

Workshop on Space Plan services (AP30B)

Creation of electronic notices with SpaceCap software and validation

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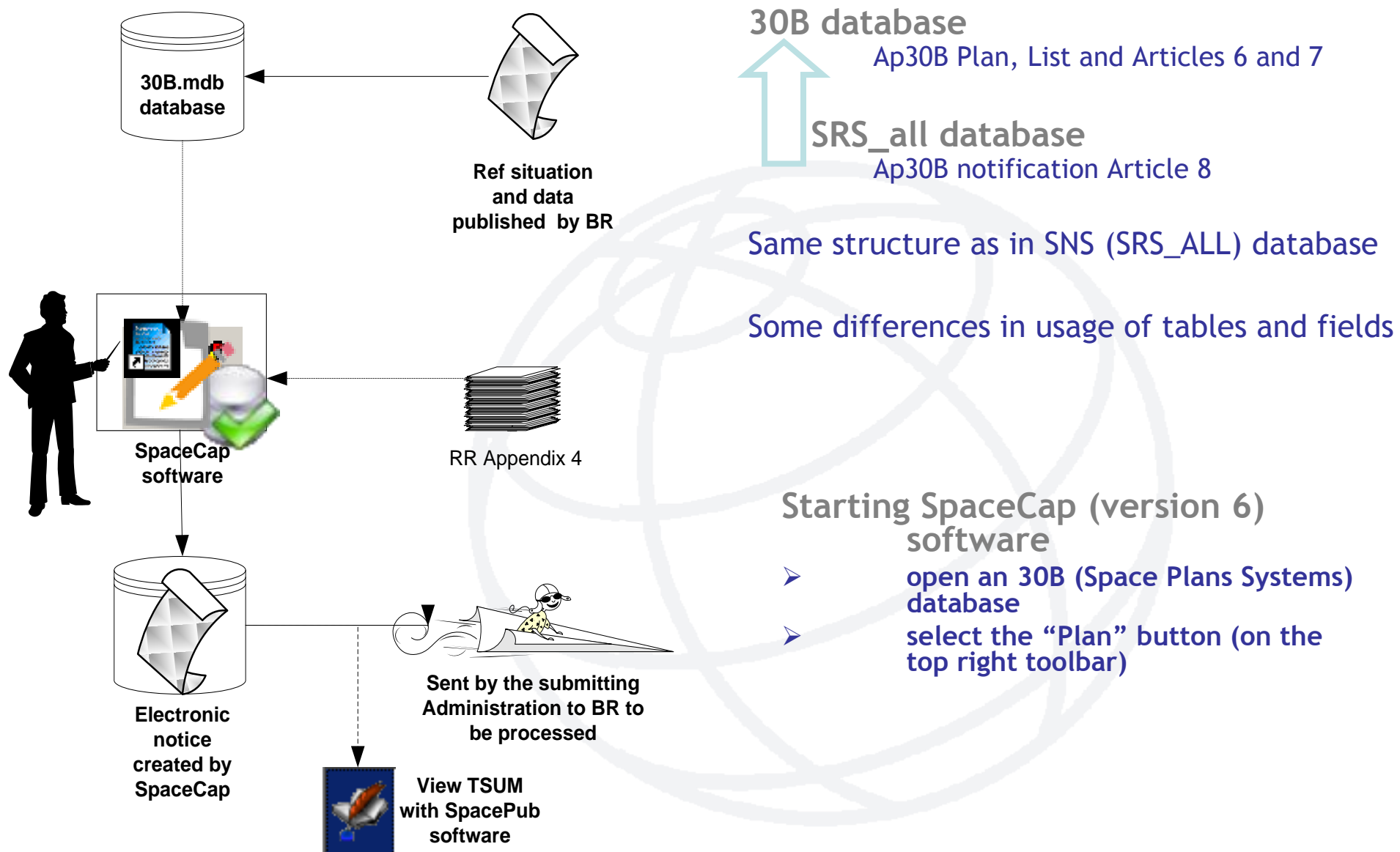
1. Introduction

2. Validation/Capture exercise

Annex 1 How to capture Appendix 30B data with SpaceCap? A step by step presentation

Annex 2 How to validate Appendix 30B data with SpaceVal? A step by step presentation

Ap30B - General submission schema



FSS Plan - Art.6 and 8 of Ap30B

Data organization in the SpaceCap software (1)



Common data to all frequencies of a network
(satellite name, orbital position...)

Diagrams data

(type (Paper, GXT, File), file name, description)

Note: normally filled in through other data entry forms

Agreements reached

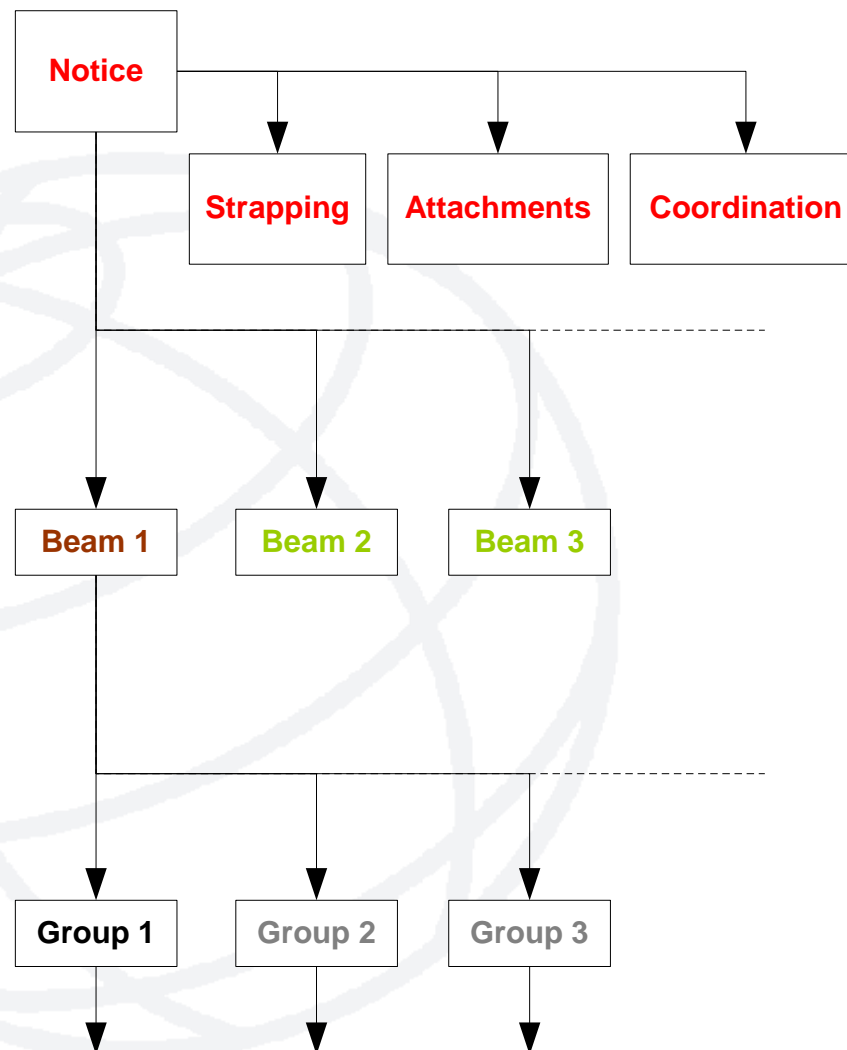
Note: captured in the “Coordination” data entry form

Antenna beam characteristics

(satellite antenna gain, boresight...)

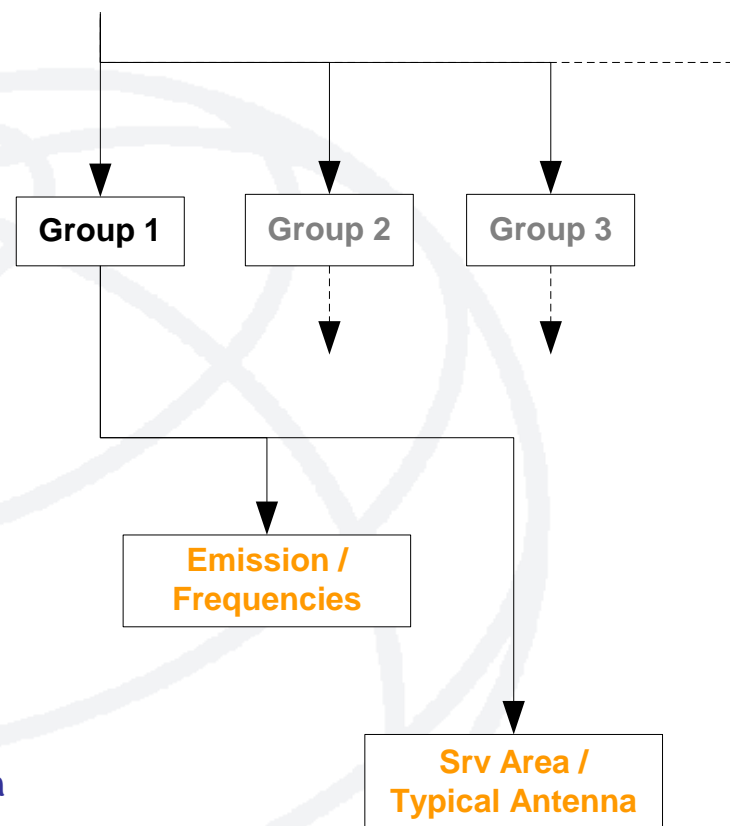
Groups of frequencies

(common characteristics, service area...)



FSS Plan - Art.6 and 8 of Ap30B

Data organization in the SpaceCap software (2)



Emission characteristics of a specific group
(frequency bands available for 4500-4800MHz, 6725-7025MHz,
10.70-10.95GHz, 11.20-11.45GHz, 12.75-13.25GHz,
noise temperature (C/I protection ratio), power...)

**Service area, test points and typical earth station antenna
characteristics of a specific group**

1/ A TSUM created with *SpacePub* of a notice contains errors identified in a report created by *SpaceVal*

File: CHOCO-SAT notice NOT valid.rtf

2/ Correcting the errors using *SpaceCap* software to pass successfully *SpaceVal* validation

File:(110559098 CHOCO-SAT) A30B_exerciseVAL_CAP.mdb

3/ Creating with *SpacePub* the TSUM of the valid notice corrected and comparing to sample one

File: CHOCO-SAT notice NOT valid.rtf

Files location:

Workshop\SpaceCap SpaceVal

SpaceVal reporting errors (1/3)



BR Space Query and Extract System - [QuickQuery Result for Network(s): 110559098]

File View Window Help

Validation Report for Network: 110559098 On: By Operator: (a30b_exerciseval_cap.mdb)

Network ID: 110559098 Adm: SUI Satellite name: CHOCO-SAT Orbital Pos: -13.00°

Applicability code(s): axiss, geo

Validation Message Counts: Total: 16, Fatais: 2, Warnings: 13; Message Option: All

Beam Name	E / R	Group ID	Row No	Item Number	Rule ID	Severity Code	Table Name	Field Name	Field Value	Validation Error Message
				0		A				VALIDATION COMPLETED; v6.1.6; ERRORS F/W: 2/13
				0	A	F	pl_strap			Uplink and Downlink frequencies not strapped (grp_id 7 freq_dn 10825)
				0	A	F	pl_strap			Uplink and Downlink frequencies not strapped (grp_id 7 freq_dn 11325)
				100	2	W	geo	sat_name	CHOCO-SAT	sat_name not found in ref table
				101	3	W	geo	long_nom	-13	sat_name not found in ref table
T64GHZ	E	9	1	675	3.2	W	emiss	pwr_ds_nbw	-20	Invalid value for downlink under AP30B
T64GHZ	E	9	1	695	4	W	e_as_stn	bmwidth	2	Value should be equal to the calculated value (2.24)
T64GHZ	E	9	2	695	4	W	e_as_stn	bmwidth	2	Value should be equal to the calculated value (2.24)
T64GHZ	E	9	3	695	4	W	e_as_stn	bmwidth	2	Value should be equal to the calculated value (2.24)
T64GHZ	E	9	4	695	4	W	e_as_stn	bmwidth	2	Value should be equal to the calculated value (2.24)
T64GHZ	E	9	5	695	4	W	e_as_stn	bmwidth	2	Value should be equal to the calculated value (2.24)
T64GHZ	E	9	6	695	4	W	e_as_stn	bmwidth	2	Value should be equal to the calculated value (2.24)
T64GHZ	E	9	7	695	4	W	e_as_stn	bmwidth	2	Value should be equal to the calculated value (2.24)
T64GHZ	E	9	8	695	4	W	e_as_stn	bmwidth	2	Value should be equal to the calculated value (2.24)
T64GHZ	E	9	9	695	4	W	e_as_stn	bmwidth	2	Value should be equal to the calculated value (2.24)
T64GHZ	F	9	10	695	4	W	e_as_stn	bmwidth	2	Value should be equal to the calculated value (2.24)

SRS: MS-Access

Corrections in SpaceCap(2/3)



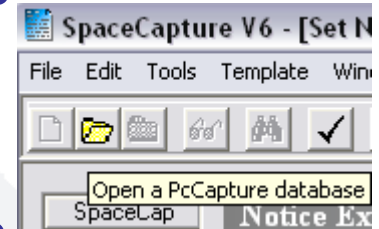
•Opening SpaceCap software



•In SpaceCap opening the filing containing the notice having errors
(110559098 CHOCO-SAT) A30B_exerciseVAL_CAP.mdb

•Modifying in the beam T64GHZ the Ap4 items as:

1. **Strapping** all downlink/feederlink beams of the notice
2. C10d4 **Half-power beamwidth**: 2.26° recommended as calculated from the Gain and the Antenna pattern instead of 2.00°
3. C8h **Maximum Power Density over Bdwth**: -40dB(W/Hz) recommended to be in the Limits of Article 21 instead of -20dB(W/Hz)
4. C11a **Test point** location at $6^\circ\text{W}/32^\circ\text{N}$ instead of at sea $16^\circ\text{W}/46^\circ\text{N}$
5. B3f1 **Boresight** location at $6.14^\circ\text{E}/46.22^\circ\text{N}$ like on the GIMS diagrams instead of $6.14^\circ\text{E}/50^\circ\text{N}$



TSUM with fatal error and warning



TSUM Requested by: _____ Date: _____ DS: 4305 EXPCTSPATL FKF M28 Plan Id: A305 Notice type: GZG
 A1a Sat. Network: CHOCO-SAT A1f1 Notifying adm: SUI A1f3 Inter. sat. org: _____ BR1 Date of receipt: 24.11.2010 BR20/BR21 BR IFIC no./part: /
 BR6a/BR6b Id.no.: 110559098 BR3a/BR3b Provision reference: A30B#6.1A P BR2 Adm. serial no.: _____ T1930GHZ E

A1b Planbeam identification: _____
 A1f2 Submitted on behalf: _____
 A4a1 Orbital long.: 13 W A4a2a East Long. tolerance limit: 0.1 A4a2b West Long. tolerance limit: 0.1 A4a2c Inclination excursion: 0.1

B1a Beam designation: T64GHZ B1b Steerable: _____ B2 Emi-Rcp: E B3a1 Max.co-polar gain: 34
 B3b1 Co-polar ant. gain contours diag.: _____ B3f1 Boresight or aim point: 6.14 E 50 N
 C12a Minimum acceptable aggregate carrier-to-interference ratio: _____

BR7a Group id.: 9 BR1 Date of receipt: 24.11.2010 2D Date of protection: 24.11.2010
 A2a Date of bringing into use: 27.11.2017 A3a Op. agency: 71 A3b Adm. resp.: A
 BR62 Expiry date for bringing into use: _____ BR64 Date of receipt of 1st Res49: _____

C1 Frequency Range	
C1a Lower limit	C1b Upper limit
4500 MHz	4800 MHz

C4a Class of station: EC
 C11a1 Service area no.: 1 C11a4 Service area name: ITU_AREA C11a5e Min. elev. angle: _____ C11a3 Service area diagram: _____

C11a5a Test points										
C11a5b Longitude	-16	-4	-2	0	10	14	18	24	24	28
C11a5c Latitude	46	57	42	26	60	52	44	32	50	40
C11a5d Altitude	0	0	0	0	0	0	0	0	0	0
BR49 Rain zone	F	F	H	A	E	E	K	E	H	K

Associated typical earth station antenna characteristics				
C10d3 Max. iso. gain	C10d4 Bmwidth	C10d5a1a Co-polar ref. pattern	C10d5a1b Coef. A	C10d6 Noise temp.
38.2	2	AP30B	29	95

Maximum Power density per Hz over ...	
C8b2 4 kHz	C8b Necessary bandwidth
-60	-20

Findings 13A Conformity with RR: _____ 13B1 Provision: _____

D1a1	D1a2	BR7a Group id.		C15a Exclusive op. group	BR70 Multibeam
Beam designation		Uplink	Downlink		
R1310_2	T1310GHZ	10	8	999	
R1310GHZ	T1310GHZ	11	8	999	
R64GHZ	T64GHZ	12	9	999	

TSUM corrected



B1a Beam designation	T64GHZ	B1b Steerable		B2 Emi-Rop	E	B3a1 Max.co-polar gain	34
B3b1 Co-polar ant. gain contours diag.						B3f1 Boresight or aim point	
						E.14 E 46.22 N	
C12a Minimum acceptable aggregate carrier-to-interference ratio							

BR7a Group id.	1	BR1 Date of receipt	01.01.2010	2D Date of protection	
A2a Date of bringing into use	27.11.2017	A3a Op. agency	71	A3b Adm. resp.	A
BR62 Expiry date for bringing into use					BR64 Date of receipt of 1st Res49

C1 Frequency Range	
C1a Lower limit	C1b Upper limit
4500 MHz	4800 MHz

C4a Class of station	EC						
C11a1 Service area no.	1	C11a4 Service area name	ITU_AREA	C11a5e Min. elev. angle		C11a3 Service area diagram	

C11a5a Test points										
C11a5b Longitude	-6	-4	-2	0	10	14	18	24	24	28
C11a5c Latitude	32	57	42	26	60	52	44	32	50	40
C11a5d Altitude	0	0	0	0	0	0	0	0	0	0
BR49 Rain zone	E	F	H	A	E	E	K	E	H	K

Associated typical earth station antenna characteristics				
C10d3 Max. iso. gain	C10d4 Bmwidth	C10d5a1a Co-polar ref. pattern	C10d5a1b Coef. A	C10d6 Noise temp.
38.2	2.24	AP30B	29	95

Maximum Power density per Hz over...	
C8b2 4 kHz	C8b Necessary bandwidth
-60	-60

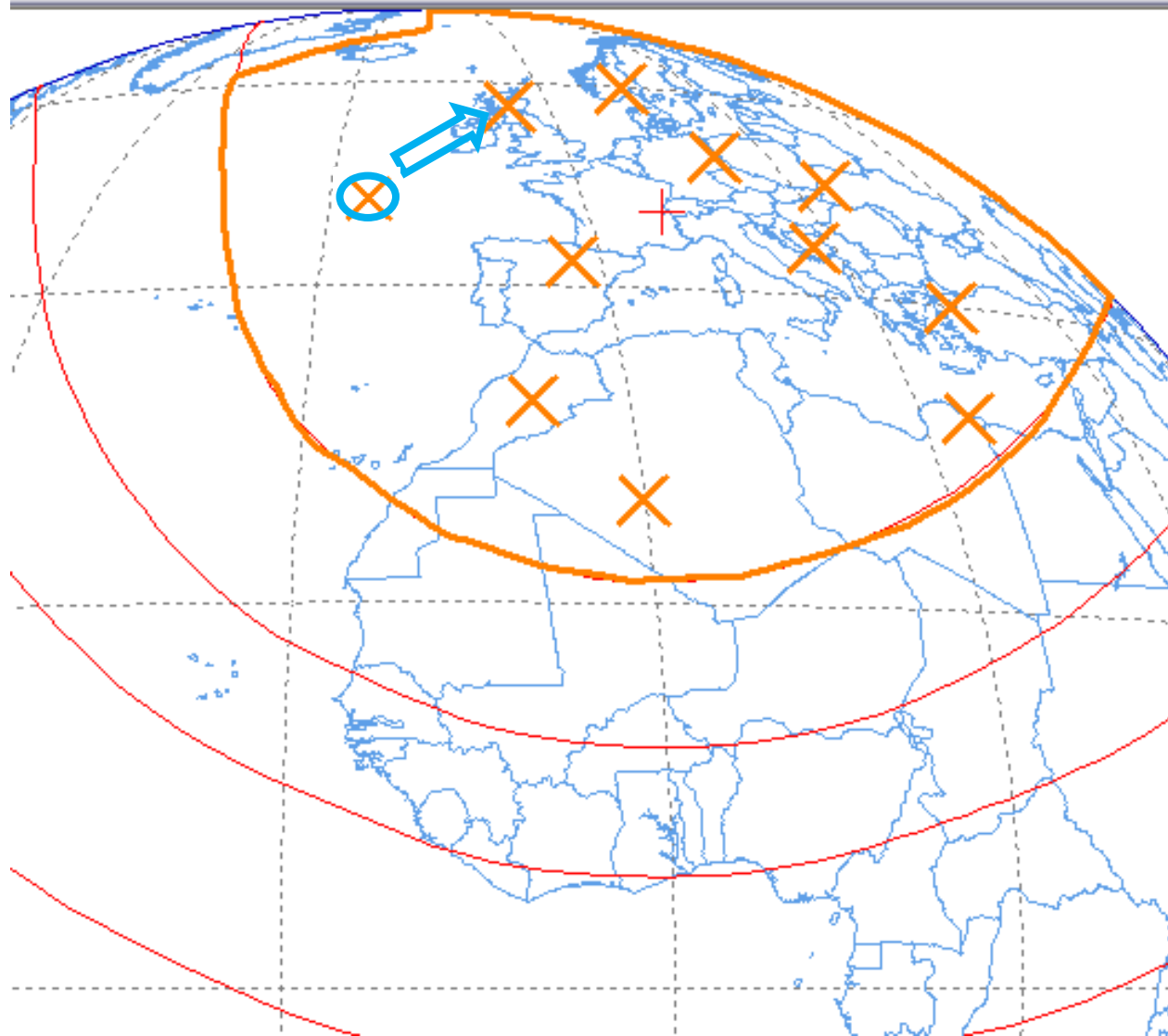
Findings	13A Conformity with RR	13B1 Provision

D1a1	D1a2	BR7a		C15a	BR70
Beam designation		Group id.		Exclusive op. group	Multibeam
Uplink	Downlink	Uplink	Downlink		
R1310_2	T1310_2	5	6	999	
R1310GHZ	T1310GHZ	4	2	999	
R64GHZ	T64GHZ	3	1	999	

GIMS diagram with Test Points on land



.SUI.T64GHZ .E.C.01.ITU_AREA



SpaceVal reporting no error (3/3)



BR Space Query and Extract System

File View Window Help

QuickQuery Result for Network(s): 110559099

Validation Report for Network: 110559099 On: By Operator: (a30b_exerciseval_cap.mdb)

Network ID: 110559099 Adm: SUI Satellite name: CHOCO-SAT Orbital Pos: -13.00°

Applicability code(s): geo

Validation Message Counts: Total: 3, FataIs: 0, Warnings: 2; Message Option: All

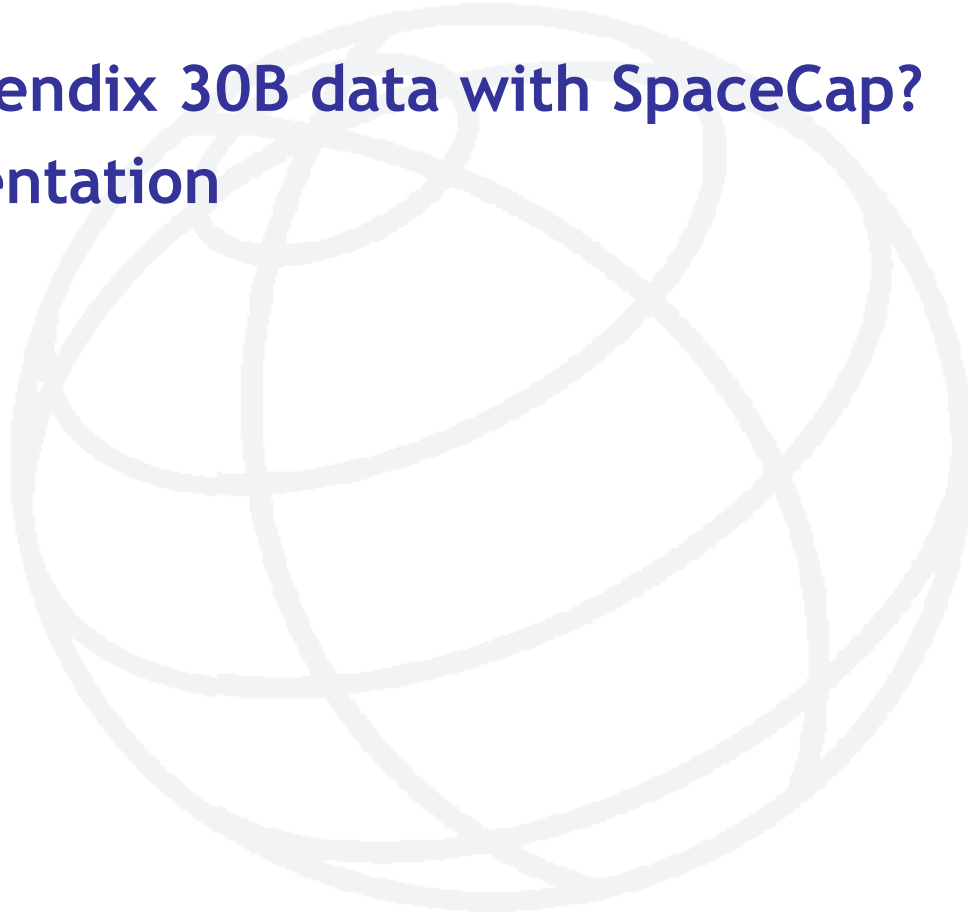
Beam Name	E / R	Group ID	Row No	Item Number	Rule ID	Severity Code	Table Name	Field Name	Field Value	Validation Error Message
				0		A				VALIDATION COMPLETED; v6.1.6; ERRORS F/w: 0/2
				100	2	W	geo	sat_name	CHOCO-SAT	sat_name not found in ref table
				101	3	W	geo	long_nom	-13	sat_name not found in ref table

SRS: MS-Access

ANNEX 1

How to capture Appendix 30B data with SpaceCap?

A step by step presentation



SpaceCap software use



SpaceCapture V6 System - [Set Notice Template]

File Edit Tools Template Window Help

CR/NOTIF API RAS PLAN RS49

Start Page - PLAN - WRC ORB-88 FSS Plan 6/4 AND 13/10-11 GHz Band (Appendix 30B)

Transaction Id:

Open Database

Set Notice type

Set Template to PLAN

Set PLAN ID

Select a Plan

PLAN ID	Description	Notice Count
00DN	WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30)	0
00UP	WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A)	0
30_2	RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A)	0
A30B	WRC ORB-88 FSS Plan 6/4 AND 13/10-11 GHz Band (Appendix 30B)	0

Plan / List / Pending Plan / List / Location Space Operation Functions

Plan / List / Pending

Plan / List / Location

Space Operation Functions

Plan ID Description Notice Count

00DN WRC-00 BSS Down-link Plan & List for Regions 1 & 3 (Appendix 30) 0

00UP WRC-00 Feeder-link Plans and Lists for Regions 1 and 3 at 14&17 GHz (Appendix 30A) 0

30_2 RARC BC SAT83 Plan for Region 2 (Appendices 30 & 30A) 0

A30B WRC ORB-88 FSS Plan 6/4 AND 13/10-11 GHz Band (Appendix 30B) 0

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

Current DB : E:\CITEL seminar 2010\Workshop\1- SpaceCap SpaceVal\Exercise\Spacecap_v6_ex_start.mdb Click on Notice Explorer to see a list of Notices, or

SpaceCap software use



SpaceCapture V6 - [Forms of Notice PLAN - WRC ORB-88 FSS Plan 6/4 AND 13/10-11 GHz Band (Appendix 30B)]

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN RS49

Notice Beam Strapping Attachments Coordination

Notice Id: 1 Plan: WRC ORB-88 FSS Plan 6/4 AND 13/10-11 GHz Band (Appendix 30B) Status: Capture

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

A1f1. Notifying Administration: B A1f3. Intergovernmental Satellite

Notice Submitted under

- ☒ 6.1 New Additional System
- ☐ Modify List Assignments
- ☐ Conversion of Allotment

6.17 Include Assignments in List
6.25 Resub notice returned 6.24
6.30 Delete Assignments from List
7.2 Allotment for New Adm

Notice Treated under

- ☐ Transfer or resubmission to 6.1
- ☐ 6.33C Reinstate Allotment

6.35 Allotment for New ITU Member

- ☐ Transfer to Allotment
- ☐ Transferred to Allotment (w/RC)

A30B#6.1A Provision Code

A4a1. Nominal Orbital Longitude: 60.00° W A4a. Identity of the Satellite Network: CITE L 1

A4a2. Longitudinal tolerance: b. West 0.1° a. East 0.1° A4a2c. Inclination Excursion: 0°

Network has no Beams

Current DB : E:\CITEL seminar 2010\Workshop\1- SpaceCap SpaceVal\Exercise\Spacecap_v6_ex_start.mdb date of receipt of the notice

Go to next tab

"W" should be captured as "- 60"

Depending of the notice type, select one

SpaceCap software use



SpaceCapture V6 - [Forms of Notice PLAN - WRC ORB-88 FSS Plan 6/4 AND 13/10-11 GHz Band (Appendix 30B1)]

File Edit Tools View Window Help

CR/NOTIF APL PLAN RS49

Coordination Notice Beam **Group** Strapping Attachments

Notice Id: 1 Satellite Network: CITELE 1 Nominal Orbital Longitude: 60.00 Administration: B

Characteristics of the Beam

B2. ☒ Receiving Beam ☐ Transmitting Beam

Shape of the Beam ☒ Elliptical ☐ Other Shape

B3d. Pointing Accuracy 0.1 °

B3a1. Co-polar gain 30.65 dBi

C12a. Protection Ratio

B1a. Beam Designation CITELE_06

Space Station Antenna B3c1. Radiation Pattern R123FR ==> APSRR_402V01

B3f2a. Rotation Accuracy 1 ° Beamlet

B3f2b. Major Axis Orientation 90 °

B3f2. Axis at half-power beamwidth c. Major 6 ° d. Minor 4 °

B3f1. Boresight Longitude -60 ° E Latitude -5 ° N

Go to next tab

List from the APL reference library

Item in Exercise

Current DB : E:\CITELE seminar 2010\Workshop\1- SpaceCap SpaceVal\Exercise\Spacecap_v6_ex_start.mdb 3:14 PM

SpaceCap software use



SpaceCapture V6 - [Forms of Notice PLAN - WRC ORB-88 FSS Plan 6/4 AND 13/10-11 GHz Band (Appendix 30B)]

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN R549

Strapping Attachments Coordination
Notice Beam Group Emissions/Frequencies Srv Area/Typical Antenna

Notice: 1 Satellite Network: CITEL 1 Beam Id: CITEL_06 R Group Id: 1 Split Grp Id:

Characteristics Common to a Group of Frequencies General Characteristics

C3a. Assigned frequency bandwidth
300000 (Hz)

C4a. Class of Station
EC

C1. Frequency Range
☒ Frequency Band 6725 - 7025 MHz
☐ Frequency Band 12.75 - 13.25 GHz
☐ Lower Frequency Band 12.75 - 13.00 GHz
☐ Upper Frequency Band 13.00 - 13.25 GHz

C5a. Receiving System
Noise Temperature: 500 Kelvins

BR Data

Remarks

Automatic insertion

Select Frequency range

Current DB : E:\CITEL seminar 2010\Workshop\1- SpaceCap SpaceVal\Exercise\Spacecap_v6_ex_start.mdb assigned frequency band expressed in kHz

SpaceCap software use



SpaceCapture V6 - [Forms of Notice PLAN - WRC ORB-88 FSS Plan 6/4 AND 13/10-11 GHz Band (Appendix 30B)]

File Edit Tools View Window Help

CR/NOTIF API RAST PLAN R549

Strapping Attachments Coordination
Notice Beam Group Emissions/Frequencies Srv Area/Typical Antenna

Notice Id: 1 Satellite Network: CITEL 1 Beam Id: CITEL_06 R Group Id: 1 Mspace Grp Code:

C8 Power Characteristics of the transmission

C7a. Designation of Emission	b2. Maximum Power Density	h. Maximum Power Density over Bdwth
300M	-52.9	-52.9

Item in Exercise

Automatic insertion after power density

C2a1. Assigned

Frequency in MHz
6875.00000

Automatic insertion

Current DB : E:\CITEL seminar 2010\Workshop\1- SpaceCap SpaceVal\Exercise\Spacecap_v6_ex_start.mdb 4:25 PM

SpaceCap software use



Attachment Wizard

Attachment No. Attachment Type ☒ File ☐ Gims ☐ Paper File Name Extension Attachment Description

Save Use Old Cancel

SpaceCapture V6 - [Forms of Notice PLAN - W...

File Edit Tools View Window Help

Strapping Attachments Coordination
Notice Beam Group Emissions/Frequencies Srv Area/Ty Antenna

Notice Id: Satellite Network: CITEL 1 Beam Id: CITEL_06 R Group Id: Mspace Grp Code:

C11a. Test Points (maximum 20)

Longitude degrees E	Latitude degrees N	Antenna Altitude (m)	Climatic Zone	C. Zone in db
-71.00	-5.00	0		N
-60.00	-22.00	100		P
-60.00	8.00	200		P
-48.00	-5.00	300		P

Service area contour

C11a1. Service Area No. C11a3. Service Area Diagram. See Attachment No.
C11a4. Service Area Name C11a5e. Minimal Elevation Angle

Associated Typical Earth Station Antenna Characteristics

C10d3. Maximum Isotropic Gain in dBi	C10d4. Half-power beamwidth in degrees	C10d5a. Radiation pattern
50.40	0.55	APEREC015V01 ==> APEREC015V01

☐ Apply these characteristics to all groups in this beam
☒ Apply these characteristics to the Current Group

Note: Each set of associated typical earth station antenna characteristics is valid for each test point.

Overwrite Climatic Zones in db with IDWM Climatic Zones

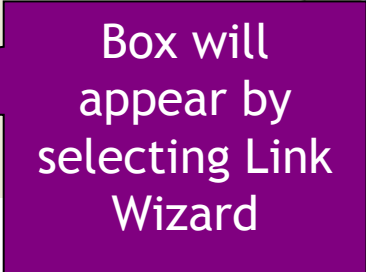
Item in Exercise

Automatic insertion

Item in Exercise

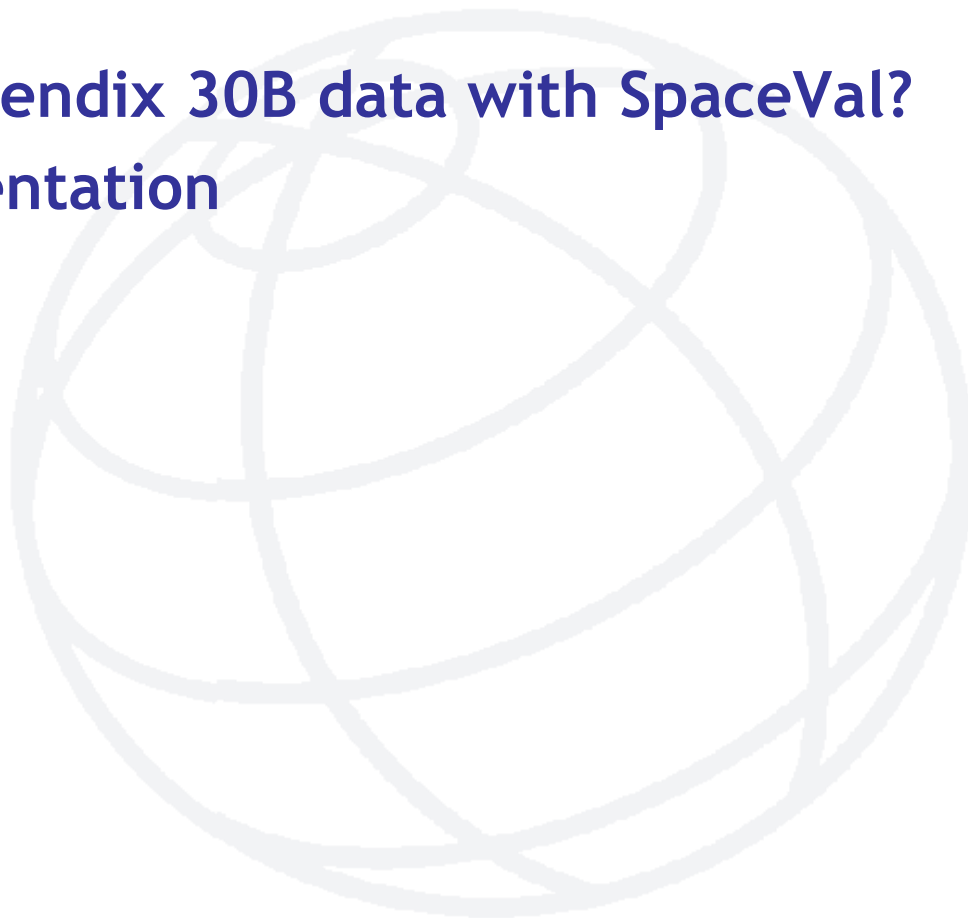
Box will appear after insertion of attachment number

List from the APL reference library



ANNEX 2

How to validate Appendix 30B data with SpaceVal? A step by step presentation

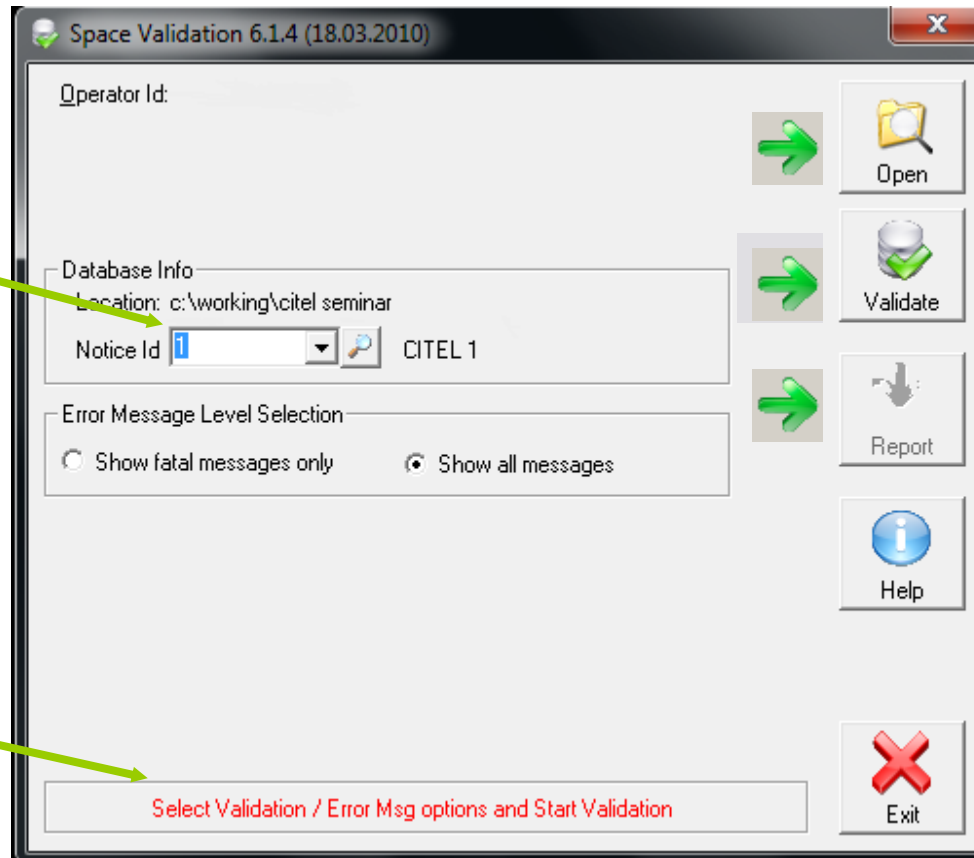


SpaceVal software use



2. Select the notice Id. to be validated

4. Check validation message



1. Browse to Select/open the database to be validated

3. Start the validation process

5. Show validation results with SpaceQry

Help / show validation rules

Exit SpaceVal

SpaceVal report to be obtained in SpaceCap



BR Space Query and Extract System - [QuickQuery Result for Network(s): 1]

File View Window Help

Validation Report for Network: 1 On: 13.07.2010 @ 16:21:03 By Operator: SAKAMOTO (spacecap_v6_ex_captured.mdb)

Network ID: 1 Adm: B Satellite name: CITEL 1 Orbital Pos: -60.00°

Applicability code(s): geo

Validation Message Counts: Total: 3, Fatais: 0, Warnings: 2; Message Option: All

Beam Name	E / R	Group ID	Row No	Item Number	Rule ID	Severity Code	Table Name	Field Name	Field Value	Validation Error Message
				0		A				VALIDATION COMPLETED; v6.1.6; ERRORS F/W: 0/2
				100	2	W	geo	sat_name	CITEL 1	sat_name not found in ref table
				101	3	W	geo	long_nom	-60	sat_name not found in ref table

SRS: MS-Access

No fatal error should be reported
by the validation !

Web links for further information

Results files are available in the workshop package

Creation of electronic Appendix 30B notices with SpaceCap software:

[http://www.itu.int/ITU-R/go/
space-software-space-notification-system-pc-capture/en](http://www.itu.int/ITU-R/go/space-software-space-notification-system-pc-capture/en)

Appendix 30B databases:

<http://www.itu.int/ITU-R/go/space-plans-ap30b/en>

Questions

Main contact person for Space Plan Services:

Mitsuhiro.Sakamoto@itu.int

Software: brsas@itu.int

