

≤ 0.1° for FSS / BSS

- No. 22.6 – No.22.10 + ROP relating to 22.10

GSO

Station keeping / Tolerance of space stations

≤ 0.5° for other services

- No. 22.11 – No.22.18 + ROP relating to 22.14

Before you submit….

Reminders:

- One notice in one mdb file compliance with SNS V8 structure
- Pass validation (SpaceVal/CrossVal without fatal errors)
- If you are unable to overcome the fatal errors, you can describe them in the attachment/note of your submission the Bureau will provide assistance to address the errors
- Make sure that all required antenna patterns are provided, either by pattern id, formula or diagrams
- Do not forget to add notes/attachments when necessary

Questions ?

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