



## Technical and Regulatory Examinations with related BR Software

Workshop on Appendices 30 & 30A

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International Telecommunication Union

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The poster features a scenic view of Geneva, Switzerland, with a large fountain in the foreground and mountains in the background. The ITU logo is prominently displayed in the center, overlaid on a red background. The text 'WORLD RADIOCOMMUNICATION SEMINAR 2014' is written in large, white, sans-serif font. Below this, the location and dates 'GENEVA, 8-12 DECEMBER 2014' are listed. A QR code is located in the bottom left corner, and the ITU logo is repeated in the bottom right corner. The text '150 1865 2015' is also present in the bottom right area.

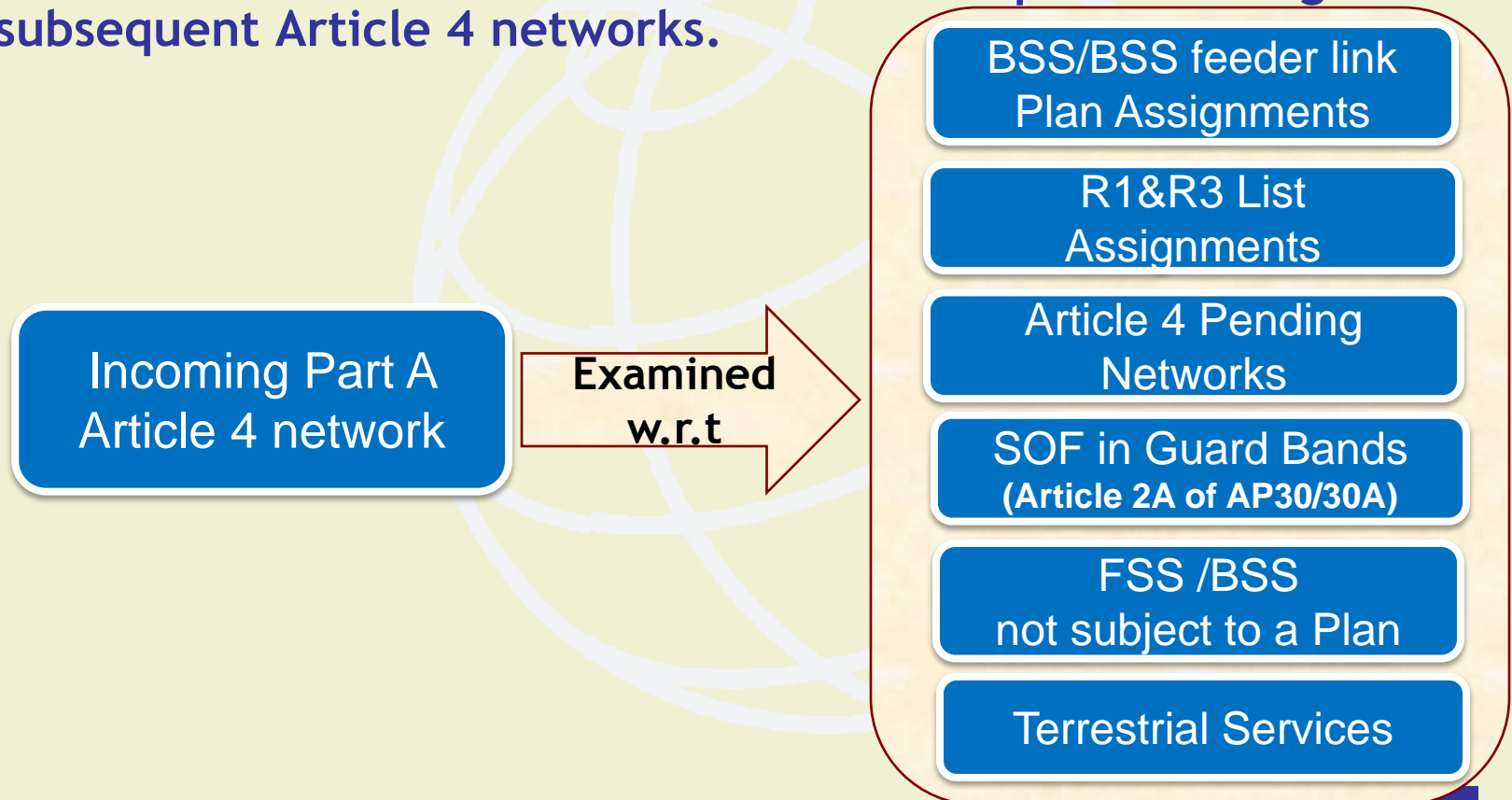
# Outline

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- ❑ Purpose of BR's Technical and Regulatory Examinations
- ❑ Protection Criteria
- ❑ List of BR Software used for Technical Examinations
- ❑ BR Software Packages SPS and GIBC
  - SPS Package
  - Examination flow chart with SPS
  - GIBC Package
  - Examination flow chart with GIBC
- ❑ Demonstration of how to run MSPACE and GIBC
- ❑ Annexes

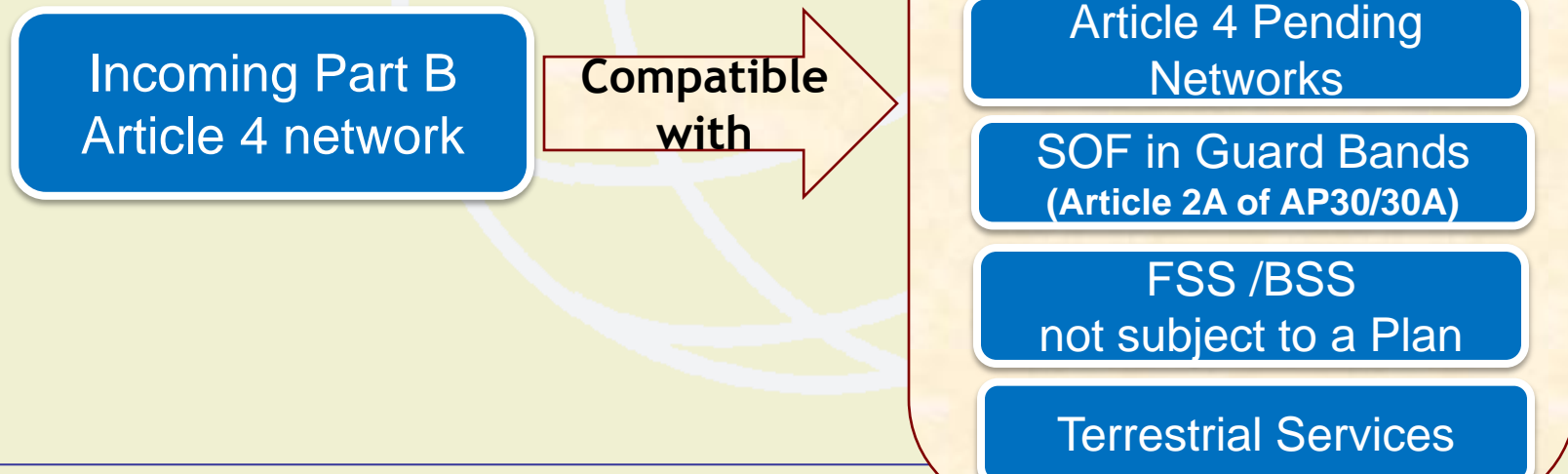
# Purpose of BR's Examinations (1)

- Article 4 networks submitted under §4.1.3 or §4.2.6 of AP30/30A
  - Conformity with the Table of Frequency Allocations and any applicable hard limits
  - Identification of potentially affected Administrations/Networks
  - Establishment of reference situation for its protection against subsequent Article 4 networks.



## Purpose of BR's Examinations (2)

- Article 4 networks submitted under §4.1.12 or §4.2.16 of AP30/30A
- Conformity with the Table of Frequency Allocations and any applicable hard limits
- Part B characteristics are within the envelope of those of Part A
- Any agreement still required
- For Regions 1 & 3, Part B characteristics do not cause more interference than Part A characteristics.



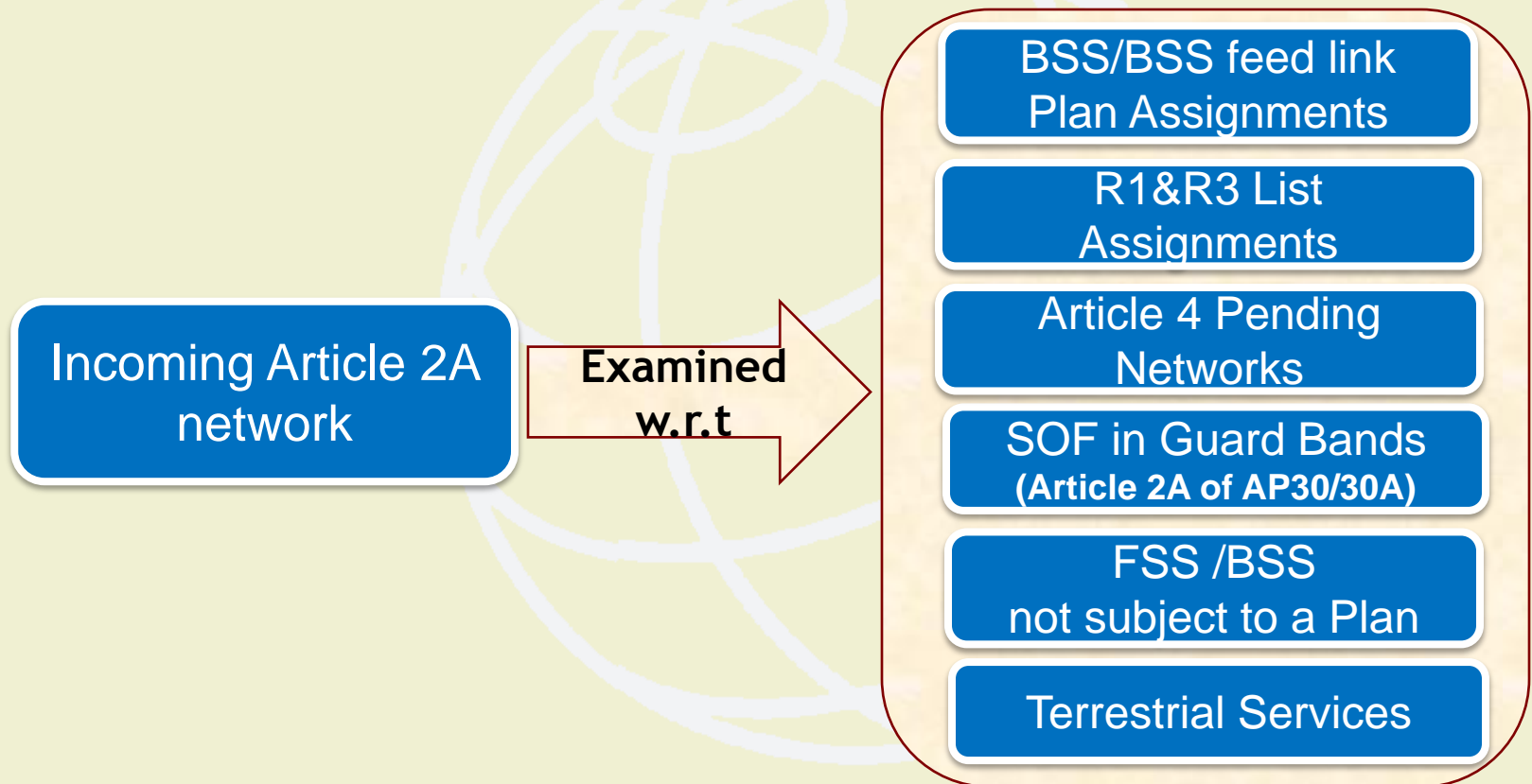
## Purpose of BR's Examinations (3)

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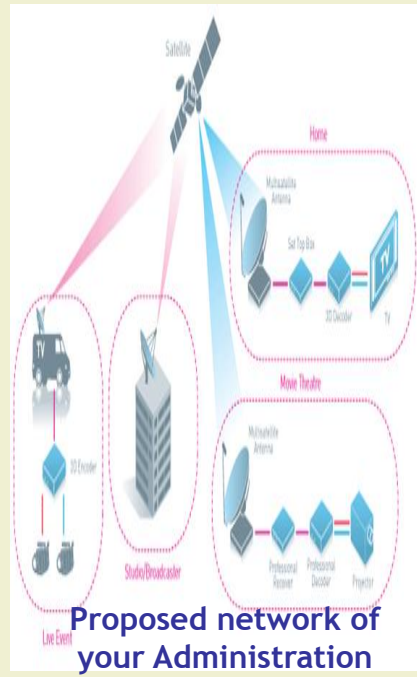
- **BR Databases used for Part A and Part B examinations:**
  - **Part A:**
    - ✓ The latest SPS\_ALL, SRS\_ALL and GIMS REFDB
  - **Part B:**
    - ✓ The same SPS\_ALL, SRS\_ALL and GIMS REFDB used for Part A for checking any missing agreements
    - ✓ In addition, for Regions 1&3, the latest SPS\_ALL, SRS\_ALL and GIMS REFDB at the time of Part B processing for examination under § 4.1.11.
  - **In preparing the above-mentioned SPS\_ALL, pay attention to:**
    - ✓ Resolution 548: resolve 5 and associated ROP for Regions 1& 3
    - ✓ Rules of Procedure concerning the receivability when multiple Part A submissions are received on the same date.

## Purpose of BR's Examinations (4)

- SOF submitted under Article 2A of AP30/30A
  - Conformity with the Table of Frequency Allocations and any applicable hard limits
  - Identification of affected Administrations/Networks



# Protection Criteria Concept

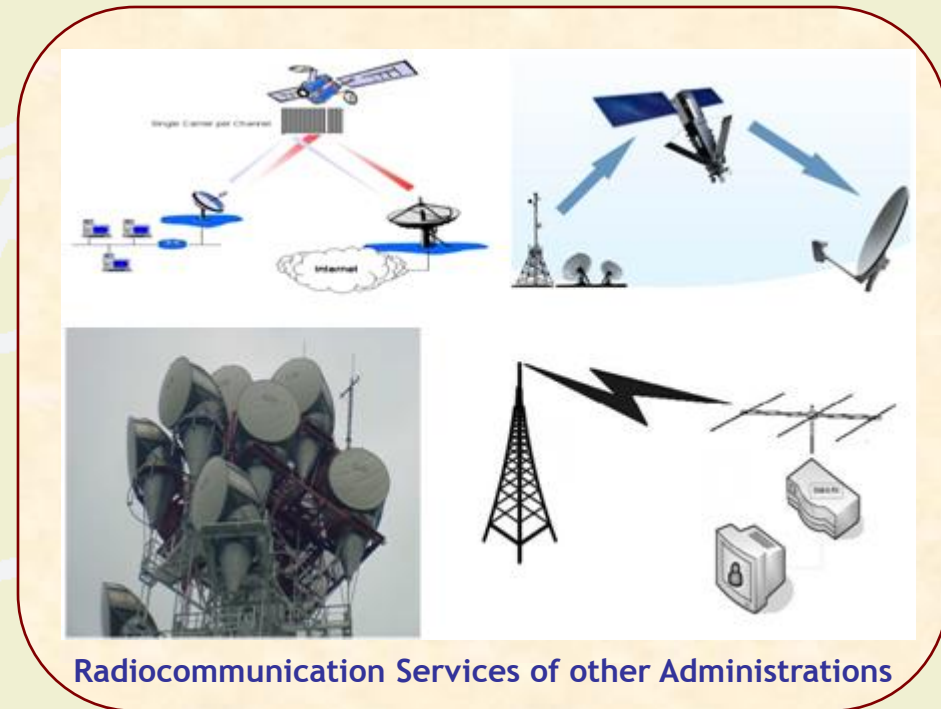


**Potential incompatibility!**

**Based on**

## Protection Criteria

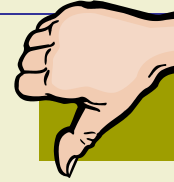
- ➔ Frequency overlap
- ➔ Orbital separation
- ➔ EIRP Limits
- ➔  $\Delta T/T$
- ➔ PFD Limits
- ➔ EPM/OEPM



# Protection Criteria Categories

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## Hard Limits



- ✓ If exceeded → the Submission is not receivable (unfavorable) and virtually returned to notifying administration
- ✓ To preserve current and future use of a Radiocommunication Service in general

## Coordination Trigger Limits

- ✓ Agreements (implicit or explicit) of affected administrations is required
- ✓ To protect:
  - Existing assignments of Space Services Networks:
    - BSS Plans and List - AP30/30A
    - Pending complete AP4 information
    - Networks with overlapping necessary bandwidth
  - Existing and future terrestrial services on territories of administrations





## ➤ Regions 1 and 3 Article 4 Downlink Network

Hard Limits	AP30 Provision	BR Software
PFD hard limit of $-103.6 \text{ dB(W/(m}^2 \cdot 27\text{MHz))}$	§ 1 Annex 1	GIBC/AP30-30A
Annex 7	Annex 7	SpaceVal/GIMS

Examined w.r.t	AP30 Provision	BR Software	Criteria
Regions 1 & 3 BSS Plan Assignments	4.1.1 a	SPS/MSPACEg	EPM
Regions 1 & 3 BSS List or Pending Art. 4 Assignments	4.1.1 b		PFD
Region 2 BSS Assignments	4.1.1 c	GIBC/PFD (space)	PFD
Terrestrial Services	4.1.1 d	GIBC/PFD (terres.)	PFD
Non-planned FSS Assignments, Article 2A Assignments	4.1.1 e	GIBC/PFD (space)	PFD



## ➤ Regions 1 and 3 Article 4 Feeder-link Network

Hard Limits	AP30A Provision	BR Software
PFD hard limit of $-76 \text{ dB(W/(m}^2 \cdot 27\text{MHz))}$	§ 4 of Annex 1	GIBC/AP30-30A
Relative off-axis E.I.R.P Limits		

Examined w.r.t	AP30A Provision	BR Software	Criteria
Regions 1 & 3 Feeder-link Plan Assignments	4.1.1 a	SPS/MSPACEg	EPM Orbital separation
Regions 1 & 3 Feeder-link List or Pending Article 4 Assignments	4.1.1 b		
Region 2 Feeder-link Assignments	4.1.1 c	GIBC/Appendix 8	$\Delta T/T$
Region 2 non-planned FSS Assignments, Article 2A Assignments	4.1.1 d		



## ➤ Region 2 Article 4 BSS/Feeder-link Network (1)

Hard Limits	AP30 Provision	BR Software
Annex 7	Annex 7	SpaceVal

Examined w.r.t	AP30 Provision	BR Software	Criteria
Regions 1 & 3 BSS Plan Assignments	4.2.3 a	GIBC/PFD (space)	PFD
Regions 1 & 3 BSS List or Pending Article 4 Assignments	4.2.3 b		
Region 2 BSS Assignments	4.2.3 c	SPS/MSPACEg	OEPM
Terrestrial Services	4.2.3 d	GIBC/PFD (terres.)	PFD
Non-planned FSS Assignments, Article 2A Assignments	4.2.3 e	GIBC/PFD (space) GIBC/Appendix 8	PFD $\Delta T/T$
Non-planned BSS Assignments	4.2.3 f	GIBC/PFD (space)	PFD

## ➤ Region 2 Article 4 BSS/Feeder-link Network (2)

Examined w.r.t	AP30 Provision	BR Software	Criteria
Regions 1 & 3 Feeder-link Plan Assignments	4.2.2 a	GIBC/Appendix 8	$\Delta T/T$
Regions 1 & 3 Feeder-link List or Pending Article 4 Assignments	4.2.2 b		
Region 2 Feeder-link Assignments	4.2.2 c	SPS/MSPACEg	OEPM
Article 2A Assignments	4.1.1 d (ref.2A.1.3)	GIBC/Appendix 8	$\Delta T/T$

# List of BR Software used for Technical Examinations (5)



## □ Article 2A Network

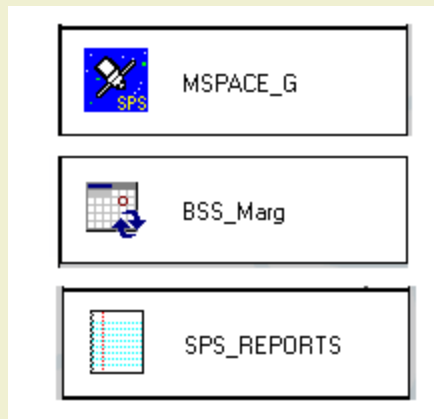
Hard Limits	Ap30 Provision	BR Software
Annex 7	Annex 7	

Examined w.r.t	Provision	BR Software	Criteria
BSS subject to a Plan	AP30/2A.1.1	GIBC/PFD (space)	PFD
Other Article 2A	AP30/2A.1.2	GIBC/Appendix 8	Coord. Arc
Terrestrial Services	AP30/2A.1.2	GIBC/PFD (terres.)	PFD
Non Planned networks	AP30/2A.1.2	GIBC/Appendix 8	Coord. Arc
BSS feeder-link subject to a Plan	AP30A/2A.1.1	GIBC/Appendix 8	$\Delta T/T$
Other Article 2A	AP30A/2A.1.2	GIBC/Appendix 8	Coord. Arc
Non Planned networks	AP30A/2A.1.2	GIBC/Appendix 8	Coord. Arc

# SPS Software Package (Space Plans Systems)

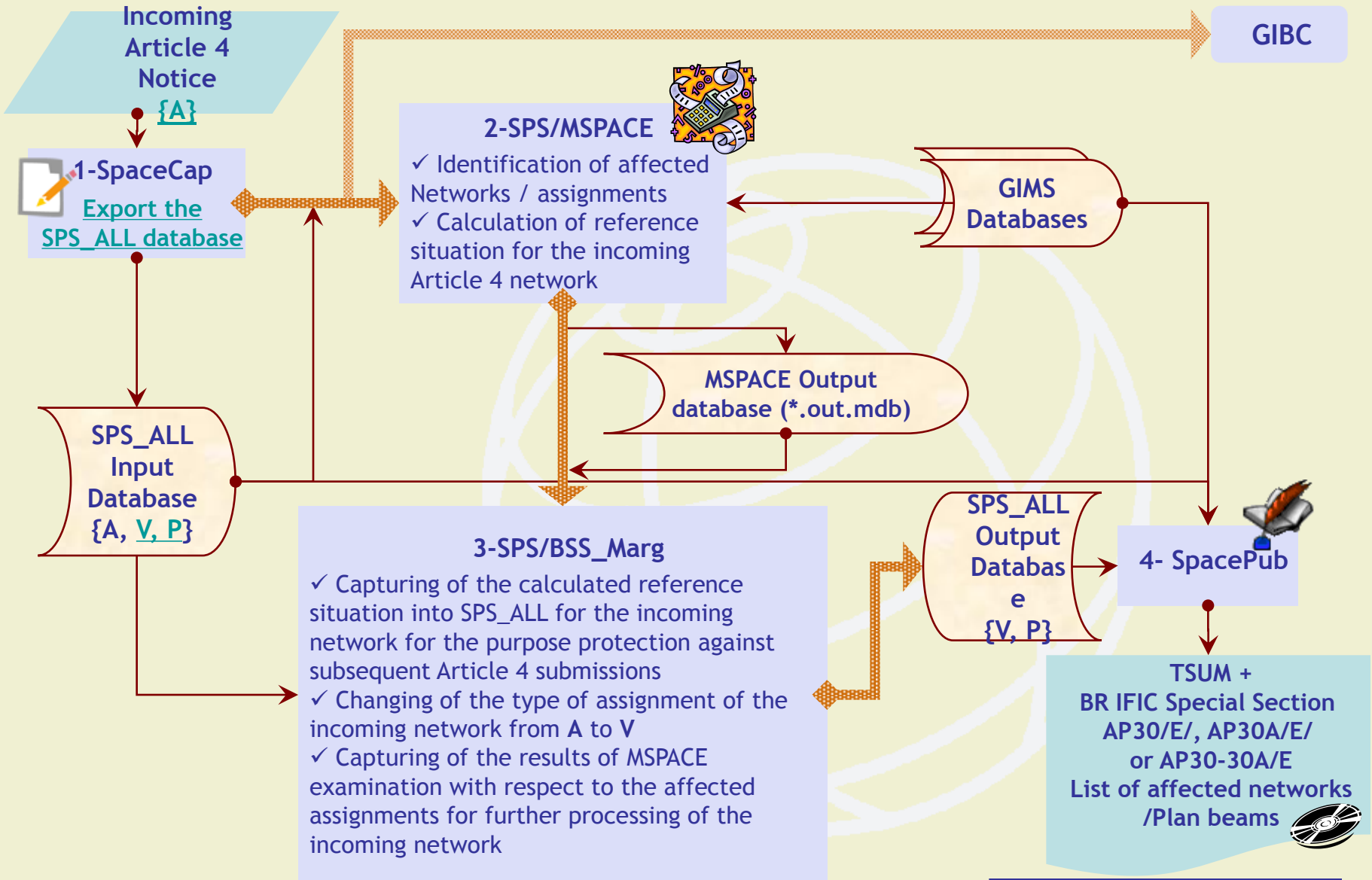
**Coordination  
Requirements**

**Minimize  
Interference**



**What If Studies**

# SPS Package - Ap.30/30A Art.4, Inter-service/region Tech. Examination



# GIBC Software Package (Graphical Interface for Batch Calculation)

Inter-service, Inter-region  
coordination requirements

**PFD Analysis  
Terrestrial**

**PFD Analysis  
Space**

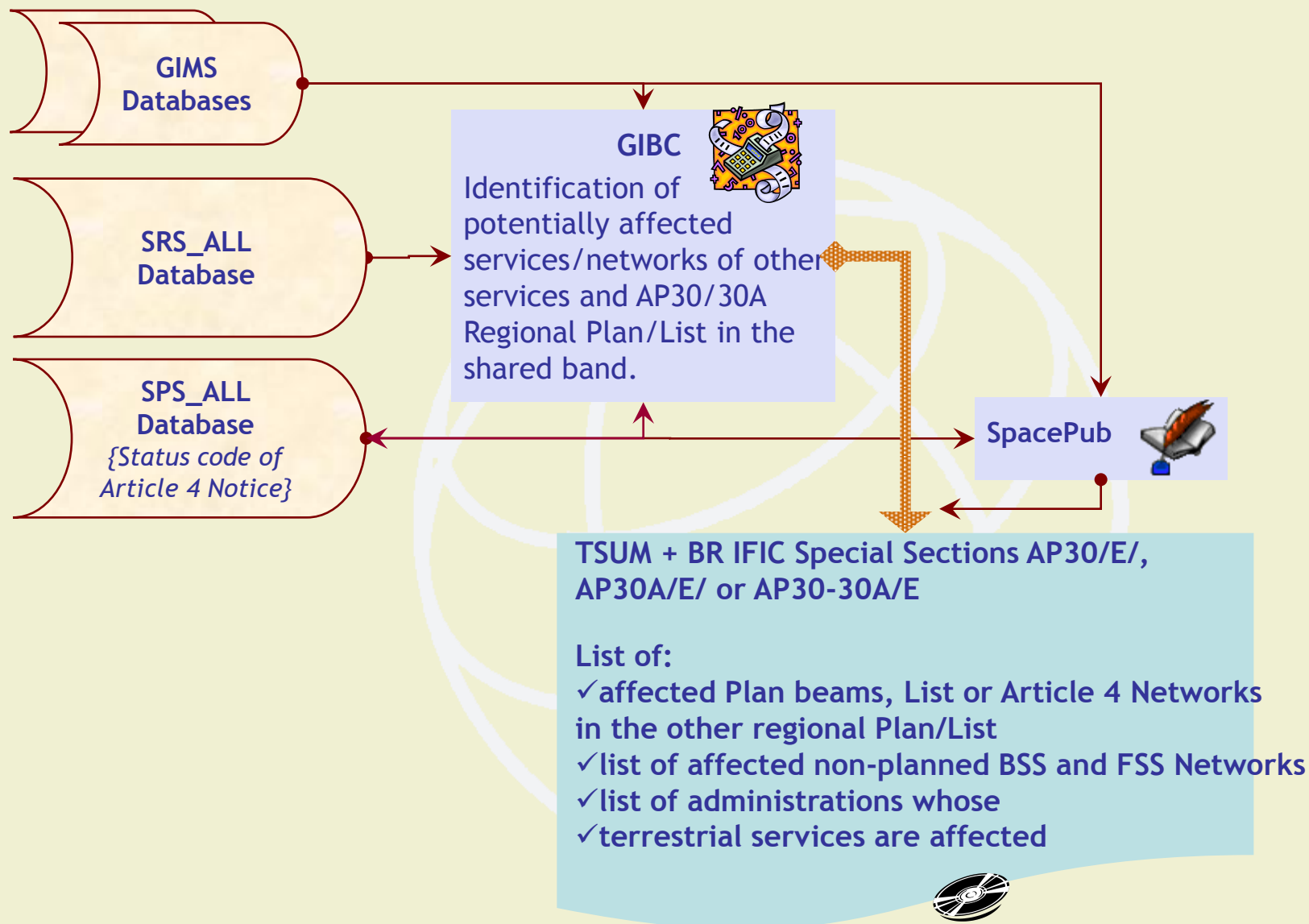
Gibc SNS V7 - Graphical Interface for Batch Calculations

Appendix 30B	Appendix 30 30A	Power Control	Tools / Options
Appendix 8	PFD (terrestrial serv.)	PFD (space serv.)	Appendix 7

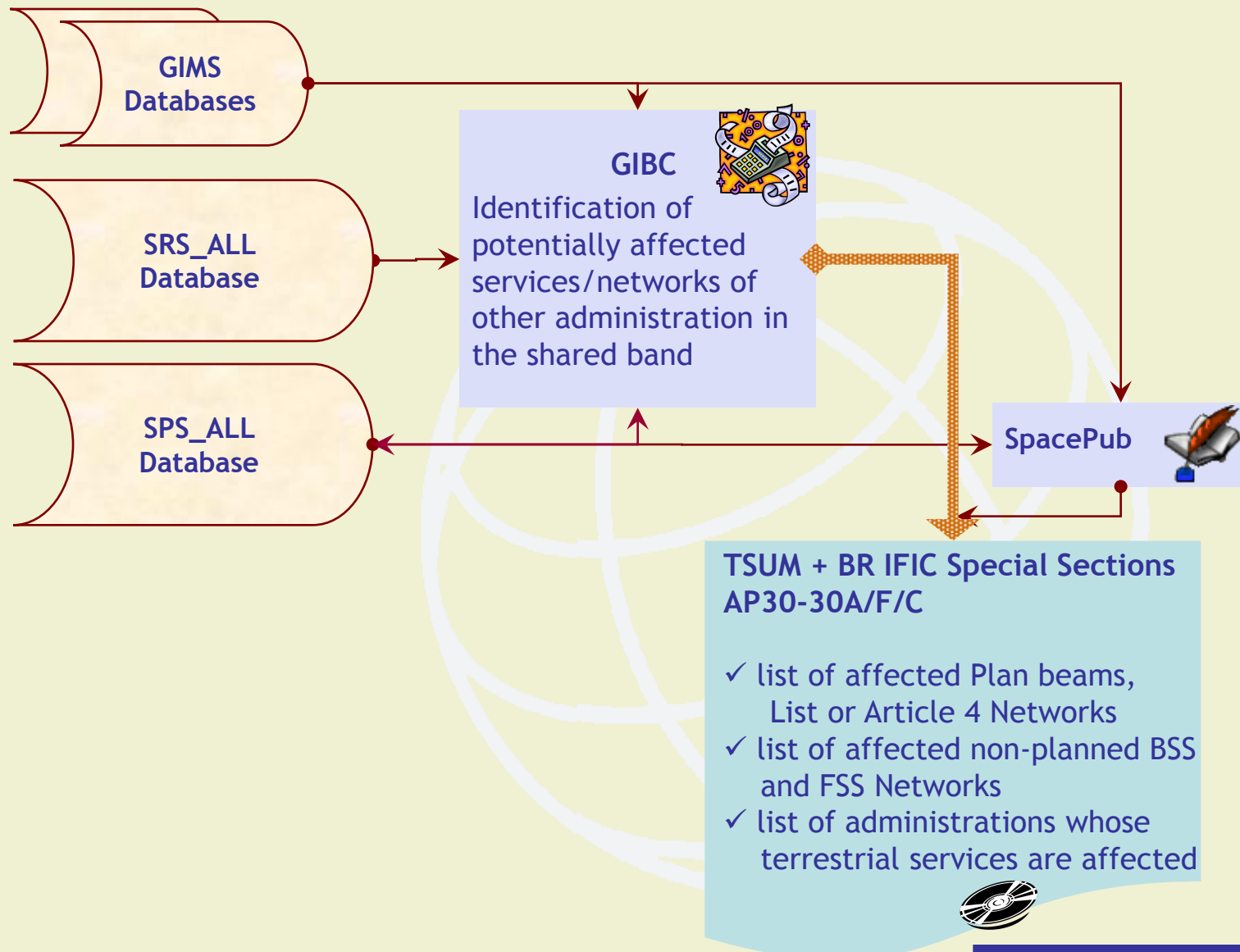


**Appendix 8 ( $\Delta T/T$  and Coord. Arc)**





# GIBC Package - Ap30/30A Art.2A, Technical Examination



## ***Demonstration of how to run SPS and GIBC***

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- ❑ **SPS/MSPACEg (slides 49-50)**
- ❑ **GIBC/AP30-30A (slides 76 - 77)**
  - **Downlink** (PFD Hard Limits)
  - **Feeder-link** (PFD and off-axis EIRP Hard Limits)
- ❑ **GIBC/PFD(terrestrial serv.) (slides 78 - 79)**
- ❑ **GIBC/PFD(space serv.) (slides 80 - 82)**
- ❑ **GIBC/Appendix 8 (slides 83 - 84)**
- ❑ **GIBC/Power Control (R1&3 Feeder-link Plan/List) (slides 85-87)**
- ***Video presentations to assist administrations in using SPS/MSPACEg and GIBC***

<http://www.itu.int/en/ITU-R/space/plans/Pages/AP30-30A.aspx>

# Annexes

# Annexes

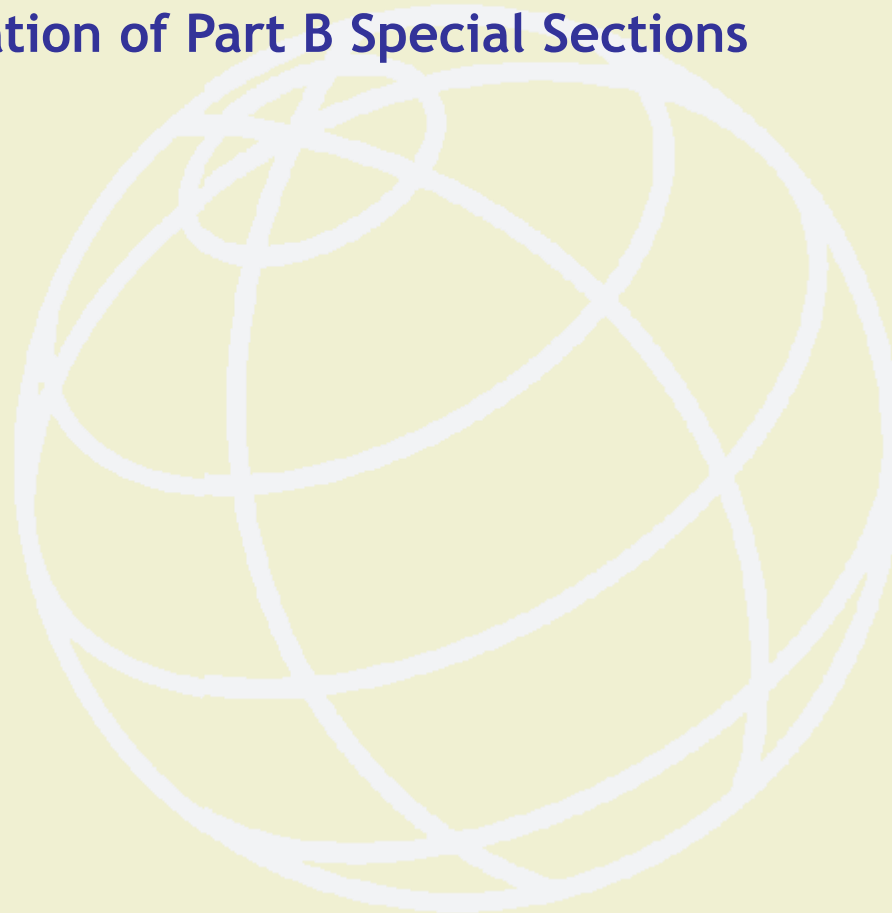
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- ❑ Exercises on Appendix 30 Article 4 networks:
  - I. Publication of Part A Special Sections
  - II. Publication of Part B Special Sections
  
- ❑ Technical Examinations of submissions under Article 4 of Appendices 30 and 30A
  - ✓ Hard Limits
  - ✓ Trigger Limits
  - ✓ Intra-service/region Examinations
  - ✓ Inter-service/region Examinations in the shared band
  - ✓ Examinations at different Stages of Article 4 Networks:
    - Publication of Part A Special Sections
    - Publication of Part B Special Sections
  
- ❑ BR Software Package SPS (Space Plans' System)
  
- ❑ BR Software Package GIBC (Graphical Interface for Batch Calculations)
  
- ❑ Technical Examinations of submissions under Article 2A of Appendices 30 and 30A

## ***Exercises on Ap30 Art.4 networks***

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- I. Publication of Part A Special Sections**
- II. Publication of Part B Special Sections**



## Exercise I : Reporting (1)

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This exercise will show you how to use **SPS\_Reports** to get the coordination requirements under 4.1.1 a) & b) of Appendix 30.

In the exercise scenario, you have just received BR IFIC 9999 that contains the Part A publication of three Article 4 networks.

The database **SPS\_ALL\_IFIC9999.mdb** is the SPS database distributed on the **BR IFIC DVD** (Space Service).

The three networks are:

- ✓ 97552999 / R13DN-LINK
  - Regions 1&3 Downlink
- ✓ 97554999 / R13FD-LINK
  - Regions 1&3 Feeder-link
- ✓ 102555999 / R2-NETWORK
  - Region 2

## ***Exercise I : Reporting (2)***

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**Launch SPS\_Reports** from Start Menu/BR Space applications/SPS/

- 1. Open the database *AP30\_R13DN-LINK\_mspace\_result.MDB* in the folder *\Exercise I\*  
Note that SPS\_Reports works with the MSPACE output database that is also published on the BR IFIC**
- 2. Click on the Compressed Report button**
- 3. In the report window, select the option PFD and EPM and click on the button Create Draft of Special Section**
- 4. Rename the file *SS\_AP\_30C.rtf* that was just created into *DL\_PartA.rtf***
- 5. Have a look at that file to see the information it provides**



## *Exercise II: SPS Package application - Part B analysis (1)*

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You will now change the characteristics of your network in order to decrease the number of affected networks with **SpaceCap**

Run **MSPACE** and check that fewer administrations are affected [Sample MSPACEg Software Output Report Files](#)

Use **GIBC** to evaluate coordination requirements with terrestrial services and FSS networks

# Startup SpaceCap to prepare the notice

1. Open the database *SPS\_ALL\_IFIC9999.mdb* in the folder *\Exercise II\*  
(This is a copy of the SPS database as published on BR IFIC 9999)
2. Export the notice 97552999 into a new database *Part B.mdb* in *\Exercise II\*  
Uncheck the option Keep Findings and Ref. Situations.  
This is important to ensure that the notice is now viewed as an addition and not left as “Victim”, so that interference from it is calculated
  - ✓ **Check** the option Keep group ids of the source
3. Open the database *Part B.mdb*. Uncheck the status 01 read only
4. Delete beams 5 and 6 and the group 384 in beam 3
5. Export the modified notice back into *SPS\_ALL\_IFIC9999.mdb* in the folder *\Exercise II\*
  - ✓ **Check** the option Replace Notice in Target
  - ✓ **Check** the option Keep group ids of the source

## Exercise II: SPS Package application - Part B analysis (3)

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### Startup MSPACE to calculate new interference

1. As input database select *SPS\_ALL\_IFIC9999.mdb* in the folder *\Exercise II\*
2. Select the R1&3 down link plan
3. Accept the proposed output database name and findings file name
4. Start the analysis and leave the analysis description empty
5. When the analysis is completed, go to the Compressed Report tab
6. Check the option PFD and EPM
7. Create a draft of Special Section (in RTF format)
8. You can compare results with those of Exercise I

## Exercise II: SPS Package application - Part B analysis (4)

### Startup GIBC to calculate new interference

1. Go to the tab PFD (Terrestrial serv.)
  - Type in the network ID: 97552999
  - Select *Triggers* as the Examination
2. Go to the tab Tools/Options
  - As the SRS Database, select *SPS\_ALL\_IFIC9999.mdb* in the folder *\Exercise II\*
  - As Additional GIMS Database, choose *gims.mdb* in *\Exercise II\*  
Although all beams are elliptical, the PFD program does not take that information from the SPS database but from GIMS, which means that each ellipse defined in SPS must also be defined in a GIMS database
3. Start the analysis and check the file *PFD.LST* in the output folder
4. You may also run a PFD (Space serv.) analysis. If you do so, do not forget to add an Additional SRS DB in the Tools/Options tab; select the database *srs.mdb* in the folder *\Exercise II\*

# Article 4 of Appendices 30 and 30A

## Hard Limits Examinations

### Coordination Trigger Limits Examination

#### I. Intra-service/region Examination

- ✓ BR Software Package: SPS (*MSPACEg, BSS\_Marg*)
- ✓ To protect: Assignments of Plan/List and those of pending Article 4 submissions in the same regional AP30/30A Plan/List

#### II. Inter-service/region Examinations in the shared band

- ✓ BR Software Package: GIBC (*PFD (Space/Terrestrial services), Appendix 8*)
- ✓ To protect:
  - Assignments in the Plans and Lists
  - Assignments of pending submissions under Article 4 in the other regional AP30/30A Plan/List
  - Non-planned FSS and BSS
  - Satellite Networks in support of Space Operation Functions submitted under Article 2A of AP30/30A
  - Terrestrial Services



## ***I. Part A Special Section: Publication under § 4.1.5/4.2.8 in BR IFIC***

- ✓ Calculation of potential interference from the incoming Article 4 network to other services/assignments based on the relevant protection criteria using the latest [SPS\\_ALL](#) / [SRS\\_ALL](#) database
- ✓ Creation of Reference Situation for the incoming Article 4 network for its protection against subsequent Article 4 networks
- ✓ Establishment of list of potentially affected administrations

## ***II. Part B Special Section: Publication under § 4.1.15/4.2.19 in BR IFIC***

- ✓ Re-calculation of potential interference would be required only if the initial network characteristics as published in Part A Special Sections have been modified SPS\_ALL/SRS\_ALL database
- ✓ Comparison of protection limits excess resulting from the modified characteristics with those produced by the Part A ones for establishment of list of administrations whose agreements are required for successful completion of Article 4 procedure



- ✓ Comparison of the results with those of Part A Special Section
- ✓ To verify whether or not an objecting administration's networks/territories are still identified as affected by the modified parameters, or
- ✓ An additional interference is imposed on an administration that has not objected or has previously agreed after an objection
- ✓ For the SPS Package examination the SPS\_ALL database included in the BR IFIC of the network's Part A publication is used as common existing reference situation scenario for comparison



## Article 2A of Appendices 30 and 30A

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- ✓ BR Software Package: GIBC (PFD (Space/Terrestrial services), *Appendix 8*)
  
- ✓ To protect:
  - Assignments in the Plans and Lists
  - Assignments of pending submissions under Article 4 in both regional AP30/30A Plans/Lists
  - Non-planned FSS and BSS
  - Satellite Networks in support of Space Operation Functions submitted under Article 2A of AP30/30A
  - Terrestrial Services





# Appendix 30 Hard Limits

Appendix 30 Provision	Limit Type	Examination of Compatibility of Article 4 network with	
		Region	Service ⇔ Frequency band
Annex 1: Section 1, Paragraph 1	Power Flux Density	1	Planned Band BSS Downlink ⇔ 11.7 - 12.5 GHz
		3	11.7 - 12.2 GHz  Protection of existing assignments and preservation for future assignments of satellite networks whose orbital position is separated by more than 9° from the assignment under examination
Annex 7: Paragraph A1	Orbital position	2	FSS Downlink ⇔ 11.7 - 12.2 GHz
Annex 7: Paragraph A2	Orbital position	1	FSS Downlink ⇔ 12.5 - 12.7 GHz
		3	FSS Downlink ⇔ 12.2 - 12.7 GHz Non-planned Band BSS Downlink ⇔ 12.5 - 12.7 GHz
Annex 7: Paragraph A3	Orbital position and E.I.R.P	2	FSS Downlink ⇔ 11.7 - 12.2 GHz



# Appendix 30A Hard Limits

Appendix 30A Provision	Limit Type	Examination of Compatibility of Article 4 network with	
		Region	Service ⇔ Frequency band
Annex 1: Section 4, Paragraph 1	Power Flux Density and off-axis EIRP	1 and 3	Feeder-link to Planned Band BSS Downlink ⇔ 14.4 - 14.8 GHz and 17.3 - 18.1 GHz Protection of existing assignments and preservation for future assignments of satellite networks whose orbital position is separated by more than 9° from the assignment under examination

# Appendix 30 Coordination Trigger Limits - SPS Package (1)



Appendix 30 Provision		Limit Type	Examination of Compatibility of Article 4 network with		
Article 4	Annex 1		Region	Service ⇔ Frequency band	BR Software
4.1.1 a) 4.1.1 b)	Section 1	PFD and <u>EPM</u> within $\pm 9^\circ$ arc	1	BSS Downlink Assignments of Plan, List and pending Article 4 networks ⇔ 11.7 - 12.5 GHz	SPS PACKAGE ( <i>MSPACEg</i> and <i>BSS_MARG</i> ) using <i>GIMS</i> and <i>SPS</i> databases  Protected area: Service area represented by a set of maximum 20 test points
			3	11.7 - 12.2 GHz	
4.2.3 c)	Section 2	<u>OEPM</u> Overall downlink and feeder-link protection criteria	2	12.2 - 12.7 GHz	

# Appendix 30A Coordination Trigger Limits - SPS Package (2)



Appendix 30A Provision		Limit Type	Examination of Compatibility of Article 4 network with		
Article 4	Annex 1		Region	Service ⇔ Frequency band	BR Software
4.1.1 a) 4.1.1 b)	Section 4	EPM within ±9° arc	1 and 3	BSS Feeder-link Assignments of Plan, List and pending Article 4 networks ⇔ 14.5 - 14.8 GHz (outside Europe) 17.3 - 18.1 GHz	<i>SPS PACKAGE (MSPACEg and BSS_MARG)</i> using <i>GIMS</i> and <i>SPS</i> databases
4.2.2 c)	Section 3	OEPM Overall downlink and feeder-link protection criteria	2	17.3 - 17.8 GHz	Protected area: Feeder-link receiving space station on its Service area represented by a set of maximum 20 test points

# Appendix 30 Coordination Trigger Limits - GIBC Package <sup>(1)</sup>



Appendix 30 Provision		Limit Type	Examination of Compatibility of Article 4 network with		
Article 4	Annex 1		Region	Service ⇔ Frequency band	BR Software
4.1.1 c)	Section 3 1 <sup>st</sup> mask	PFD Mask as a function of orbital Separation Angle	2	BSS Downlink Assignments of Plan, List and pending Article 4 networks ⇔ 12.2 - 12.5 GHz	<b>GIBC-PFD</b> (Space) using GIMS and SPS databases  Output Report File Name: <b>PXT.LST</b>  Protected area: -Service area represented by a set of maximum 20 test points. -Service area for Region 3 in 12.5-12.7 GHz.
4.2.3 a) 4.2.3 b)			1	12.2 - 12.5 GHz	
4.2.3 f)	2 <sup>nd</sup> mask		3	Non-planned BSS Downlink Assignments ⇔ 12.5 - 12.7 GHz	

# Appendix 30 Coordination Trigger Limits - GIBC Package <sup>(2)</sup>



Appendix 30 Provision		Limit Type	Examination of Compatibility of Article 4 network with		
Article 4	Annex 1		Region	Service ⇔ Frequency band	BR Software
4.1.1 d) 4.2.3 d)	Section 4	PFD Mask as a function of Arrival Angle Or PFD comparison as appropriate	1	Terrestrial Services ⇔ 11.7 - 12.5 GHz	<b><i>GIBC-PFD</i></b> (Terrestrial) using GIMS and SPS databases and the latest updated PFD extract file (bss_sstn.dat)  Output Report File Name: <b><i>PFD.LST</i></b>  Protected area: Affected parts of territories of administrations that have no BSS assignments in the Plan/List whose necessary bandwidth overlaps that of assignment under examination
			2	11.7 - 12.1 GHz 12.2 - 12.7 GHz	
			3	11.7 - 12.7 GHz	

# Appendix 30 Coordination Trigger Limits - GIBC Package <sup>(3)</sup>



Appendix 30 Provision		Limit Type	Examination of Compatibility of Article 4 network with		
Article 4	Annex 1		Region	Service ⇔ Frequency band	BR Software
4.1.1 e)	Section 6	PFD Mask as a function of orbital Separation Angle Or PFD comparison as appropriate	1	SOF Downlink ⇔ Region 1 Lower and Upper Guard Band: 11.7 - 11.714 GHz / 12.489 - 12.500 GHz	<i>GIBC-PFD</i> (Space) using GIMS, SPS and SRS databases  Output Report File Name: <i>PXT.LST</i>  Protected area: Service area
	1 <sup>st</sup> mask		2	FSS Downlink ⇔ 11.7 - 12.2 GHz  SOF Downlink ⇔ Region 2 Lower Guard Band: 12.200 - 12.212 GHz	
	1 <sup>st</sup> or 2 <sup>nd</sup> mask		3	FSS Downlink ⇔ 12.2 - 12.5 GHz	
	1 <sup>st</sup> mask			SOF Downlink ⇔ Region 3 Lower and Upper Guard Band: 11.7 - 11.714 GHz / 12.189 - 12.200 GHz	

# Appendix 30 Coordination Trigger Limits - GIBC Package <sup>(4)</sup>



Appendix 30 Provision		Limit Type	Examination of Compatibility of Article 4 network with		
Article 4	Annex 1		Region	Service ⇔ Frequency band	BR Software
4.2.3 e)	Section 6 1 <sup>st</sup> mask	PFD Mask as a function of orbital Separation Angle Or PFD comparison as appropriate	1	FSS Downlink ⇔ 12.5 - 12.7 GHz  SOF Downlink ⇔ Region 1 Upper Guard Band: 12.489 - 12.500 GHz	<b>GIBC-PFD</b> (Space) using GIMS, SPS and SRS databases Output Report File Name: <b>PXT.LST</b> Protected area: Service area
			2	SOF Downlink ⇔ Region 2 Lower and Upper Guard Band: 12.2 - 12.212 GHz / 12.688 - 12.700 GHz	
			3	FSS Downlink ⇔ 12.2 - 12.7 GHz	
	Section 7	ΔT/T	1	FSS Uplink ⇔ 12.5 - 12.7 GHz	<b>GIBC-Appendix 8</b> , Case II using GIMS, SPS and SRS databases Output Report File Name: <b>APP8.LST</b> Protected area: Feeder-link receiving space station on its Service area



# Appendix 30A Coordination Trigger Limits - GIBC Package <sup>(5)</sup>



Appendix 30A Provision		Limit Type	Examination of Compatibility of Article 4 network with		
Article 4	Annex 1		Region	Service ⇔ Frequency band	BR Software
4.1.1 c)	Section 5	ΔT/T	2	BSS Feeder-link Assignments of Plan, List and pending Article 4 networks ⇔ 17.3 - 17.8 GHz	<b>GIBC-Appendix 8</b> , Case I using GIMS and SPS databases Output Report File Name: <b>APP8.LST</b> Protected area: Feeder-link receiving space station on its Service area represented by a set of maximum 20 test points
4.2.2 a) 4.2.2 b)			1 and 3		

# Appendix 30A Coordination Trigger Limits - GIBC Package <sup>(6)</sup>

Appendix 30A Provision		Limit Type	Examination of Compatibility of Article 4 network with		
Article	Annex 1		Region	Service ⇔ Frequency band	BR Software
Article 4 4.1.1 d)	Section 6	ΔT/T	2	Non-planned BSS Feeder-link Assignments ⇔ 17.8 - 18.1 GHz	<b>GIBC-Appendix 8</b> , Case I using GIMS, SPS and SRS databases  Output Report File Name: <b>APP8.LST</b>  Protected area: Feeder-link receiving space station on its Service area
Article 4 4.1.1 d) and Article 2A			1 and 3	<u>SOF</u> Feeder-link ⇔ Regions 1 & 3 Lower and upper Guard Bands: 17.300 - 17.314 GHz 18.089 - 18.100 GHz 14.500-14.5118 GHz 14.78814-14.800 GHz	
			2	<u>SOF</u> Feeder-link ⇔ Region 2 Lower and upper Guard Bands: : 17.300 - 17.312 GHz 17.788 - 17.800 GHz	

# Appendix 30 Coordination Trigger Limits - GIBC Package <sup>(7)</sup>



Appendix 30 Provision		Limit Type	Examination of Compatibility of Article 2A network with		
Article 4	Annex 1		Region	Service ⇔ Frequency band	BR Software
4.1.1 d) 4.2.3 d)	Section 4	PFD Mask as a function of Arrival Angle	1	Terrestrial Services ⇔ Region 1 Lower and Upper Guard Bands: 11.700 - 11.714 GHz 12.489 - 12.500 GHz	<b>GIBC-PFD</b> (Terrestrial) using GIMS and SPS databases and the latest updated PFD extract file (bss_sstn.dat)  Output Report File Name: <b>PFD.LST</b>  Protected area: Affected parts of territories of administrations that have no BSS assignments in the Plan/List whose necessary bandwidth overlaps fully that of assignment under examination
			2	Region 2 Lower and Upper Guard Bands: 12.200 - 12.212 GHz 12.688 - 12.700 GHz	
			3	Region 3 Lower and Upper Guard Bands: 11.700 - 11.714 GHz 12.189 - 12.200 GHz	

# Appendix 30 Coordination Trigger Limits - GIBC Package <sup>(8)</sup>



Appendix 30 Provision		Limit Type	Examination of Compatibility of Article 2A network with		
Article	Annex 4		Region	Service ⇔ Frequency band	BR Software
Article 2A and Article 7 7.1 & 7.2	Section 4	PFD Mask as a function of orbital Separation Angle	1	BSS Downlink Assignments of Plan, List and pending Article 4 networks ⇔	<b>GIBC-PFD</b> (Space) using GIMS, SPS and SRS databases Output Report File Name: <b>PXT.LST</b> Protected area: Service area
	1 <sup>st</sup> mask			Region 1 Lower and Upper Guard Bands: 11.700 - 11.714 GHz 12.489 - 12.500 GHz	
	3 <sup>rd</sup> mask			2	
	1 <sup>st</sup> or 2 <sup>nd</sup> mask		3	Region 3 Lower and Upper Guard Bands: 11.700 - 11.714 GHz 12.189 - 12.200 GHz	

# Appendix 30A Coordination Trigger Limits - GIBC Package <sup>(10)</sup>

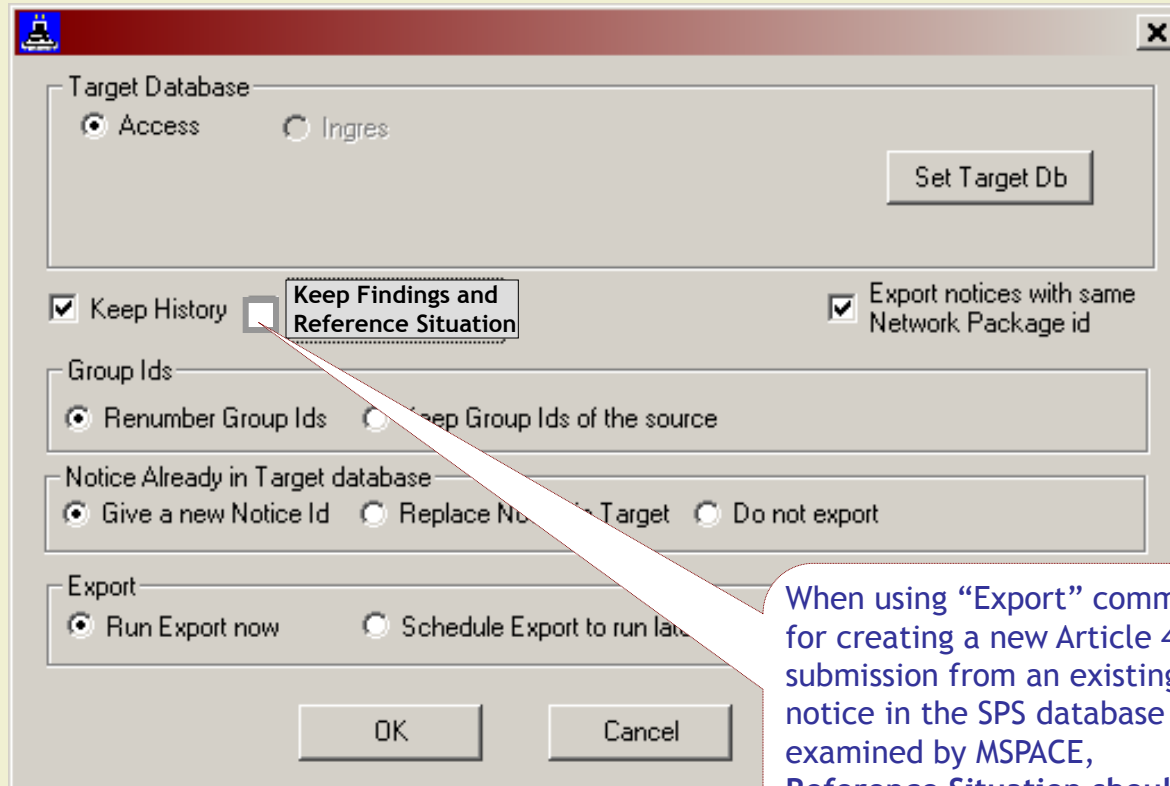


Appendix 30A Provision		Limit Type	Examination of Compatibility of Article 2A network with		
Article	Annex 4		Region	Service ⇔ Frequency band	BR Software
Article 2A, Article 4 4.1.1 d) and Article 7 7.1 & 7.2	Section 2	ΔT/T	1 and 3	BSS Feeder-link Assignments of Plan, List and pending Article 4 networks ⇔ Regions 1 and 3 Lower and upper Guard Bands: 17.300 - 17.314 GHz 18.089 - 18.100 GHz	<b><i>GIBC-Appendix 8</i></b> , Case I using GIMS, SPS and SRS databases  Output Report File Name: <b><i>APP8.LST</i></b>  Protected area: Feeder-link receiving space station on its Service area
			2	BSS Feeder-link Assignments of Plan, List and pending Article 4 networks ⇔ Region 2 Lower and upper Guard Bands: 17.300 - 17.312 GHz 17.788 - 17.800 GHz	

# Comparison Examination for Part B submissions

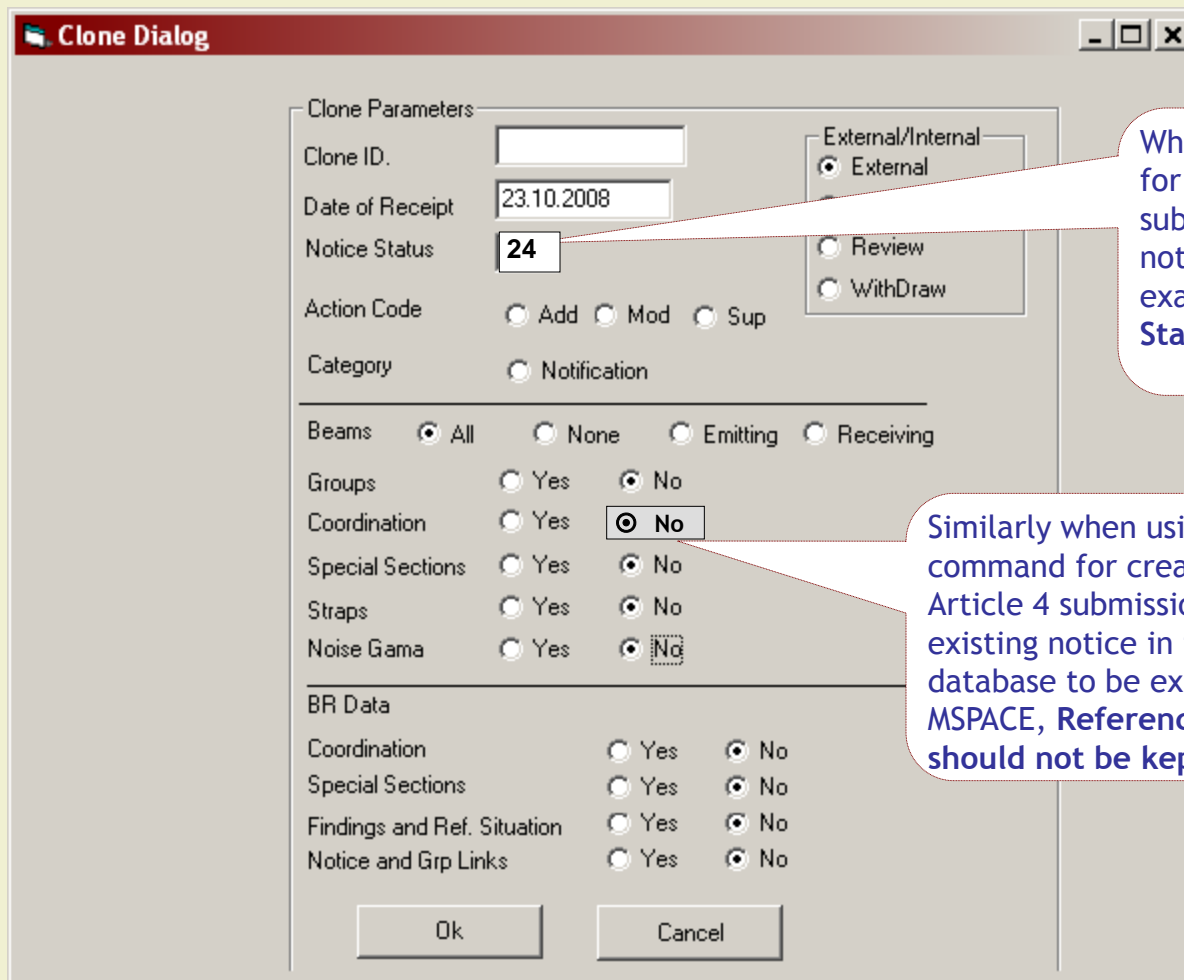
Network/Plan Beam identified as affected in results of examination with		Interference Levels Comparison	Affected Adm. Objected or not on Part A	Agreement Required for Part B?	Remark	
No.	Part A parameters					Part B parameters
1	<i>Identified</i> with Level X	Not Identified	N.A.	Not objected	No	Since the affected network/Plan Beam/Country is no more identified in the updated Part B results, agreement is not required
2			<i>Objected</i>			
3	<i>Identified</i> with Level Y	Not Identified	$X \geq Y$	Not objected	No	Since the level of interference of Part B is not greater than that of the published Part A, the previous implicit agreement of the affected administration is still valid
4			N.A.	<i>Objected</i>	<i>Yes</i>	Since the objecting administration is still identified as affected, its agreement is required
5			$X < Y$	Not objected	<i>Yes</i>	Since the level of interference of Part B is greater than that of the published Part A, the previous implicit agreement of the affected adm. is no longer valid. An explicit agreement is therefore required
6	Not Identified	N.A.	Not objected	<i>Yes</i>	The agreement of the affected administration whose service/network has been newly identified as affected, is required	
7	Not Identified	Not Identified	N.A.	N.A.	No	This evident case is only included for the sake of the completeness of all possible combinations

# Creating new submission with SpaceCap Export

A screenshot of the 'SpaceCap Export' dialog box. The dialog has a title bar with a small icon and a close button. It contains several sections: 'Target Database' with radio buttons for 'Access' (selected) and 'Ingres', and a 'Set Target Db' button; 'Keep History' (checked) and 'Keep Findings and Reference Situation' (unchecked); 'Export notices with same Network Package id' (checked); 'Group Ids' with radio buttons for 'Renumber Group Ids' (selected) and 'Keep Group Ids of the source'; 'Notice Already in Target database' with radio buttons for 'Give a new Notice Id' (selected), 'Replace Notice in Target', and 'Do not export'; and 'Export' with radio buttons for 'Run Export now' (selected) and 'Schedule Export to run later'. At the bottom are 'OK' and 'Cancel' buttons.

When using “Export” command for creating a new Article 4 submission from an existing notice in the SPS database be examined by MSPACE, Reference Situation should not be kept

# Creating new submission with SpaceCap Clone



The image shows a screenshot of the "Clone Dialog" window in a software application. The window has a title bar with the text "Clone Dialog" and standard window control buttons (minimize, maximize, close). The main area is divided into several sections:

- Clone Parameters:**
  - Clone ID: [Empty text box]
  - Date of Receipt: 23.10.2008
  - Notice Status: 24
  - Action Code:  Add  Mod  Sup
  - Category:  Notification
- External/Internal:**
  - External
  - Review
  - WithDraw
- Beams:**  All  None  Emitting  Receiving
- Groups:**  Yes  No
- Coordination:**  Yes  No
- Special Sections:**  Yes  No
- Straps:**  Yes  No
- Noise Gama:**  Yes  No
- BR Data:**
  - Coordination:  Yes  No
  - Special Sections:  Yes  No
  - Findings and Ref. Situation:  Yes  No
  - Notice and Grp Links:  Yes  No

At the bottom of the dialog are two buttons: "Ok" and "Cancel".

When using "Clone" command for creating a new Article 4 submission from an existing notice in the SPS database to be examined by GIBC, the Notice Status should be set to 24

Similarly when using "Clone" command for creating a new Article 4 submission from an existing notice in the SPS database to be examined by MSPACE, Reference Situation should not be kept



# SPS tools - MSpace

Select Plan/List which you want to analyse....

Please, choose a Plan, which you want to analyse from the list below (by clicking on the related row) and click on OK button

Plan_Id	Plan Description
A30B	WRC ORB-88 FSS Plan 6/4 AND 13/10-11 GHz Band (Appendix 30B)

Only one global Plan/List

Select Plan/List which you want to analyse....

Please, choose a Plan, which you want to analyse from the list below (by clicking on the related row) and click on OK button

Plan_Id	Plan Description
00DN	WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)
00UP	WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)
30_2	RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)

Three different Regional Plans/Lists

Networks/Assignments to be Considered:

All Networks/Assignments
  Those with Date of Receipt before:

All networks/assignments which are part of Plan/List (having status 50: St\_Cur field of NOTICE table) are always analysed independantly of their date of receipt.

OK Cancel

**SPS: Determination of Coordination Requirements' Software - MSPACeg (v5.6.0.1) WRC-2000 Regions 1 and ...**

File Query Options Help

**Input/Output**    Run-time Information    Compressed Report    Graphical Report

**Title of Analyses (from Input File)**

Input File Name (80 characters maximum)  
 SNS/SPS  
 Database with **C:\TEMP\sps\_all\_ific9999.mdb**    Choose type of Input File  
 Use Input Database  
 Use ASCII Input File  
 Plan's / List's Data

Output File Names (80 characters maximum)  
 Findings File **C:\TEMP\sps\_all\_ific9999.fnd**  
 Findings/Ref. Sit. DB **C:\TEMP\sps\_all\_ific9999.OUT.MDB**

Level of Detail for Output Report  
 Level 0 - Minimum Details     Level 1  
 Level 2     Level 3 (HUGE Report for One Beam only)

Study One Beam?  
 Analyse Complete Plan (all beams)  
 Analyse One Beam

Calculate Reference Situation for All Beams?  
 Yes  
 No

Options Related to Application of Orbital Separation Limit  
 Apply Orbital Separation Limit  
 Co-polar Orbital Limit (degrees) **9.0**  
 Cross-polar Orbital Limit (degrees) **9.0**

Applied Margin Degradation Limit (dB) **0.45**

**Start Analysis**

Add GIMS Database(s)

Container	DB Name	Path

Reading Order ↑

Add Antenna Library(s)

APL Id.	APL Name	APL File and Path

Study Options for Regions 1 & 3 Plans/Lists

# References and Explanatory Notes <sup>(1)</sup>

[Back](#)

<b>Assignment Type</b>	<p><b>A:</b> Incoming Article 4 under examination without Reference Situation.</p> <p><b>V:</b> Pending Article 4 network published in Part A - receives interference from other types of assignments but its interference caused from them is not taken into account.</p> <p><b>P:</b> Plan/List assignment.</p>
<b>EPM/OEPM</b>	<p><i><u>E</u>quivalent <u>P</u>rotection <u>M</u>argin</i></p> <p><i><u>O</u>verall <u>E</u>quivalent <u>P</u>rotection <u>M</u>argin</i></p>
<b>Pending Article 4 submissions</b>	<p>Article 4 submissions whose Appendix 4 information is received by the Bureau on or before the date of receipt of the incoming network.</p>

## References and Explanatory Notes <sup>(2)</sup>

[Back](#)

SPS\_ALL

*Space Plans' Systems Database*

Contains currently AP30/30A Plans, Lists, Article 4 and Article 2A assignments. Released each two weeks in the BR IFIC DVD. It can be downloaded from the following URL:

<http://www.itu.int/ITU-R/go/space-plans-ap30-30a/en>

SRS\_ALL

*Space Radiocommunications Stations Database*

Contains non-planned Spaces Services Notices. Released each two weeks in the BR IFIC DVD.

## BR Software Package SPS (Space Plans System)

# Introduction

Main Concepts



SPS Package



## SPS ?

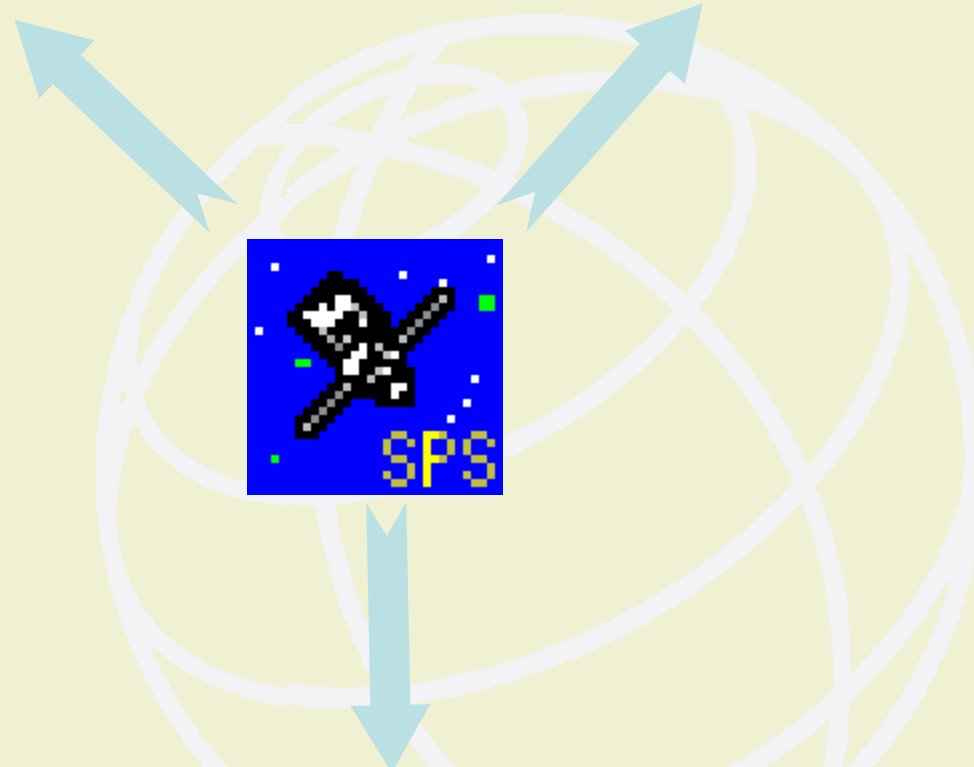
---

1. **Package of software programs to determine intra-service and intra-region coordination requirements for space networks of the planned services**
2. **Availability**
  - ✓ BR IFIC DVD
  - ✓ <http://www.itu.int/ITU-R/go/space-plans-ap30-30a/en>
    - Latest version
    - Latest data files
3. **Requires GIMS to be installed**
  - ✓ GIMS data up to date!
4. **Support**
  - ✓ MSPACE manual
  - ✓ Software related question: [brsas@itu.int](mailto:brsas@itu.int)

# When to use SPS?

**BSS Down Link R1&3 Plan**  
**Appendix 30**

**BSS Feeder Link R1&3 Plan**  
**Appendix 30A**



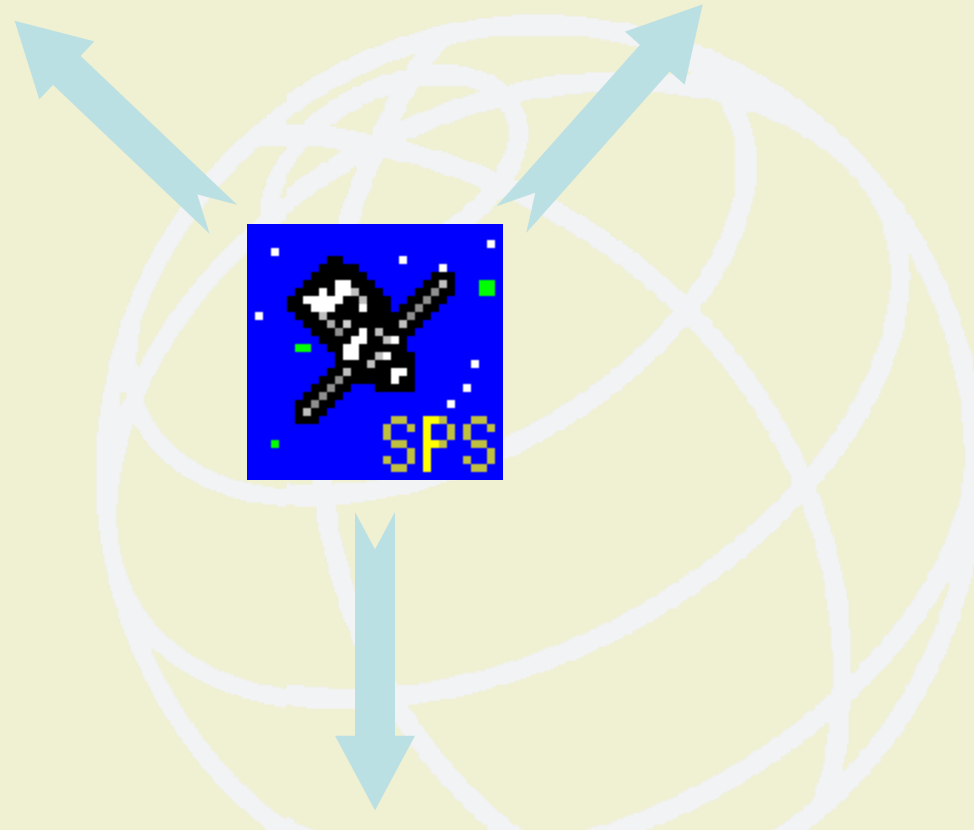
**Region 2 Plan**  
**Appendices 30/30A**



# What Is the Purpose of SPS?

**Coordination  
Requirements**

**Minimize  
Interference**

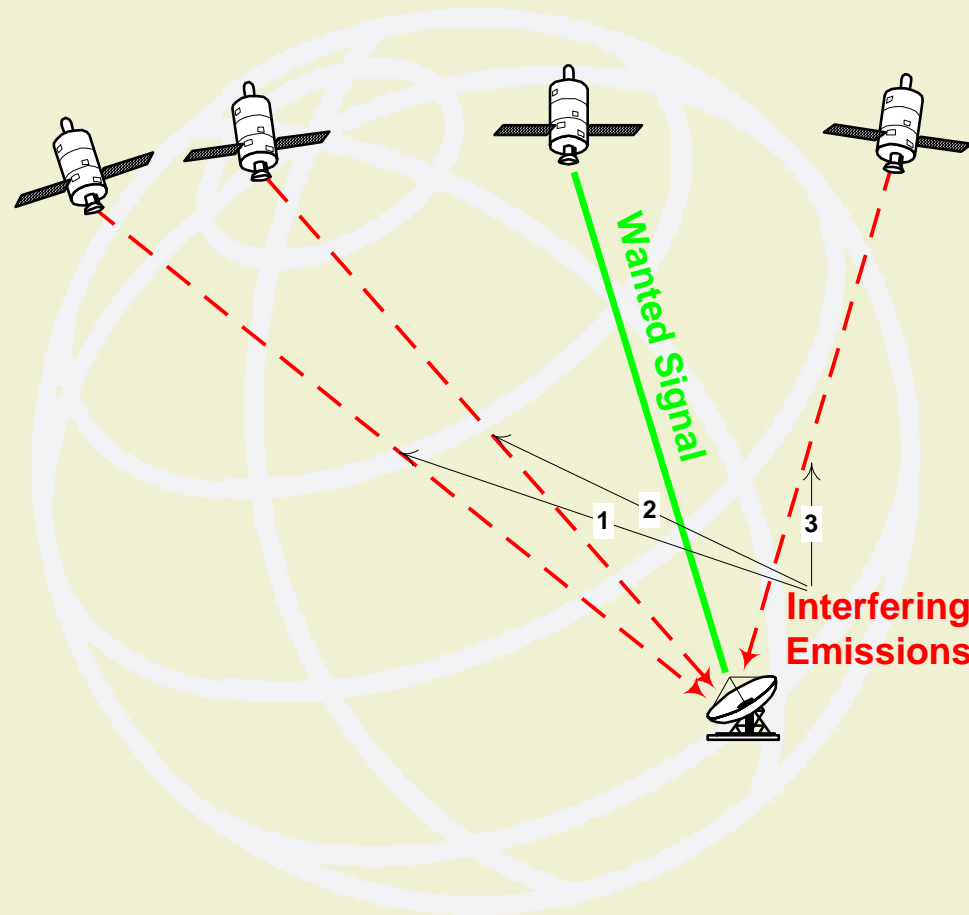


**What If Studies**

## Main Concepts

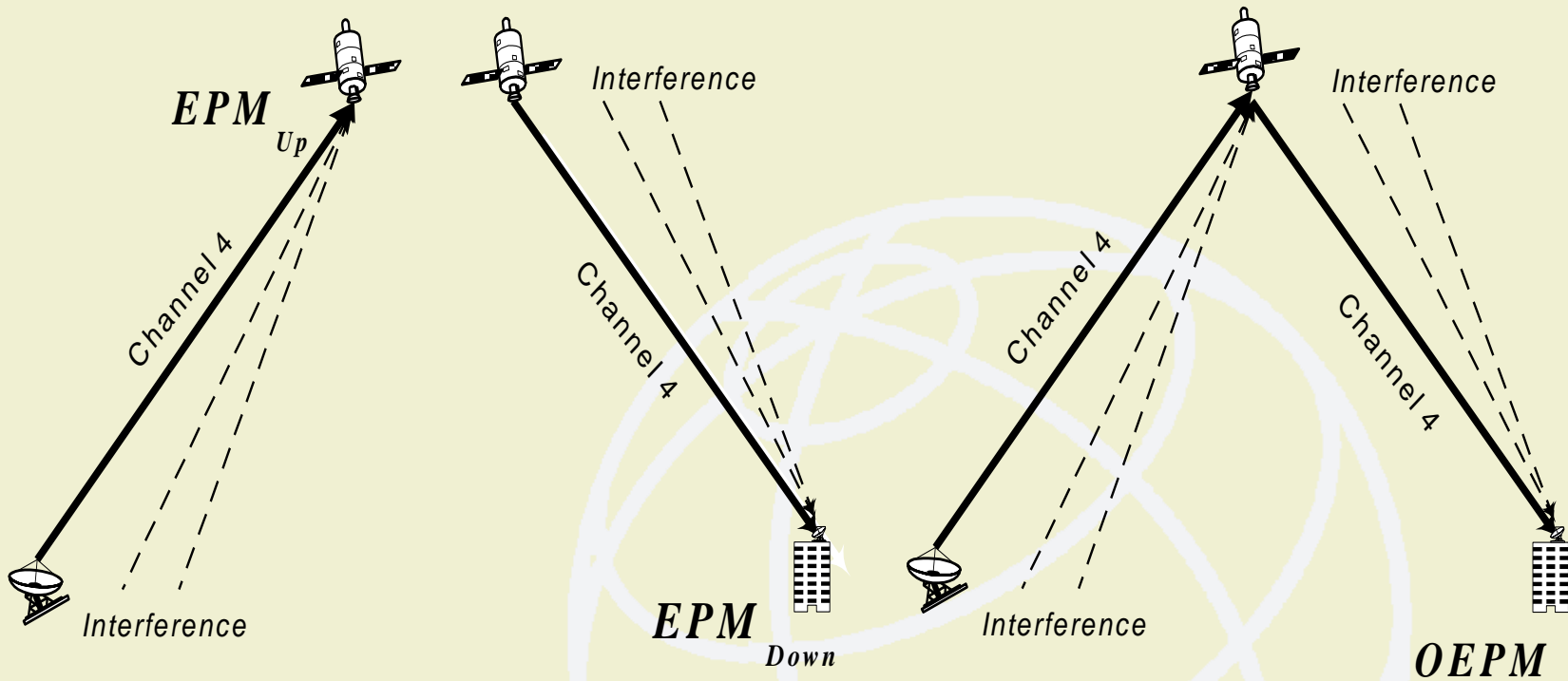


## Aggregate interfering effect from all interfering sources



Interferers are  
“existing” and  
“virtual”  
networks

# BSS Appendix 30/30A



**Regions 1 and 3 Approach**  
(separated links)

**Region 2 Approach**  
(overall link analyses)

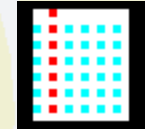
# Space Plans' System Software



**MSPACE**  
Parameter Input,  
calculation

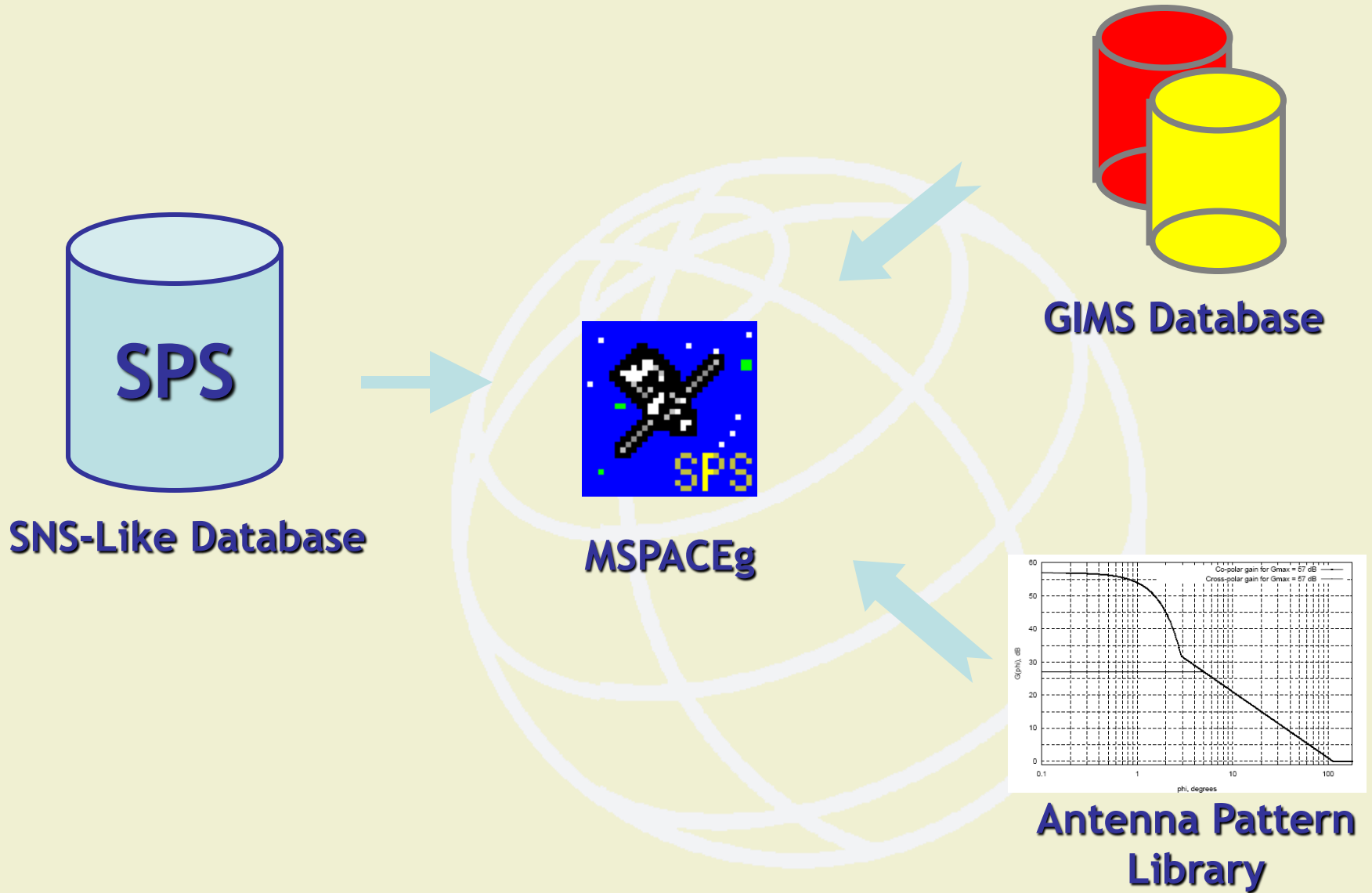


**BSS\_Margin**  
Update of reference  
situation (BSS)

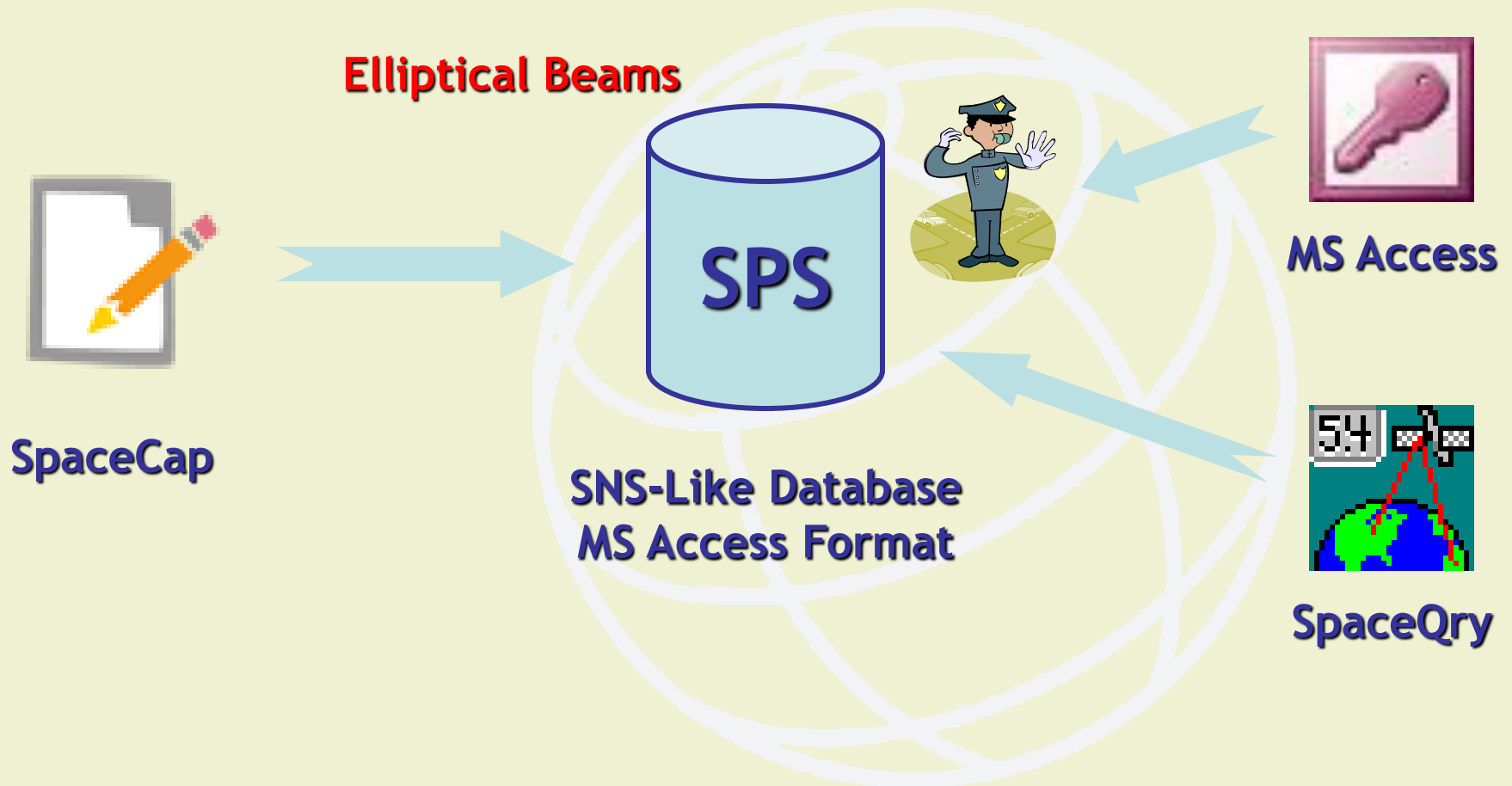


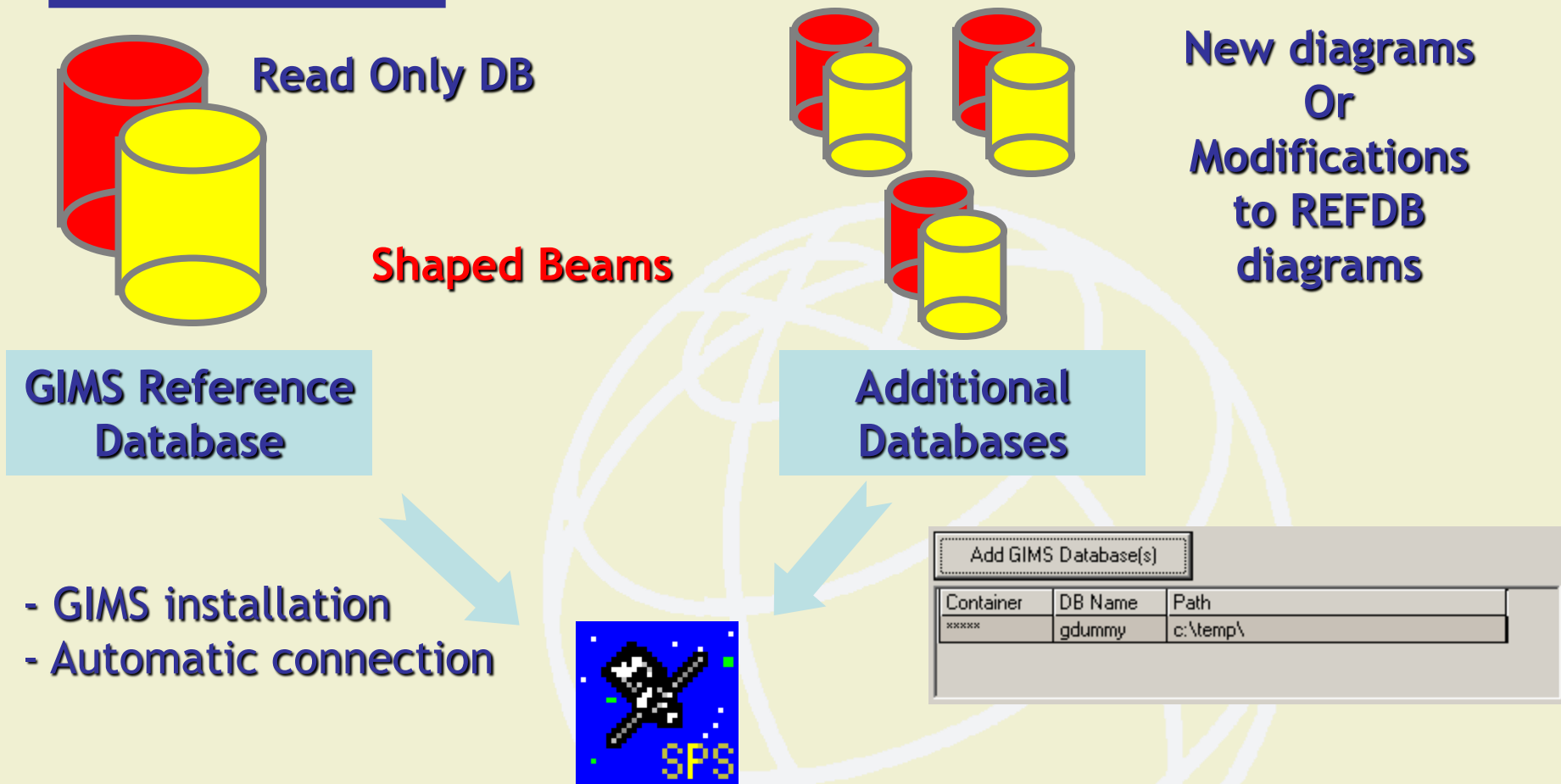
**SPS\_Reports**  
Reporting tool

# Space Plans' System Input



- Preferred editing tool of SPS database is SpaceCap



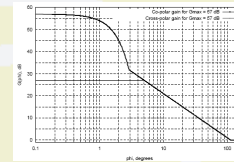
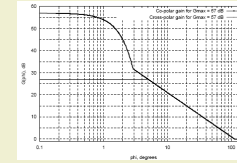
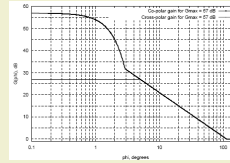
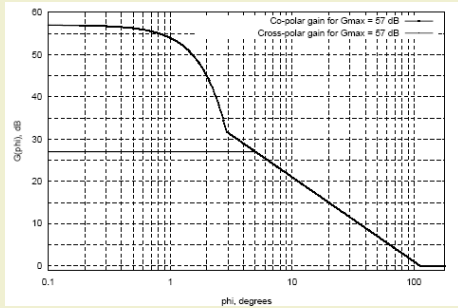


- GIMS installation
- Automatic connection

**SPS data must be matching diagram key elements: notice ID, notification reason, satellite name...**



# Space Plans' System Input (APL)



APL

Users' defined pattern



Add Antenna Library(s)

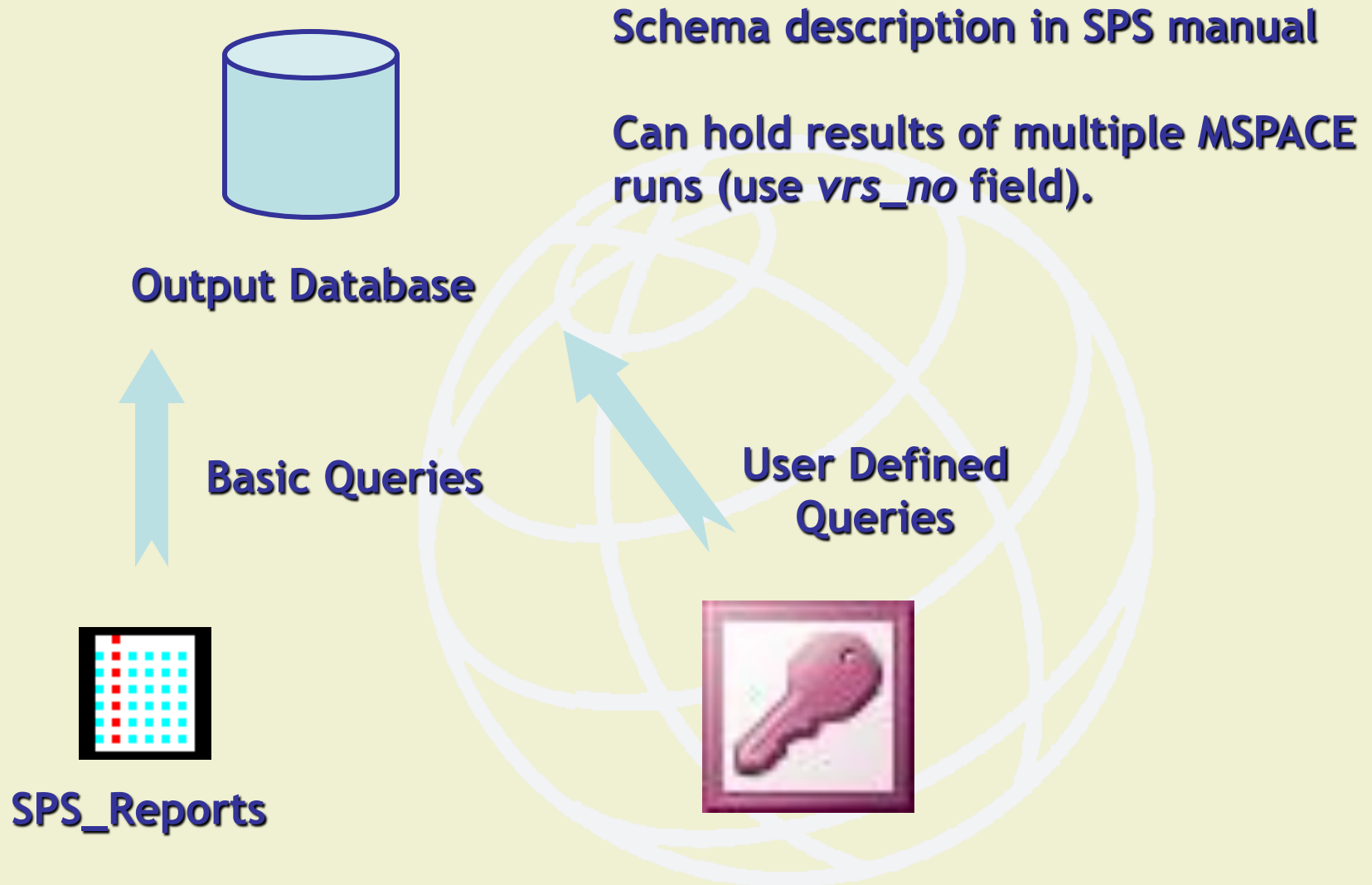
APL Id.	APL Name	APL File and Path

Programmatic mean of allowing SPS to use new antenna patterns.

# Space Plans' System Output



# Space Plans' System Output (DB)

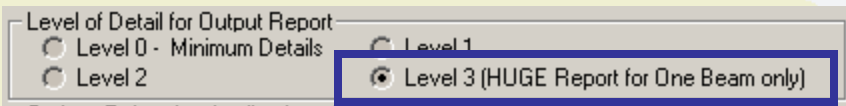
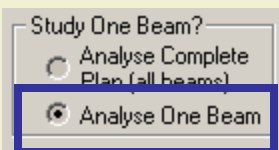


# Space Plans' System Output (Text)

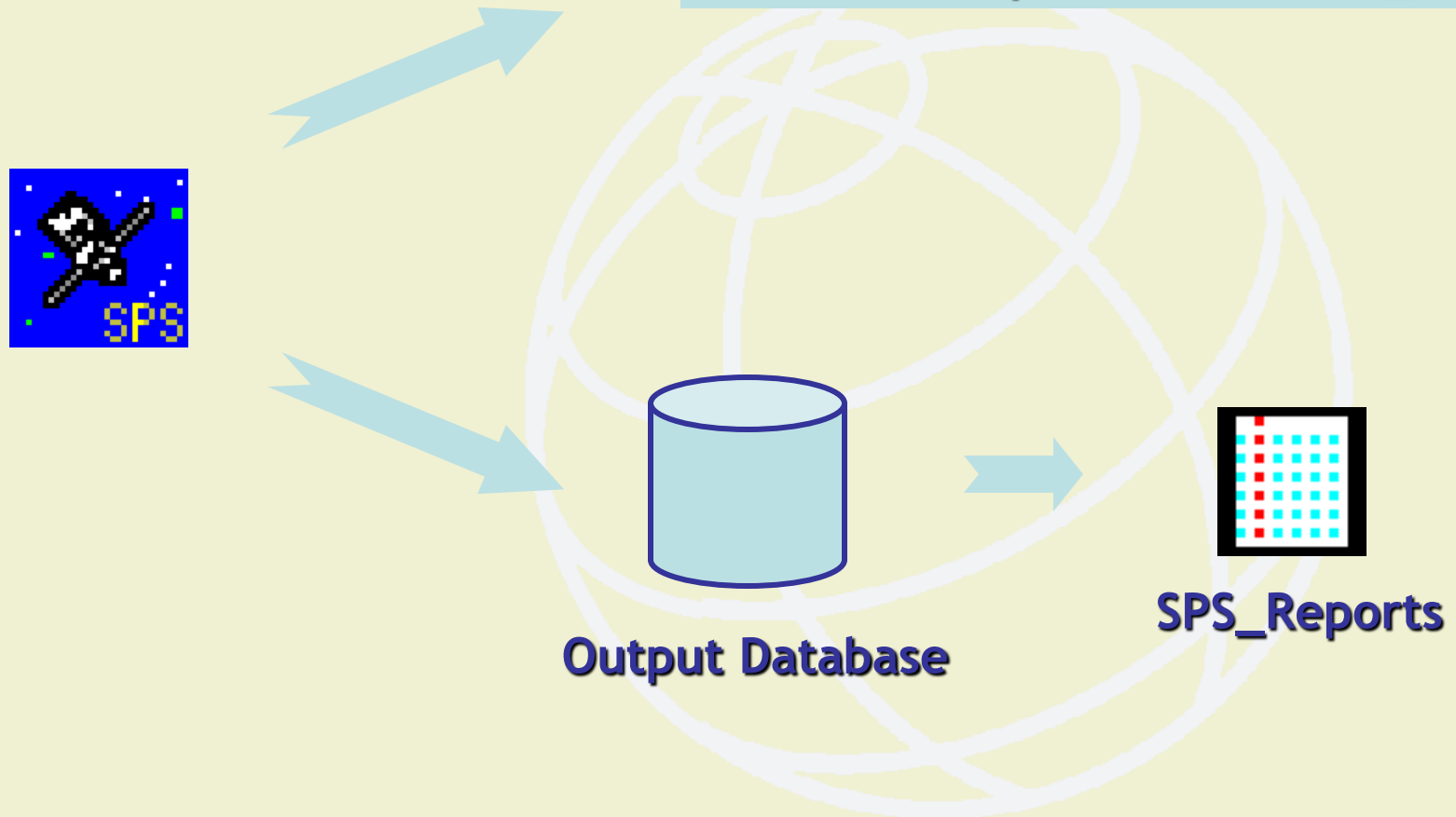


## Text Files

1. Findings File (.fnd)
  - ✓ All plans
  - ✓ Summary of affected beams
  - ✓ Error and warning messages
2. Detailed Report (.det)
  - ✓ Only for one beam analysis
  - ✓ Log intermediate values
  - ✓ Used mainly for debugging



## Runtime Reports in MSPACE\_G



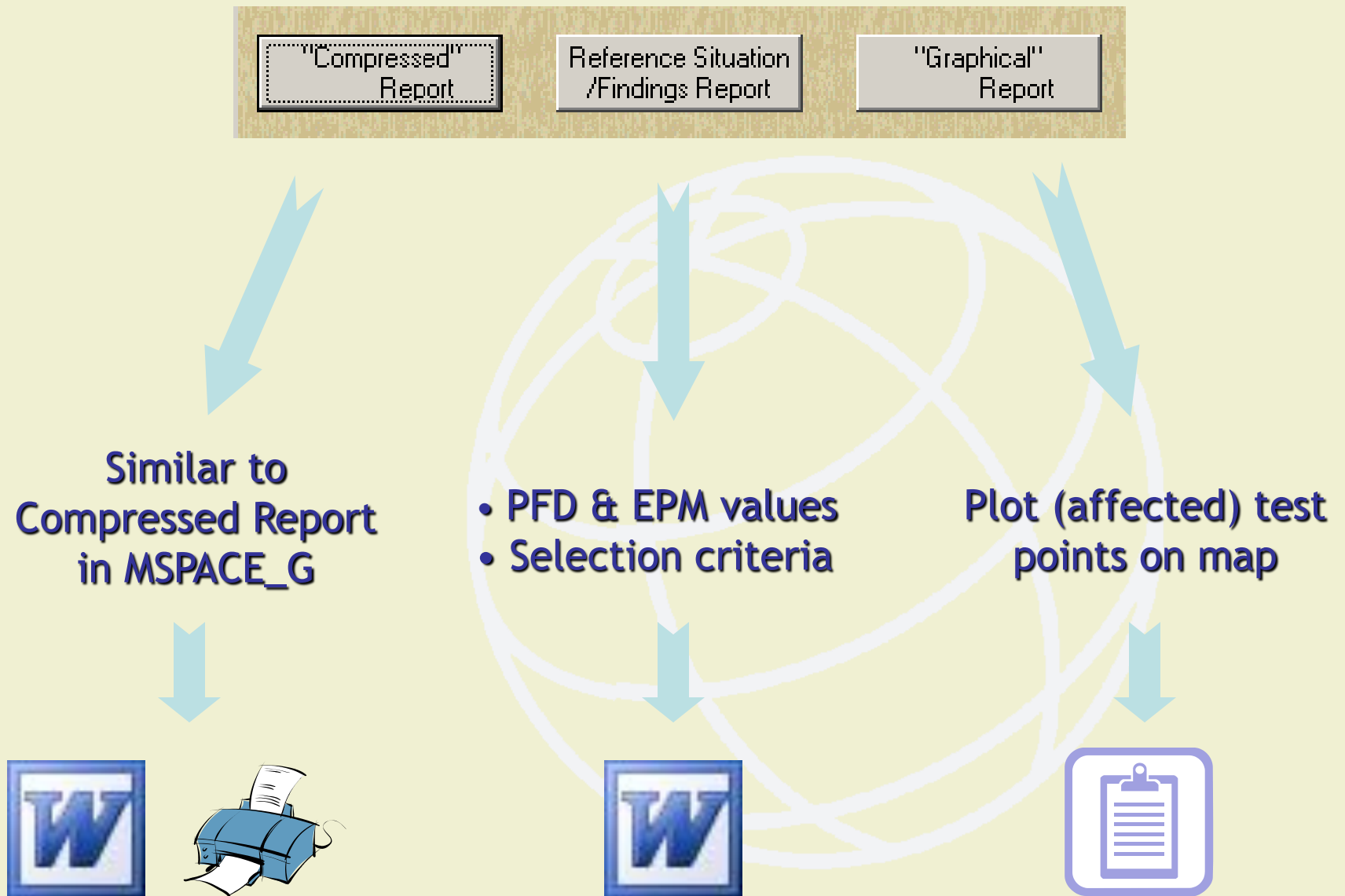
### 1. Compressed Report

- ✓ Built while MSPACEg is running
- ✓ Shows affected beams
- ✓ Print at the end of the run

### 2. Graphical Report

- ✓ At the end of the run
- ✓ Display affected test points
- ✓ Can copy map picture

# Reporting with SPS\_Reports



# .fnd File R1&3 BSS Downlink Analysis

MSPAGE Version 5.300 (MS Windows)  
 WRC-2000 Regions 1&3 BSS Down-link Plan/List

26.09.2006 08:16:25

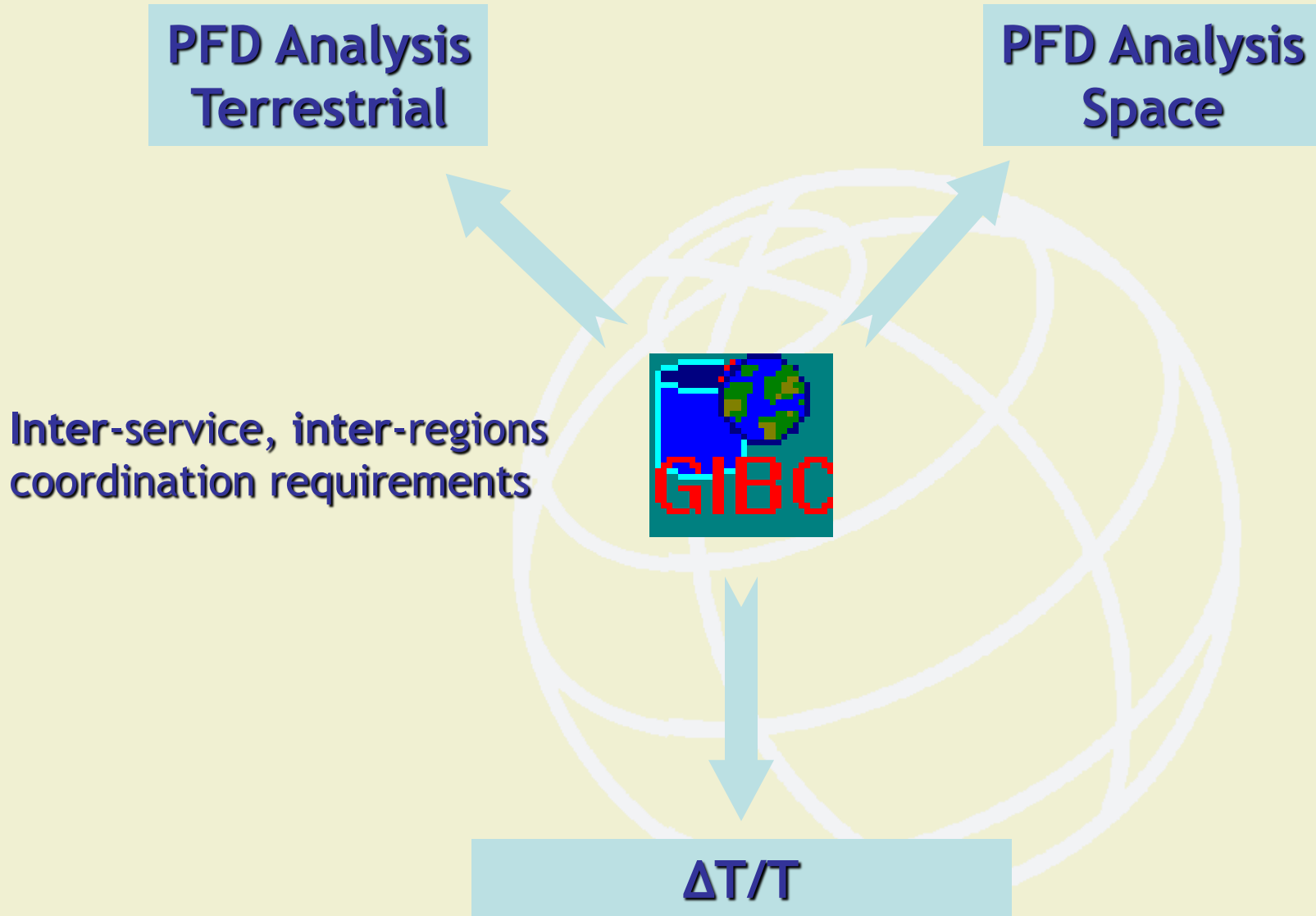
(Tolerance for margin degradation is 0.45 dB)

BEAM	CHN	TP	ADM	MARGIN	REFERENCE	DELTA
00000039	1	1	IRN	25.90	23.0390	-32.5681
00000039	1	2	IRN	25.90	21.0220	-32.5979
00000039	1	3	IRN	25.90	22.7020	-32.4860
00000039	1	4	IRN	25.90	17.4330	-32.6233
00000039	1	5	IRN	25.90	14.5160	-32.6350
00000039	1	6	IRN	25.90	21.3630	-32.4296
00000039	1	7	IRN	25.90	16.5890	-32.6012
00000039	1	8	IRN	25.90	21.1830	-32.4170
00000039	1	9	IRN	25.90	7.5220	-32.5587
00000039	1	10	IRN	25.90	8.6710	-38.3679
00000039	1	11	IRN	25.90	9.4510	-36.8587
00000039	3	1	IRN	25.90	22.8260	-32.4797
00000039	3	2	IRN	25.90	20.8090	-32.5095
00000039	3	3	IRN	25.90	22.4930	-32.4017
00000039	3	4	IRN	25.90	17.2180	-32.5329
00000039	3	5	IRN	25.90	14.3000	-32.5437
00000039	3	6	IRN	25.90	21.1570	-32.3483
00000039	3	7	IRN	25.90	16.3750	-32.5118
00000039	3	8	IRN	25.90	20.9770	-32.3356
00000039	3	9	IRN	25.90	7.3100	-32.4713
00000039	3	10	IRN	25.90	8.2320	-38.0545
00000039	3	11	IRN	25.90	9.0870	-36.6203
00000039	5	1	IRN	25.90	22.7310	-32.5049
00000039	5	2	IRN	25.90	20.7140	-32.5347
00000039	5	3	IRN	25.90	22.3970	-32.4259

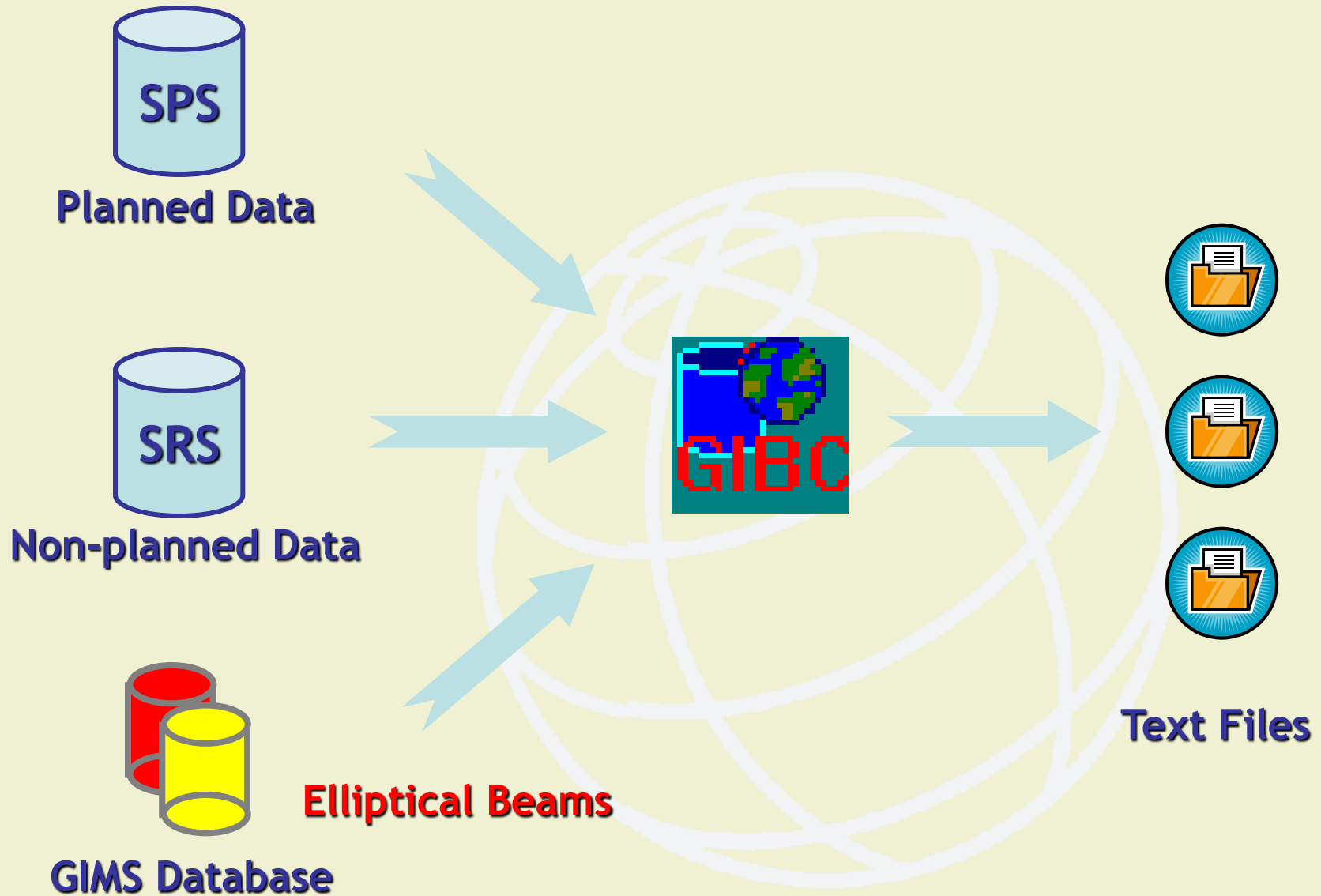


## BR Software Package GIBC (Graphical Interface for Batch Calculations)

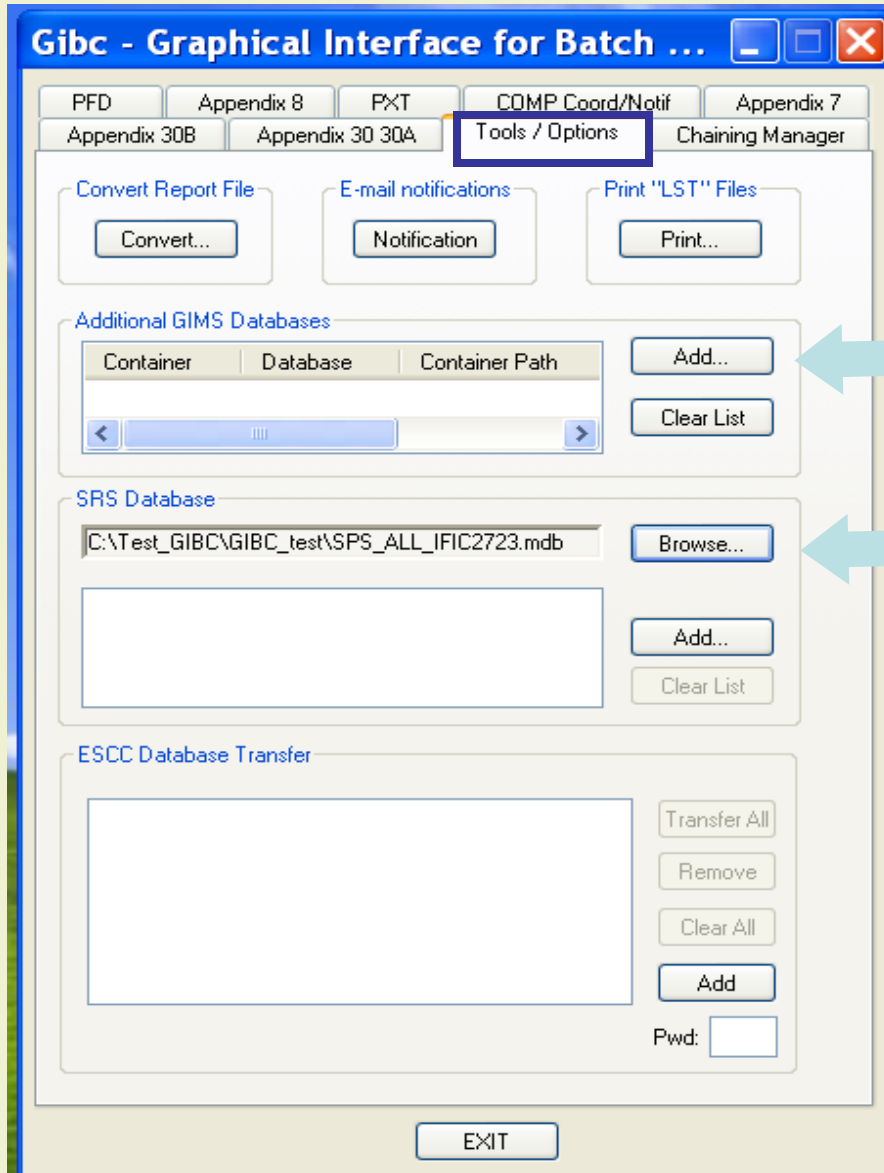
# What's the Purpose of GIBC?



# GIBC Input/Output



# AP30/30A Hard Limits Examination with GIBC/AP30-30A (1)



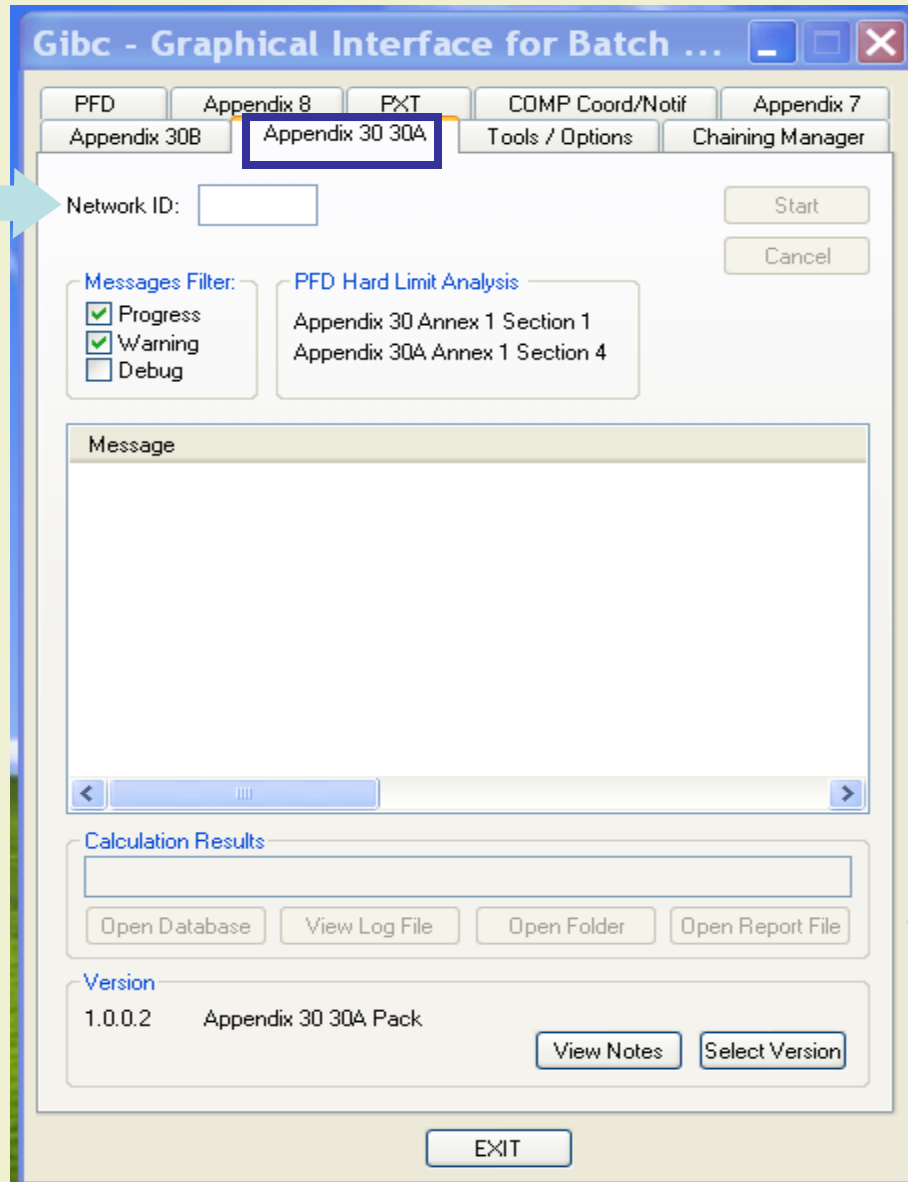
Click to connect to the GIMS data of the analyzed network (not required for an AP30A network)

Click to connect to the latest SPS\_ALL database which contains the analyzed network or SPS single database in case of an AP30A network

# AP30/30A Hard Limits Examination with GIBC/AP30-30A (2)

Enter Notice\_id of the analyzed network

3



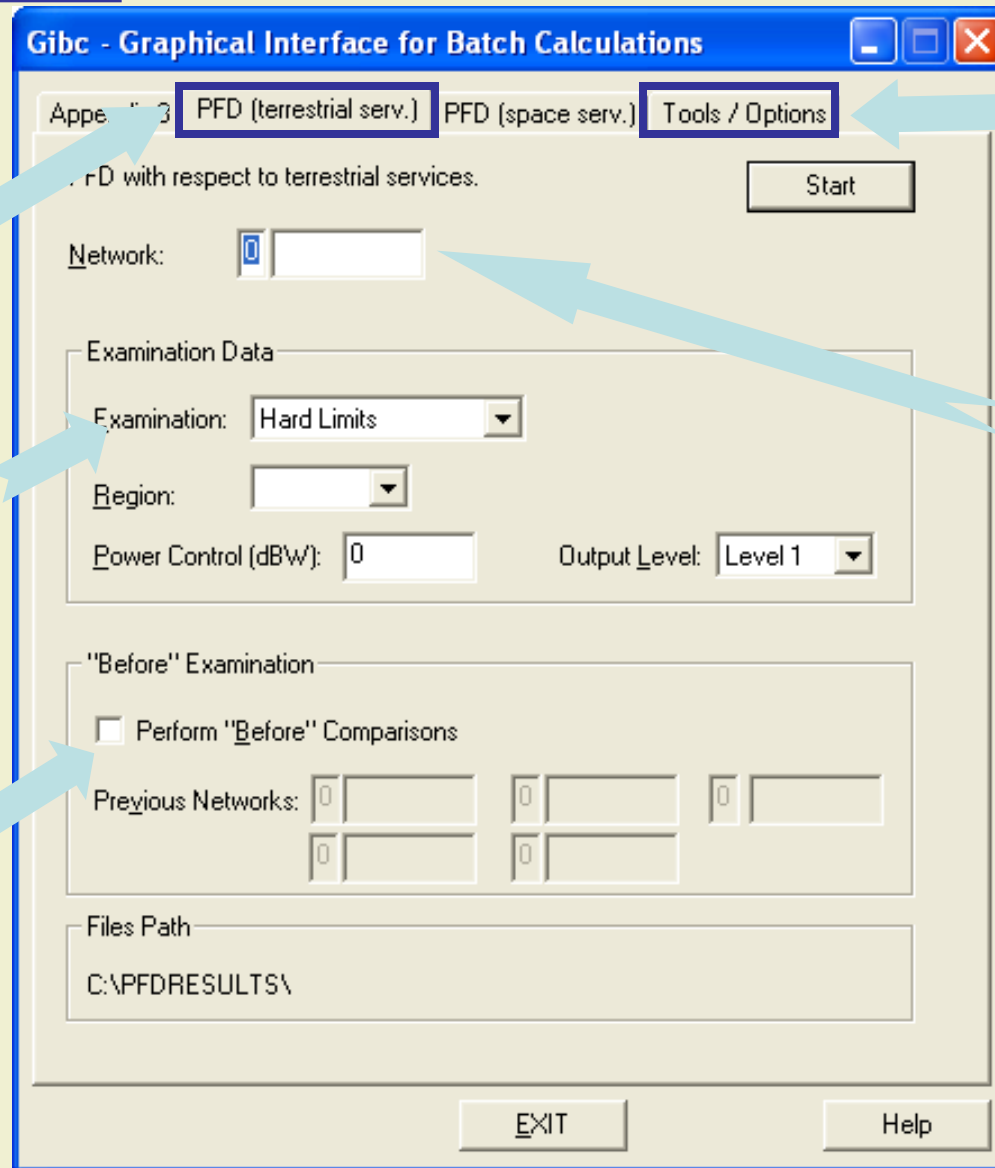
4

Click to run

5

Click to view the results

# Protection of Terrestrial Services



Select PFD (terrestrial)

Select Trigger Limits

ID of notice in corresponding plan

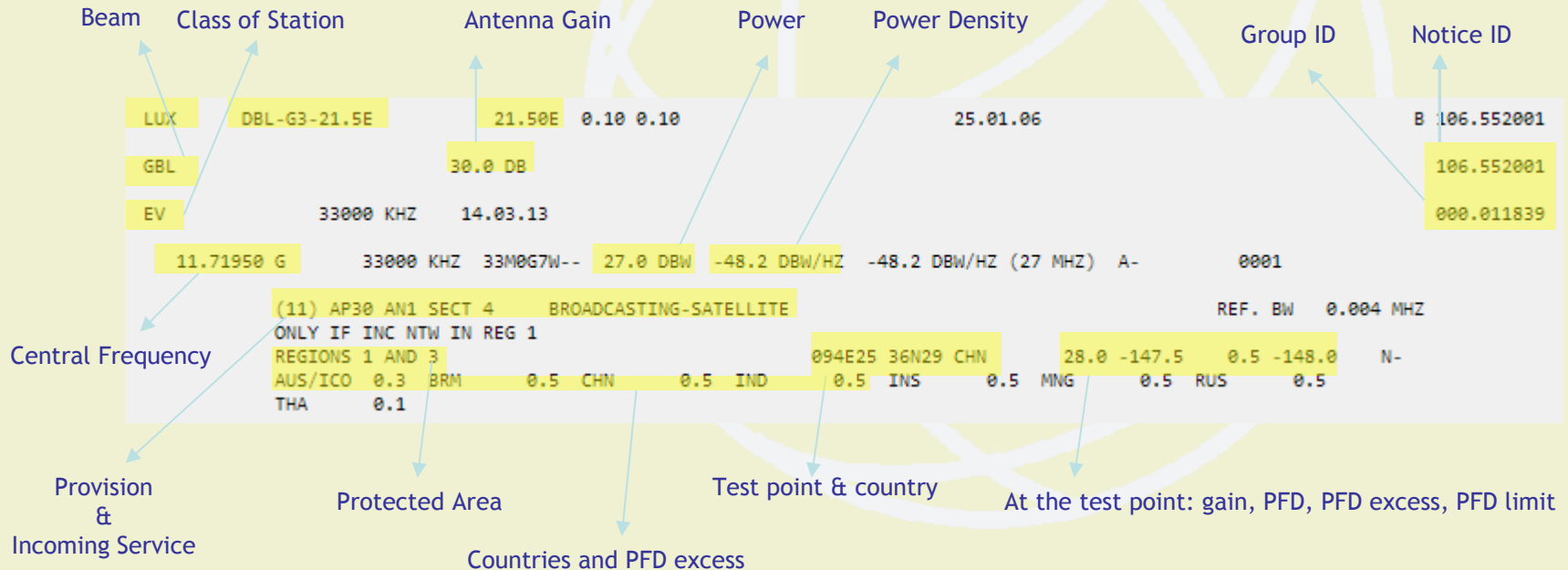
SPS DB path  
GIMS DBs

Type in ID of notice to examine

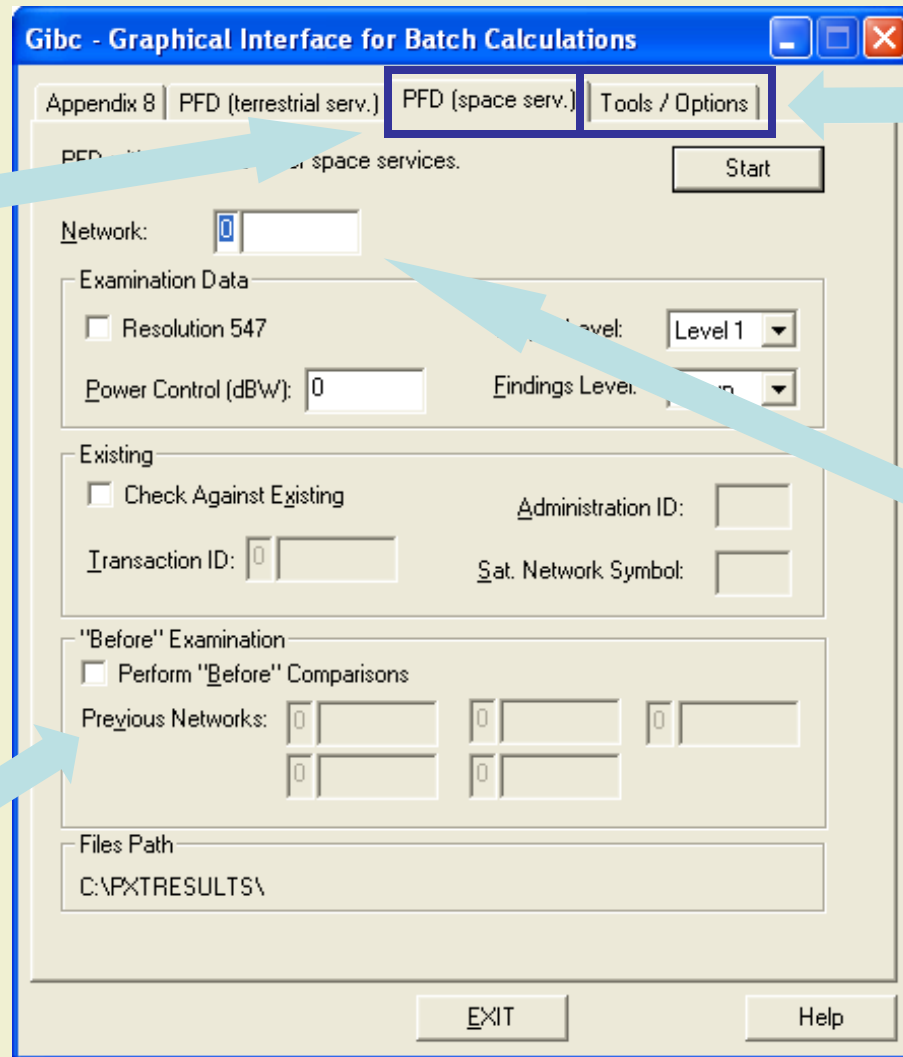
# Protection of Terrestrial Services

## 1. Output Files

- ✓ C:\PFDRESULTS\
- ✓ MSG.LST
  - Error messages
  - Always check !
- ✓ PFD.LST
  - Report file
  - Affected administrations



# Protection of Space Services



Select PFD  
(space serv.)

SPS DB path  
SNS DB path  
GIMS DBs

Type in ID of  
notice to  
examine

ID of notice in  
corresponding  
plan



# Protection of Space Services (PFD)

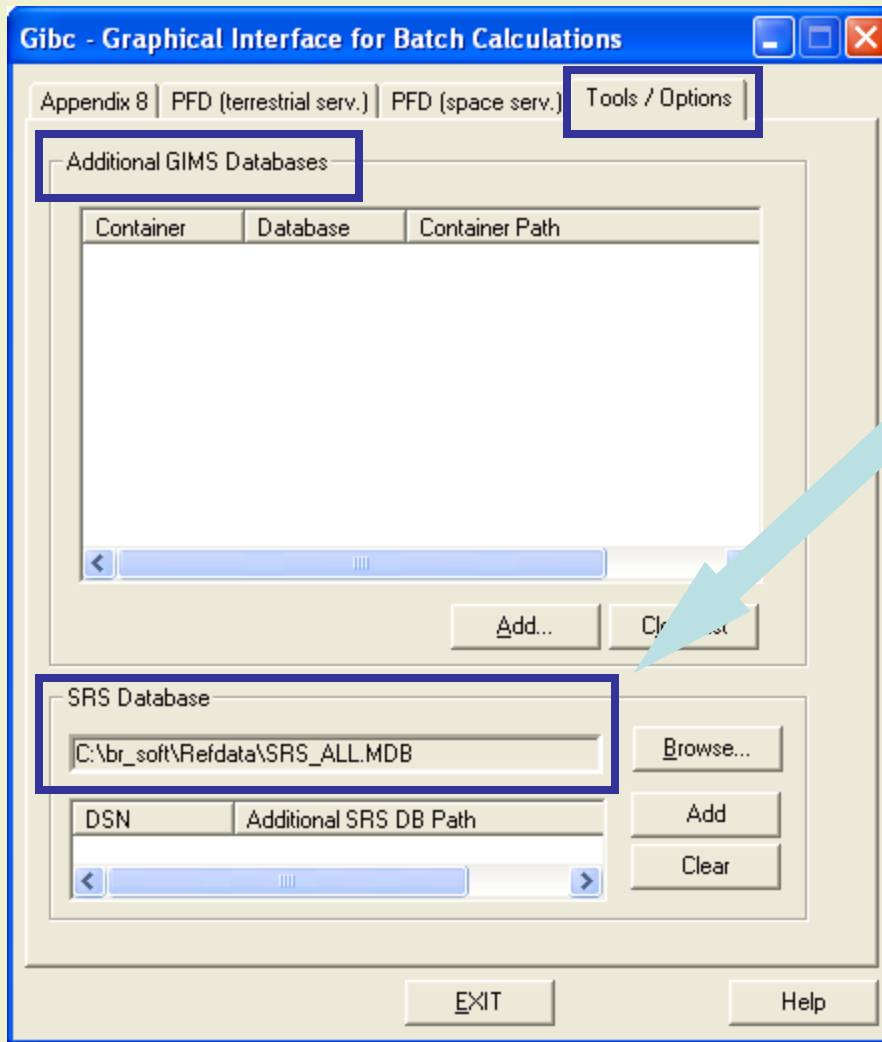
## 1. Output Files

- ✓ C:\PXTRESULTS\
- ✓ MSG.LST
  - Error messages
  - Always check !
- ✓ PXT.LST
  - Report file
  - Affected administrations

Beam	Administration	Sat. Name	Sat. Pos.	Gain	Central Frequency	Date of Receipt	ID of notice/group/assignment
Incoming	I S LUX TU3R	LUX-G4-8 EC M 36M0G7W--	31.50E 0.10 0.10 40.0 DB		11.95000 G	09.06.06	C106.520103/106.624481/0001
Existing	E S ARS/ARB ARAB1	ARABSAT BSS 6E EB LE 27M0G7W--	34.50E 0.10 0.10 35.0 DB		11.72748 G	26.04.05	T B105.552006/000.011420/0001
Class of Station	E E ARS	056E5212 23N2248 MODRES	-62.7 DBW/HZ -54.2 DBW/HZ -54.2 DBW/HZ		27000 K	2D: 26.04.05	
Provision & Service AP30 AN4 REGIONS 1 AND 3 Protected Area							
Affected test point & country 031E21 00509 UGA At test point: gain, PFD, PFD excess, PFD limit 40.00 -110.45 13.23 -123.69 A30#A4.1							
Date of protection 35.5 DB							
SNS PXT ANALYSIS REQUESTED BY : evrard DATE: 26/09/06 13:16:11 PAGE: 0002							
SUMMARY FOR TRANSACTION : C 106.520103 LUX-G4-8 LUX							
AP30 7.1 (ANNEX 4) ADMINISTRATIONS RECEIVING INTERFERENCE: CONCERNED ADM: ARS/ARB TU3R E G106.624481 11 GHZ :ARS/ARB							

Summary of affected administration

# GIBC Tool/Options

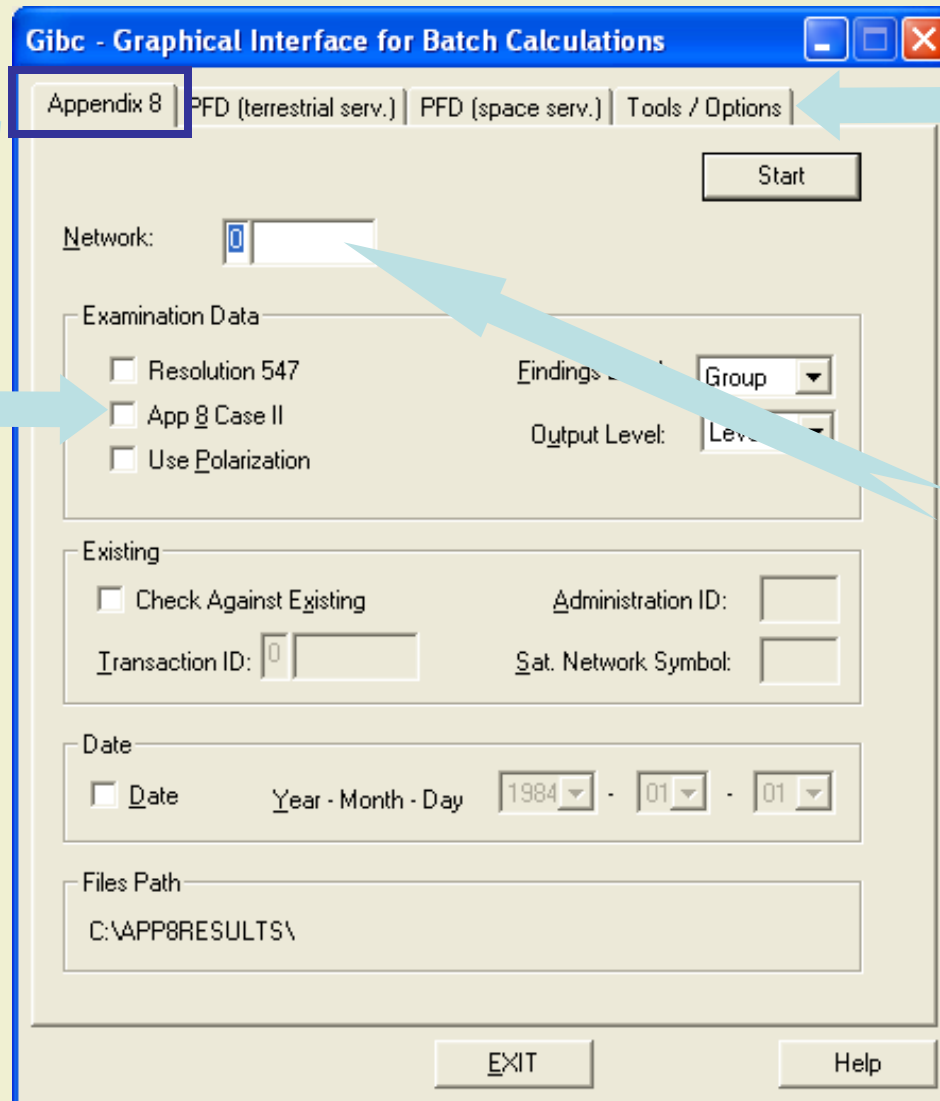


**Database that contains the network to analyze**

# Protection of Space Services ( $\Delta T/T$ )

Select Appendix 8

Activate Appendix 8 Case II



SPS DB path  
SNS DB path  
GIMS DBs

Type in ID of notice to examine

# Protection of Space Services ( $\Delta T/T$ )

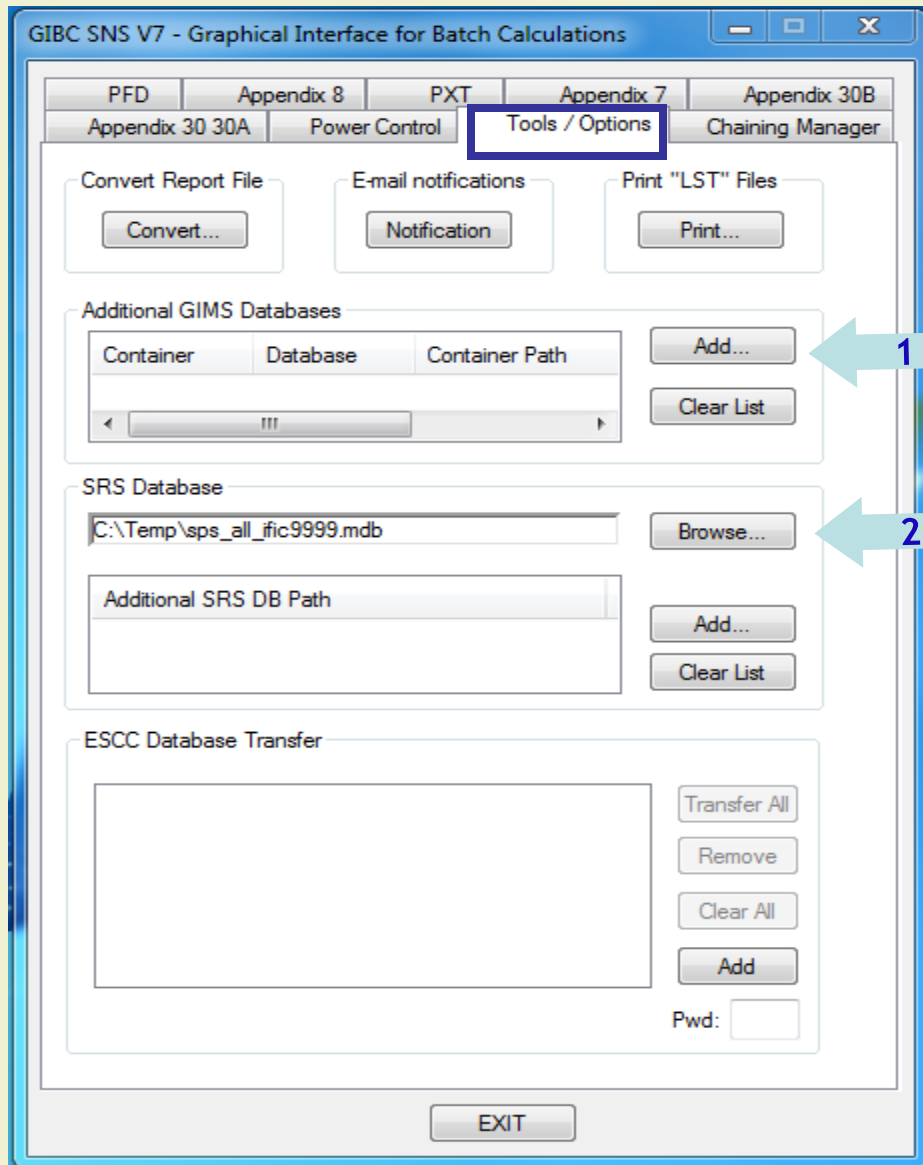
## 1. Output Files

- ✓ C:\APP8RESULTS\
- ✓ MSG.LST
  - Error messages
  - Always check !
- ✓ APP8.LST and APP8\_OPT.LST
  - Report file
  - Affected administrations

	Administration	Sat. Name	Power	Sat. Pos.	Gain	Central Frequency	Date of Receipt	$\Delta T/T$
		EXI UP-LINK IS AFFECTED			MANDATORY EXAMINATION			DT/TS = 5175.70 %
Inc.	I S D 170 1M00F9D--	IOMBSS-1 TTC EM CR	96.50W 50.0 DB	0.05 0.05	17.30600 G	12000 K	27.06.06	C000.000001/000.009598/0001 ID of notice/group/assignment
		50.0 DBW	50.0 DBW/HZ	-10.0 DBW/HZ (TOT. BW)	2D:	Date of protection		
Exi.	E S CAN SC1M 750KF2D--	USABSS-1M ED CR	100.00W 32.4 DB	0.05 0.05	17.30300 G	750 K	27.06.05	A B000.000002/000.009605/0001 DT/TS = 5175.70 %
		26.1 DBW	-33.9 DBW/HZ	-32.6 DBW/HZ (TOT. BW)	2D:			
	I E D	TT&C KA5.0 METER	095W5037	38N1832	REC-580	57.4 DB	14.4 DB	

Beam: I S D 170  
 Administration: IOMBSS-1 TTC EM CR  
 Sat. Name: IOMBSS-1 TTC  
 Power: 96.50W  
 Sat. Pos.: 0.05 0.05  
 Gain: 17.30600 G  
 Central Frequency: 12000 K  
 Date of Receipt: 27.06.06  
 $\Delta T/T$ : DT/TS = 5175.70 %  
 ID of notice/group/assignment: C000.000001/000.009598/0001  
 Date of protection: 2D:  
 Beam: E S CAN SC1M 750KF2D--  
 Administration: USABSS-1M ED CR  
 Sat. Name: USABSS-1M  
 Power: 100.00W  
 Sat. Pos.: 0.05 0.05  
 Gain: 17.30300 G  
 Central Frequency: 750 K  
 Date of Receipt: 27.06.05  
 $\Delta T/T$ : DT/TS = 5175.70 %  
 Date of protection: 2D:  
 Beam: I E D  
 Administration: TT&C KA5.0 METER  
 Sat. Name: TT&C KA5.0 METER  
 Power: 095W5037  
 Sat. Pos.: 38N1832  
 Gain: REC-580  
 Central Frequency: 57.4 DB  
 Date of Receipt: 14.4 DB  
 Associated earth station: REC-580

# GIBC/Power Control (only for R1&3 Feeder-link Plan/List) (1)



Click to connect to the GIMS data of the analyzed network

Click to connect to the latest SPS\_ALL database which contains the analyzed network

# GIBC/Power Control (only for R1&3 Feeder-link Plan/List) (2)



Enter Notice\_id of the analyzed network

3

GIBC SNS V7 - Graphical Interface for Batch Calculations

PFD Appendix 8 PXT Appendix 7 Appendix 30B  
Appendix 30 30A Power Control Tools / Options Chaining Manager

Network ID:

Start  
Cancel

Space Plan Selection  
 14GHz  17GHz

Plan Beam Selection  
Beam Name:

Channel Selection  
Channel:   Detailed Report

Test Point Selection  
Test Point:

Progress  Warning  Debug

Message

Calculation Results  
PWR\_CTRL.MDB  
Open Database View Log File Open Folder

Version  
1.0.0.1 Power Control Calculation Pack  
View Notes Select Version

EXIT

4

Click to run

5

Click to view the results

# GIBC/Power Control (only for R1&3 Feeder-link Plan/List) (3)



id	plan	StudiedBear	StudiedChar	StudiedTPN	RainAttenuation	PowerControlValue
1	1	1	2	0	1.812088	1.8
2	1	1	4	0	1.822359	1.8
3	1	1	6	0	1.832635	1.8
4	1	1	8	0	1.842915	1.8
5	1	1	10	0	1.8532	1.8
6	1	1	12	0	1.86349	1.8
7	1	1	14	0	1.873784	1.8
8	1	2	1	0	1.807989	1.8
9	1	2	3	0	1.818261	1.8
10	1	2	5	0	1.828539	1.8
11	1	2	7	0	1.838821	1.8
12	1	2	9	0	1.849109	1.8
13	1	2	11	0	1.859401	1.8
14	1	2	13	0	1.869698	1.8
15	1	3	1	0	1.808212	1.8
16	1	3	3	0	1.81892	1.8
17	1	3	5	0	1.829634	1.8
18	1	3	8	0	1.840353	1.8
19	1	3	10	0	1.851076	1.8
20	1	3	12	0	1.861805	1.8
21	1	3	14	0	1.872539	1.8

Calculated Power control values are stored in the “PowerControlValue” column of the “Power\_Control” table of the output database.