

Space Plans Workshop (AP30/30A)

Technical and Regulatory Examinations with related BR Software

Presented by:

ITU-R/Space Services Department
Space Notification and Plans Division



Committed to connecting the world



Outline

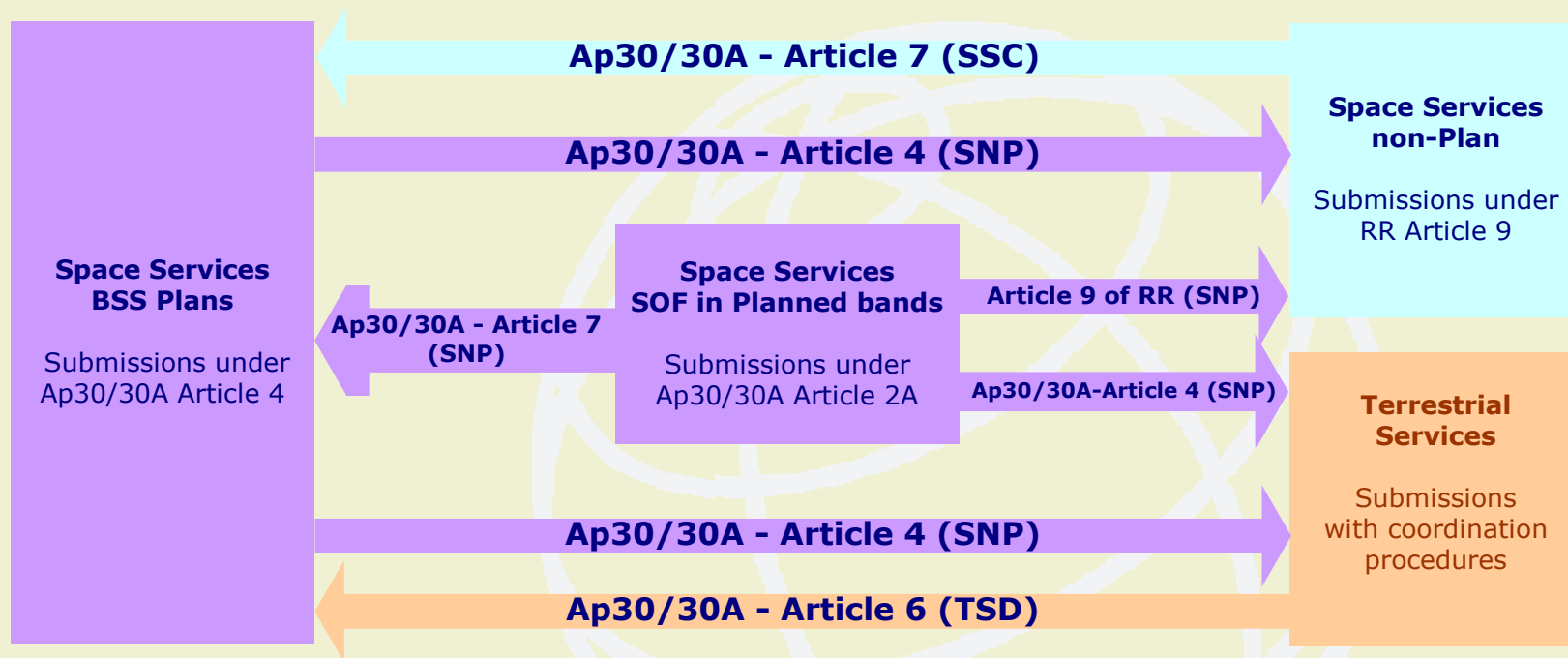
- ❑ Ap30/30A Technical Examinations in ITU-R: Who does what?
 - ❑ Protection Criteria
 - ❑ BR Software Packages SPS and GIBC
 - ❑ Exercises on Appendix 30 Article 4 networks:
 - I. Publication of Part A Special Sections
 - II. Publication of Part B Special Sections
 - ❑ Technical Examinations:
SOF in guard bands - Ap30/30A Art.2A
-



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- Ap30/30A Technical Examinations in ITU-R: Who does what?
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- Exercises on Ap30 Art.4 networks:
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Ap30/30A Technical Examinations in ITU-R: Who does what?



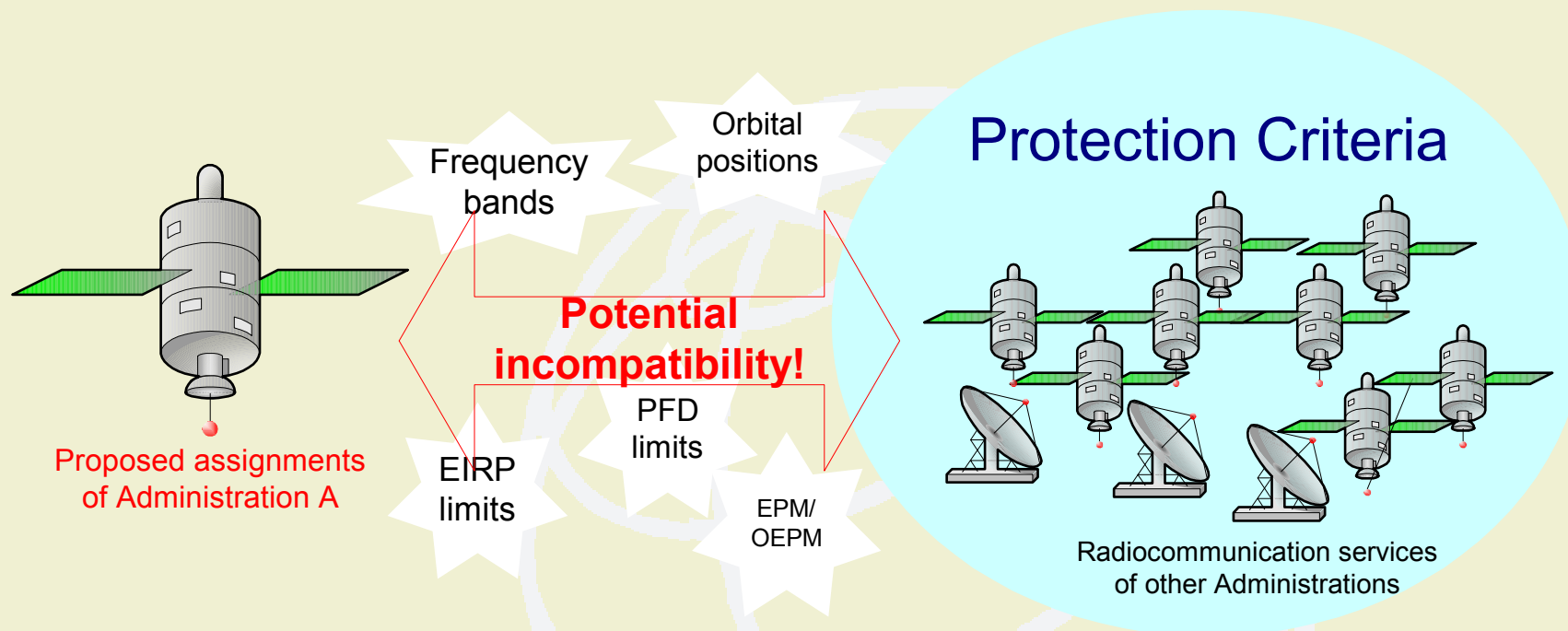
SNP: Space Notification and Plans division
SSC: Space Systems Coordination division
TSD: Terrestrial Services Department



Outline

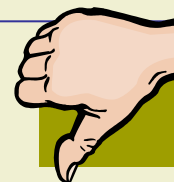
- ❑ Ap30/30A Technical Examinations in ITU-R: Who does what?
- ❑ **Protection Criteria**
- ❑ BR Software Packages SPS and GIBC
- ❑ Exercises on Ap30 Art.4 networks:
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Protection Criteria Concept



Protection Criteria Categories

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



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What Is the Purpose of SPS?

**Coordination
Requirements**

**Minimize
Interference**



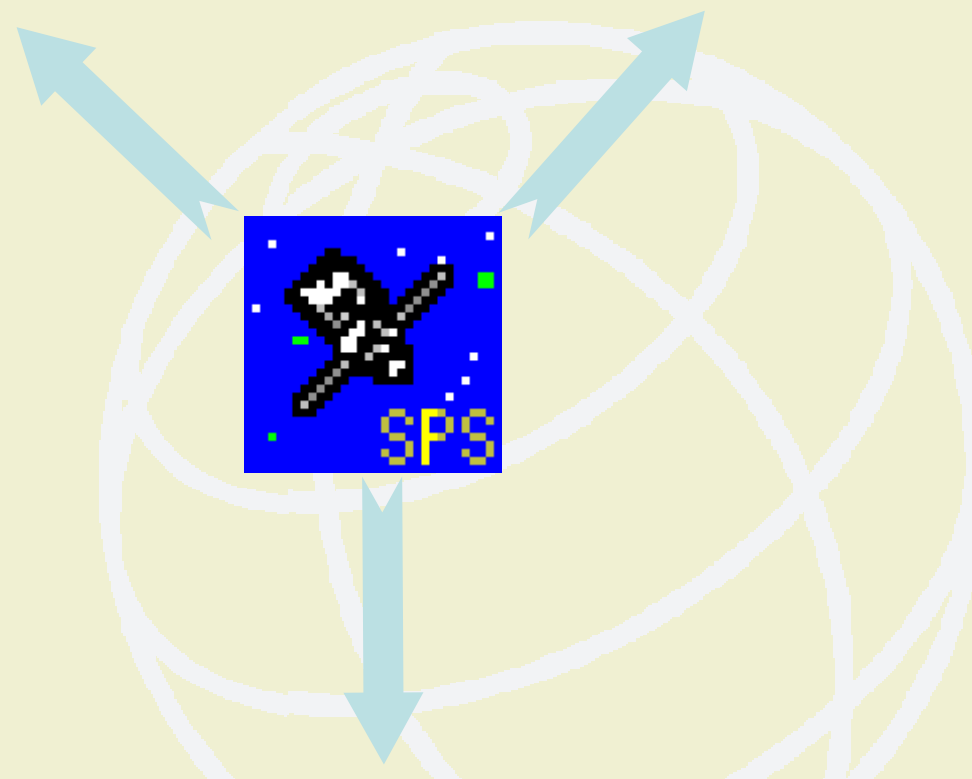
What If Studies



When to use SPS?

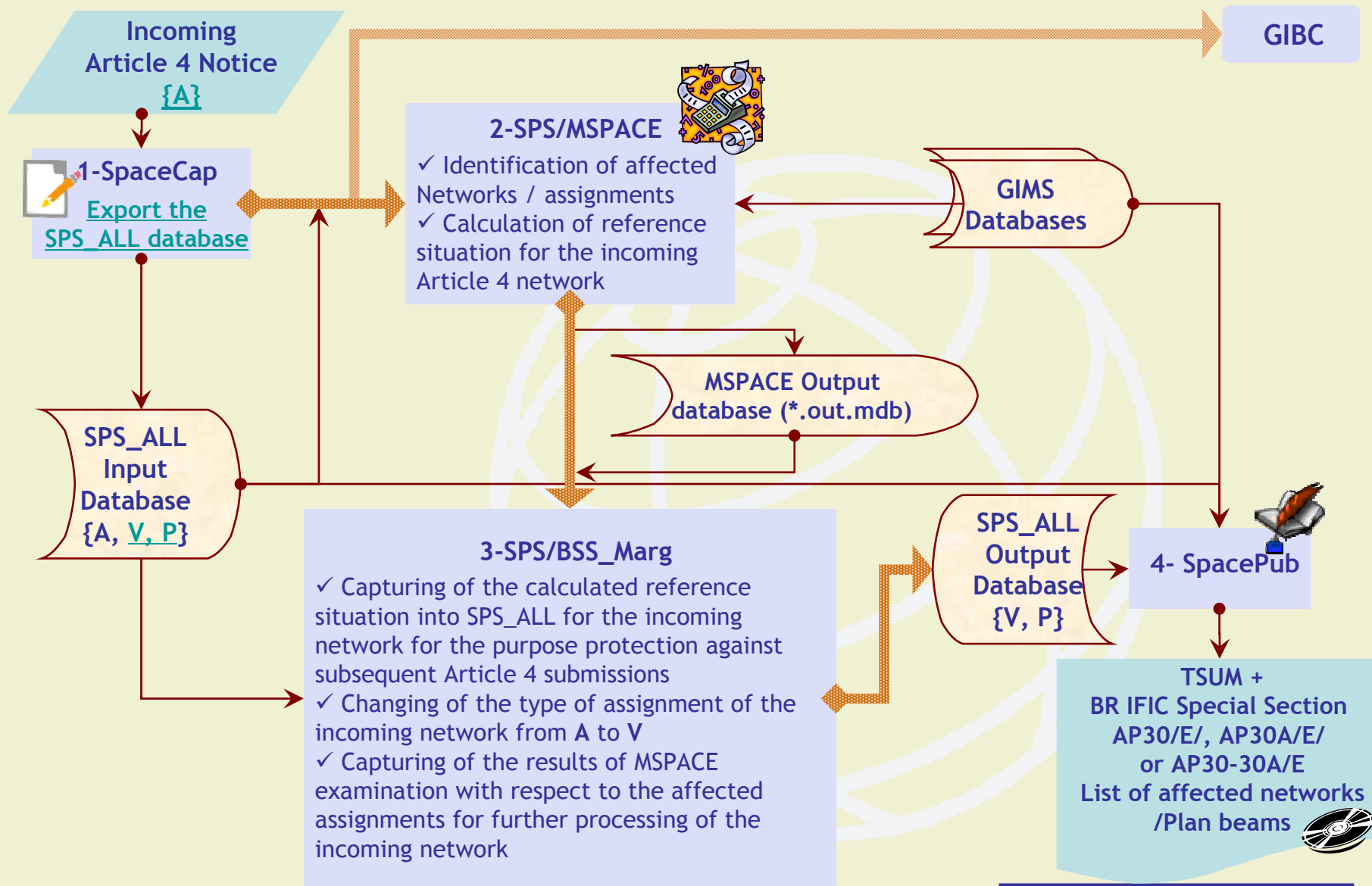
BSS Down Link R1&3 Plan
Appendix 30

BSS Feeder Link R1&3 Plan
Appendix 30A



Region 2 Plan
Appendices 30 & 30A

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





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What's the Purpose of GIBC?

**PFD Analysis
Terrestrial**

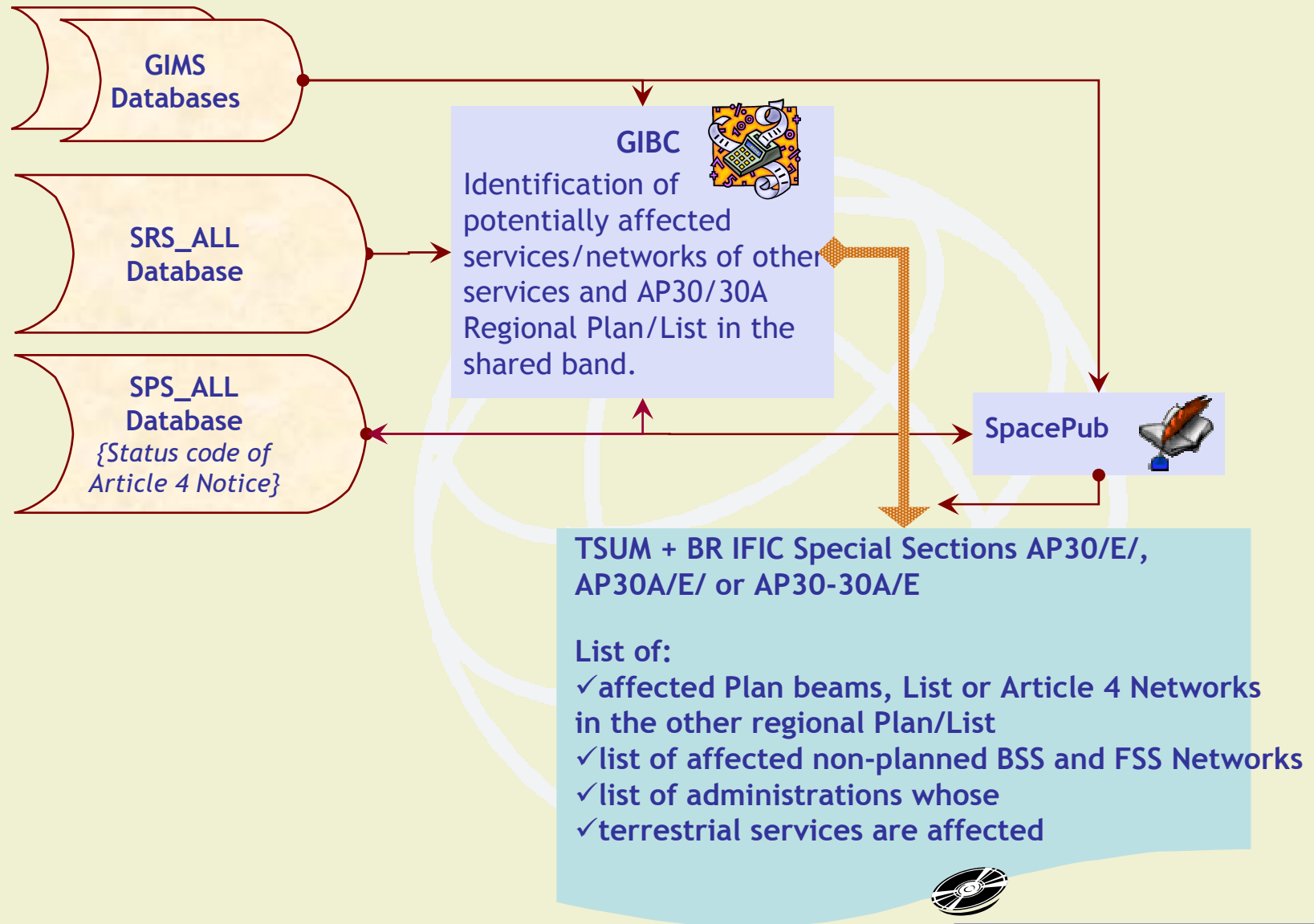
**PFD Analysis
Space**

**Inter-service, Inter-region
coordination requirements**



$\Delta T/T$

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





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Exercise I : Reporting (1)

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 CD-ROM.

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)

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)



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 less administrations are affected [Sample MSPACEg Software Output Report Files](#)

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



Exercise II: SPS Package application - Part B analysis (2)

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)

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. Add GIMS.mdb and cb.mdb
 5. Start the analysis and leave the analysis description empty
 6. When the analysis is completed, go to the Compressed Report tab
 7. Check the option PFD and EPM
 8. Create a draft of Special Section (in RTF format)
 9. You can compare results with those of Exercise I
-



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

Startup GIBC to calculate new interference

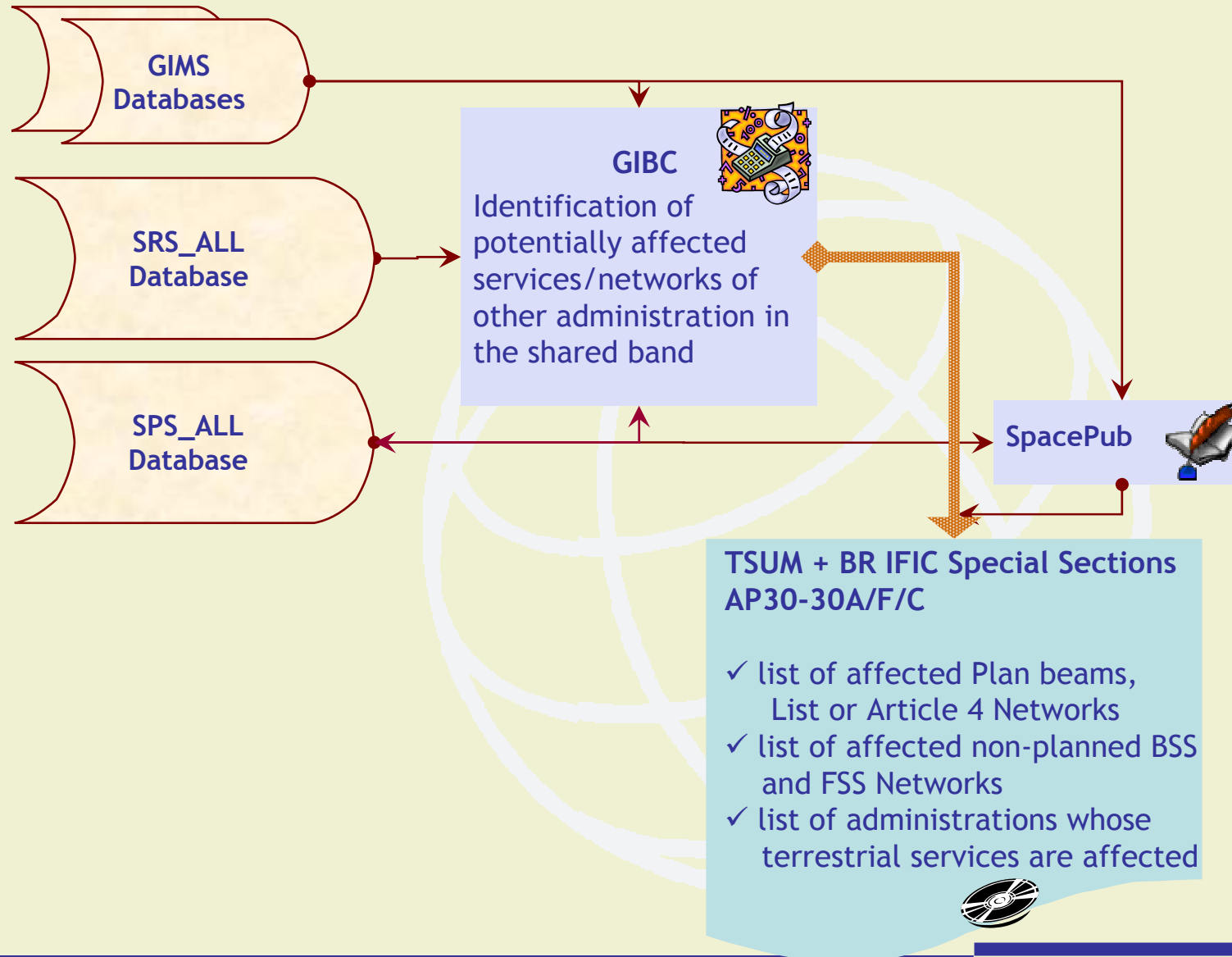
1. Go to the tab PFD (Terrestrial serv.)
 - Type in the network ID: 97552999
 - Select *Triggers* as the Examination
 2. Go to the tab Tools/Options
 - As the SRS Database, select *SPS_ALL_IFIC9999.mdb* in the folder *\Exercise II*
 - As Additional GIMS Databases, choose *gims.mdb* and *cb.mdb* in *\Exercise 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*
-



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- ❑ **Technical Examinations:
SOF in guard bands - Ap30/30A Art.2A**

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



Any questions?

About Space Plans

Main contact point:

Mitsuhiro.Sakamoto@itu.int

Software:

briap-sts@itu.int

Annexes

- ❑ 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

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

Tech. Exam. at different Stages of Article 4 Networks



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



Examination of Part B submissions (Art.4 of Ap30/30A)



- ✓ 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

- ✓ 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 3	Planned Band BSS Downlink ⇔ 11.7 - 12.5 GHz 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	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	PFD and 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	SPS PACKAGE (<i>MSPACEg</i> and <i>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 ⁽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 c)	Section 3	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	GIBC-PFD (Space) using GIMS and SPS databases Output Report File Name: PXT.LST Protected area: - Service area represented by a set of maximum 20 test points
4.2.3 a) 4.2.3 b)	1 st mask			1	
4.2.3 f)	2 nd mask		3	Non-planned BSS Downlink Assignments ⇔ 12.5 - 12.7 GHz	

Appendix 30 Coordination Trigger Limits - GIBC Package ⁽²⁾



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	1	Terrestrial Services ⇔ 11.7 - 12.5 GHz	GIBC-PFD (Terrestrial) using GIMS and SPS databases and the latest updated PFD extract file (bss_sstn.dat) Output Report File Name: PFD.LST 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	11.7 - 12.1 GHz 12.2 - 12.7 GHz	
			3	11.7 - 12.7 GHz	

Appendix 30 Coordination Trigger Limits - GIBC Package ⁽³⁾



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	2	FSS Downlink ⇔ 11.7 - 12.2 GHz	GIBC-PFD (Space) using GIMS, SPS and SRS databases Output Report File Name: PXT.LST Protected area: Service area
	1 st mask			SOF Downlink ⇔ Region2 Lower Guard Band: 12.200 - 12.212 GHz	
	1 st or 2 nd mask		3	FSS Downlink ⇔ 12.2 - 12.5 GHz	
	1 st mask			SOF Downlink ⇔ Region3 Upper Guard Band: 12.189 - 12.200 GHz	

Appendix 30 Coordination Trigger Limits - GIBC Package ⁽⁴⁾



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 st mask	PFD Mask as a function of orbital Separation Angle	1	FSS Downlink ⇔ 12.5 - 12.7 GHz SOF Downlink ⇔ Region1 Upper Guard Band: 12.489 - 12.500 GHz	GIBC-PFD (Space) using GIMS, SPS and SRS databases Output Report File Name: PFD.LST Protected area: Service area
	1 st or 2 nd mask 1 st mask		3	FSS Downlink ⇔ 12.2 - 12.7 GHz SOF Downlink ⇔ Region3 Upper Guard Band: 12.189 - 12.200 GHz	
	Section 7	Δ_T/T	1	FSS Uplink ⇔ 12.5 - 12.7 GHz	GIBC-Appendix 8 , Case II using GIMS, SPS and SRS databases Output Report File Name: APP8.LST Protected area: Feeder-link receiving space station on its Service area

Appendix 30A Coordination Trigger Limits - GIBC Package ⁽⁵⁾



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	Δ_T/T	2	BSS Feeder-link Assignments of Plan, List and pending Article 4 networks ⇔ 17.3 - 17.8 GHz	<i>GIBC-Appendix 8</i> , Case I using GIMS and SPS databases Output Report File Name: <i>APP8.LST</i> 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 ⁽⁶⁾



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	Δ_T/T	2	Non-planned BSS Feeder-link Assignments ⇔ 17.8 - 18.1 GHz	<i>GIBC-Appendix 8</i> , Case I using GIMS, SPS and SRS databases
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 - 17.31398 GHz 18.089 - 18.100 GHz	
			2	<u>SOF</u> Feeder-link ⇔ Region 2 Lower and upper Guard Bands: : 17.300 - 17.312 GHz 17.788 - 17.800 GHz	Protected area: Feeder-link receiving space station on its Service area

Appendix 30 Coordination Trigger Limits - GIBC Package (7)



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 - 11.71398 GHz 12.489 - 12.500 GHz	GIBC-PFD (Terrestrial) using GIMS and SPS databases and the latest updated PFD extract file (bss_sstn.dat) Output Report File Name: PFD.LST 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 - 11.71398 GHz 12.189 - 12.200 GHz	

Appendix 30 Coordination Trigger Limits - GIBC Package (8)



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 ⇔ Region 1 Lower and Upper Guard Bands: 11.700 - 11.71398 GHz 12.489 - 12.500 GHz	GIBC-PFD (Terrestrial) using GIMS and SPS databases and the latest updated PFD extract file (bss_sstn.dat) Output Report File Name: PFD.LST 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
	1 st mask				
	3 rd mask				
	1 st or 2 nd mask		3	Region 3 Lower and Upper Guard Bands: 11.700 - 11.71398 GHz 12.189 - 12.200 GHz	

Appendix 30A Coordination Trigger Limits - GIBC Package ⁽⁹⁾



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	Δ_T/T	2	Non-planned BSS Feeder-link Assignments ⇔ 17.8 - 18.1 GHz	<i>GIBC-Appendix 8</i> , Case I using GIMS, SPS and SRS databases
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 - 17.31398 GHz 18.089 - 18.100 GHz	
			2	<u>SOF</u> Feeder-link ⇔ Region 2 Lower and upper Guard Bands: : 17.300 - 17.312 GHz 17.788 - 17.800 GHz	Protected area: Feeder-link / Uplink receiving space station on its Service area

Appendix 30A Coordination Trigger Limits - GIBC Package ⁽¹⁰⁾



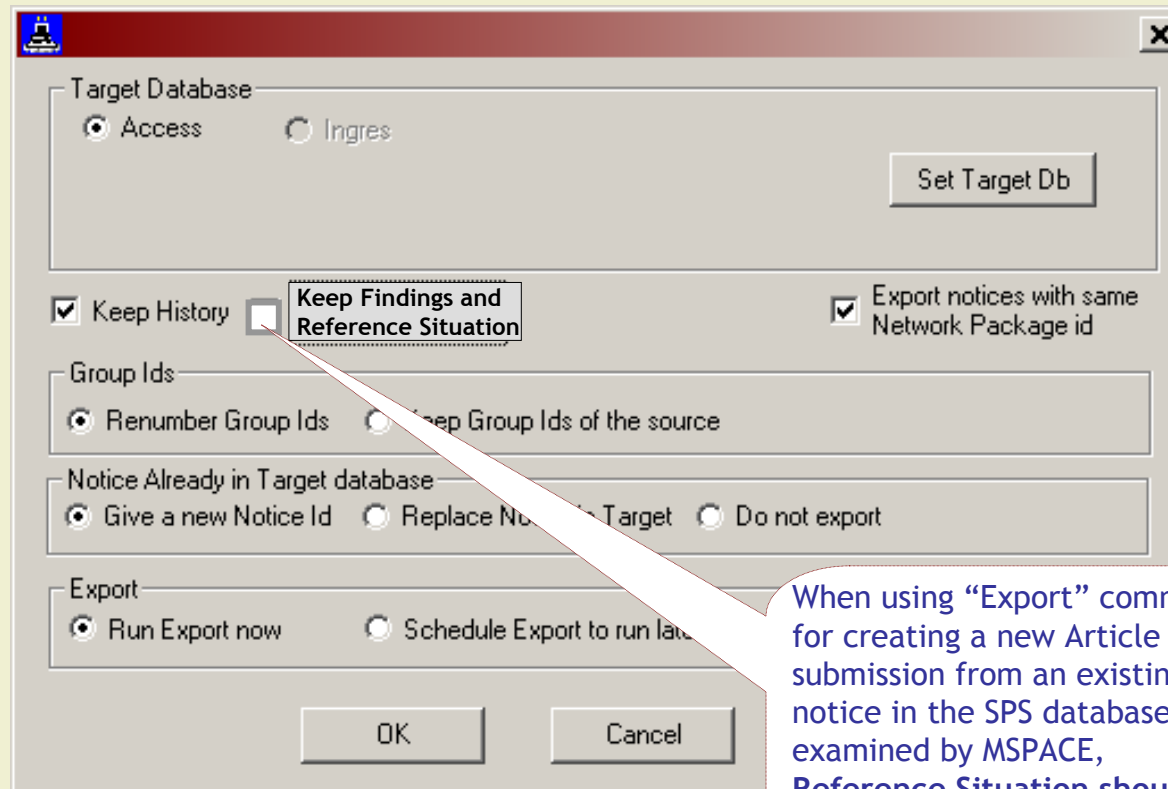
Appendix 30A Provision		Limit Type	Examination of Compatibility of Article 2A network with		
Article	Annex 4		Region	Service ⇔ Frequency band	BR Software
Article 2A, Article 4 4.1.1 d) and Article 7 7.1 & 7.2	Section 2	Δ_T/T	1 and 3	BSS Feeder-link Assignments of Plan, List and pending Article 4 networks ⇔ Regions 1 and 3 Lower and upper Guard Bands: 17.300 - 17.31398 GHz 18.089 - 18.100 GHz	<i>GIBC-Appendix 8</i> , Case I using GIMS, SPS and SRS databases Output Report File Name: <i>APP8.LST</i>
			2	BSS Feeder-link Assignments of Plan, List and pending Article 4 networks ⇔ Regions 1 and 3 Lower and upper Guard Bands: 17.300 - 17.31398 GHz 18.089 - 18.100 GHz	Protected area: Feeder-link receiving space station on its Service area



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	Not Identified	<i>Identified</i> with Level Y	$X \geq Y$	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>	Yes	Since the objecting administration is still identified as affected, its agreement is required
5			$X < Y$	Not objected	Yes	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	Yes	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



The image shows 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 with radio buttons and checkboxes. The 'Target Database' section has 'Access' selected. The 'Keep History' checkbox is checked, and the 'Keep Findings and Reference Situation' checkbox is unchecked. The 'Export notices with same Network Package id' checkbox is checked. The 'Group Ids' section has 'Renumber Group Ids' selected. The 'Notice Already in Target database' section has 'Give a new Notice Id' selected. The 'Export' section has 'Run Export now' selected. 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



Clone Dialog

Clone Parameters

Clone ID.

Date of Receipt

Notice Status

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

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

to be Considered:

Those with Date of Receipt before:

...s 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 tools MSpace - AP30/30A



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 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

Findings/Ref. Sit. DB

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)
 Cross-polar Orbital Limit (degrees)

Applied Margin Degradation Limit (dB)

Start Analysis

Add GIMS Database(s)

Container	DB Name	Path

Reading Order ↑

Add Antenna Library(s)

APL Id.	APL Name	APL File and Path

Select or Type Database Name for Storing Reference Situation and Findings 23.10.2008 4:30 PM

Study Options for Regions 1 & 3 Plans/Lists



References and Explanatory Notes ⁽¹⁾

Assignment Type	<p>A: Incoming Article 4 under examination without Reference Situation.</p> <p>V: Pending Article 4 network published in Part A - receives interference from other types of assignments but its interference caused to them is not taken into account.</p> <p>P: Plan/List assignment.</p>
EPM/OEPM	<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>
Pending Article 4 submissions	<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 ⁽²⁾

SPS_ALL	<p><i>Space Plans' Systems Database</i></p> <p>Contains currently AP30/30A Plans, Lists, Article 4 and Article 2A assignments. Released each two weeks in the BR IFIC CD-ROM. It can be downloaded from the following URL:</p> <p>http://www.itu.int/en/ITU-R/space/plans/Pages/AP30-30A.aspx</p>
SRS_ALL	<p><i>Space Radiocommunications Stations Database</i></p> <p>Contains non-planned Spaces Services Notices. Released quarterly in BR SRS on CD-ROM. Should be incrementally updated using BR IFIC CD-ROM between two subsequent release of SRS on CD-ROM.</p>

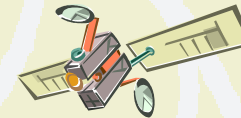
BR Software Package SPS (Space Plans System)

Introduction

Main Concepts



GIBC



SPS Package



Introduction



1. **Package of software programs to determine intra-service and intra-region coordination requirements for space networks of the planned services**
 2. **Availability**
 - ✓ SRS CD/DVD
 - ✓ BR IFIC CD
 - ✓ <http://www.itu.int/en/ITU-R/space/plans/Pages/AP30-30A.aspx>
 - 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
-



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**



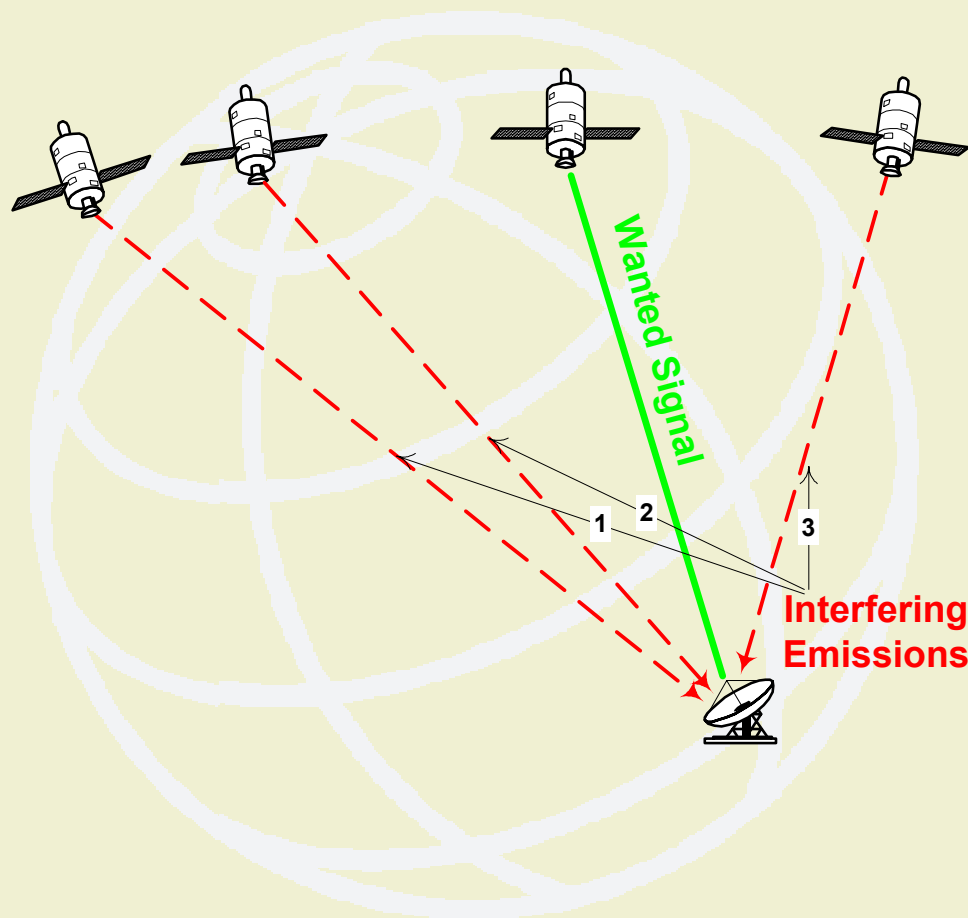
What If Studies

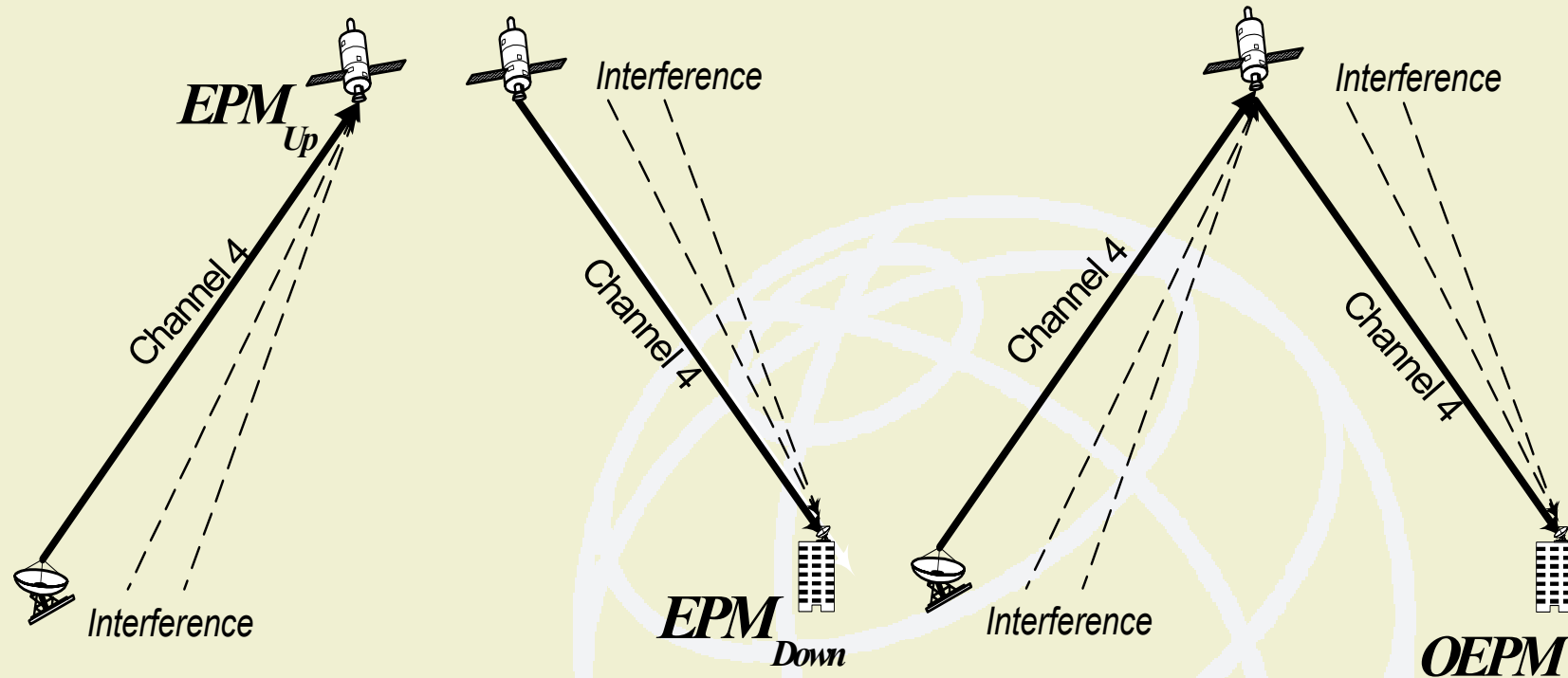
Main Concepts



Aggregate interfering effect from all interfering sources

Interferers are
“existing” and
“virtual”
networks

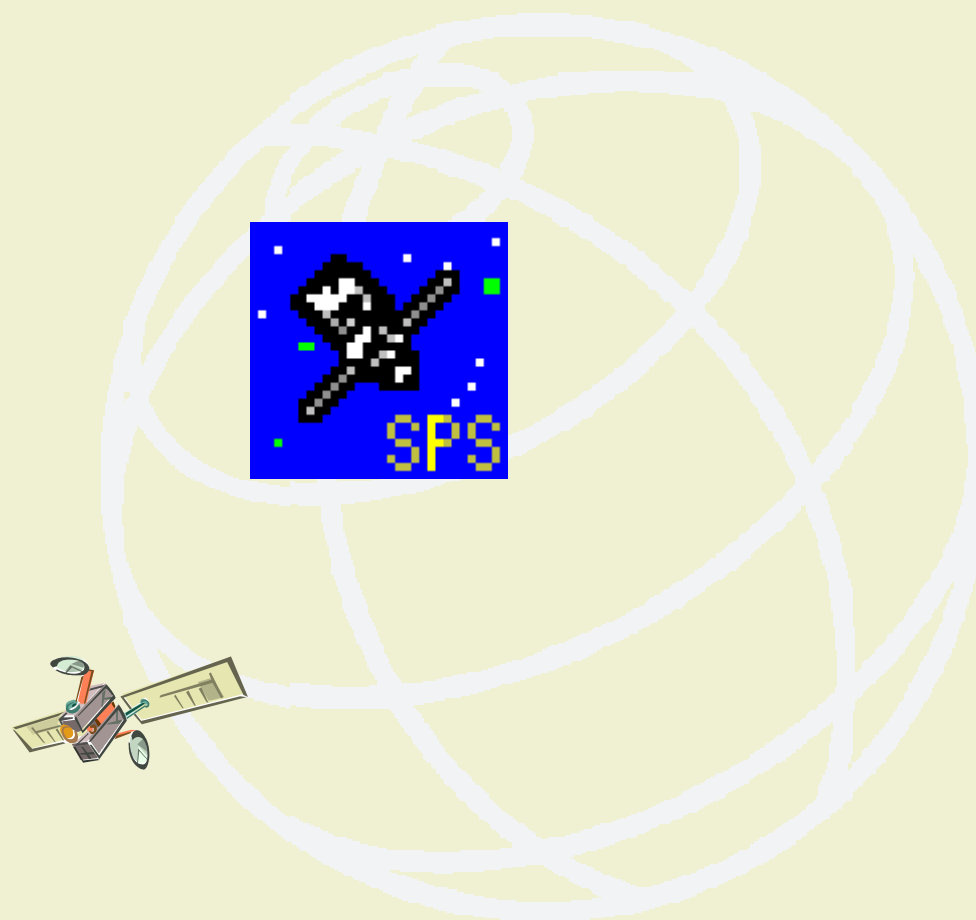




Regions 1 and 3 Approach
(separated links)

Region 2 Approach
(overall link analyses)

FSS : Single-entry & aggregate C/I



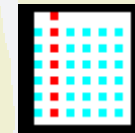
SPS Package



MSPACE
Parameter Input,
calculation



BSS_Margin
Update of reference
situation (BSS)



SPS_Reports
Reporting tool



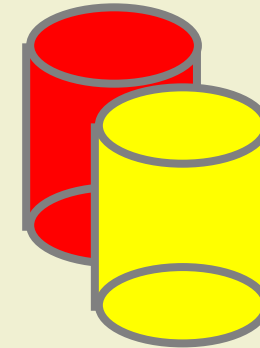
Space Plans' System Input



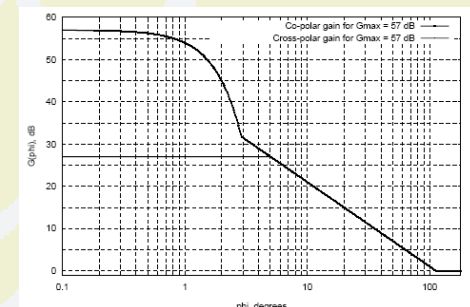
SNS-Like Database



MSPACEg



GIMS Database



Antenna Pattern Library

- Preferred editing tool of SPS database is SpaceCap

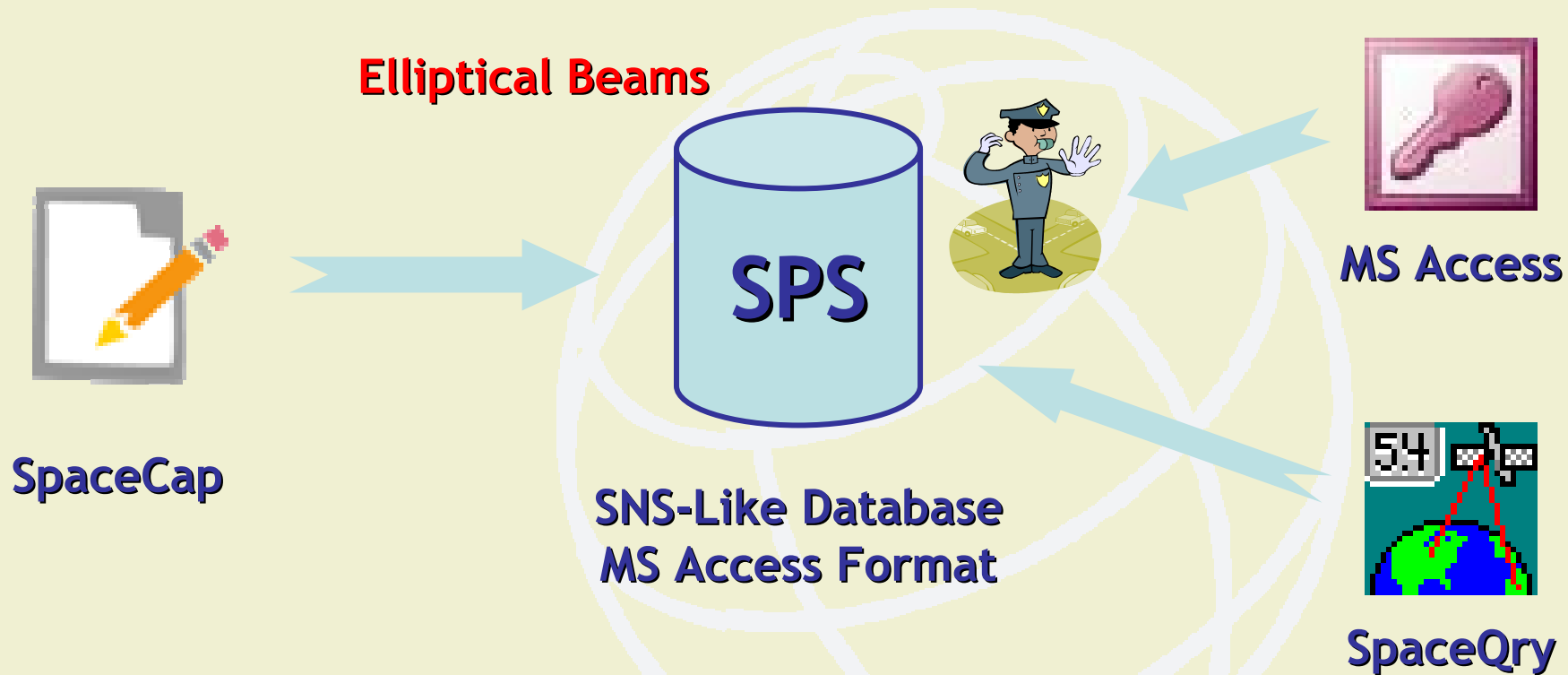
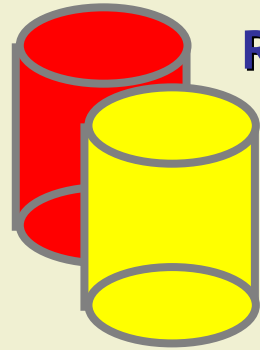


Diagram description:

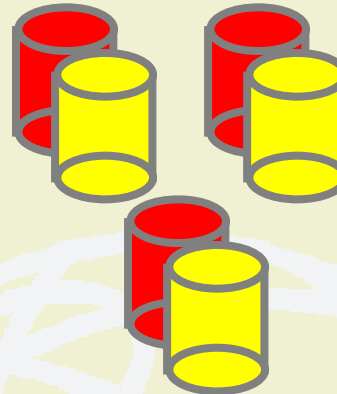
http://www.itu.int/en/ITU-R/software/Documents/spaceqry/sns_v6_diagram.pdf

Space Plans' System Input (GIMS)



Read Only DB

Shaped Beams



New diagrams
Or
Modifications
to REFDB
diagrams

GIMS Reference Database

Additional Databases

- GIMS installation
- Automatic connection

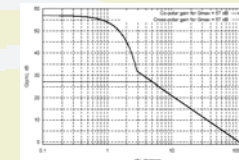
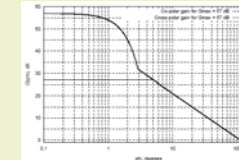
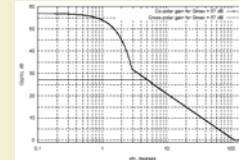
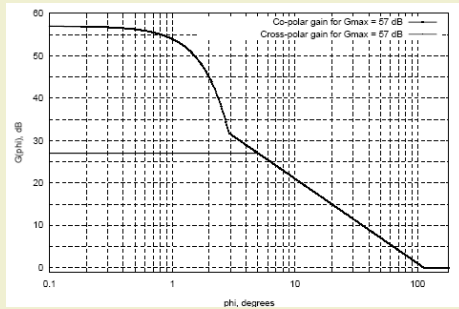


Add GIMS Database(s)

Container	DB Name	Path
xxxxx	gdummy	c:\temp\

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

Space Plans' System Input (APL)



APL

Users' defined pattern

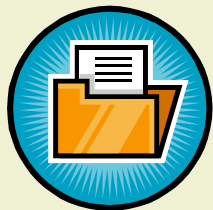


Add Antenna Library(s)

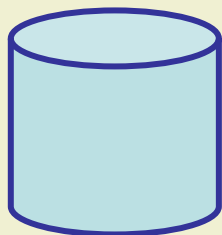
APL Id.	APL Name	APL File and Path

Programmatic mean of allowing SPS to use new antenna patterns.

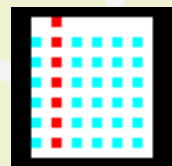
Space Plans' System Output



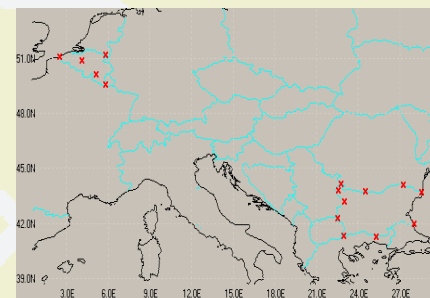
Text Files



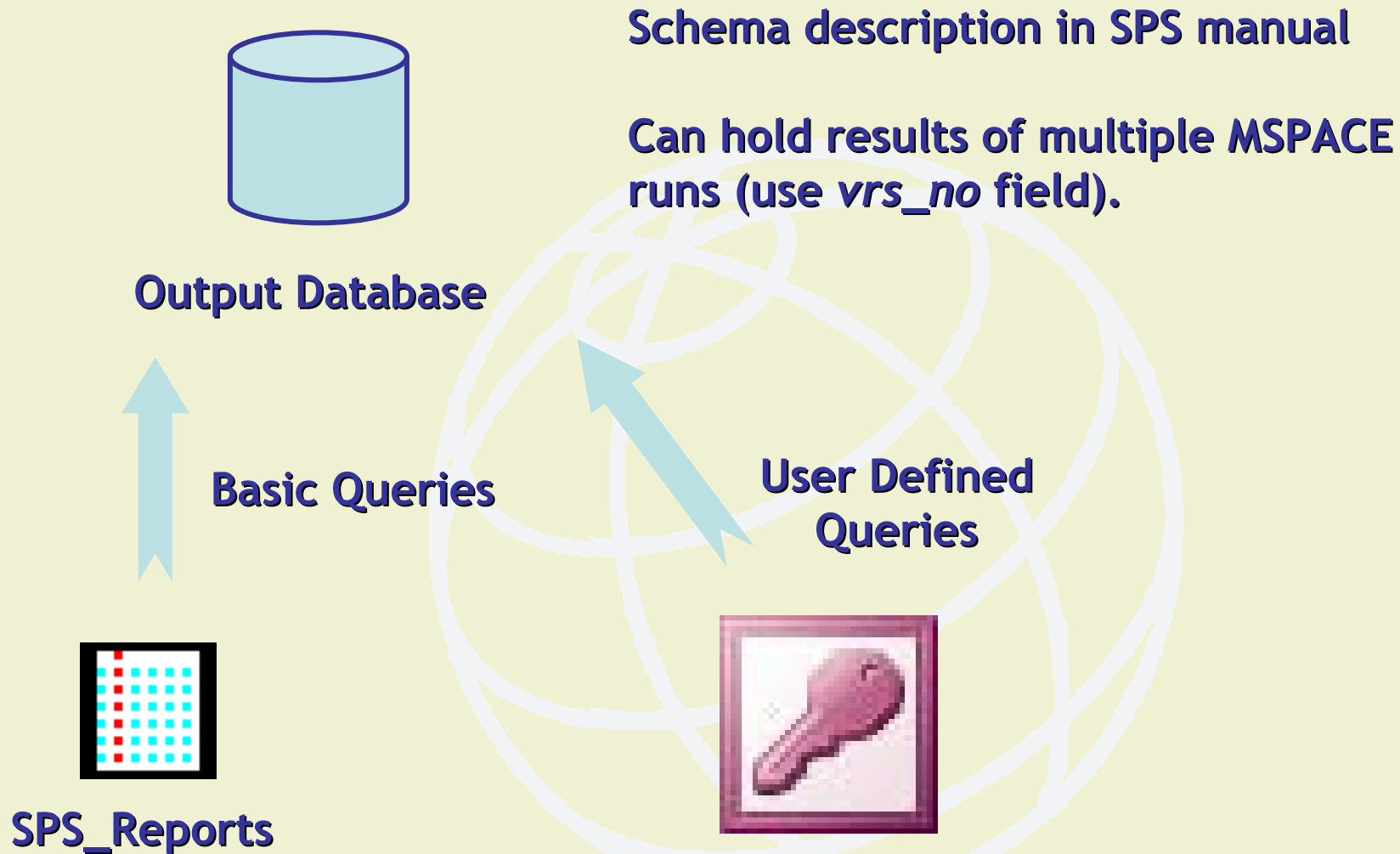
Output Database



SPS_Reports



Orb.Pos.	Adm.	Beam Name	Aggregate C/I		Single Entry C/I		Interferer
			Test Point	C/I Degrad.	Test Point	C/I Degrad.	
53.55	BEL	BEL00000	1		1	24.47	BUL00000
		BEL00000	2		2	25.83	BUL00000
		BEL00000	3		3	25.20	BUL00000
		BEL00000	4		4	24.93	BUL00000
		BEL00000	5		5	25.08	BUL00000
55.55	BUL	BUL00000	1		1	10.50	BEL00000
		BUL00000	2		2	10.50	BEL00000
		BUL00000	3		3	10.50	BEL00000
		BUL00000	4		4	10.50	BEL00000
		BUL00000	5		5	10.50	BEL00000
		BUL00000	6		6	10.50	BEL00000
		BUL00000	7		7	10.50	BEL00000
		BUL00000	8		8	10.50	BEL00000
		BUL00000	9		9	10.50	BEL00000
		BUL00000	10		10	10.50	BEL00000

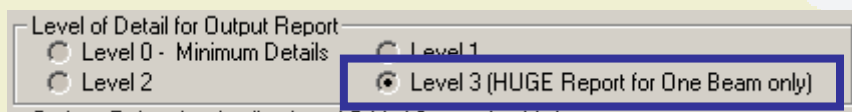
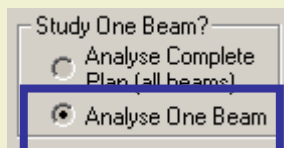


Space Plans' System Output (Text)

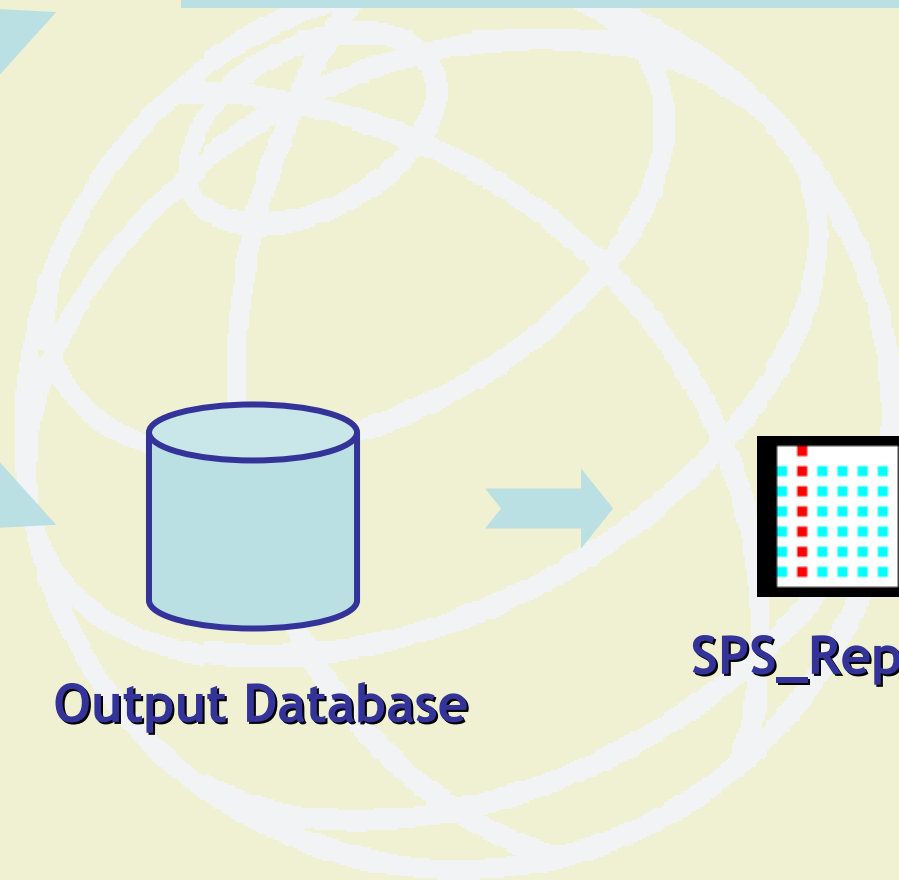


Text Files

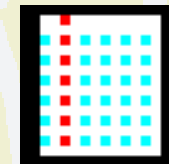
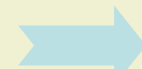
1. Findings File (.fnd)
 - ✓ All plans
 - ✓ Summary of affected beams
 - ✓ Error and warning messages
2. Detailed Report (.det)
 - ✓ Only for one beam analysis
 - ✓ Log intermediate values
 - ✓ Used mainly for debugging



Runtime Reports in MSPACE_G



Output Database



SPS_Reports



Reporting in MSPACE_G

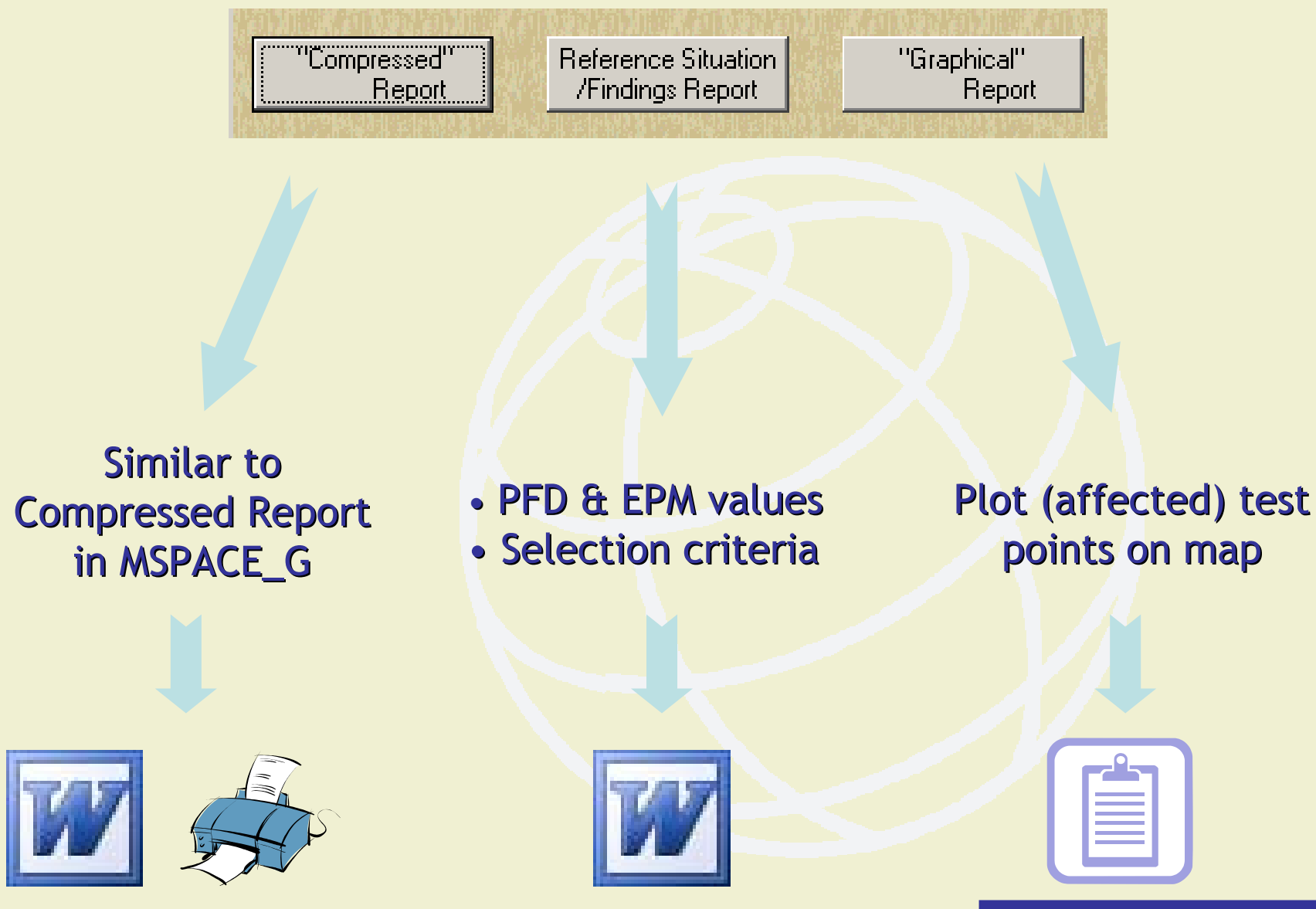
1. Compressed Report

- ✓ 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





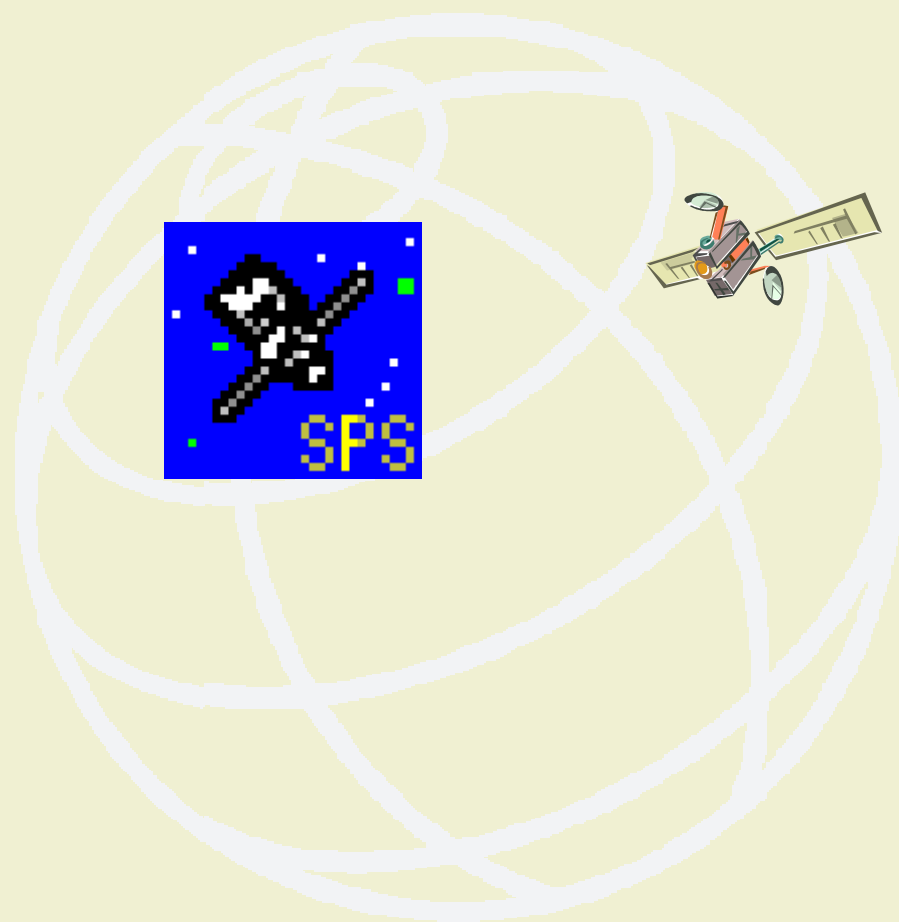
.fnd File R1&3 BSS Downlink Analysis

MSPAGE Version 5.300 (MS Windows) 26.09.2006 08:16:25
WRC-2000 Regions 1&3 BSS Down-link Plan/List

(Tolerance for margin degradation is 0.45 dB)

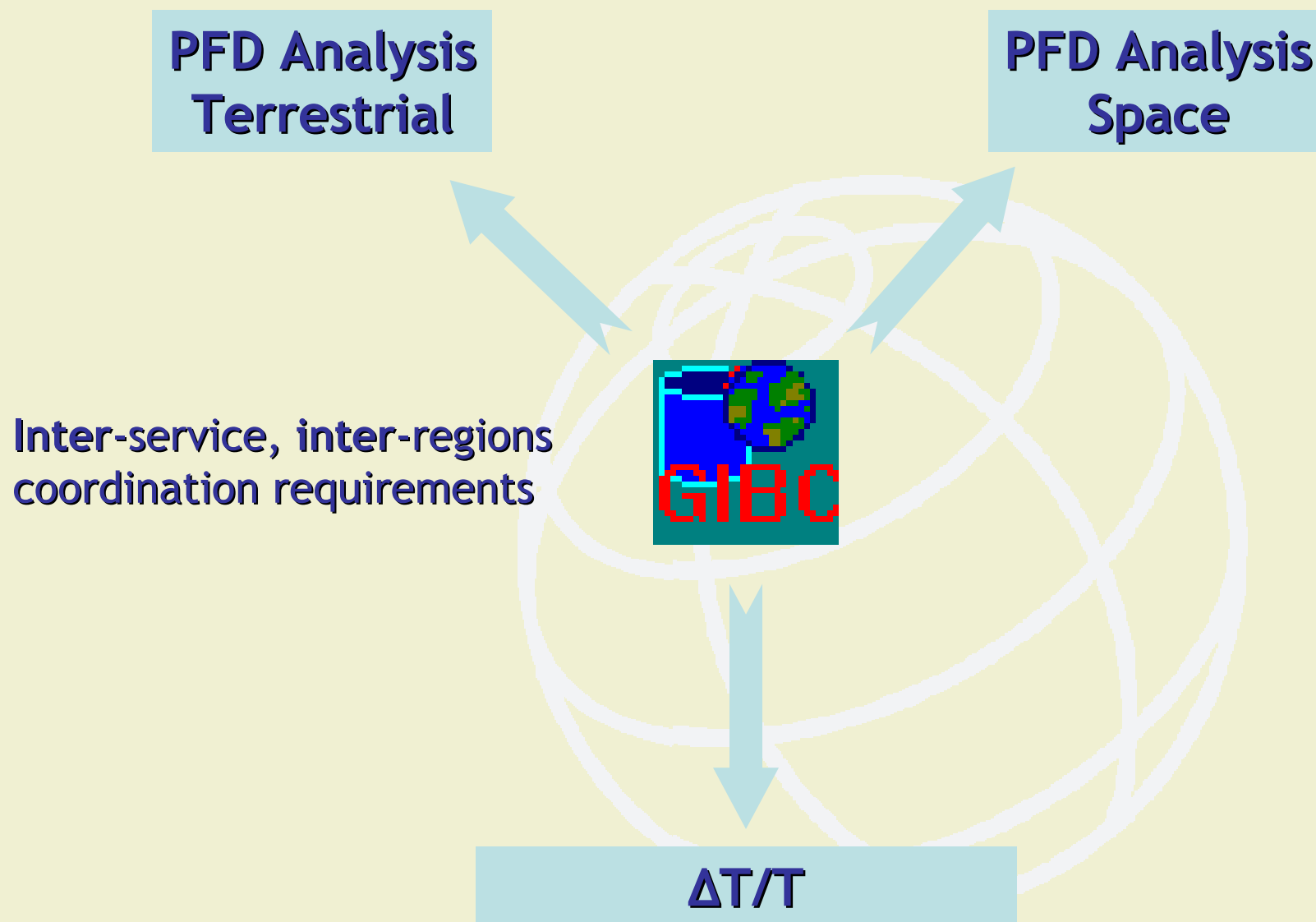
BEAM	CHN	TP	ADM	MARGIN	REFERENCE	DELTA	
00000039	1	1	IRN	25.90	-9.5291	23.0390	-32.5681
00000039	1	2	IRN	25.90	-11.5759	21.0220	-32.5979
00000039	1	3	IRN	25.90	-9.7840	22.7020	-32.4860
00000039	1	4	IRN	25.90	-15.1903	17.4330	-32.6233
00000039	1	5	IRN	25.90	-18.1190	14.5160	-32.6350
00000039	1	6	IRN	25.90	-11.0666	21.3630	-32.4296
00000039	1	7	IRN	25.90	-16.0122	16.5890	-32.6012
00000039	1	8	IRN	25.90	-11.2340	21.1830	-32.4170
00000039	1	9	IRN	25.90	-25.0367	7.5220	-32.5587
00000039	1	10	IRN	25.90	-29.6969	8.6710	-38.3679
00000039	1	11	IRN	25.90	-27.4077	9.4510	-36.8587
00000039	3	1	IRN	25.90	-9.6537	22.8260	-32.4797
00000039	3	2	IRN	25.90	-11.7005	20.8090	-32.5095
00000039	3	3	IRN	25.90	-9.9087	22.4930	-32.4017
00000039	3	4	IRN	25.90	-15.3149	17.2180	-32.5329
00000039	3	5	IRN	25.90	-18.2437	14.3000	-32.5437
00000039	3	6	IRN	25.90	-11.1913	21.1570	-32.3483
00000039	3	7	IRN	25.90	-16.1368	16.3750	-32.5118
00000039	3	8	IRN	25.90	-11.3586	20.9770	-32.3356
00000039	3	9	IRN	25.90	-25.1613	7.3100	-32.4713
00000039	3	10	IRN	25.90	-29.8225	8.2320	-38.0545
00000039	3	11	IRN	25.90	-27.5333	9.0870	-36.6203
00000039	5	1	IRN	25.90	-9.7739	22.7310	-32.5049
00000039	5	2	IRN	25.90	-11.8207	20.7140	-32.5347
00000039	5	3	IRN	25.90	-10.0289	22.3970	-32.4259

BR Software Package GIBC
(Graphical Interface for Batch Calculations)

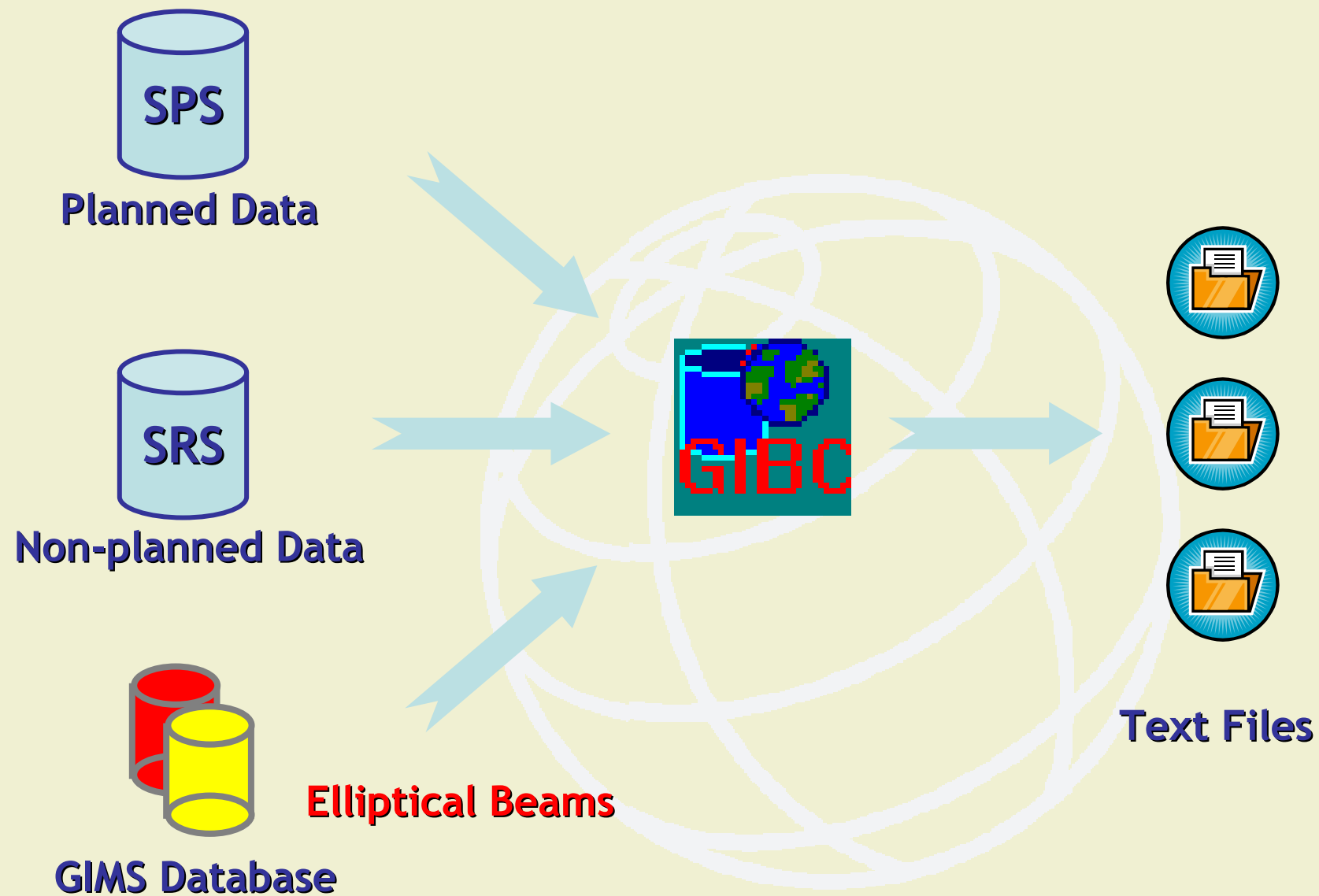


GIBC

What's the Purpose of GIBC?



GIBC Input/Output



Protection of Terrestrial Services



Gibc - Graphical Interface for Batch Calculations

Appel: 3 PFD (terrestrial serv.) PFD (space serv.) Tools / Options

PFD with respect to terrestrial services. Start

Network: 0

Examination Data

Examination: Hard Limits

Region:

Power Control (dBW): 0 Output Level: Level 1

"Before" Examination

Perform "Before" Comparisons

Previous Networks: 0 0 0

Files Path

C:\PFDRESULTS\

EXIT Help

Select PFD (terrestrial)

Select Trigger Limits

ID of notice in corresponding plan

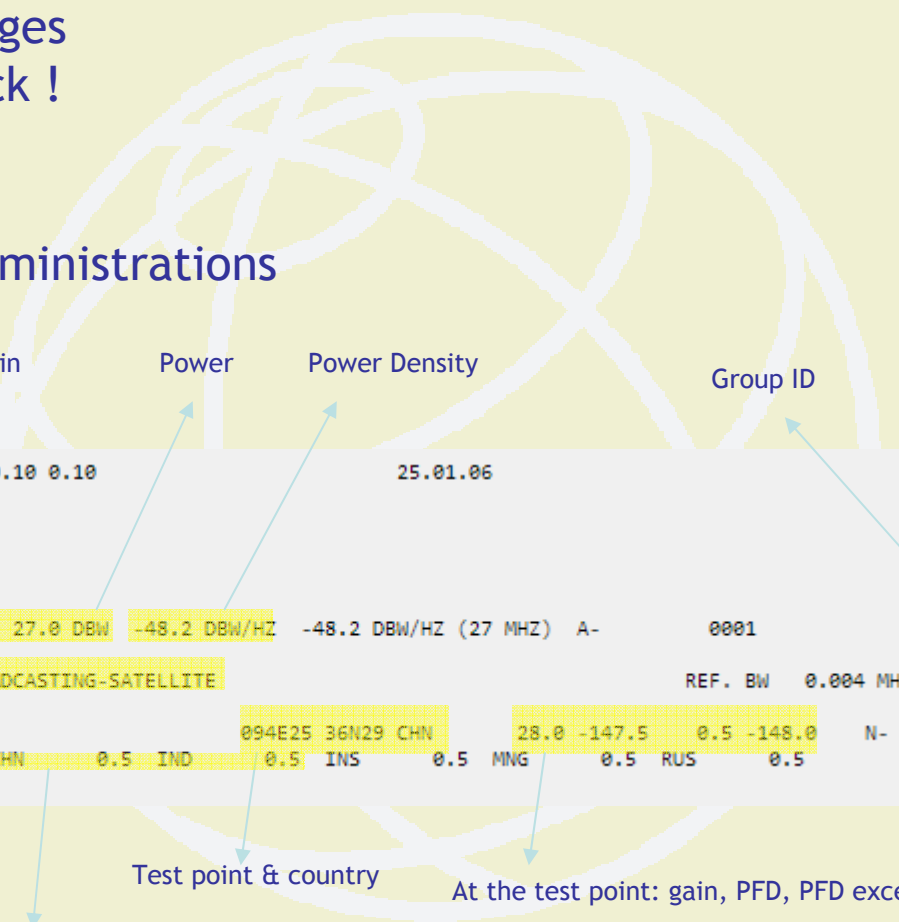
SPS DB path
GIMS DBs

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



Beam	Class of Station	Antenna Gain	Power	Power Density	Group ID	Notice ID
LUX	DBL-G3-21.5E	21.50E 0.10 0.10		25.01.06		B 106.552001
GBL		30.0 DB				106.552001
EV	33000 KHZ	14.03.13				000.011839
11.71950 G	33000 KHZ	33M0G7W--	27.0 DBW	-48.2 DBW/HZ	-48.2 DBW/HZ (27 MHz) A-	0001
(11) AP30 AN1 SECT 4 BROADCASTING-SATELLITE				REF. BW	0.004 MHZ	
ONLY IF INC NTW IN REG 1						
REGIONS 1 AND 3				094E25 36N29 CHN	28.0 -147.5 0.5 -148.0	N-
AUS/ICO 0.3 BRM 0.5 CHN 0.5 IND 0.5 INS 0.5 MNG 0.5 RUS 0.5						
THA 0.1						

Labels and arrows pointing to data fields:

- Beam: LUX, GBL, EV
- Class of Station: DBL-G3-21.5E
- Antenna Gain: 21.50E 0.10 0.10, 30.0 DB
- Power: 27.0 DBW
- Power Density: -48.2 DBW/HZ
- Group ID: -48.2 DBW/HZ (27 MHz) A-
- Notice ID: B 106.552001, 106.552001, 000.011839
- Central Frequency: 11.71950 G
- Provision & Incoming Service: (11) AP30 AN1 SECT 4 BROADCASTING-SATELLITE
- Protected Area: ONLY IF INC NTW IN REG 1
- Countries and PFD excess: REGIONS 1 AND 3, AUS/ICO 0.3 BRM 0.5 CHN 0.5 IND 0.5 INS 0.5 MNG 0.5 RUS 0.5, THA 0.1
- Test point & country: 094E25 36N29 CHN
- At the test point: gain, PFD, PFD excess, PFD limit: 28.0 -147.5 0.5 -148.0

Protection of Space Services



Gibc - Graphical Interface for Batch Calculations

Appendix 8 | PFD (terrestrial serv.) | **PFD (space serv.)** | Tools / Options

PFD for space services. Start

Network: 0

Examination Data

Resolution 547 Level: Level 1

Power Control (dBW): 0 Findings Level: 1

Existing

Check Against Existing Administration ID:

Transaction ID: 0 Sat. Network Symbol:

"Before" Examination

Perform "Before" Comparisons

Previous Networks: 0 0 0

Files Path

C:\PXTRESULTS\

EXIT Help

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	LUX	LUX-G4-8	31.50E 0.10 0.10	40.0 DB	11.95000 G	09.06.06	C106.520103/106.624481/0001
	TU3R	EC M					
		36M0G7W--	13.0 DBW	-62.7 DBW/HZ		2D:	
Existing	ARS/ARB	ARABSAT BSS 6E	34.50E 0.10 0.10	35.0 DB	11.72748 G	26.04.05	T B105.552006/000.011420/0001
	ARAB1	EB LE					
		27M0G7W--	20.0 DBW	-54.2 DBW/HZ		2D:26.04.05	
	E E ARS		056E5212 23N2248	MODRES	35.5 DB		
Class of Station	Provision & Service					Date of protection	
	AP30 AN4		FIXED-SATELLITE				
	REGIONS 1 AND 3				031E21 00S09 UGA		40.00 -110.45 13.23 -123.69 A30#A4.1
	Protected Area				Affected test point & country		At test point: gain, PFD, PFD excess, PFD limit

	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



Gibc - Graphical Interface for Batch Calculations

Appendix 8 | PFD (terrestrial serv.) | PFD (space serv.) | Tools / Options

Additional GIMS Databases

Container	Database	Container Path
-----------	----------	----------------

Add... Clear

SRS Database

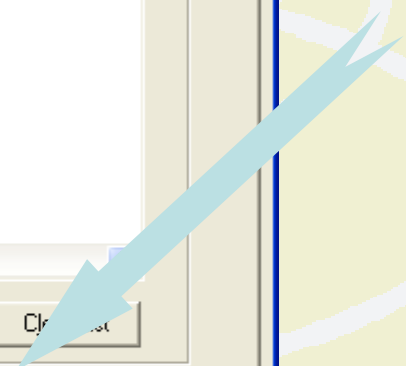
C:\br_soft\Refdata\SRS_ALL.MDB Browse...

DSN	Additional SRS DB Path
-----	------------------------

Add Clear

EXIT Help

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

Beam	Administration	Sat. Name	Power	Sat. Pos.	Gain	Central Frequency	Date of Receipt	$\Delta T/T$
Inc.	I S D 170 1M00F9D--	IOMBSS-1 TTC EM CR	96.50W 50.0 DBW	0.05 0.05 50.0 DBW/HZ	0.05 -10.0 DBW/HZ (TOT. BW)	17.30600 G 2D:	12000 K Date of protection	27.06.06 C000.000001/000.009598/0001 ID of notice/group/assignment
Exi.	E S CAN SC1M 750KF2D--	USABSS-1M ED CR	100.00W 26.1 DBW	0.05 0.05 -33.9 DBW/HZ	0.05 -32.6 DBW/HZ (TOT. BW)	17.30300 G 2D:	750 K	27.06.05 A 0000.000002/000.009605/0001 DT/TS = 5175.70 %
	I E D	TT&C KAS.0 METER	095W5037	38N1832	REC-580	57.4 DB	14.4 DB	

Labels for the table:

- Beam: I S D, 170, 1M00F9D--
- Administration: IOMBSS-1 TTC, EM CR
- Sat. Name: IOMBSS-1 TTC
- Power: 96.50W, 50.0 DBW
- Sat. Pos.: 0.05 0.05, 50.0 DBW/HZ
- Gain: 0.05, -10.0 DBW/HZ (TOT. BW)
- Central Frequency: 17.30600 G, 2D:
- Date of Receipt: 12000 K, Date of protection
- $\Delta T/T$: 27.06.06, C000.000001/000.009598/0001, ID of notice/group/assignment
- Class of Station: I S D, E S CAN, SC1M, 750KF2D--
- Power density: 100.00W, 26.1 DBW
- Associated earth station: TT&C KAS.0 METER