



# **Exercise on capture and validation of an AP30/30A notice for its submission to the Bureau**

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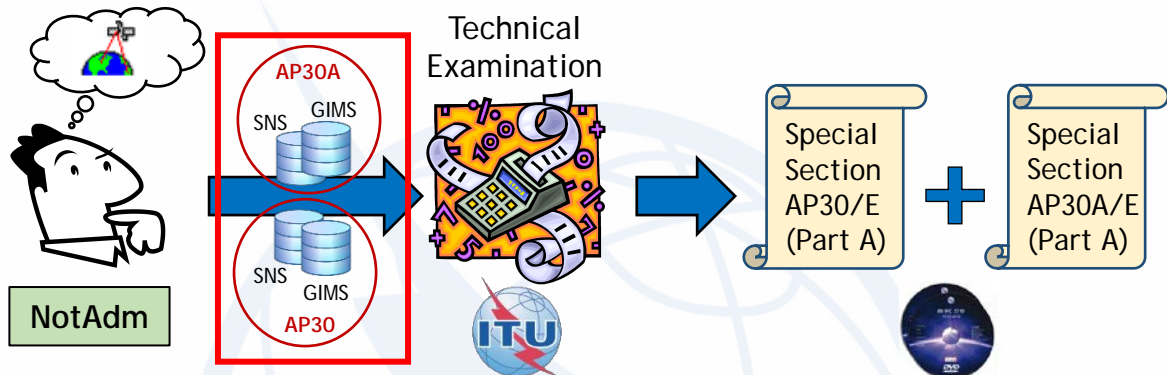
## **Resolution COM5/3 (WRC-19) = Resolution 559 (WRC-19)**

- **Main idea:** To replace national BSS assignments related to Appendices 30 and 30A for administrations in Regions 1 and 3 Plan with low EPM in order to improve their EPM values.
- **Conditions:** This procedure can only be applied once by an administration with:
  1. No frequency assignments included in the List or for which complete Appendix 4 information has been received by the Bureau in accordance with the provisions of § 4.1.3 of Appendix 30; and
  2. At least 50% of the total number of EPM values of the national assignments in the Regions 1 and 3 Plan in Appendix 30 are equal to or below -10 dB.
- **Procedure for application of Resolution 559 (WRC-19):**
  1. Administration to submit Appendix 4 information in accordance with § 4.1.3 of Appendices 30 and 30A, in particular:
    - *Request to use the special procedure in the cover letter of the submission;*
    - *Service area limited to the national territory of the administration;*
    - *A set of maximum 20 test-points inside the national territory;*
    - *A minimal ellipse determined by the set of test-points (the Bureau may create it);*
    - *Ten consecutive odd or even channels with standard frequencies in the same polarization with a bandwidth of 27 MHz;*
    - *A corresponding submission for Appendix 30A with the same above principles.*
  2. Coordinate with affected administrations and include assignments in the List.
  3. Request subsequent WRCs to consider the inclusion of these assignments in the Appendices 30 and 30A Plans as a replacement of its national assignments appearing in the Plans.



# Procedure for application of Resolution 559 (WRC-19)

**1**  
*Initial characteristics*

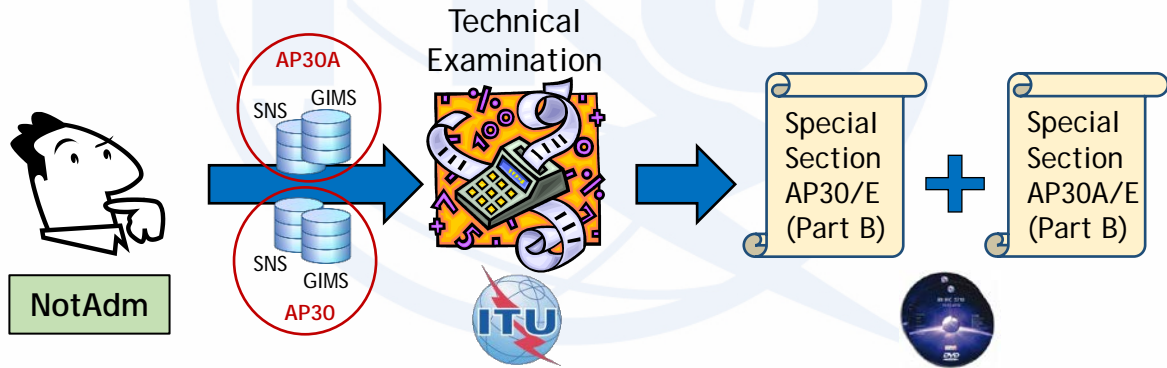


*Publication of Affected Administrations!*

**2**  
*...Coordination with affected Administrations...*

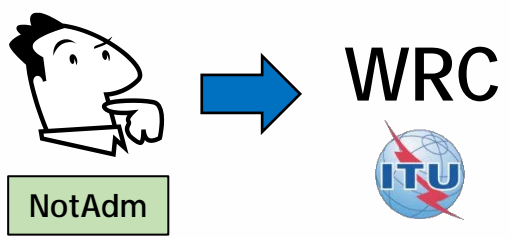
*Maximum 8 years to complete coordination*

**3**  
*Final characteristics*



*Inclusion of assignments in the Regions 1 & 3 List*

**4**  
*Request next WRC to include AP30/30A assignments into the Plan (in accordance with § 4 of Attachment 1 to Resolution 559)*



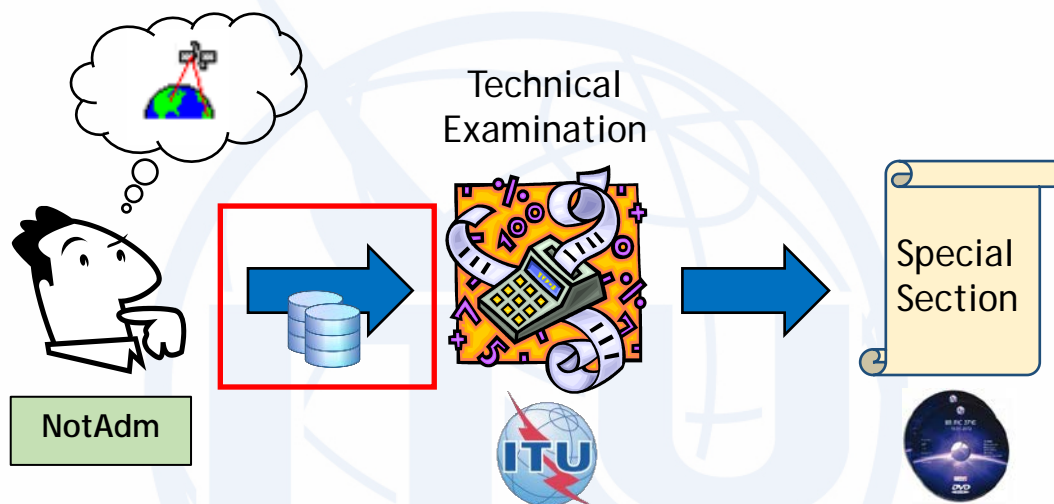
*Inclusion of assignments in the Regions 1 & 3 Plan*



## Practical information for submissions

- Orbital positions:
  - Further west than 37.2W; or
  - 35.99°W to 33.51°W, 32.49°W to 30.01°W, 28.99°W to 26.01°W, 23.99°W to 20.01°W, 17.99°W to 14.01°W, 11.99°W to 8.01°W, 5.99°W to 4.01°W, 3.99°W to 2.01°W, 0.01°E to 3.99°E, 6.01°E to 8.99°E and 9.01°E to 10°E.
- Minimum desired **elevation angle**
- Frequency bands and channels:
  - Downlink: **11.7-12.5 GHz**
    - Possible channels: 1 to 40
    - Ten consecutive odd or even channels with standard Appendix **30** assigned frequencies in the same polarization (Linear, Circular right or left).
  - Feeder-link:
    - **17.3-18.1 GHz**
      - Possible channels: 1 to 40
      - Ten consecutive odd or even channels with standard Appendix **30A** assigned frequencies in the same polarization (Linear, Circular right or left).
    - **14.5-14.8 GHz**
      - Possible channels: 1 to 14
      - The maximum of ten channels with standard Appendix **30A** assigned frequencies could have different polarization (Linear, Circular right or left).
- Bandwidth: **27 MHz**
- EIRP: **58.4 dBW** for the downlink and **84 dBW** for the feeder-link. Then run GIBC/AP3030A for AP30 Hard Limits and increase EIRP for the downlink, if possible.

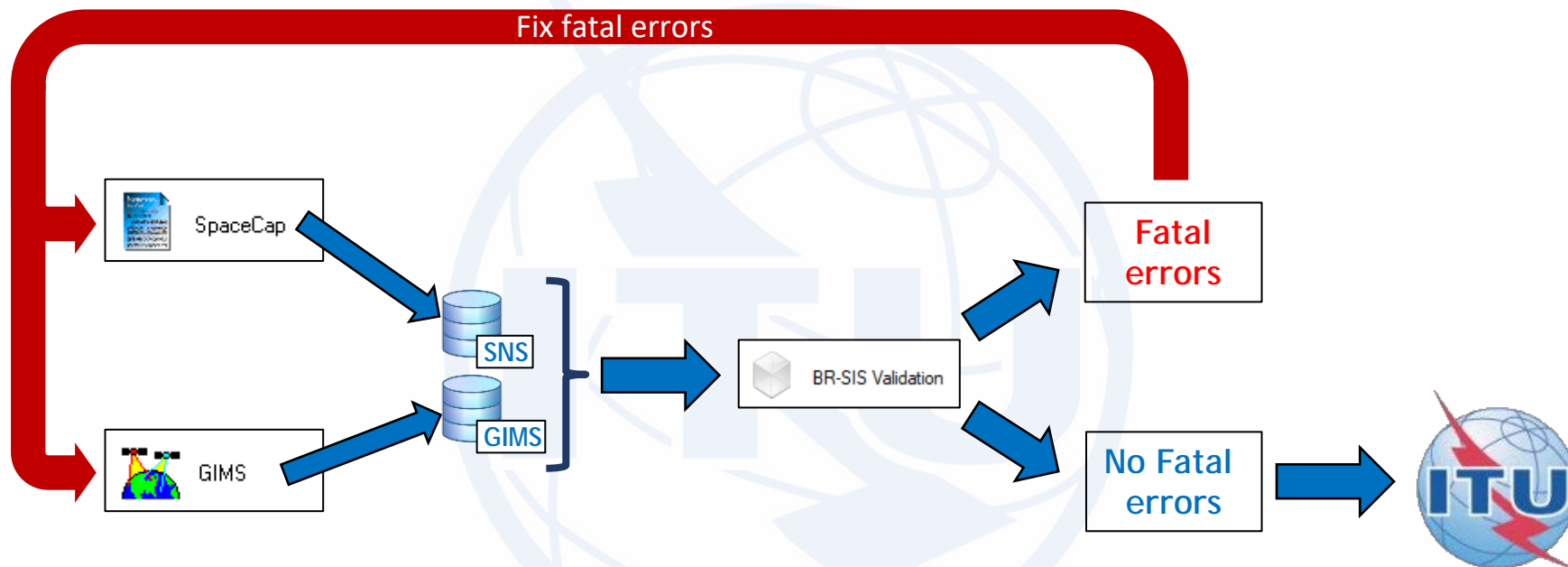
# Treatment of Article 4 Submissions



- Submission of validated Appendix 4 data: **GIMS + SNS** databases
- BR validates GIMS + SNS databases:
  - **Validation OK** → Acknowledgement by telefax + further processing of the notice
  - **Validation not OK** → Notice is returned to the notifying administration



# Capture and validation of a submission



1. Capture AP4 data with SpaceCap and GIMS and generate SNS and GIMS databases
2. Validate with GIMS:
  - a. If there is any fatal error → correct with SpaceCap and/or GIMS and validate
  - b. If there is no fatal error → submission is ready to be sent to the Bureau



# Exercise: Generate submission to apply the special procedure in Resolution 559

## Main Steps:

1. **AP30 submission:**
  - a) Generate GIMS database with graphical information with GIMS
    - Gain contour (-3 dB ellipse) + Service area (national territory)
  - b) Generate SNS database with SpaceCap
  - c) Run BR-SIS Validation with SNS and GIMS databases
2. **AP30A submission:**
  - a) Generate GIMS database with graphical information with GIMS
    - Gain contour (-3 dB ellipse) + Service area (national territory)
  - b) Generate SNS database with SpaceCap
  - c) Run BR-SIS Validation with SNS and GIMS databases
3. **Run GIBC/Appendix 30 30A to check Hard Limits**
  - a) For AP30 submission
  - b) For AP30A submission



## Exercise: Generate submission to apply the special procedure in Resolution 559

**1.a) AP30: Generate GIMS database**

**1.b) AP30: Generate SNS database**

**1.c) AP30: Run BR-SIS Validation**

**2.a) AP30A: Generate GIMS database**

**2.b) AP30A: Generate SNS database**

**2.c) AP30A: Run BR-SIS Validation**

**3.a) Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission**

**3.b) Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission**





# 1.a) AP30: Generate GIMS database (GAIN CONTOUR)

The screenshot shows the GIMS software interface. The 'Database' menu is open, with 'New' selected. A dialog box titled 'Select a GIMS Database' is displayed, showing the 'Create a new empty database' option selected. The 'Location' field contains 'C:\BR\_SOFT\AP30\_30A', the 'Name' field contains 'R13\_BSS\_SUI\_GIMS', and the 'Description' field is empty. The 'Open an existing file' option is also visible, with a list of files including 'GIMS on Prod' and 'GIMS on Devl'. Two purple callout boxes provide instructions: '1. Create a new GIMS database' and '2. Specify path and name of the database and click OK'.

**1. Create a new GIMS database**

**2. Specify path and name of the database and click OK**



# 1.a) AP30: Generate GIMS database (GAIN CONTOUR)

1. Open a new diagram

2. Select footprint

3. Select orbital position (e.g. "-10") and press OK

The screenshot displays the GIMS software interface. The main window title is 'GIMS' and the menu bar includes 'Diagram', 'Database', 'Edit', 'View', 'Tools', 'Window', and 'Help'. The toolbar contains various icons for file operations and editing. The status bar at the bottom indicates the current file is 'R13\_BSS\_SUI\_GIMS on C:\Exercise\_submission'. Two dialog boxes are open: 'New' and 'Modify Satellite Position'. The 'New' dialog box has a list with 'Footprint' selected, and the 'Modify Satellite Position' dialog box has '-10' entered in the 'Longitude' field.

**New**

- New
- Footprint
- Service Area
- AGGSO
- Non-Geostationary

Buttons: OK, Cancel, Help

**Modify Satellite Position**

Longitude: -10

Buttons: OK, Cancel

Obscured Zone Limit

Low: 152.6222 deg. High: 187.3778 deg.



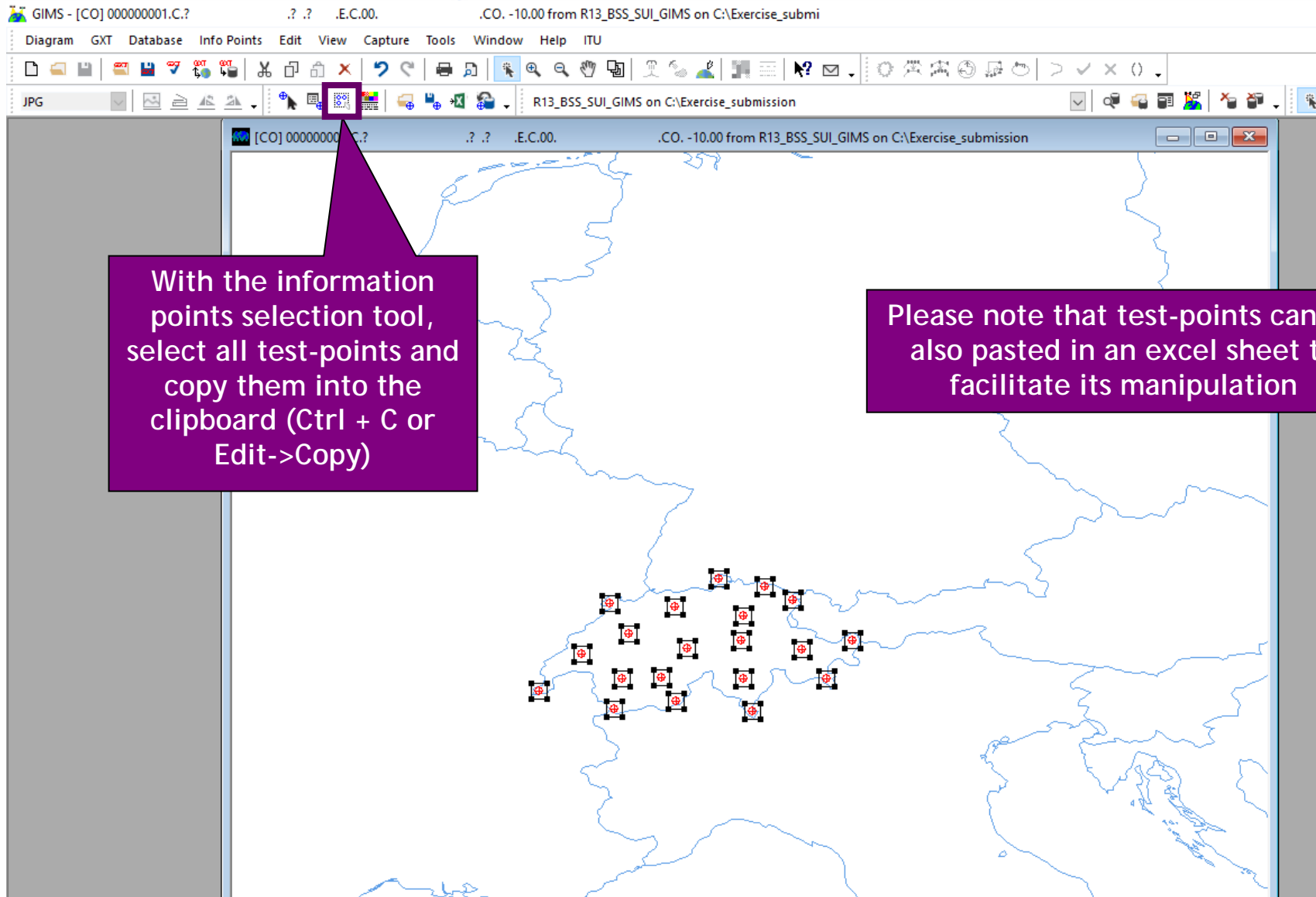
# 1.a) AP30: Generate GIMS database (GAIN CONTOUR)

The screenshot shows the GIMS software interface with a map of a territory. A zoom tool is highlighted in the toolbar, and a callout box points to it with the instruction: "1. With the zoom tool, enlarge the map around the desired territory". Another callout box points to the information point tool with the instruction: "2. With the information point tool, choose up to 20 test-points located within the territory and on land. It is recommended to select test-points close to the border for the minimum ellipse to cover all territory and also inside in order to represent the territory homogenously". A third callout box points to a test point on the map with the instruction: "When leaving the mouse over a test-point, GIMS will display the coordinates as well as the elevation angle from that point.". A fourth callout box points to a data popup window with the instruction: "Please make sure that the test-point is located in your territory!". The data popup window displays the following information:

Position	: 10.0301;46.3643
Earth azimuth(deg)	: 206.74
Earth elevation (deg)	: 33.15
Gain (dB)	:
ID# Rain Zone	: K
Located in	: SUI/SUI/XR1
PFd (dB/W/m**2)	:
Space azimuth (deg)	: 2.27
Space elevation (deg)	: 6.91
Spreading Loss (dB)	: 162.66



# 1.a) AP30: Generate GIMS database (GAIN CONTOUR)



With the information points selection tool, select all test-points and copy them into the clipboard (Ctrl + C or Edit->Copy)

Please note that test-points can be also pasted in an excel sheet to facilitate its manipulation



# 1.a) AP30: Generate GIMS database (GAIN CONTOUR)

The screenshot shows the GIMS software interface with the 'Capture' menu open. The 'Gain Information' sub-menu is selected, and the '-3dB Ellipse' option is highlighted. The 'Modify Formula Interpolation' dialog box is open, showing various parameters for beam interpolation. The 'Rotational error of beam' is set to 1 degree, and the 'Pointing error of beam' is set to 0.1 degrees. The 'Use test points' checkbox is checked, and the 'From Clipboard' button is highlighted. The 'Re-calculate ellipse parameters from test points' checkbox is also checked. The 'Min 3dB beamwidth' is set to 0.6, and the 'Satellite Position (degrees)' is set to -10. The 'Show Test Points' checkbox is unchecked. The 'OK' button is highlighted.

1. Capture a -3 dB ellipse

2. Rotational Accuracy=0°

3. Pointing Accuracy=0.1°

4. Activate the use of test-points

5. Paste test-points from the clipboard

6. Generate ellipse

7. Deactivate the use of test-points

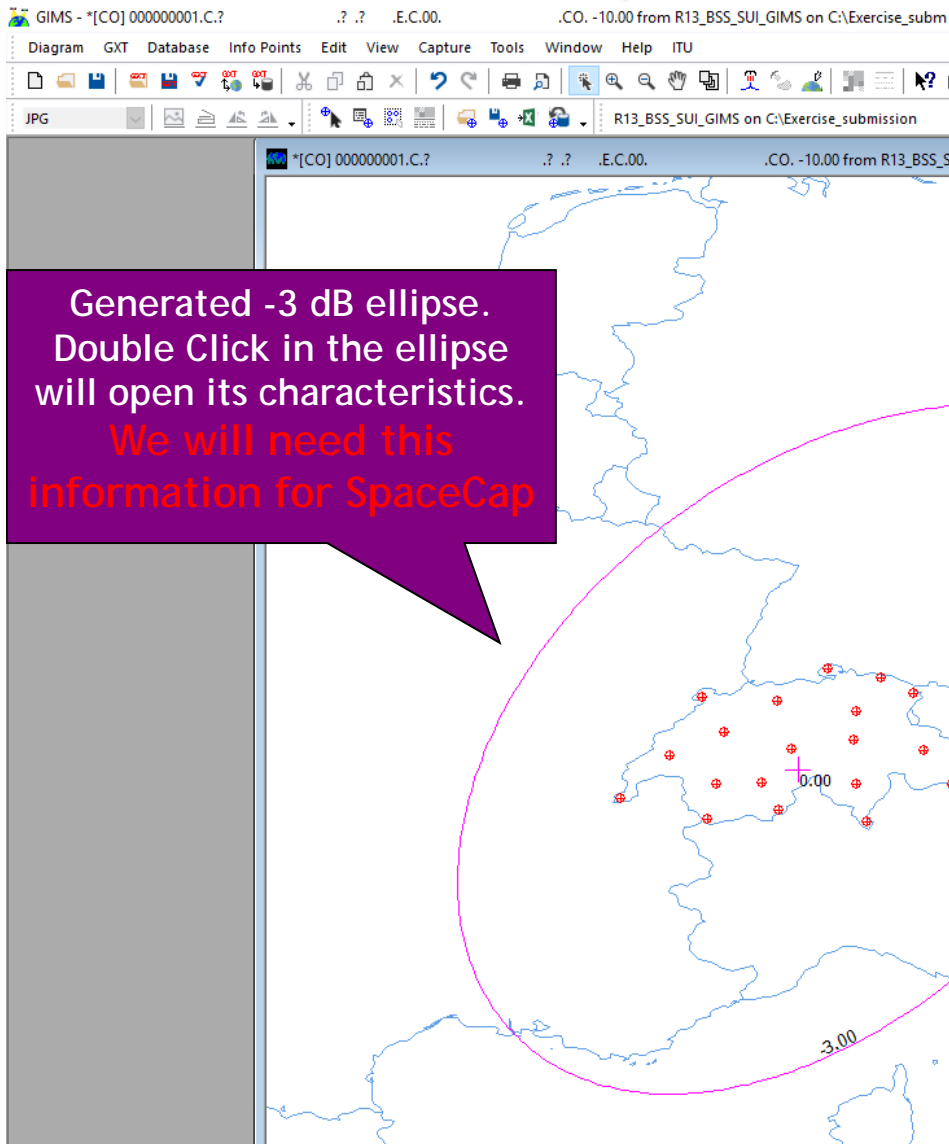
8. Rotational Accuracy=1°

9. Press OK

	Long.	Lat.
1	7.0794	47.4415
2	9.5865	47.4174
3	8.562	47.7308
4	7.5857	47.5741
5	10.0566	46.3085
6	8.562	46.9232



# 1.a) AP30: Generate GIMS database (GAIN CONTOUR)



Generated -3 dB ellipse.  
Double Click in the ellipse  
will open its characteristics.  
We will need this  
information for SpaceCap

### Modify Formula Interpolation

Boresight Longitude: 8.2 degrees  
Boresight Latitude: 46.46 degrees

Major axis: 0.65 degrees  
Minor axis: 0.6 degrees  
Orientation of major axis: 1.03 degrees  
i.e. phase angle in degrees with positive (eastward) azimuth axis

RR pattern code: APSRR\_401V01

Fast roll-off parameter: 0 degrees

Rotational error of beam: 1 degrees  
Pointing error of beam: 0.1 degrees

Use test points

Enter points using the digitiser or by typing on the keyboard

	Long.	Lat.
1	6.0308	46.2
2	6.1754	46.5978
3	6.4768	46.9232
4	6.8263	47.104
5	6.8866	46.1157
6	7.0794	47.4415

From Clipboard  
Clear Table  
 Show Test Points

OK Cancel

This information will be used  
in SpaceCap for the  
generation of the SNS  
database



# 1.a) AP30: Generate GIMS database (GAIN CONTOUR)

**1. Save the gain contour**

**2. Press OK**

**3. Introduce the information**

- Notice ID: 1
- Notification Reason: B (AP30/30A)
- Administration: SUI
- Satellite name: ITU\_SAT
- Beam name: E001
- Emission/Reception: E
- Polarization: C (Co-polar)

Then press OK

Field	Value
Notice ID	1
Notification Reason	B (AP30/30A)
Administration	SUI
Satellite Name	ITU_SAT
Beam Name	E001
Emission / Reception	E (Emission = Down Link)
Polarization	C (Co-polar)
Comment	

Category	Count	Item
Saving gain contour diagram consisting of	1	boresight(s)
	0	digitised contour(s)
	1	generated contour(s)
Saving service area diagram consisting of	0	service point(s)
	0	service region(s)
	0	excluded region(s)



# 1.a) AP30: Generate GIMS database (SERVICE AREA)

1. Open a new diagram

2. Select Service area

3. Select orbital position  
"-10" and press OK

The screenshot shows the GIMS software interface. The main window title is 'R13\_BSS\_SUI\_GIMS on C:\Exercise\_submission'. The menu bar includes 'Diagram', 'Database', 'Edit', 'View', 'Tools', 'Window', and 'Help'. The toolbar contains various icons for file operations and editing. A 'New' dialog box is open, showing a list of options: 'Footprint', 'Service Area' (highlighted), 'AGGSO', and 'Non-Geostationary'. The 'OK' button is highlighted. A 'Modify Satellite Position' dialog box is also open, showing the 'Longitude' field set to '-10'. The 'Obscured Zone Limit' section shows 'Low: 152.6222 deg.' and 'High: 187.3778 deg.'. The 'OK' button is highlighted.





# 1.a) AP30: Generate GIMS database (SERVICE AREA)

.E.C.00. .SA. -10.00 from R13\_BSS\_SUI\_GIMS on C:\Exercise\_submi

Info Points Edit View Capture Tools Window Help ITU

Recognise Projection...  
Gain Information  
Boresight  
Gain Contour  
-3dB Ellipse  
✓ Service Area Information  
Discrete Service Points  
Service Region  
Clip By ITU Region  
Clip By Elevation Angle  
Horizon Closure  
Toggle Horizon Closure  
Remove Horizon Points  
Squint Beam  
Generate AG/GSO  
Analytical Interpolation  
✓ General Interpolation

1. Create Service area

From Gain Contour  
By Geographical Areas  
By Elevation  
As Vertices

Service Region Defined by Geographical Areas

Selected Geographical Areas : Add from clipboard

Code	ITU Region	Long. Min	Long. Max	Lat. Min	Lat. Max	EXCL.
XR1						
XR2						
XR3						
S						
SDN						
SEN						
SEY						
SHN						
SLM						
SLV						
SMA						
SMO						
SMR						
SNG						
SOM						
SPM						
SRB						
SRL						
SSD						
STP						
SUI						
SUR						
5.369						
5.386						
5.401						
5.521						
ARR						
Res. 163						
Res. 164						

2. Select administration code (e.g. SUI), include it in the list of geographical areas and press OK

OK Cancel



# 1.a) AP30: Generate GIMS database (SERVICE AREA)

1. Save the Service area

2. Press OK

Diagram key - Save to R13_BSS_SUI_GIMS	
Notice ID	1
Notification Reason	B (AP30/30A)
Administration	SUI
Satellite Name	ITU_SAT
Beam Name	E001
Emission / Reception	E (Emission = Down Link)
Polarization	C (Co-polar)
Service Area Number	1
Service Area Name	SA
Comment	

3. Introduce the information

- Notice ID: 1
  - Notification Reason: B (AP30/30A)
  - Administration: SUI
  - Satellite name: ITU\_SAT
  - Beam name: E001
  - Emission/Reception: E
  - Polarization: C (Co-polar)
  - Service Area Number: 1
  - Service Area Name: SA
- Then press OK



# 1.a) AP30: Generate GIMS database (HOW TO OPEN DIAGRAMS)

1. Be sure you are connected to the desired database (otherwise open the database first)

2. Open the diagrams

3. Select the type of diagrams you want to display (we have generated only 1 gain contour and 1 service area)

4. Select the diagrams you want to display

- Downlink
- Feeder-link

The screenshot shows the GIMS Database Explorer window. The title bar indicates the current database is 'R13\_BSS\_SUI\_GIMS on C:\Exercise\_submission'. The main window is divided into several sections:

- Database:** Location: c:\exercise\_submission\13\_bss\_sui\_gims.mdb
- Browse for ...:** Radio buttons for 'Geostationary Satellites' (selected) and 'Non-geostationary Satellites'.
- Notice ID:** A dropdown menu.
- Filter by:** A dropdown menu set to 'Administration'.
- Select only:** A list of checkboxes:  CO (Gain Contours),  SA (Service Area), and  AG/GSO (Gain towards the GSO).
- Ignore:** Checkboxes for 'C (Co-polar)', 'E (Emission = Down Link)', 'X (Cross-polar)', and 'R (Reception = Up Link)'. 'E' and 'R' are selected.
- Notice Table:** A table with columns: Notice, Reason, Admin., Satellite Name, Position, Status. The first row is expanded to show a tree view with '1' (selected), 'E001', 'CO (Gain Contours)', and 'SA (Service Area)'. The second row is '2'.
- Bottom Panel:** A text area containing the following data:

```
000000001;B;ITU_SAT ;SUI;E001 ;E;C;00; ;CO; -10.00
000000001;B;ITU_SAT ;SUI;E001 ;E;C;01;SA ;SA; -10.00
```

At the bottom of the window are 'OK' and 'Cancel' buttons.



## Exercise: Generate submission to apply the special procedure in Resolution 559

1.a) AP30: Generate GIMS database

1.b) AP30: Generate SNS database

1.c) AP30: Run BR-SIS Validation

2.a) AP30A: Generate GIMS database

2.b) AP30A: Generate SNS database

2.c) AP30A: Run BR-SIS Validation

3.a) Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission

3.b) Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission



# 1.b) AP30: Generate SNS database (CREATE DATABASE)

SpaceCapture V8 - [Set Notice Template]

File Edit Tools Template Window Help

Open Database  
New Database  
Open SNS Database  
Open SQLServer Localdb  
Preferences

1. Create a new database

New database

This PC > OSDisk (C:) > BR\_SOFT > AP30\_30A

Search AP30\_30A

Name	Date modified	Type
R13_BSS_SUI_GIMS.mdb	10.02.2020 5:20 PM	Microsoft Access Database Engine 2010 .mdb file
SPS_ALL_IFIC2913.mdb	10.02.2020 5:14 PM	Microsoft Access Database Engine 2010 .mdb file

2. Choose same path as for the GIMS database (C:\BR\_SOFT\AP30\_30A)

3. Select the name of the database (e.g. "R13\_BSS\_SUI") and click "Open"

File name: R13\_BSS\_SUI.mdb

Access mdb

Open Cancel



# 1.b) AP30: Generate SNS database (CREATE NOTICE)

The screenshot shows the SpaceCapture V8 interface with the following components and annotations:

- Callout 1:** A purple box pointing to the 'PLAN' button in the top toolbar.
- Callout 2:** A purple box pointing to the 'Read-only mode' checkbox, which is currently checked.
- Callout 3:** A purple box pointing to the '00DN' row in the table below.
- Callout 4:** A purple box pointing to the 'New Notice' button in the left sidebar.

**Table Data:**

PLAN ID	Description	Notice Count
00DN	WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)	0
00UP	WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)	0
30_2	RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)	0
A30B	WRC07 FSS Plan 6/4 AND 13/10-11 GHz Band (App	

**Page Footer:** Current DB : C:\Exercise\_submission\AR13\_BSS\_SUI.mdb Click on Notice Explorer to see a list of Notices, or New Notice to create one. 5



# 1.b) AP30: Generate SNS database (NOTICE LEVEL)

SpaceCapture V8 - [Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)]

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN RS49/552

Notice Beam Attachments Coordination

Notice Id: 1 Plan WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30) Status 01

Date of Receipt: DD.MM.YYYY Administration Serial Number

A1f1. Notifying Administration: SUI

A1f3. Intergovernmental Satellite:

**Notice Submitted under**

- 4.1.12 Part B Submission
- 4.1.23 List Suppression
- 4.1.26 New Adm
- 4.1.27 Replacement in Plan
- 4.1.3
- RS548 Re...

Part A submission

A13c

Part A suppression

4.1.3

A4a1. Nominal Orbital Longitude: 10° W

A1a. Identity of the Satellite Network: ITU\_SAT

A4a2. Longitudinal tolerance

- b. West: 0.1°
- a. East: 0.1°

A11. Regular Hours of Operation

- a. start: 0
- b. end: 24

List of Available Beams

001

Select Administration (e.g. SUI)

Select 4.1.3 Submission and Part A submission

Select east and west tolerance of the satellite (0.1° for both)

Select orbital position (e.g. -10=10°W) and satellite name (e.g. ITU\_SAT)

Hours of operation: 0 to 24



# 1.b) AP30: Generate SNS database (BEAM LEVEL)

SpaceCapture V8 - [Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)]

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN RS49/552

Notice Beam Group Attachments Coordination

Nominal Orbital Longitude: -10 Administration: SUI

Characteristics of the Beam

B2.  Receiving Beam  **Transmitting Beam**

Shape of the Beam  **Elliptical**  Other Shape

B3d. Pointing Accuracy: 0.1 °

B3a1. Co-polar gain: 48.54 dB

B1a. Beam Designation: E001

Space Station Antenna: R123SS ==> APSRR\_401V01

B3c. Radiation Pattern

B3f2a. Rotation Accuracy: 1 °

B3f2b. Major Axis Orientation: 1.03 °

B3f2. Axis at half-power beamwidth: c. Major: 0.65 °, d. Minor: 0.6 °

B3f1. Boresight: Longitude: 8.2 ° E, Latitude: 46.46 ° N

Modify Formula Interpolation

Boresight Longitude: 8.2 degrees  
Boresight Latitude: 46.46 degrees

Major axis: 0.65 degrees  
Minor axis: 0.6 degrees  
Orientation of major axis: 1.03 degrees (i.e. phase angle in degrees with positive (eastward) azimuth axis)

RR pattern code: APSRR\_401V01

Fast roll-off parameter: 0 degrees

Rotational error of beam: 1 degrees  
Pointing error of beam: 0.1 degrees

Use test points

	Long.	Lat.
1	7.0794	47.4415
2	9.5865	47.4174
3	8.562	47.7308
4	7.5857	47.5741
5	10.0566	46.3085
6	6.4768	46.9332

Min 3db beamwidth: 0.6  
Satellite Position (degrees): -10

Plan Id 00DN 6:03 PM 16.12.20

**Transmitting beam (downlink)**

**Elliptical beam**

Co-polar antenna gain should be equal to

$$10x \log\left(\frac{27843}{\text{min. axis} \times \text{maj. axis}}\right)$$

Please also note that:

$$\text{EIRP}_{DL} = \text{GAIN} + \text{TOTAL POWER}$$

$$\text{EIRP}_{DL} = 58.4 \text{ dBW}$$

TOTAL POWER in Emissions/Frequencies

This information should be extracted from the elliptical parameters in GIMS







# 1.b) AP30: Generate SNS database (GROUP LEVEL)

SpaceCapture V8 - [Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)]

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN RS49/552

Attachments Coordination

Notice Beam Group Emissions/Frequencies Srv Area/Assoc Earth Stn

Satellite Network: ITU\_SAT Beam Id: E001 E Group Id: 1 Split Grp Id:

Characteristics Common to a Group of Frequencies General Characteristics

C3a. Assigned frequency bandwidth: 27000 (kHz)

C15a. MSPACE Group code: Z9

C4a. Class of Station: EV

C.6 Polarization: a. Type: CR Circular Right (Direct)

b. Electric Vector Angle:

Remarks:

Select a bandwidth of 27 MHz

Select class of station EV for television broadcasting

Select a polarization (e.g. CR). If linear polarization is selected, electric vector angle is mandatory



# 1.b) AP30: Generate SNS database (GROUP LEVEL)

SpaceCapture V8 - [Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)]

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN RS49/552

Attachments Coordination  
Notice Beam Group

Notice 1 Satellite Network: ITU\_SAT Beam Id E001 E Group Split Grp Id:

Characteristics Common to a Group of Frequencies **General Characteristics**

A3a. Operating Administration or Agency  
001 ... RADIOD-SUISSE S.A.

A3b. Responsible Administration  
A ... FEDERAL OFFICE OF COMMUNICATION

To apply this information to other groups, select the beam or notice option:

Apply to current group only  Apply to all groups in this beam  Apply to all groups in this notice

**1. Click on General Characteristics**

**2. Introduce any "Responsible Administration" and "Operating Administration or Agency" from the list. Please note that this information is required only for the sake of completeness of the notice and will be removed once the assignments are included into the Plan.**

Current DB : C:\Exercise\_submission\NR13\_BSS\_SUI.mdb Plan Id 00DN 11:31 AM 17.12.2019



# 1.b) AP30: Generate SNS database (EMISSIONS/FREQ LEVEL)

SpaceCapture V8 - [Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)]

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN RS49/552

Group Emissions/Frequencies Srv Area/Assoc Earth Stn

Beam Id E001 E

C8 Power Characteristics of the transmission

C7a. Designation of Emission	C9. Modulation Char	b1. Total Power (dBW)	b2. Maximum Power Density	h. Maximum Power Density over Bandwidth
27MOG7W--	modchar	9.12	-65.19	-65.19

Notice Id.

11888.32

11

11919.28

13

11957.64

15

11996.00

**Please note that:**  
 $EIRP_{DL} = GAIN + TOTAL\ POWER$   
 $EIRP_{DL} = 58.4\ dBW$   
**GAIN in Beam tab**

- For digital emissions, the maximum power density default value (assuming uniform distribution of the power over the necessary bandwidth) is calculated once the total power is entered using the following formula:  
 $pwr - 10 * \log(B)$ .
- Default values are automatically calculated once total power is introduced.

- Introduce 27MOG7W--
- Necessary bandwidth: 27 MHz
- Only digital modulation may be submitted under Article 4 in Regions 1 and 3.

Shall be captured for every emission. (next slide)

- For Regions 1 and 3 downlink:
  - `total_pow+co_pol_ant_gain` shall be in conformity with e.i.r.p. limitations of Annex 7 to Appendix 30, and;
  - the PFD level produced by the total e.i.r.p./ 27MH shall not exceed the limit of -103.6 dB(W/m<sup>2</sup>. 27 MHz) of § 1 of Annex 1 to Appendix 30.
- Run GIBC/Appendix 30 30A to check Hard Limits and increase the  $EIRP_{DL}$  with the margin between pfd produced and pfd hard limit (exercise 3.a))



## 1.b) AP30: Generate SNS database (EMISSIONS/FREQ LEVEL)

Modulation Characteristics

Current Designation of Emission 27M0G7W--

C9a. Modulation Characteristics for Each Carrier

C9a1. Type of modulation QPSK

C9a3. For a carrier frequency modulated by TV signal

C9a3c. Multiplexing type DVB-S

C9a7. Energy dispersal type Carrier always spread by digital stream

C9a9. TV standard DVB-S

Apply these characteristics to all emissions in this notice with the same designation of emission

Apply these characteristics to the current emission

OK CANCEL

List of proposed values.  
Any modulation characteristics may be introduced since they are not taken into account for the calculation of interference



# 1.b) AP30: Generate SNS database (EMISSIONS/FREQ LEVEL)

SpaceCapture V8 - [Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)]

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN RS49/552

Attachments Coordination  
Notice Beam Group Emissions/Frequencies Srv Area/Assoc Earth Stn

Notice Id: 1 Satellite Network: ITU\_SAT Beam Id: E001 E Group Id: 1 Mspace Grp Code:

C8 Power Characteristics of the transmission				
C7a. Designation of Emission	C9. Modulation Char	b1. Total Power (dBW)	b2. Maximum Power Density	h. Maximum Power Density over Bandwidth
27M0G7W--	modchar	9.12	-65.19	-65.19

C2a. Assigned Frequencies	
Channel	Frequency in MHz
1	11727.48
3	11765.84
5	11804.20
7	11842.56
9	11880.92
11	11919.28
13	11957.64
15	11996.00
17	12034.36
19	12072.72

- Select ten consecutive odd or even channels with standard Appendix 30 assigned frequencies.
- Frequency: 11.7-12.5 GHz
- Channels: 1 to 40
- Automatic calculation of channel number from frequency or frequency from channel number.



# 1.b) AP30: Generate SNS database (SRV AREA/EARTH STN)

SpaceCapture V8 - [Forms of Notice PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)]

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN RS49/552

Attachments Coordination

Notice Beam Group Emissions/Frequencies Srv Area/Assoc Earth Stn

Notice Id: 1 Satellite Network: ITU\_SAT Beam Id: E001 E Group Id: 1

Service area=1

C11a. Test Points (maximum 100)

Longitude degrees E	Latitude degrees N	Antenna Altitude (m)	Climatic Zone	C. Zone in db
6.0308	46.2000	0		

Service area contour  
C11a1. Service Area No. 1 C11a5e. Minimal Elevation Angle

C.10.d.5 Reference Pattern	Maximum gain Default value
BO2063-0	$35.5+20*\log(D/0.6)$
MODRES	$35.5+20*\log(D/0.6)$

C.10.d.5 Reference Pattern	3 dB beamwidth Default value
BO2063-0	$1.734/D$
MODRES	$2.86*0.6/D$

Associated Typical Earth Station Antenna Characteristics

C10d5a. Radiation Pattern MODRES ==> APERR\_007V01

C10d3. Maximum Isotropic Gain in dBi 35.5

C10d4. Half-power beamwidth in degrees 2.86 °

C10d8. Equivalent Diameter in meters 0.6

Note: These associated typical earth station antenna characteristics are valid for each test point.

Apply these to all groups

Overwrite Climat

- ✓ Introduce proposed values (MODRES)
- ✓ Maximum Gain and 3dB beamwidth should be consistent with submitted antenna diameters.
- ✓ Radiation pattern shall contain both co-polar and cross-polar patterns.
- ✓ Gain and 3dB beamwidth are stored with 2 digits after decimal.



# 1.b) AP30: Generate SNS database (SRV AREA/EARTH STN)

4. Close the notice

SpaceCapture V8 - [Form] Link Plan & List for Regions 1 & 3 (Appendix 30)

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN RS49/552

C11a Test Points (Maximum 100)

Row No	Longitude degrees E	Latitude degrees N	Antenna Altitude (m)	Climatic Zone	C. Zon in db
1	6.0308	46.2000	0		
2	6.1754	46.5978	0		
3	6.4768	46.9232	0		
4	6.8263	47.1040	0		
5	6.8866	46.1157	0		
6	7.0794	47.4415	0		
7	7.4531	46.0072	0		
8	7.5857	47.5741	0		
9	8.0316	46.2121	0		
10	8.1883	47.5862	0		
11	8.5138	46.2844	0		
12	8.5620	47.7308	0		
13	9.0079	45.9108	0		
14	9.1405	47.6223	0		
15	9.5383	46.3808	0		
16	9.5865	47.4174	0		
17	9.7914	46.9835	0		
18	10.0566	46.3085	0		
19	10.3941	46.6098	0		
20	10.4061	46.9353	0		

Copy Rows  
Paste Rows  
Select All  
Delete

Save and Close  
Close

3. Paste test-points in the auxiliary window and click "Save and Close"

1. Click to open auxiliary window to manipulate test-points

2. Copy test-points from GIMS or Excel:

- Select test-points with information points selection tool
- Ctrl + C or Edit-> Copy

Associated Typical Earth Station Antenna Characteristics

C10d5a. Radiation Pattern MODRES ==> APERR\_007V01

C10d3. Maximum Isotropic Gain in dBi 35.5

C10d4. Half-

C10d8. Equip

Apply the to all groups in this beam the Current Group

Overwrite Climatic Zones in db with IDWM Climatic Zones



# 1.b) AP30: Generate SNS database (SRV AREA/EARTH STN)

The screenshot shows the SpaceCapture V8 software interface. The main window is titled "SpaceCapture V8 - [Set Notice Template]". The menu bar includes "File", "Edit", "Tools", "Template", "Window", and "Help". The toolbar contains various icons for file operations and navigation. The main workspace is titled "Notice Explorer PLAN - WRC-00 BSS Down-link Plan". A table titled "List of notices" is displayed with the following data:

Notice id	Type	Adm./Org.	Orb. Pos.	Station	Count
000000001	A1	G	SUT/	10W ITU SAT	no date 01

A context menu is open over the selected row, listing various actions. The action "Prepare incoming notice for Mspace" is highlighted at the bottom of the menu. A purple callout box points to the first row of the table with the text "1. Select incoming notice and click on right button of the mouse". Another purple callout box points to the "Prepare incoming notice for Mspace" option in the menu with the text "2. Click on 'Prepare incoming notice for Mspace'".





## Exercise: Generate submission to apply the special procedure in Resolution 559

1.a) AP30: Generate GIMS database

1.b) AP30: Generate SNS database

1.c) AP30: Run BR-SIS Validation

2.a) AP30A: Generate GIMS database

2.b) AP30A: Generate SNS database

2.c) AP30A: Run BR-SIS Validation

3.a) Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission

3.b) Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission



# 1.c) AP30: Run BR-SIS Validation

**Selected task: Validation**

Validation

- Version: 8.0.1.25 [what's new?](#)
- Description: Validate electronic submissions
- Contact: [sandrine.moret@itu.int](mailto:sandrine.moret@itu.int)
- Validation Rules: Satellites Earth Stations Plans

Selected database: R13\_BSS\_SUI.mdb

Microsoft Access

C:\BR\_SOFT\AP30\_30A\R13\_BSS\_SUI.mdb

Browse

Start

Quit

devega

1. Browse SNS database (e.g. R13\_BSS\_SUI.mdb")

2. Click on Start

BR-SIS - Validation v8.0.1.25

Notice Id. 1

Sat. name: ITU\_SAT

Type of notice: Part A (R1&3) Downlink Status: 24

Adm./Org.: SUI Orb. pos.: 10W Station type: G

Validation Reports

Run as external user

Graphical data cross validation

GIMS Database (.mdb) c:\br\_soft\ap30\_30a\r13\_bss\_sui\_gims.mdb

Browse

Validate notice

3. Browse GIMS database  
-> Open an existing file  
-> More files...  
(e.g. R13\_BSS\_SUI\_GIMS.mdb)

2. Click on Validate notice



## 1.c) AP30: Run BR-SIS Validation (REPORT)

BRSIS - Validation v8.0.1.25

Notice Id. 1

Sat. name: ITU\_SAT  
Type of notice: Part A (R1&3) Downlink Status: 24  
Adm./Org.: SUI Orb. pos.: 10W Station type: G

Validation Reports

created on 10/02/2020 - start time: 18:56:02 - duration: 0min. 15sec. by user devega us

Validation: 2 Errors  
 SRSFIX: 5 Errors

VALIDATION RESULT: Warnings:2

Beam	E/R	Grp Id	Table	Field	Value	Row	Valerr	Rule	F/W	Ap4 Ref	Error Message
			geo	long_nom	-10		101	3	W	A.4.A.1	sat_name not found in ref table
			geo	sat_name	ITU_SAT		100	2	W	A.1.a	sat_name not found in ref table

W: Warning error  
F: Fatal error  
Displayed warnings: Ignore as we are using a new sat. name and a new orb. position

No **fatal errors** should appear. If there is a fatal error, it should be corrected. Otherwise, the submission may be returned to your administration.

**Warning errors** should be corrected, although the submission will not be returned to your administration.



## Exercise: Generate submission to apply the special procedure in Resolution 559

1.a) AP30: Generate GIMS database

1.b) AP30: Generate SNS database

1.c) AP30: Run BR-SIS Validation

2.a) AP30A: Generate GIMS database

2.b) AP30A: Generate SNS database

2.c) AP30A: Run BR-SIS Validation

3.a) Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission

3.b) Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission



## 2.a) AP30A: Generate GIMS database (GAIN CONTOUR)

The screenshot shows the GIMS software interface. The 'Database' menu is open, with the 'New' option highlighted. A callout box points to this option with the text: "1. Create a new GIMS database".

The 'Select a GIMS Database' dialog box is displayed. The 'Create a new empty database' radio button is selected. The 'Location' field contains 'C:\BR\_SOFT\AP30\_30A'. The 'Name' field contains 'R13\_BSS\_FL\_SUI\_GIMS'. The 'Description' field contains '(This is a string that shortly de... the database. Max. 255)'. A callout box points to the 'Location' and 'Name' fields with the text: "2. Specify path and name of the database and click OK".

At the bottom of the dialog box, there are buttons for 'Clear List', 'OK', and 'Cancel'.



## 2.a) AP30A: Generate GIMS database (GAIN CONTOUR)

1. Open a new diagram

2. Select footprint

3. Select orbital position (e.g. "-10", the same as the one used for the downlink) and press OK

The screenshot displays the GIMS software interface. The main window title is 'GIMS' and the menu bar includes 'Diagram', 'Database', 'Edit', 'View', 'Tools', 'Window', and 'Help'. The toolbar contains various icons for file operations and editing. The status bar at the bottom indicates the current file is 'R13\_BSS\_SUI\_GIMS on C:\Exercise\_submission'.

Two dialog boxes are overlaid on the main window:

- The 'New' dialog box is open, showing a list of options: 'Footprint', 'Service Area', 'AGGSO', and 'Non-Geostationary'. The 'Footprint' option is selected and highlighted. The 'OK' button is highlighted in blue.
- The 'Modify Satellite Position' dialog box is open, showing a 'Longitude' field with the value '-10' entered. The 'OK' button is highlighted in blue. Below the longitude field, there is an 'Obscured Zone Limit' section with 'Low: 152.6222 deg.' and 'High: 187.3778 deg.'.



## 2.a) AP30A: Generate GIMS database (GAIN CONTOUR)

The screenshot shows the GIMS software interface. The main window displays a map of a territory with several red crosshair test points placed on land. A purple callout box points to the zoom tool in the toolbar, and another points to the information point tool. A third callout points to a test point, which has a data popup window open. The data popup contains the following information:

Position	: 10.0301;46.3643
Earth azimuth(deg)	: 206.74
Earth elevation (deg)	: 33.15
Gain (dB)	:
ID# Rain Zone	: K
Located in	: SUI/SUI/XR1
PFd (dB/W/m**2)	:
Space azimuth (deg)	: 2.27
Space elevation (deg)	: 6.91
Spreading Loss (dB)	: 162.66

1. With the zoom tool, enlarge the map around the desired territory

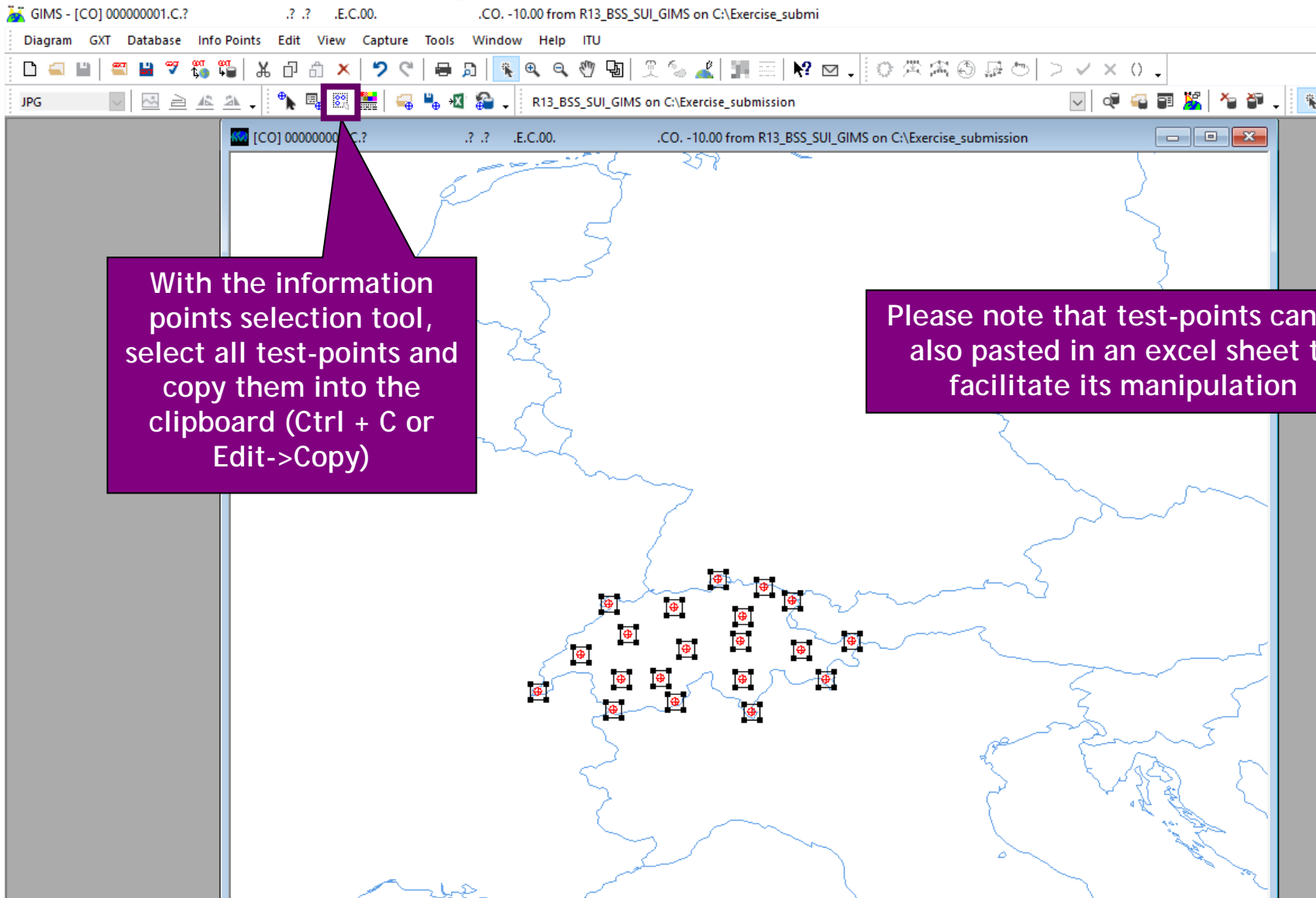
2. With the information point tool, choose up to 20 test-points located within the territory and on land. It is recommended to select test-points close to the border for the minimum ellipse to cover all territory and also inside in order to represent the territory homogenously

When leaving the mouse over a test-point, GIMS will display the coordinates as well as the elevation angle from that point.

Please make sure that the test-point is located in your territory!



## 2.a) AP30A: Generate GIMS database (GAIN CONTOUR)



With the information points selection tool, select all test-points and copy them into the clipboard (Ctrl + C or Edit->Copy)

Please note that test-points can be also pasted in an excel sheet to facilitate its manipulation





# 2.a) AP30A: Generate GIMS database (GAIN CONTOUR)

The screenshot shows the GIMS software interface with the 'Capture' menu open. The 'Gain Information' sub-menu is selected, and the '-3dB Ellipse' option is highlighted. The 'Modify Formula Interpolation' dialog box is open, showing various parameters for the gain contour generation. The 'Rotational error of beam' is set to 1 degree, and the 'Pointing error of beam' is set to 0.1 degrees. The 'Use test points' checkbox is checked, and the 'From Clipboard' button is highlighted. The 'Re-calculate ellipse parameters from test points' checkbox is also checked. The 'Min 3dB beamwidth' is set to 0.6, and the 'Satellite Position (degrees)' is set to -10. The 'Show Test Points' checkbox is unchecked. The 'OK' button is highlighted.

1. Capture a -3 dB ellipse

2. Rotational Accuracy=0°

3. Pointing Accuracy=0.1°

4. Activate the use of test-points

5. Paste test-points from the clipboard

6. Generate ellipse

7. Deactivate the use of test-points

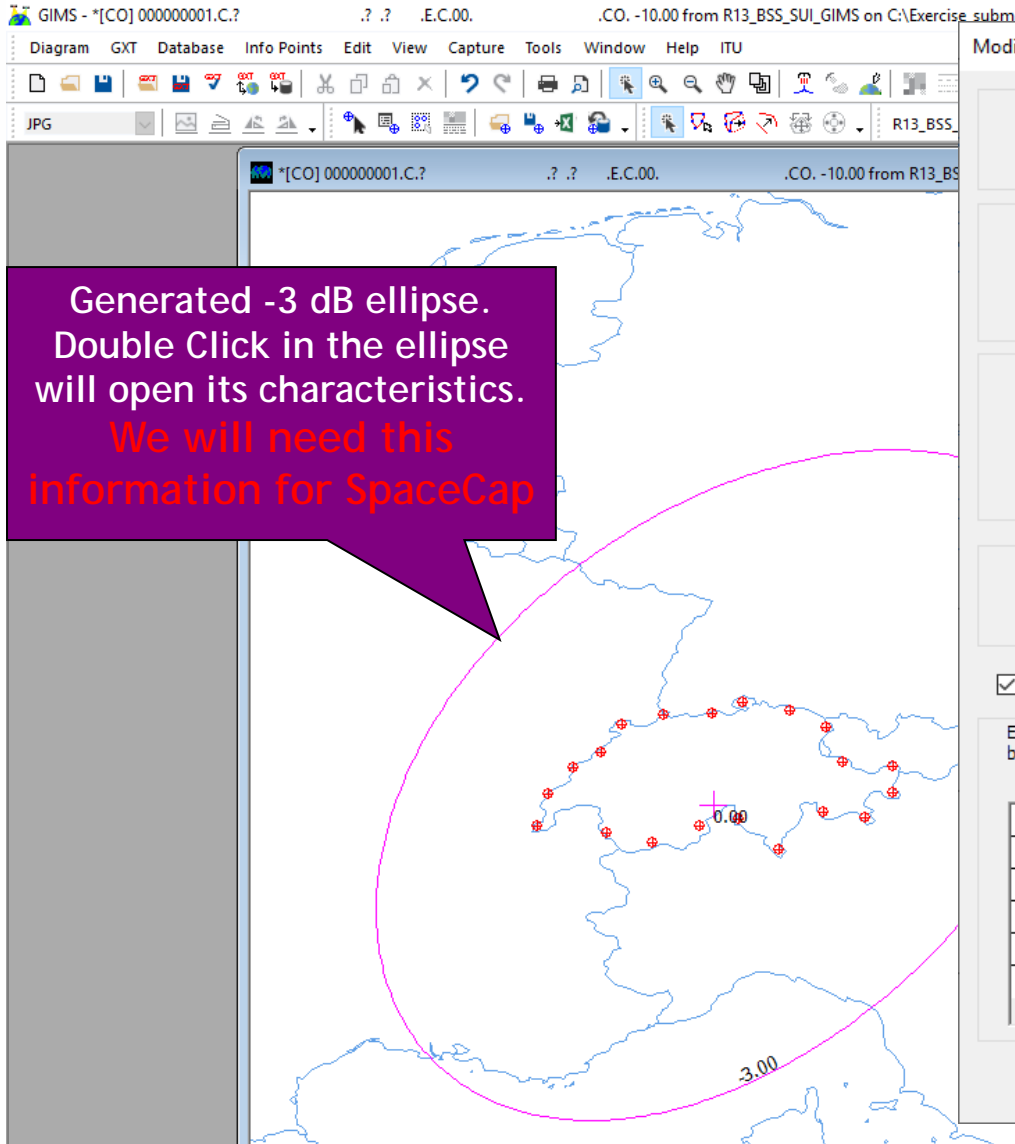
8. Rotational Accuracy=1°

9. Press OK

	Long.	Lat.
1	7.0794	47.4415
2	9.5865	47.4174
3	8.562	47.7308
	5857	47.5741
	0566	46.3085
		46.9232



# 2.a) AP30A: Generate GIMS database (GAIN CONTOUR)



Generated -3 dB ellipse.  
Double Click in the ellipse  
will open its characteristics.  
We will need this  
information for SpaceCap

### Modify Formula Interpolation

Boresight Longitude: 8.2 degrees  
Boresight Latitude: 46.46 degrees

Major axis: 0.65 degrees  
Minor axis: 0.6 degrees  
Orientation of major axis: 1.03 degrees  
i.e. phase angle in degrees with positive (eastward) azimuth axis

RR pattern code: APSRR\_401V01

Fast roll-off parameter: 0 degrees

Rotational error of beam: 1 degrees  
Pointing error of beam: 0.1 degrees

Use test points

Enter points using the digitiser or by typing on the keyboard

	Long.	Lat.
1	6.0308	46.2
2	6.1754	46.5978
3	6.4768	46.9232
4	6.8263	47.104
5	6.8866	46.1157
6	7.0794	47.4415

From Clipboard  
Clear Table  
 Show Test Points

OK Cancel

This information will be used  
in SpaceCap for the  
generation of the SNS  
database



# 2.a) AP30A: Generate GIMS database (GAIN CONTOUR)

**1. Save the gain contour**

**2. Press OK**

**3. Introduce the information**

- Notice ID: 2 (different from AP30)
- Notification Reason: B (AP30/30A)
- Administration: SUI
- Satellite name: ITU\_SAT
- Beam name: E001
- Emission/Reception: R
- Polarization: C (Co-polar)

Then press OK

Field	Value
Notice ID	2
Notification Reason	B (AP30/30A)
Administration	SUI
Satellite Name	ITU_SAT
Beam Name	E001
Emission / Reception	R (Reception = Up Link)
Polarization	C (Co-polar)
Comment	

Category	Item	Count
Saving gain contour diagram consisting of	boresight(s)	1
	digitised contour(s)	0
	generated contour(s)	1
Saving service area diagram consisting of	service point(s)	0
	service region(s)	0
	excluded region(s)	0



## 2.a) AP30A: Generate GIMS database (SERVICE AREA)

1. Open a new diagram

2. Select Service area

3. Select orbital position (e.g. "-10", the same as the one used for the downlink) and press OK

The screenshot shows the GIMS software interface. The main window title is "R13\_BSS\_SUI\_GIMS on C:\Exercise\_submission". The menu bar includes "Diagram", "Database", "Edit", "View", "Tools", "Window", and "Help". The toolbar contains various icons for file operations and editing. A "New" dialog box is open, showing a list of options: "Footprint", "Service Area", "AGGSO", and "Non-Geostationary". The "Service Area" option is selected. Below the list are "OK", "Cancel", and "Help" buttons. A "Modify Satellite Parameters" dialog box is also open, showing a "Longitude" field with the value "-10" entered. Below this field are "OK" and "Cancel" buttons. At the bottom of the dialog, there is an "Obscured Zone Limit" section with "Low: 152.6222 deg." and "High: 187.3778 deg." labels.



## 2.a) AP30A: Generate GIMS database (SERVICE AREA)

.E.C.00. .SA. -10.00 from R13\_BSS\_SUI\_GIMS on C:\Exercise\_submi

Info Points Edit View Capture Tools Window Help ITU

Recognise Projection...  
Gain Information  
Boresight  
Gain Contour  
-3dB Ellipse  
✓ Service Area Information  
Discrete Service Points  
Service Region  
Clip By ITU Region  
Clip By Elevation Angle  
Horizon Closure  
Toggle Horizon Closure  
Remove Horizon Points  
Squint Beam  
Generate AG/GSO  
Analytical Interpolation  
✓ General Interpolation

1. Create Service area

From Gain Contour  
By Geographical Areas  
By Elevation  
As Vertices

Service Region Defined by Geographical Areas

Selected Geographical Areas : Add from clipboard

Code	ITU Region	Long. Min	Long. Max	Lat. Min	Lat. Max	EXCL.
XR1						
XR2						
XR3						
S						
SDN						
SEN						
SEY						
SHN						
SLM						
SLV						
SMA						
SMO						
SMR						
SNG						
SOM						
SPM						
SRB						
SRL						
SSD						
STP						
SUI						
SUR						
5.369						
5.386						
5.401						
5.521						
ARR						
Res. 163						
Res. 164						

2. Select administration code (e.g. SUI), include it in the list of geographical areas and press OK

OK Cancel



# 2.a) AP30A: Generate GIMS database (SERVICE AREA)

The screenshot shows the GIMS software interface. The 'File' menu is open, and 'Save As...' is highlighted. A 'Confirm Save' dialog box is displayed in the center, showing details of the save operation. The dialog box contains the following information:

**Confirm Save**

Please check what is going to be saved.

Saving gain contour diagram consisting of

- 0 boresight(s)
- 0 digitised contour(s)
- 0 generated contour(s)

Saving service area diagram consisting of

- 0 service point(s)
- 1 service region(s)
- 0 excluded region(s)

Buttons: OK, Cancel, ?

1. Save the Service area

2. Press OK

The screenshot shows the 'Diagram key - Save to R13\_BSS\_SUI\_GIMS' dialog box. The dialog box contains the following fields:

Notice ID	2
Notification Reason	B (AP30/30A)
Administration	SUI
Satellite Name	ITU_SAT
Beam Name	E001
Emission / Reception	R (Reception = Up Link)
Polarization	C (Co-polar)
Service Area Number	1
Service Area Name	SA
Comment	

Buttons: OK, Cancel

3. Introduce the information

- Notice ID: 2 (different from AP30)
- Notification Reason: B (AP30/30A)
- Administration: SUI
- Satellite name: ITU\_SAT
- Beam name: E001
- Emission/Reception: R
- Polarization: C (Co-polar)
- Service Area Number: 1
- Service Area Name: SA

Then press OK



# 1.a) AP30A: Generate GIMS database (HOW TO OPEN DIAGRAMS)

1. Be sure you are connected to the desired database (otherwise open the database first)

The screenshot shows the GIMS Database Explorer window. The title bar indicates the current database is 'R13\_BSS\_SUI\_GIMS on C:\Exercise\_submission'. The main window is divided into several sections:

- Database:** Location: c:\exercise\_submission\13\_bss\_sui\_gims.mdb
- Browse for ...:** Radio buttons for 'Geostationary Satellites' (selected) and 'Non-geostationary Satellites'.
- Notice ID:** A dropdown menu.
- Filter by:** A dropdown menu set to 'Administration'.
- Select only:** A list of checkboxes:  CO (Gain Contours),  SA (Service Area), and  AG/GSO (Gain towards the GSO).
- Ignore:** Checkboxes for 'C (Co-polar)', 'E (Emission = Down Link)', 'X (Cross-polar)', and 'R (Reception = Up Link)'. 'Emission = Down Link' is selected.
- Notice Table:** A table with columns: Notice, Reason, Admin., Satellite Name, Position, Status. The first row is expanded to show a tree view of diagrams: '1' (expanded), 'E001' (expanded), 'CO (Gain Contours)', and 'SA (Service Area)'. The second row is '2'.
- Legend:** A box with a blue arrow pointing down labeled 'Downlink' and a red arrow pointing up labeled 'Feeder-link'.
- Footer:** A text area containing coordinates: '000000001;B;ITU\_SAT ;SUI;E001 ;E;C;00; ;CO; -10.00' and '000000001;B;ITU\_SAT ;SUI;E001 ;E;C;01;SA ;SA; -10.00'.

2. Open the diagrams

3. Select the type of diagrams you want to display (we have generated only 1 gain contour and 1 service area)

4. Select the diagrams you want to display

- Downlink
- Feeder-link



## Exercise: Generate submission to apply the special procedure in Resolution 559

- 1.a) AP30: Generate GIMS database
- 1.b) AP30: Generate SNS database
- 1.c) AP30: Run BR-SIS Validation
- 2.a) AP30A: Generate GIMS database
- 2.b) AP30A: Generate SNS database**
- 2.c) AP30A: Run BR-SIS Validation
- 3.a) Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission
- 3.b) Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission





# 1.b) AP30A: Generate SNS database (CREATE DATABASE)

**1. Create a new database**

**2. Choose same path as for the GIMS database (C:\BR\_SOFT\AP30\_30A)**

**3. Select the name of the database (e.g. "R13\_BSS\_FL\_SUI") and click "Open"**

Name	Date modified	Type
R13_BSS_FL_SUI.mdb	17.12.2019 2:40 PM	Microsoft Access Database Engine 2010 .mdb file
R13_BSS_SUI.mdb	10.02.2020 6:56 PM	Microsoft Access Database Engine 2010 .mdb file
R13_BSS_SUI_GIMS.mdb	17.12.2019 3:08 PM	Microsoft Access Database Engine 2010 .mdb file
SPS_ALL_IFIC2913.mdb	10.02.2020 5:22 PM	Microsoft Access Database Engine 2010 .mdb file

File name: R13\_BSS\_FL\_SUI.mdb

Access mdb

Open Cancel



# 1.b) AP30A: Generate SNS database (CREATE NOTICE)

The screenshot shows the SpaceCapture V8 interface. The title bar reads "SpaceCapture V8 - [Set Notice Template]". The menu bar includes "File", "Edit", "Tools", "Template", "Window", and "Help". The toolbar contains various icons, and the current view is "PLAN" with a file named "RS49/552". The main window title is "Start Page - PLAN - WRC-00 Feeder-link Plans and Lists for Region".

Annotations and steps:

1. Click on PLAN
2. Unclick "Read-only mode"
3. Double click on 00UP Plan (Appendix 30A)
4. Click on "New Notice"

The "New Notice" button in the left sidebar is highlighted with a red box. The table below shows the selected plan:

PLAN ID	Description	Notice Count
00DN	WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)	1
00UP	WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)	0
30_2	RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)	0
A30B	WRC07 FSS Plan 6/4 AND 13/10-11 GHz Band (Appendix 30B)	0

Below the table, there is a checkbox labeled "Plan/List/Pending notices (Status: above 01) read-only mode" which is currently unchecked.



# 1.b) AP30A: Generate SNS database (NOTICE LEVEL)

SpaceCapture V8 - [Forms of Notice PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)]

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN RS49/552

Notice Beam Attachments Coordination

Notice Id: 1 Plan WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A) Status 01

Date of Receipt: DD.MM.YYYY Administration Serial Number

A1f1. Notifying Administration: SUI

A1f3. Intergovernmental Satellite:

**Notice Submitted under**

- 4.1.12 Part B Submission
- 4.1.23 List Suppression
- 4.1.26 New Adm
- 4.1.27 Replacement in Plan
- 4.1.3 Part A submission
- A13d Part A suppression
- RS548 Re...

Select Administration (e.g. SUI)

Select 4.1.3 Submission and Part A submission

A4a1. Nominal Orbital Longitude: 10.00° W

A1a. Identity of the Satellite Network: ITU\_SAT

A4a2. Longitudinal tolerance:  
b. West: 0.1°  
a. East: 0.1°

Select east and west tolerance of the satellite (0.1° for both)

A11. Regular Hours of Operation:  
a. start: 0 b. end: 24

Select orbital position (e.g. -10=10°W) and satellite name (e.g. ITU\_SAT)

Hours of operation: 0 to 24



# 1.b) AP30A: Generate SNS database (BEAM LEVEL)

SpaceCapture V8 - [Forms of Notice PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)]

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN RS49/552

Notice Beam Group Attachments Coordination

Receiving beam (feeder-link)

Nominal Orbital Longitude: -10 Administration: SUI

Characteristics of the Beam

B2.  Receiving Beam  Transmitting Beam

Shape of the Beam

Elliptical  Other Shape

B3d. Pointing Accuracy: 0.1 °

B3a1. Co-polar gain: 48.54 dB

B1a. Beam Designation: E001   B1b. Steerable/Reconfigurable Beam

Space Station Antenna

B3c. Radiation Pattern: R123SS ==> APSRR\_401V01

B3f2a. Rotation Accuracy: 1 °

B3f2b. Major Axis Orientation: 1.03 °

B3f2. Axis at half-power beamwidth

c. Major: 0.65 ° d. Minor: 0.6 °

B3f1. Boresight

Longitude: 8.2 ° E Latitude: 46.46 ° N

Modify Formula Interpolation

Boresight Longitude: 8.2 degrees

Boresight Latitude: 46.46 degrees

Major axis: 0.65 degrees

Minor axis: 0.6 degrees

Orientation of major axis: 1.03 degrees  
i.e. phase angle in degrees with positive (eastward) azimuth axis

RR pattern code: APSRR\_401V01

Fast roll-off parameter: 0 degrees

Rotational error of beam: 1 degrees

Pointing error of beam: 0.1 degrees

Use test points

Enter points using the digitiser or by typing on the keyboard

	Long.	Lat.
1	7.0794	47.4415
2	9.5865	47.4174
3	8.562	47.7308
4	7.5857	47.5741
5	10.0566	46.3085
6	6.4768	46.9332

Min 3dB beamwidth: 0.6

Satellite Position (degrees): -10

Show Test Points

Elliptical beam

Co-polar antenna gain should be equal to

$$10 \times \log \left( \frac{27843}{\text{min. axis} \times \text{maj. axis}} \right)$$

This information should be extracted from the elliptical parameters in GIMS



# 1.b) AP30A: Generate SNS database (GROUP LEVEL)

SpaceCapture V8 - [Forms of Notice PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)]

File Edit Tools View Window Help

CR/NOTIF API

Assoc Specific Earth Stn Attachments Coordination

Notice Beam **Group** Emissions/Frequencies

Notice: 2 Satellite Network: ITU\_SAT Beam Id: E001 R Group Id: 1

**Characteristics Common to a Group of Frequencies** **General Characteristics**

C3a. Assigned frequency bandwidth: 27000 (kHz)

C15a. MSPACE Group code: Z9

C4a. Class of Station: EC

C.6 Polarization: a. Type: CL Circular Left (Indirect) b. Electric Vector Angle: 0

C5a. Receiving System: Noise Temperature: 600 Kelvins

BR Data

Remarks:

Select a bandwidth of 27 MHz

Select a polarization (e.g. CL). If linear polarization is selected, electric vector angle is mandatory

Indicates whether the group can contain 14GHz or 17GHz frequencies.  
 WRC-00 14 GHz  WRC-00 17 GHz

Only EC is valid for the feeder-link.

Indicate 14 GHz or 17 GHz frequencies

- For R1&3:  
• For 17 GHz, a value of 600K should be provided.  
• For 14 GHz, a value of 750K should be provided.



# 1.b) AP30A: Generate SNS database (GROUP LEVEL)

The screenshot shows the SpaceCapture V8 software interface. The title bar reads "SpaceCapture V8 - [Forms of Notice PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)]". The menu bar includes File, Edit, Tools, View, Window, and Help. The toolbar contains various icons for file operations and navigation. The main window has a tabbed interface with tabs for "Assoc Specific Earth Stn", "Attachments", "Coordination", "Notice", "Beam", and "Group". The "Group" tab is active. A purple callout box with the text "1. Click on General Characteristics" points to the "General Characteristics" button in the "Characteristics Common to a Group of Frequencies" section. Below this, the "General Characteristics" form is displayed, containing two dropdown menus: "A3a. Operating Administration or Agency" (selected: "001 ... RADIO-SUISSE S.A.") and "A3b. Responsible Administration" (selected: "A ... FEDERAL OFFICE OF COMMUNICATION"). Below the dropdowns, there are three radio buttons for applying the information: "Apply to current group only" (selected), "Apply to all groups in this beam", and "Apply to all groups in this notice". A purple callout box with the text "2. Introduce any 'Responsible Administration' and 'Operating Administration or Agency' from the list. Please note that this information is required only for the sake of completeness of the notice and will be removed once the assignments are included into the Plan." points to the dropdown menus. The status bar at the bottom shows "Current DB : C:\Exercise\_submission\R13\_BSS\_FL\_SUI.mdb", "Plan Id 00UP", "11:27 AM", and "17.12.2019".



# 1.b) AP30A: Generate SNS database (EMISSIONS/FREQ LEVEL)

SpaceCapture V8 - [Forms of Notice PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)]

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN RS49/552

Ass Coordination

Group Emissions/Frequencies Srv Area/Assoc Earth Stn

Notice Id: SA1 Beam Id: E001 R

C8 Power Characteristics of the transmission

C7a. Designation of Emission	C9. Modulation Char	b1. Total Power (dBW)	b2. Maximum Power Density	h. Maximum Power Density over Bandwidth
27MOG7W--	modchar	28.00	-46.31	-46.31
				17508.18
				17538.46
				17576.82
				17615.18

Apply this power control value to all channels in the group

Please note that:  
 $EIRP_{FL} = GAIN + TOTAL\ POWER$   
 $EIRP_{FL} = 84\ dBW$   
 GAIN in "Srv Area/Assoc Earth Stn" tab

- For digital emissions, the maximum power density default value (assuming uniform distribution of the power over the necessary bandwidth) is calculated once the total power is entered using the following formula:  
 $pwr - 10 * \log(B)$ .
- Default values are automatically calculated once total power is introduced.

- Introduce 27MOG7W--
- Necessary bandwidth: 27 MHz
- Only digital modulation may be submitted under Article 4 in Regions 1 and 3.

Shall be captured for every emission. (next slide)

- For Regions 1 and 3 feeder-link: the PFD level produced by the total e.i.r.p. of  $pow\_dens_{27MHz} + co-pol\_ant\_gain$  shall not exceed the limit of  $-76\ dB(W/m^2, 27\ MHz)$  of § 4 of Annex 1 to Appendix 30A.
- Run GIBC/Appendix 30 30A to check Hard Limits



## 1.b) AP30A: Generate SNS database (EMISSIONS/FREQ LEVEL)

Modulation Characteristics

Current Designation of Emission 27M0G7W--

C9a. Modulation Characteristics for Each Carrier

C9a1. Type of modulation QPSK

C9a3. For a carrier frequency modulated by TV signal

C9a3c. Multiplexing type DVB-S

C9a7. Energy dispersal type Carrier always spread by digital stream

C9a9. TV standard DVB-S

Apply these characteristics to all emissions in this notice with the same designation of emission

Apply these characteristics to the current emission

A12. Range of automatic gain control 15 dB

OK CANCEL

List of proposed values.  
Any modulation characteristics may be introduced since they are not taken into account for the calculation of interference

- Required only for the feeder-link.
- The value must be in the range 0 to 15 dB.





# 1.b) AP30A: Generate SNS database (EMISSIONS/FREQ LEVEL)

SpaceCapture V8 - [Forms of Notice PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)]

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN RS49/552

Assoc Specific Earth Stn Attachments Coordination

Notice Beam Group Emissions/Frequencies Srv Area/Assoc Earth Stn

Notice Id: [ ] Satellite Network: ITU\_SAT Beam Id: E001 R Group Id: 1 Mspace Grp Code: [ ]

C8 Power Characteristics of the transmission

C7a. Designation of Emission	C9. Modulation Char	b1. Total Power (dBW)	b2. Maximum Power Density	h. Maximum Power Density over Bandwidth
27M0G7W--	modchar	28.00	-46.31	-46.31

C2a. Assigned Frequencies

Channel	Frequency in MHz	C8.i Power Con (dB)
2	17346.66	
4	17385.02	
6	17423.38	
8	17461.74	
10	17500.10	
12	17538.46	
14	17576.82	
16	17615.18	
18	17653.54	
20	17691.90	

- Select ten consecutive odd or even channels with standard Appendix 30A assigned frequencies.
- Frequency:
  - 17.3-18.1 GHz (channels 1-40)
  - 14.5-14.8 GHz (channels 1-14)
- Automatic calculation of channel number from frequency or frequency from channel number.
- In case of submission in the 14 GHz band, the maximum of ten channels with a bandwidth of 27 MHz could be in different polarization. ([Annex 1](#))

- Leave Power Control empty. Once the assignments are entered into the List, the Bureau will calculate and publish the final power control values (between 0 and 10 dB)



# 1.b) AP30A: Generate SNS database (SRV AREA/EARTH STN)

SpaceCapture V8 - [Forms of Notice PLAN - WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)]

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN RS49/552

Assoc Specific Earth Stn Attachments Coordination

Notice Beam Emissions/Frequencies

Service area=1

Notice Id: 1 Satellite Network: ITU\_SAT Beam: E001 R Group Id:

C11a. Test Points (maximum 100)

Longitude degrees E	Latitude degrees N	Antenna Altitude (m)	Climatic Zone	C. Zone in db
6.0308	46.2000	0		
6.1754	46.5978	0		

Service area contour  
C11a1. Service Area No. 1

Maximum isotropic gain, please also note that:  
 $EIRP_{FL} = GAIN + TOTAL\ POWER$   
 $EIRP_{FL} = 84\ dBW$   
**TOTAL POWER in Emissions/Frequencies**

C.10.d.5 reference pattern	maximum gain Default Value
R13TES	14GHz: $57+20*\log(D/6)$
MODTES	17GHz: $57+20*\log(D/5)$

C.10.d.5 reference pattern	3dB beamwidth Default Value
R13TES	14GHz feeder-link: $\leq 0.25$
MODTES	17GHz feeder-link: $\leq 0.25$

Associated Typical Earth Station Antenna Characteristics

C10d5a. Radiation Pattern MODTES ==> APERR\_010V01

C10d3. Maximum Isotropic Gain in dBi 57

C10d4. Half-power beamwidth in degrees 0.25 ° **Note: These associated typical earth station antenna characteristics are valid for each test point.**

C10d7. Antenna Diameter in meters 5

Apply these to all groups

Overwrite Climat

- ✓ Introduce proposed values (MODTES)
- ✓ Maximum Gain and 3dB beamwidth should be consistent with submitted antenna diameters.
- ✓ Radiation pattern shall contain both co-polar and cross-polar patterns.
- ✓ Gain and 3dB beamwidth are stored with 2 digits after decimal.



# 1.b) AP30A: Generate SNS database (SRV AREA/EARTH STN)

4. Close the notice

SpaceCapture V8 - [Forms] Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN RS49/552

C11a Test Points (Maximum 100)

Row No	Longitude degrees E	Latitude degrees N	Antenna Altitude (m)	Climatic Zone	C. Zon in db
1	6.0308	46.2000	0		
2	6.1754	46.5978	0		
3	6.4768	46.9232	0		
4	6.8263	47.1040	0		
5	6.8866	46.1157	0		
6	7.0794	47.4415	0		
7	7.4531	46.0072	0		
8	7.5857	47.5741	0		
9	8.0316	46.2121	0		
10	8.1883	47.5862	0		
11	8.5138	46.2844	0		
12	8.5620	47.7308	0		
13	9.0079	45.9108	0		
14	9.1405	47.6223	0		
15	9.5383	46.3808	0		
16	9.5865	47.4174	0		
17	9.7914	46.9835	0		
18	10.0566	46.3085	0		
19	10.3941	46.6098	0		
20	10.4061	46.9353	0		

Copy Rows

Paste Rows

Select All

Delete

Save and Close

Close

3. Paste test-points in the auxiliary window and click "Save and Close"

1. Click to open auxiliary window to manipulate test-points

2. Copy test-points from GIMS or Excel:

- Select test-points with information points selection tool
- Ctrl + C or Edit-> Copy

Associated Typical Earth Station Antenna Characteristics

C10d5a. Radiation Pattern MODTES ==> APERR\_010V01

C10d3. Maximum Isotropic Gain in dBi 57

C10d4. Half-

C10d7. Ante

Apply the to all groups in this beam the Current Group

Overwrite Climatic Zones in db with IDWM Climatic Zones



# 1.b) AP30A: Generate SNS database (NETWORK LEVEL)

The screenshot shows the SpaceCapture V8 interface with a context menu open over the 'ITU\_SAT' satellite network. The 'Renumber Notice Id' option is highlighted. A dialog box titled 'Question' is open, asking for a 'New Notice Id' with the value '2' entered. A purple callout box points to the 'Renumber Notice Id' option in the menu, and another purple callout box points to the '2' in the dialog box.

1. Right click over the satellite network "ITU\_SAT" and "Renumber Notice ID"

2. Renumber Notice ID to a value "2" to differentiate from downlink and press OK



# 1.b) AP30A: Generate SNS database (NETWORK LEVEL)

SpaceCapture V8 - [Set Notice Template]

File Edit Tools Template Window Help

CR/NOTIF API RAST PLAN RS49/552

SpaceCap

Start Page

Notice Explorer

Open Notice

New Notice

Search

Notice Explorer PLAN - WRC-00 Feeder-link Plans and

Notice id.	Type	Adm./Org.	Orb. Pos.	Station	Count=1
000000002[A]	G	SUI/	10W	ITU_SAT	no date 01

Control Box

- Show
- Clone
- Export
- Delete
- To SNS
- SpaceVal
- Esub
- RS49/552

1. Select incoming notice and click on right button of the mouse

- Open Notice
- Show Selected Entity
- View History
- Print Notice
- Export Notice(s)
- Clone
- Delete
- Assign Notice Id
- Renumber Notice Id
- Modify Notice Action Code
- Modify Date of Receipt
- Paginate Groups
- Sort Frequencies
- Delete Notice and Grp Links
- Create Notice Links
- Create Grp Links
- Create Regulatory Dates
- Cost Recovery Analysis (Dec 482 C2008)
- Prepare incoming notice for Mspace

2. Click on "Prepare incoming notice for Mspace"



## Exercise: Generate submission to apply the special procedure in Resolution 559

1.a) AP30: Generate GIMS database

1.b) AP30: Generate SNS database

1.c) AP30: Run BR-SIS Validation

2.a) AP30A: Generate GIMS database

2.b) AP30A: Generate SNS database

2.c) AP30A: Run BR-SIS Validation

3.a) Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission

3.b) Run GIBC/Appendix 30 30A to check Hard Limits for AP30A submission



# 1.c) AP30: Run BR-SIS Validation

**Selected task: Validation**

- Version: 8.0.1.25 [\(what's new?\)](#)
- Description: Validate electronic submissions
- Contact: [sandrine.moret@itu.int](mailto:sandrine.moret@itu.int)
- Validation Rules: [Satellites](#) [Earth Stations](#) [Plans](#)

**Selected database: R13\_BSS\_FL\_SUI.mdb**

Microsoft Access  
C:\BR\_SOFT\AP30\_30A\R13\_BSS\_FL\_SUI.mdb

2. Click on Start

1. Browse SNS database (e.g. R13\_BSS\_FL\_SUI.mdb")

BRSIS - Validation v8.0.1.25

Notice Id. 2

Sat. name: ITU\_SAT  
Type of notice: Part A (R1&3) Feeder-link Status: 24  
Adm./Org.: SUI Orb. pos.: 10W Station type: G

Validation Reports

Run as external user

**Graphical data cross validation**

GIMS Database (.mdb) c:\br\_soft\ap30\_30a\r13\_bss\_fl\_sui\_gims.mdb

3. Browse GIMS database  
-> Open an existing file  
-> More files...  
(e.g. R13\_BSS\_FL\_SUI\_GIMS.mdb)

2. Click on Validate notice



# 1.c) AP30: Run BR-SIS Validation (REPORT)

BRSIS - Validation v8.0.1.25

Notice Id.

Sat. name: ITU\_SAT  
Type of notice: Part A (R1&3) Feeder-link      Status: 24  
Adm./Org.: SUI      Orb. pos.: 10W      Station type: G

Validation   Reports

created on 10/02/2020 - start time: 19:17:46 - duration: 0min. 9sec. by user devega using

**Validation: 2 Errors**  
 **SRSFIX: 3 Errors**

**VALIDATION RESULT: Warnings:2**   Export           Summary

Beam	E/R	Grp Id	Table	Field	Value	Row	Valerr	Rule	F/W	Ap4 Ref	Error Message
			geo	long_nom	-10		101	3	<b>W</b>	A.4.A.1	sat_name not found in ref table
			geo	sat_name	ITU_SAT		100	2	<b>W</b>	A.1.a	sat_name not found in ref table

W: Warning error  
F: Fatal error  
Displayed warnings: Ignore as we are using a new sat. name and a new orb. position

No **fatal errors** should appear. If there is a fatal error, it should be corrected. Otherwise, the submission may be returned to your administration.

**Warning errors** should be corrected, although the submission will not be returned to your administration.





## Exercise: Generate submission to apply the special procedure in Resolution 559

1.a) AP30: Generate GIMS database

1.b) AP30: Generate SNS database

1.c) AP30: Run BR-SIS Validation

2.a) AP30A: Generate GIMS database

2.b) AP30A: Generate SNS database

2.c) AP30A: Run BR-SIS Validation

3.a) Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission

3.b) Run GIBC/Appendix 30 30A to check Hard Limits for AP30A submission



## *Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission*

### ***Needed databases:***

- SPS\_ALL database published in latest BR IFIC containing the subject notice*
- GIMS database of the subject notice*

### ***Main steps:***

- 1. Copy latest SPS\_ALL database from last published DVD-ROM BR IFIC to your local drive. Be sure the database is not “Read-only” (right click in windows explorer, Properties).*
- 2. Export incoming AP30 notice into latest SPS\_ALL database with SpaceCap*
- 3. Connect above-mentioned SPS\_ALL database in “SRS database” in “Tool-Options” in GIBC*
- 4. Connect GIMS database of the subject notice in “GIMS database” in “Tool-Options” in GIBC*
- 5. Go to section “Appendix 30 30A” in GIBC*
- 6. Introduce “Network ID” of the subject network (1 in the example)*
- 7. Press start*
- 8. Once finished, click “Open Database”*
- 9. Open “ap30\_30a\_clc\_head” and check that “f\_sucess”=Y*
- 10. Open “ap30\_pfd\_res” and check that “pfd\_excess” is equal or below to 0. Otherwise, there would be an excess in the PFD produced by the subject network.*



# Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission

The screenshot shows the SpaceCapture V8 interface. The title bar reads "SpaceCapture V8 - [Set Notice Template]". The menu bar includes "File", "Edit", "Tools", "Template", "Window", and "Help". The toolbar contains various icons, with a folder icon and a "PLAN" button highlighted by purple boxes. The main window displays a "Start Page" with the instruction "Please select the type of plan from the list". A "Transaction Id:" field is visible. On the left sidebar, there are buttons for "Open Notice", "New Notice", and "Search". A table of plan options is shown, with a "Select a Plan" label and a hand cursor pointing to the table. Below the table is a checkbox for "Plan/List/Pending notices (Status above 01) read-only mode".

1. Set Template to PLAN

2. Set Notice type

3. Uncheck read-only mode

4. Open Database

PLAN ID	Description	Notice Count
00DN	WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)	1
00UP	WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)	0
30_2	RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)	0
A30B	WRC07 FSS Plan 6/4 AND 13/10-11 GHz Band (Appendix 30B)	0

Plan/List/Pending notices (Status above 01) read-only mode



# Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission

SpaceCapture V8 - [Set Notice Template]

File Edit Tools Template Window Help

CR/NOTIF API RAST PLAN RS49/552

SpaceCap Start Page - Please select the type of plan from the list

Database to open

This PC > OSDisk (C:) > Exercise\_submission

Organize New folder

Music Pictures Videos OSDisk (C:) SRecycle.Bin 1\_VG\_working Alvaro BR\_SOFT BR\_TEX\_RESULTS Config.Msi DATA Documents and Settings Ejercicio Exercise\_submission Intel MSOCache OneDriveTemp

Name Date modified

R13\_BSS\_FL\_SUI.mdb 17.12.2019 2:40 PM

R13\_BSS\_SUI.mdb

R13\_BSS\_SUI\_GIMS.mdb 17.12.2019 11:59 AM

File name: R13\_BSS\_FL\_SUI - Copy.mdb Access mdb

Open Cancel

Select downlink database (e.g. R13\_BSS\_SUI.mdb) and click Open

	Notice Count
	1
dix 30A)	0
	0
	0



# Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission

SpaceCapture V8 - [Set Notice Template]

File Edit Tools Template Window Help

CR/NOTIF API RAST PLAN RS49/552

Start Page - PLAN - WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)

Transaction Id:

Transaction ID input field

Double click on "00DN"

Plan / List / Pending    Plan / List Notification    Space Operation Functions

PLAN ID	Description	Notice Count
00DN	WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)	1
00UP	WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)	0
30_2	RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)	0
A30B	WRC07 FSS Plan 6/4 AND 13/10-11 GHz Band (Appendix 30B)	0

Select a Plan

Plan/List/Pending notices (Status above 01) read-only mode



# Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission

1. Select the notice and click Export

Notice id.	Type	Adm./Org.	Orb. Pos.	Station name	Count
10W	ITU_SAT			no date	01

2. Click Set Target Db

Target Database

Access  Ingres

Set Target Db

Keep History  Keep Findings and Reference Situation  Export notices with same Network Package id

Group Ids

Renumber Group Ids  Keep Group Ids of the source

Notice Already in Target database

Give a new Notice Id  Replace Notice in Target  Do not export

Export

Run Export now  Schedule Export to run later

OK Cancel

4. Click OK

Export to database name

This PC > OSDisk (C:) > Exercise\_submission

Name	Date modified	Type
R13_BSS_FL_SUI.mdb	17.12.2019 2:40 PM	Microsoft A
R13_BSS_SUI.mdb	17.12.2019 2:40 PM	Microsoft A
R13_BSS_SUI_GIMS.mdb	17.12.2019 11:39 AM	Microsoft A
SPS_ALL_IFIC2910.mdb	02.12.2019 10:01 AM	Microsoft A

File name: SPS\_ALL\_IFIC2910.mdb

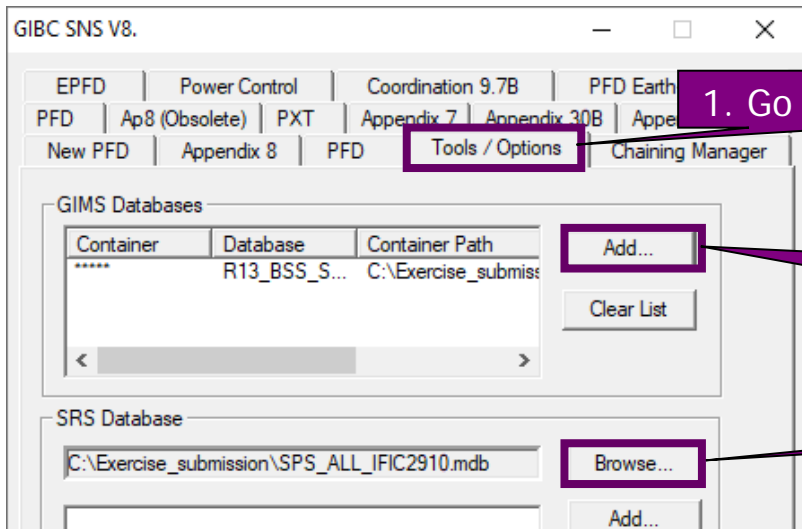
Access: mdb

Open Cancel

3. Select latest SPS\_ALL database and click Open



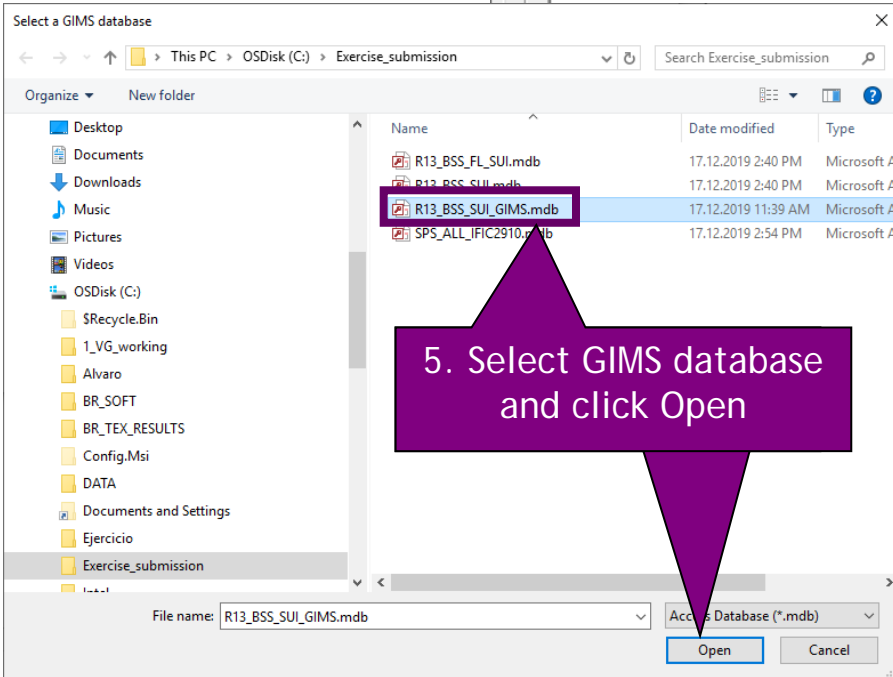
# Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission



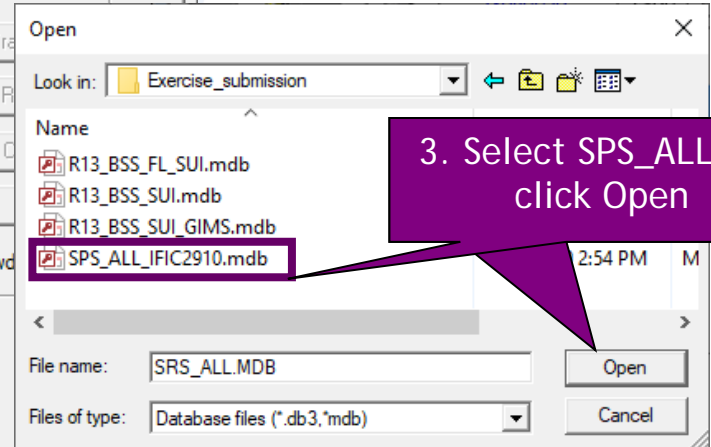
1. Go to Tools/Options

4. Add GIMS

2. Browse SPS\_ALL



5. Select GIMS database and click Open



3. Select SPS\_ALL and click Open



## Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission

2. Introduce the notice ID of the downlink network (e.g. 1)

1. Go to Appendix 30 30A

3. Click Start

4. Once finished, open the results database

GIBC SNS V8.

EPFD	Power Control	Coordination 9.7B	PFD Earth-to-space
New PFD	Appendix 8	PFD	Tools / Options
PFD	Ap8 (Obsolete)	PXT	Appendix 7
		Appendix 30B	Appendix 30 30A

Network ID:

Start  
Cancel

Messages Filter:  Progress  Warning  Debug

PFD Hard Limit Analysis  
Appendix 30 Annex 1 Section 1  
Appendix 30A Annex 1 Section 4

Message

```
PROGR> Closing GIMS database connections  
PROGR> Starting to export results to output database  
PROGR> grp: 1026513 - 27M0G7W- | num_tps: 4262 - exported!  
PROGR> Export results to output database completed  
PROGR> Starting to export results to report  
PROGR> Export results to report completed  
PROGR> Compacting output database  
Appendix 30&30A PFD calculation finished. 14:59:51.
```

Date  
 Date Year - Month - Day 1984 - 01 - 01

Calculation Results  
C:\BR\_TEX\_RESULTS\1\AP30\_30A\_191217\_145940\AP30\_30A\_RESULTS.

Open Database View Log File Open Folder Open Report File

Version  
4.1.0.0 Appendix 30 30A Pack  
View Notes Select Version

EXIT





# Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission

1. In ap30\_30a\_clc\_head table, check that "f\_success" = Y

Tables

- ap30\_30a\_clc\_head Table  
Date Created: 13.03.2009 8:...
- ap30\_pfd\_res Table  
Date Created: 06.11.2009 1...
- ap30a\_pfd\_res Table  
Date Created: 01.03.2010 1...
- BR\_Internal Table  
Date Created: 17.11.2009 1...
- version Table  
Date Created: 13.03.2009 8:...

onentc_id	start_time	end_time	oper_id	f_details	input_file	soft_ver	f_success	f_prod	module_id
119552006	019 4:07:30 PM	019 4:08:21 PM	devega	Y	C:\DATA\Comp	4.1.0.0	Y	Y	AP30 PFD Hard

2. In ap30\_pfd\_res table, check that "pfd\_excess" is always equal or below to 0

ttpwbw	refbw	es_st	gso_pos	long_dec	lat_dec	pfd_produce	pfd_limit	pfd_excess
25.1355	27	2919	144.1	146.85	-2.18	-106.936	-103.6	-3.3
25.1355	27	2919	144.1	146.85	-2.18	-106.936	-103.6	-3.3
25.1355	27	2922	144.1	146.91	-2.09	-106.936	-103.6	-3.3
25.1355	27	2919	144.1	146.85	-2.18	-106.936	-103.6	-3.3
25.1355	27	2919	144.1	146.91	-2.18	-106.936	-103.6	-3.3
25.1355	27	2919	144.1	146.85	-2.18	-106.936	-103.6	-3.3
25.1355	27	2919	144.1	146.85	-2.18	-106.936	-103.6	-3.3
25.1355	27	2919	144.1	146.85	-2.18	-106.936	-103.6	-3.336
25.1355	27	2919	144.1	146.85	-2.18	-106.936	-103.6	-3.336
25.1355	27	2919	144.1	146.85	-2.18	-106.936	-103.6	-3.336
25.1355	27	2919	144.1	146.85	-2.18	-106.936	-103.6	-3.336

NOTE: The maximum excess (subtracting 0.1 dB), is the amount we can increase the EIRP for the downlink while complying with the AP30 Hard limits



## Exercise: Generate submission to apply the special procedure in Resolution 559

1. Assign MSPACE group code to existing Plan assignments
  - 1.a) AP30: Generate GIMS database
  - 1.b) AP30: Generate SNS database
  - 1.c) AP30: Run BR-SIS Validation
- 2.a) AP30A: Generate GIMS database
- 2.b) AP30A: Generate SNS database
- 2.c) AP30A: Run BR-SIS Validation
- 3.a) Run GIBC/Appendix 30 30A to check Hard Limits for AP30 submission
- 3.b) Run GIBC/Appendix 30 30A to check Hard Limits for AP30A submission



## *Run GIBC/Appendix 30 30A to check Hard Limits for AP30A submission*

### ***Needed databases:***

- *SNS database of the subject notice related to the AP30A submission*

### ***Main steps:***

1. *Connect the SNS database in “SRS database” in “Tool-Options” in GIBC*
2. *Go to section “Appendix 30 30A” in GIBC*
3. *Introduce “Network ID” of the subject network (2 in the example)*
4. *Press start*
5. *Once finished, click “Open Database”*
6. *Open “ap30\_30a\_clc\_head” and check that “f\_sucess”=Y*
7. *Open “ap30a\_pfd\_res” and check that:*
  - *“pfd\_excess” is equal or below to 0. Otherwise, there would be an excess in the PFD produced by the subject network.*
  - *“Compliance\_c” is always “Y”. Otherwise, there would be an excess in the co-polar component of the relative off-axis e.i.r.p. of the associated feeder-link antenna.*
  - *“Compliance\_x” is always “Y”. Otherwise, there would be an excess in the cross-polar component of the relative off-axis e.i.r.p. of the associated feeder-link antenna.*





## Run GIBC/Appendix 30 30A to check Hard Limits for AP30A submission

2. Introduce the notice ID of the feeder-link network (e.g. 2)

1. Go to Appendix 30 30A

3. Click Start

4. Once finished, open the results database

GIBC SNS V8.

EPFD | Power Control | Coordination 9.7B | PFD Earth-to-space  
New PFD | Appendix 8 | PFD | Tools / Options | Chaining Manager  
PFD | Ap8 (Obsolete) | PXT | Appendix 7 | Appendix 30B | **Appendix 30 30A**

Network ID:

**Start**  
Cancel

Messages Filter: PFD Hard Limit Analysis  
 Progress Appendix 30 Annex 1 Section 1  
 Warning Appendix 30A Annex 1 Section 4  
 Debug

```
PROGR> Closing GIMS database connections
PROGR> Starting to export results to output database
PROGR> grp: 1 - 27M0G7W-- | num_tps: 20 - exported!
PROGR> Export results to output database completed
PROGR> Starting to export results to report
PROGR> Export results to report completed
PROGR> Compacting output database
Appendix 30&30A PFD calculation finished. 15:54:24.
```

Date  
 Date Year - Month - Day 1984 - 01 - 01

Calculation Results  
C:\BR\_TEX\_RESULTS\2\AP30\_30A\_191217\_155414\AP30\_30A\_RESULTS.

**Open Database** View Log File Open Folder Open Report File

Version  
4.1.0.0 Appendix 30 30A Pack  
View Notes Select Version

EXIT



# Run GIBC/Appendix 30 30A to check Hard Limits for AP30A submission

1. In ap30\_30a\_clc\_head table, check that "f\_success" = Y

onontc_id	start_time	end_time	oper_id	f_details	input_file	soft_vrs	f_success	f_prod	module_id
2	019 3:54:16 PM	019 3:54:23 PM	devega	Y	C:\Exercise_su	4.1.0.0	Y	Y	AP30A PFD Har

2. In ap30a\_pfd\_res table, check that:

- "pfd\_excess" is always equal or below to 0
- "Compliance\_c" is always "Y"
- "Compliance\_x" is always "Y"

pfd_produce	pfd_limit	pfd_excess	E	compliance_c	eirp_calc_c	off_axis_c	eirp_limit_c	eirp_excess	compliance_x
-77.638	-76	-638	86.639	Y					Y
-77.646	-76	-646	86.647	Y					Y
-77.654	-76	-654	86.655	Y					Y
-77.66	-76	-66	86.661	Y					Y
-77.641	-76	-641	86.64	Y					Y
-77.667	-76	-667	86.6	Y					Y
-77.642	-76	-642	86	Y					Y
-77.673	-76	-673		Y					Y
-77.649	-76	-649		Y					Y
-77.676	-76	-676		Y					Y
-77.653	-76	-653		Y					Y
-77.681	-76	-681		Y					Y
-77.649	-76	-649		Y					Y
-77.683	-76	-683		Y					Y
-77.662	-76	-662		Y					Y
-77.682	-76	-682		Y					Y
-77.675	-76	-675		Y					Y
-77.663	-76	-663		Y					Y
-77.671	-76	-671		Y					Y
-77.678	-76	-678		Y					Y



## Summary of parameters for AP30 submission (1)

Level	AP4 Item	AP4 reference	Value	Conditions
Notice	Notifying Administration	A.1.f.1	Any	Acronym of administration
	Satellite network name	A.1.a	Any	Up to 30 characters (see <a href="https://www.itu.int/ITU-R/go/space-naming-convention/en">https://www.itu.int/ITU-R/go/space-naming-convention/en</a> )
	Nominal Orbital Longitude	A.4.a.1	Any	orbital positions for which the Annex 7 to Appendix 30 (Rev.WRC-15) limitations were suppressed by WRC-19
	Longitudinal tolerance west	A.4.a.2.b	0.1	-
	Longitudinal tolerance east	A.4.a.2.a	0.1	-
	Regular Hours of Operation start	A.11.a	0	-
	Regular Hours of Operation end	A.11.b	24	-
Beam	Transmitting/Receiving	B.2	Transmitting	-
	Shape of the Beam	-	Elliptical	-
	Beam designation	B.1.a	Any	Avoid spaces (suggested name: E001)
	Co-polar gain	B.3.a.1	Any	$10 \cdot \log(27843 / (\text{min.axis} \cdot \text{major axis}))$
	Radiation Pattern	B.3.c	Any	Extracted from ellipse parameters in GIMS
	Pointing accuracy	B.3.d	0.1	-
	Boresight	B.3.f.1	Any	Extracted from ellipse parameters in GIMS
	Rotation accuracy	B.3.f.2.a	1	-
	Major axis orientation	B.3.f.2.b	Any	Extracted from ellipse parameters in GIMS
	Major axis at hal-power beamwidth	B.3.f.2.c	Any	Extracted from ellipse parameters in GIMS
	Minor axis at hal-power beamwidth	B.3.f.2.d	Any	Extracted from ellipse parameters in GIMS
Group	Operating Administration or Agency	A.3.a	Any	Just for completeness. Will be removed in Plan assignment
	Responsible Administration	A.3.b	Any	Just for completeness. Will be removed in Plan assignment
	Assigned frequency bandwidth	C.3.a	27000	-
	Class of station	C.4.a	EV	-
	Polarization	C.6	CR, CL or L	If linear, vector angle is mandatory



## Summary of parameters for AP30 submission (2)

Level	AP4 Item	AP4 reference	Value	Conditions
Emission/freq	Assigned frequencies	C.2.a	Any	Ten consecutive odd or even channels with standard Appendix 30 assigned frequencies
	Designation of emission	C.7.a	27M0G7W--	27 MHz and digital
	Total Power	C.8.b.1	Any	PFD level shall not exceed $-103.6 \text{ dB(W/m}^2 \cdot 27 \text{ MHz)}$ EIRP = total power (C.8.b.1) + Co-polar gain (B.3.a.1) Default $\text{EIRP}_{\text{DL}} = 58.4 \text{ dBW}$
	Maximum power density	C.8.b.2	Any	Total power $\cdot 10 \cdot \log(27 \text{ MHz})$
	Maximum power density over bandwidth	C.8.h	Any	Equal to maximum power density
	Modulation Characteristics	C.9	Any	Just for completeness.
Srv Area/Assoc ES	Maximum isotropic gain	C.10.d.3	Any	Default value depending on diameter and radiation pattern (suggested: 35.5 dBi)
	Half-power beamwidth	C.10.d.4	Any	Default value depending on diameter and radiation pattern (suggested: 2.86 degrees)
	Radiation Pattern	C.10.d.5.a	Any	(suggested: MODRES)
	Equivalent antenna diameter	C.10.d.8	Any	Default value depending on gain and radiation pattern (suggested: 0.6 m)
	Service area No.	C.11.a.1	1	-
	Test-points coordinates	C.11.a	Any	Up to 20 test-points. On land and within national territory.





## Summary of parameters for AP30A submission (1)

Level	AP4 Item	AP4 reference	Value	Conditions
Notice	Notifying Administration	A.1.f.1	Any	Acronym of administration
	Satellite network name	A.1.a	Any	Up to 30 characters (see <a href="https://www.itu.int/ITU-R/go/space-naming-convention/en">https://www.itu.int/ITU-R/go/space-naming-convention/en</a> )
	Nominal Orbital Longitude	A.4.a.1	Any	orbital positions for which the Annex 7 to Appendix 30 (Rev.WRC-15) limitations were suppressed by WRC-19. Same orbital position as AP30 submission.
	Longitudinal tolerance west	A.4.a.2.b	0.1	-
	Longitudinal tolerance east	A.4.a.2.a	0.1	-
	Regular Hours of Operation start	A.11.a	0	-
	Regular Hours of Operation end	A.11.b	24	-
Beam	Transmitting/Receiving	B.2	Receiving	-
	Shape of the Beam	-	Elliptical	-
	Beam designation	B.1.a	Any	Avoid spaces (suggested name: E001)
	Co-polar gain	B.3.a.1	Any	$10 \cdot \log(27843 / (\text{min.axis} \cdot \text{major axis}))$
	Radiation Pattern	B.3.c	Any	Extracted from ellipse parameters in GIMS
	Pointing accuracy	B.3.d	0.1	-
	Boresight	B.3.f.1	Any	Extracted from ellipse parameters in GIMS
	Rotation accuracy	B.3.f.2.a	1	-
	Major axis orientation	B.3.f.2.b	Any	Extracted from ellipse parameters in GIMS
	Major axis at hal-power beamwidth	B.3.f.2.c	Any	Extracted from ellipse parameters in GIMS
	Minor axis at hal-power beamwidth	B.3.f.2.d	Any	Extracted from ellipse parameters in GIMS
Group	Operating Administration or Agency	A.3.a	Any	Just for completeness. Will be removed in Plan assignment
	Responsible Administration	A.3.b	Any	Just for completeness. Will be removed in Plan assignment
	Assigned frequency bandwidth	C.3.a	27000	-
	Class of station	C.4.a	EC	-
	Receiving system noise temperature	C.5.a	600 or 750	600 (for 17 GHz) or 750 (for 14 GHz)
	Polarization	C.6	CR, CL or L	If linear, vector angle is mandatory



## Summary of parameters for AP30A submission (2)

Level	AP4 Item	AP4 reference	Value	Conditions
Emission/freq	Assigned frequencies	C.2.a	<i>Any</i>	Ten consecutive odd or even channels with standard Appendix 30 assigned frequencies
	Designation of emission	C.7.a	27M0G7W--	27 MHz and digital
	Total Power	C.8.b.1	<i>Any</i>	PFD level shall not exceed $-76$ dB(W/m <sup>2</sup> . 27 MHz)) EIRP = total power (C.8.b.1) + Co-polar gain (B.3.a.1) Default EIRP <sub>FL</sub> = 84 dBW
	Maximum power density	C.8.b.2	<i>Any</i>	Total power-10*log(27 MHz)
	Maximum power density over bandwidth	C.8.h	<i>Any</i>	Equal to maximum power density
	Power control	C.8.i	<i>Blank</i>	Bureau will calculate and publish the final power control values
	Modulation Characteristics	C.9	<i>Any</i>	Just for completeness.
Srv Area/Assoc ES	Maximum isotropic gain	C.10.d.3	<i>Any</i>	Default value depending on diameter and radiation pattern (suggested: 57 dBi)
	Half-power beamwidth	C.10.d.4	<i>Any</i>	Default value depending on diameter and radiation pattern (suggested: 0.25 degrees)
	Radiation Pattern	C.10.d.5.a	<i>Any</i>	(suggested: MODTES)
	Antenna diameter	C.10.d.7	<i>Any</i>	Default value depending on gain and radiation pattern (suggested: 5 m)
	Service area No.	C.11.a.1	1	-
	Test-points coordinates	C.11.a	<i>Any</i>	Up to 20 test-points. On land and within national territory.



## Annex 1: Submission AP30A in 14 GHz

- *In 14 GHz, possible channels are 1 to 14, so it is not possible to select 10 consecutive odd or even channels. So, it is necessary a combination of maximum 10 channels with different polarization (for example, 5 odd channels with circular right polarization and 5 even channels with circular left polarization).*

### **Main steps:**

1. *Follow the instructions for the generation of the SNS database for the AP30A submission in exercise 2.b), selecting the first part of the channels (e.g. 5 odd channels with circular right polarization).*
2. *Once finished, close the notice and go to “Notice Explorer”*
3. *Select the AP30A notice and double click on it. The beam will be displayed.*
4. *Select the beam and double click on it. The group will be displayed.*
5. *Select the group and click on right button of the mouse. Select the option “Clone”.*
6. *Press OK to create the new group in the same notice and the same beam.*
7. *Select new group (group id: 2) and click on “Show”. The tab “Group” will open.*
8. *Change to the opposite polarization to group id 1 (e.g. CR vs CL, L/0 vs L/90)*
9. *Go to tab “Emissions/Frequencies” and modify the channel numbers to select the rest of the channels not included in group id 1 (e.g. 5 even channels with circular left polarization).*