# Technical examination under Appendix 30B

Niamey, Niger

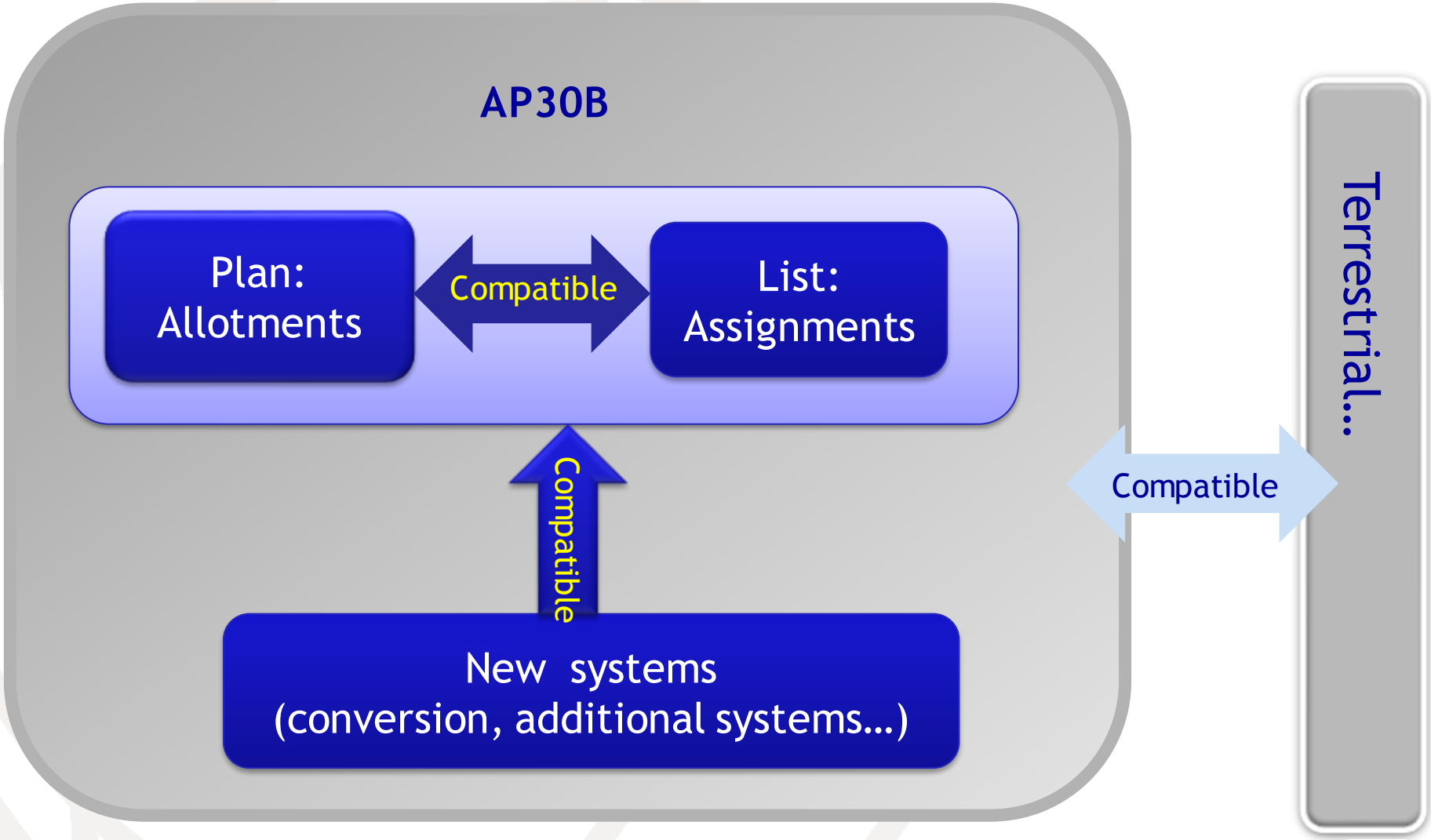
5-9 December 2011

**Omar KA**

Omar.ka@itu.int

BR/SSD/SSC

# COMPATIBILITY



# Protection of terrestrial services

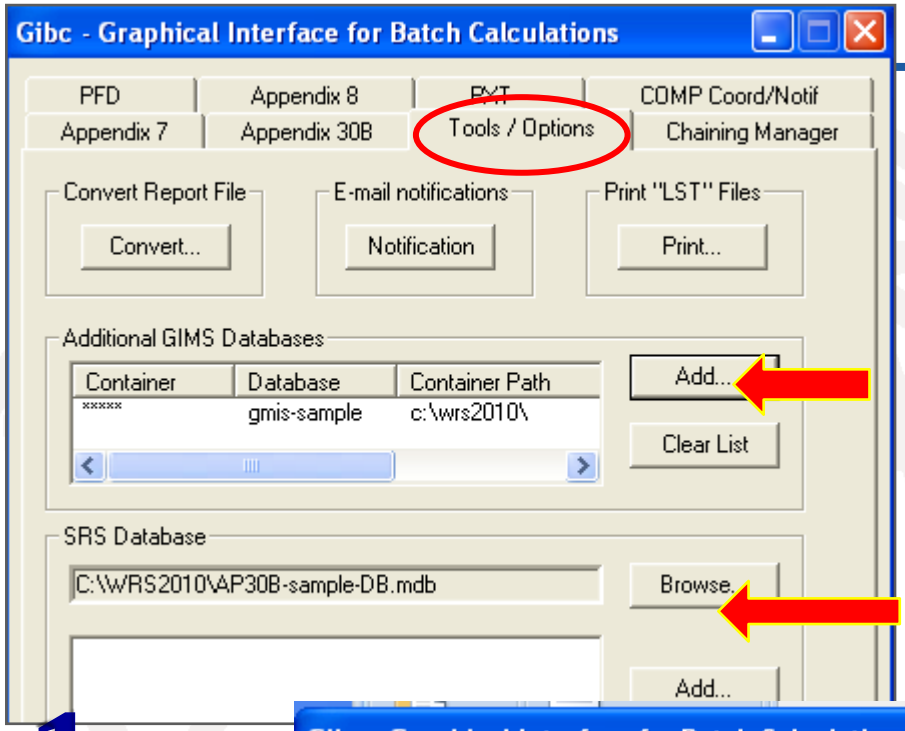
In application of Articles 6,7 and 8 of AP30B

**Downlink PFD hard limit at the Earth's surface**

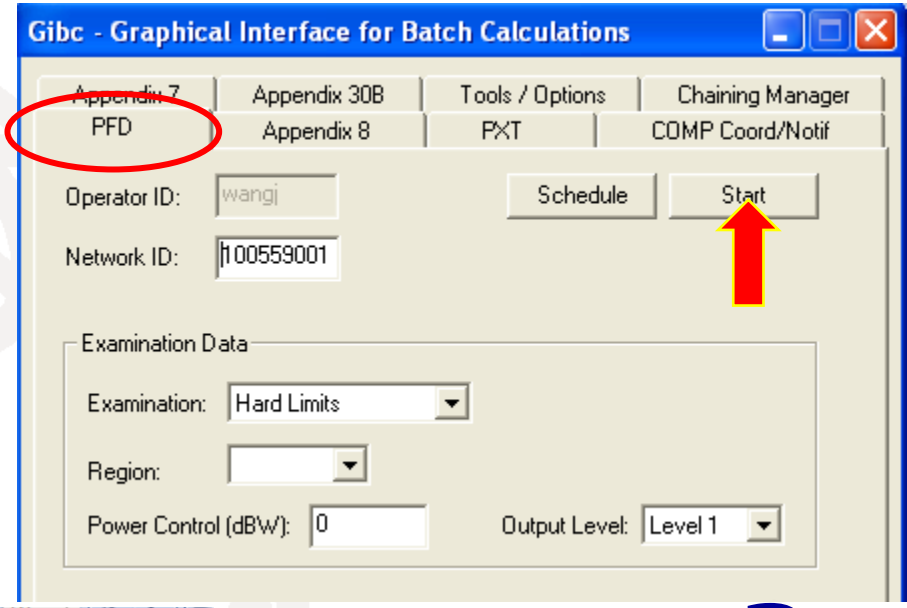
(Article 21 of Radio regulations)

| Frequency band | Service | Limit in dB(W/m$^2$) for angles of arrival (d) above the horizontal plane | | | Reference bandwidth |
|---|---|---|---|---|---|
| | | 0°-5° | 5°-25° | 25°-90° | |
| 4 500-4 800 MHz<br>5 670-5 725 MHz (Nos. **5.453** and **5.455**)<br>7 250-7 850 MHz | Fixed-satellite (space-to-Earth)<br>Meteorological-satellite (space-to-Earth)<br>Mobile-satellite<br>Space research | -152 | -152 + 0.5(d – 5) | -142 | 4 kHz |
| 10.7-11.7 GHz | Fixed-satellite (space-to-Earth) (geostationary-satellite orbit) | -150 | -150+0.5(d – 5) | -140 | 4 kHz |

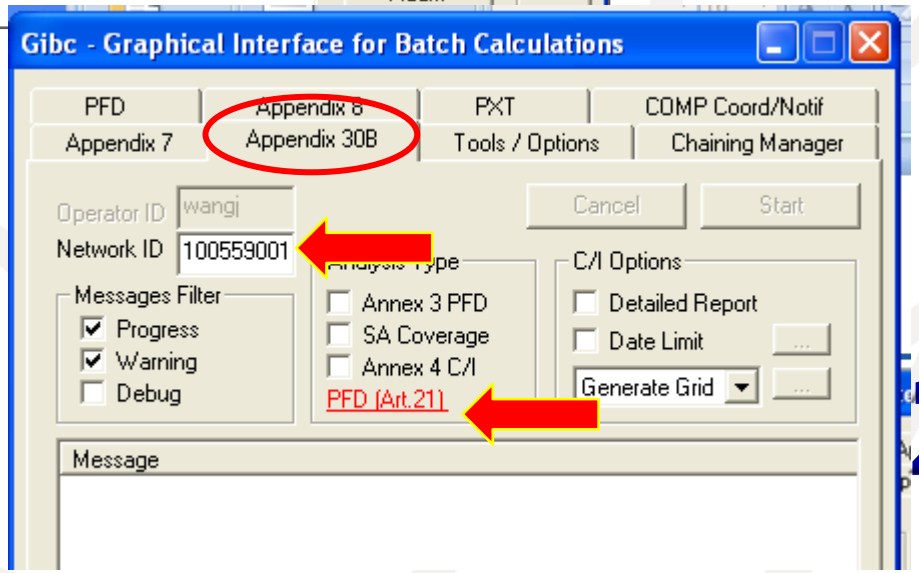
# Article 21 PFD examination




1




3




2

# Annex 3 of Appendix 30B

**Downlink PFD hard limit**

on any portion of the surface of the Earth

-127.5dB (W/m$^2$.MHz) in 4GHz

-114.0dB (W/m$^2$.MHz) in 10/11GHz

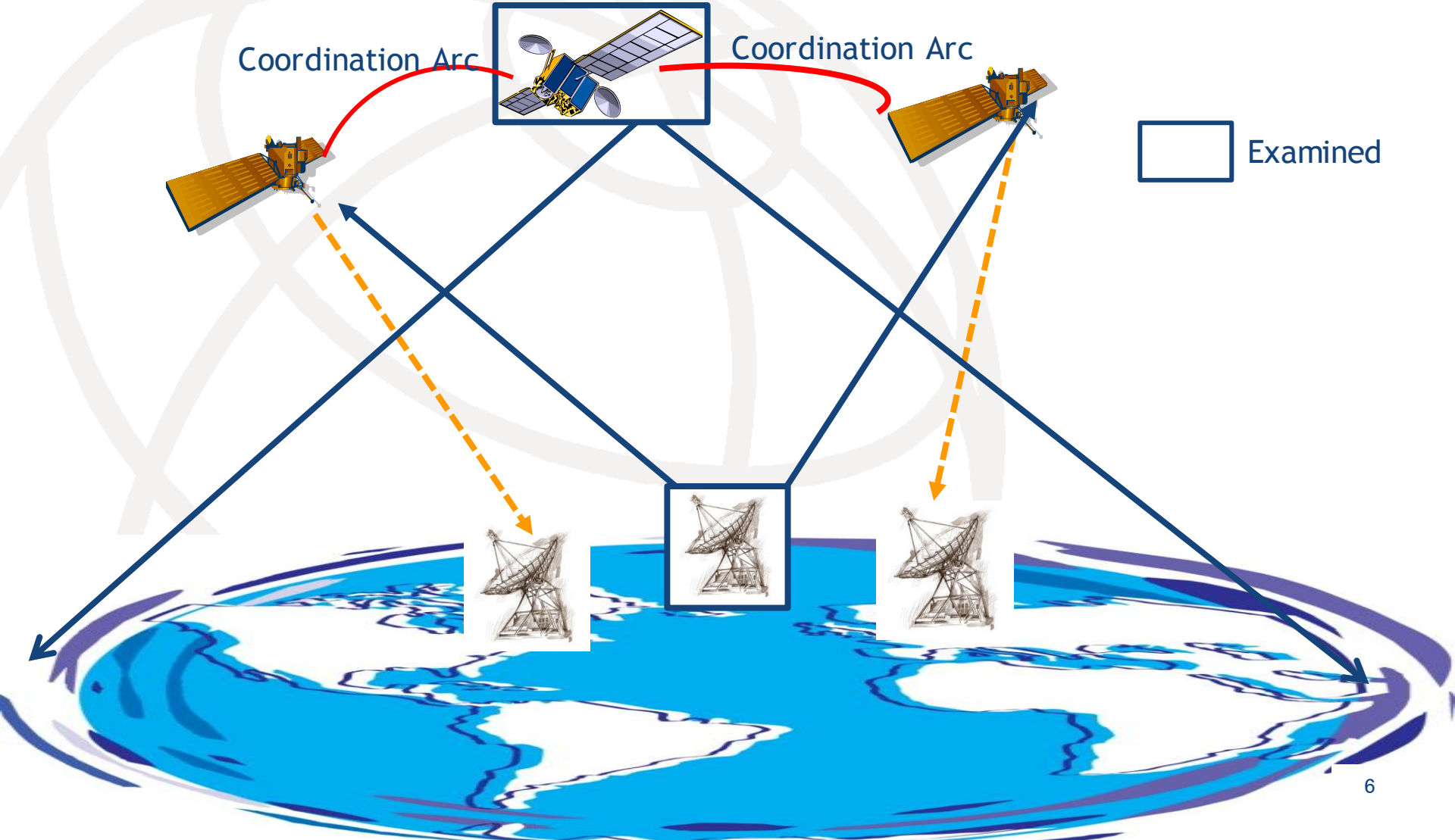
**Uplink PFD hard limit**

towards any location in the geostationary-satellite orbit located beyond the coordination arc

-140.0dB (W/m2.MHz) beyond10° in 4GHz

-133.0dB (W/m2.MHz) beyond 9° in 10/11GHz

# Annex 3 PFD limits



# Annex 4 of Appendix 30B

## Compatibility within coordination arc,

**agreement is required when at least one of the following three conditions is not satisfied**

**Uplink single-entry C/I ≥ 30dB, or (C/N)up +9dB,**
**or accepted value**

**Downlink single-entry C/I ≥ 26.65dB or (C/N)down +11.65dB**
**or accepted value**

**Over all aggregate C/I ≥ 21dB or (C/N)total+7dB**
**or accepted value**

**Computation precision is 0.05dB for all**
**Tolerance of 0.25dB for aggregate C/I criteria of assignments <u>not stemming from conversion</u> (beyond the envelop characteristics of the initial allotment)**

# Grid points for downlink examination

The examination at grid points was introduced by WRC-07 to properly protect the service area of allotments and assignments from shaped beams whose antenna diagrams contain a number of “holes” towards certain specific downlink test points.

The grid points are regularly generated within the service areas of interfered networks. To ensure good coverage of irregularly shaped service areas, points are also added on the border of the service areas.

At grids points as well as the test points, the calculated space-to-Earth (downlink) single-entry *C/I* are examined against the corresponding reference values. The reference value at a grid point is interpolated from the reference values on the test points.

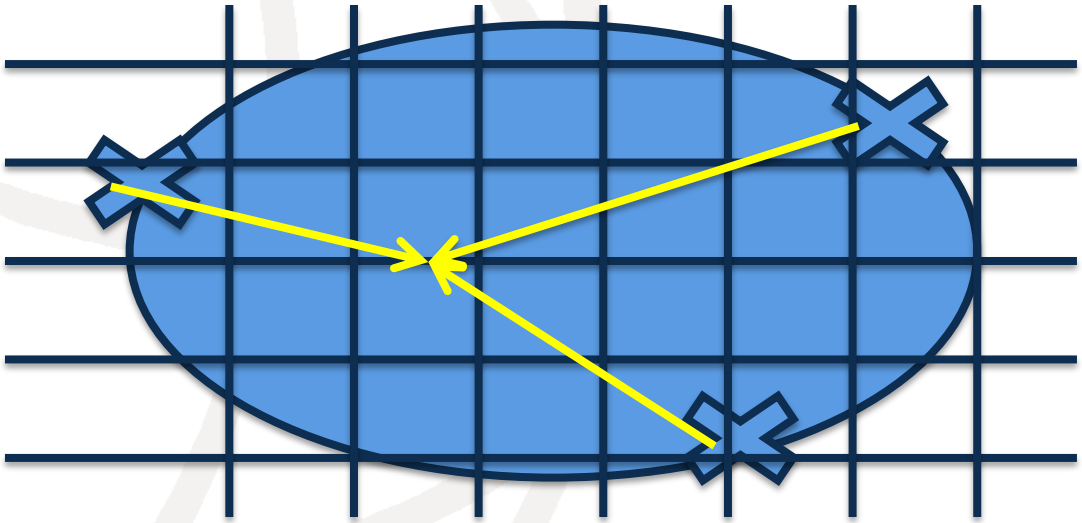
# Grid points for downlink examination

**Calculation of the interpolated single entry C/I reference value at (dB) grid point Eg:**

**(See Annex1 of CR302 of 19 May 2009,**

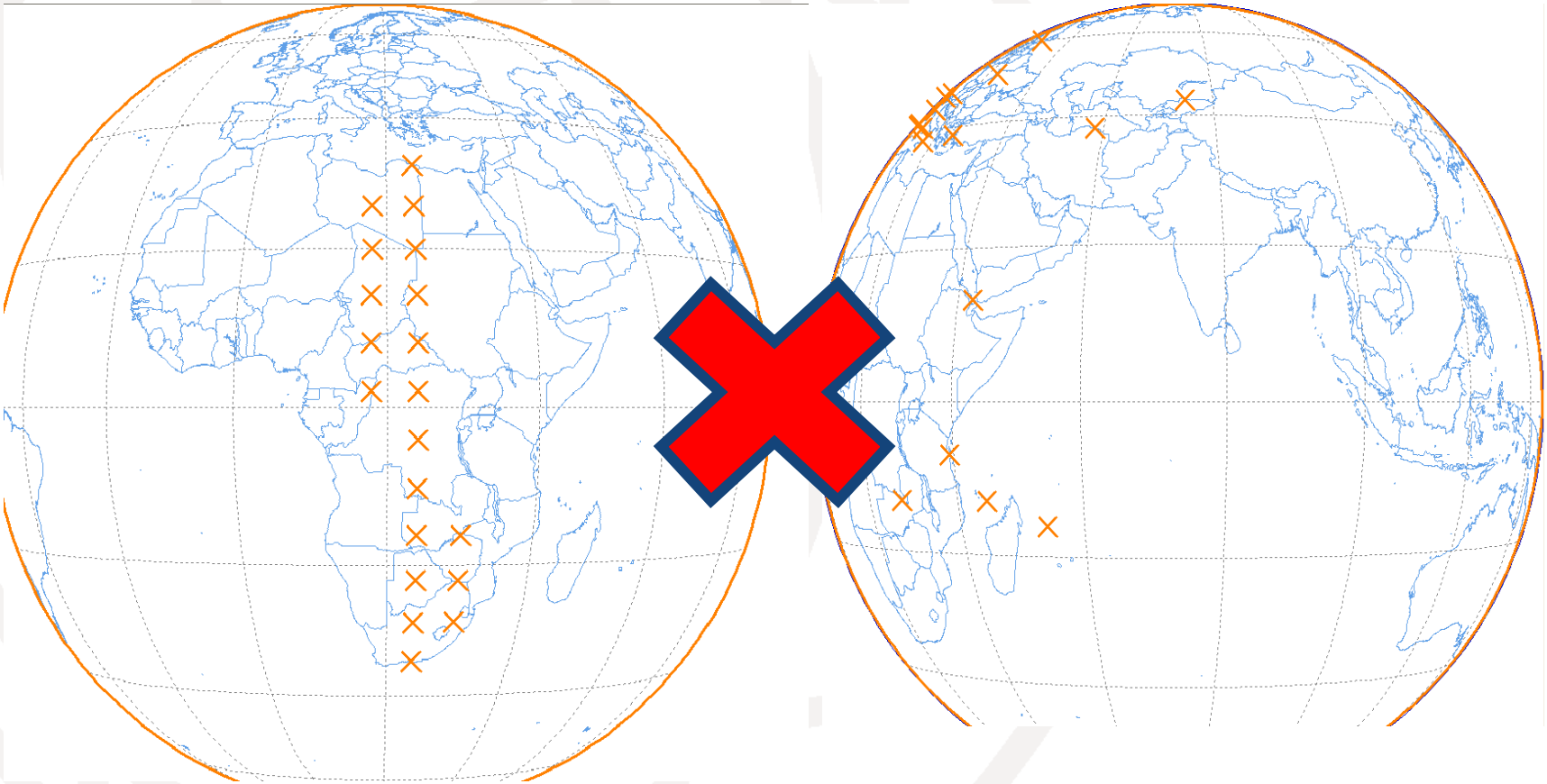
**(the note 19 of Annex 4 to AP30B (WRC-07))**

$$V_{Eg} = \frac{\sum_{h=1}^{Nt} R_{Th} \times (d_{Th})^{-2}}{\sum_{h=1}^{Nt} (d_{Th})^{-2}}$$

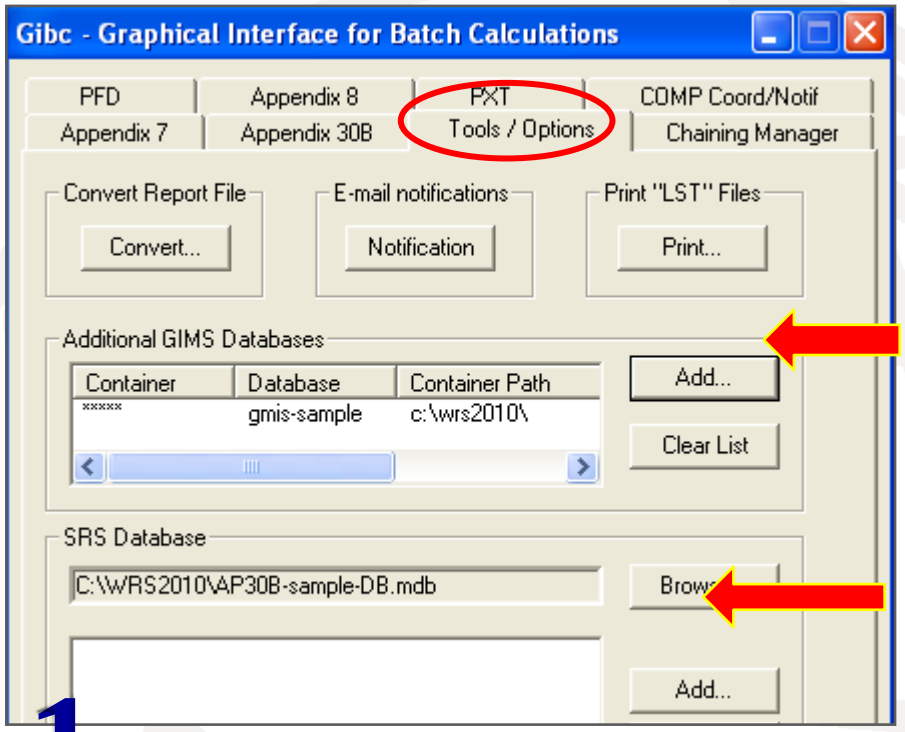


# Distribution of Test Points

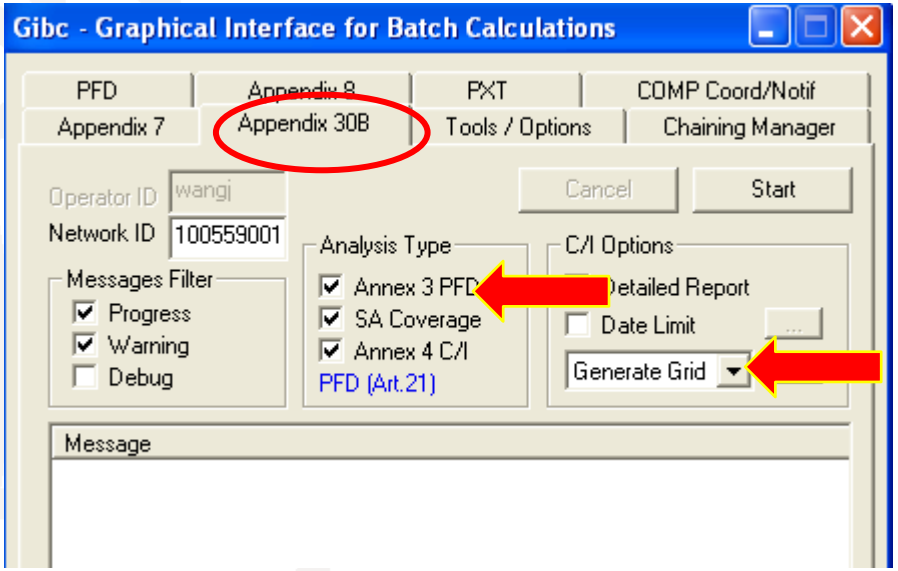
In order to get reasonable reference values on the grids in the whole service area, the locations and distribution of test points should be consistent with their corresponding service area.



# Annex 4 Examinations




1




2

# EXERCISES

**\Space Workshop\Space Plans\7_A30B examination exercise\Exercise**

- **Master Database:** ***30B_mater sample.mdb***
- **Additional GIMS:** ***A30B_exercise_GIMS.mdb***
    - **Network under examination:** ***XXX-XXX-XXX***

# Results of GIBC

**Located at C:\BR_TEX_RESULTS**

**Article 21: C:\BR_TEX_RESULTS\PFD**

**Annex 3 and 4: C:\BR_TEX_RESULTS\AP30B**

**A subfolder is created for each examined network (named after its notice ID)**

# Video demonstration

**The Bureau has produced video presentations to assist administrations in using the new GIBC software package:**

**http://www.itu.int/en/ITU-R/space/plans/Pages/AP30B.aspx**

- **gibc_ap30b_ci** (MPEG-4 or avi format) shows how to perform C/I degradation analysis with respect to Appendix 30B Annex 4 protection criteria using GIBC-Appendix 30B.

- **gibc_ap30b_pfd_sa** (MPEG-4 or avi format) shows how to perform PFD and Service Area coverage analysis using GIBC Appendix 30B application.

- **AP30BTexCap_A6B** (MPEG-4 or avi format) shows how to update reference situations (AP30B#A6B and AP30B#A7).

- **AP30BTexCap_A6A** (MPEG-4 or avi format) shows how to establish the reference situation of the examined network and store examination results, affected administrations and networks in the SNS-format AP30B database.

- **AP30BTexCap_A6A_ViewResults** (MPEG-4 or avi format) shows how to view and print the Annex 4 C/I examination results

# Any question ?