ITUEvents

ITU in service of space

28 June 2023
Geneva, Switzerland

www.itu.int/go/ITU-R/ITU-in-Service-of-Space

Development of Recommendation ITU-R S.1503

John Pahl

ITU in Service of Space: Development of Recommendation ITU-R S.1503

- The purpose of this Workshop is to:

  "identify the needs of the satellite industry in developing ITU rules/procedures for regulating the use of the frequency spectrum/satellite orbits, to ensure the development and implementation of new satellite technologies while guaranteeing the equitable access and rational use of GSO and non-GSO orbit/spectrum resources"

- This presentation focusses on how this purpose relates to Recommendation ITU-R S.1503
- Of particular relevance to Recommendation ITU-R S.1503 are:
  - "to ensure the development and implementation of new satellite technologies"
  - "guaranteeing the equitable access and rational use of GSO and non-GSO orbit/spectrum resources"

Recommendation ITU-R S.1503

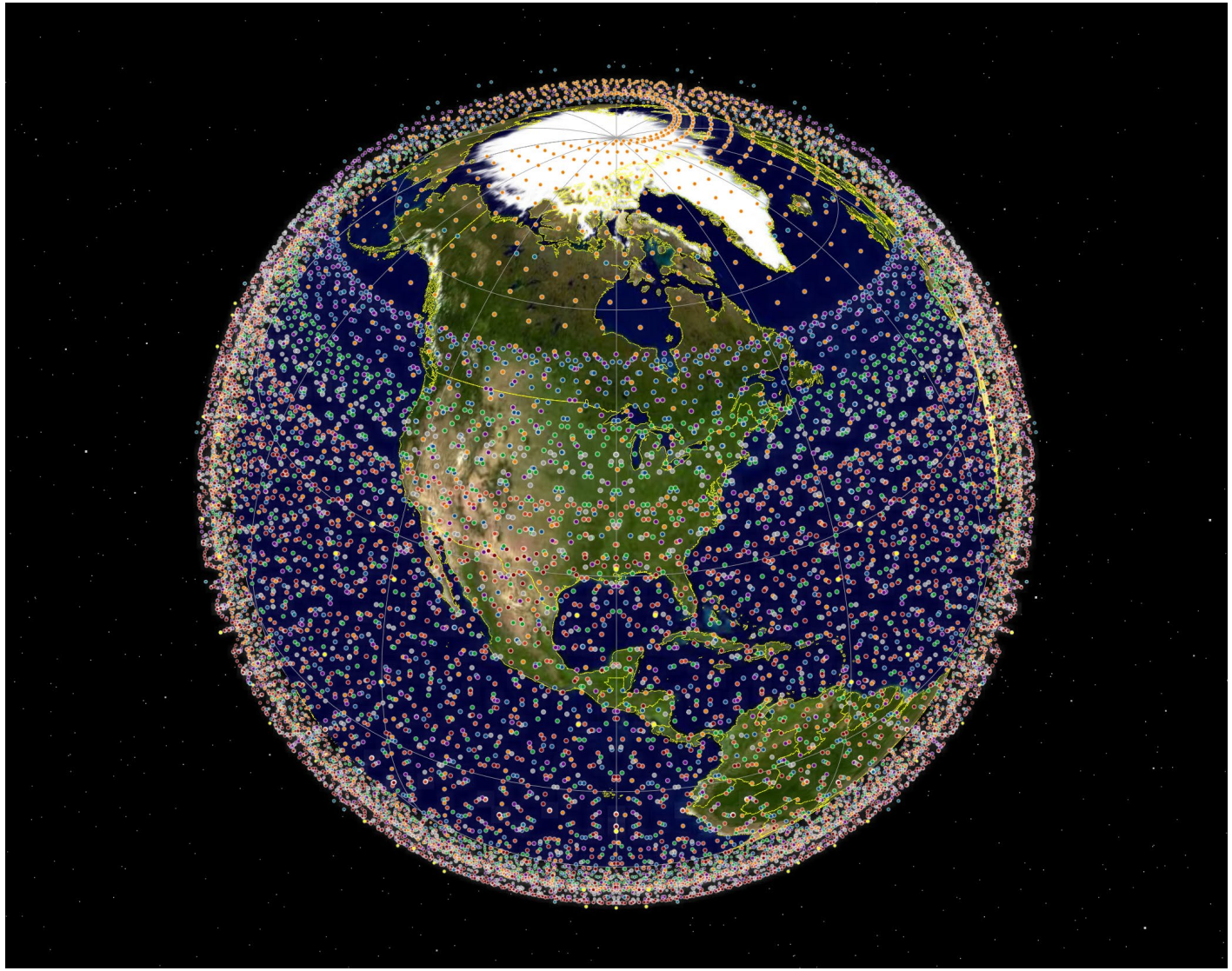
- Title of Recommendation:

  "Functional description to be used in developing software tools for determining conformity of non-geostationary-satellite orbit fixed-satellite service systems or networks with limits contained in Article 22 of the Radio Regulations"

- Software developed in accordance with the algorithm in this Recommendation is used by the BR to determine if a non-GSO filing is in conformity with the equivalent power flux density (EPFD) limits in RR Article 22
  - Also used by the algorithm in Resolution 770 (WRC-19) to check compliance of Q/V band non-GSO systems with the criteria in RR 22.5L
- Approval and revision history:
  - Initial approved at the Radiocommunication Assembly in May 2000
  - Revision 1: April 2005
  - Revision 2: December 2013
    - Implemented in the two software tools used by the BR
    - Availability announced in Circular Letter CR/414 in December 2016
    - Prior to that, BR gave a qualified finding under Resolution 85
  - Revision 3: January 2018

Key drivers

- Rapid industry change
- Development of new technologies
- Increasing number of non-GSO systems filed[1] and launched
- Development of larger non-GSO constellations
- Continuing efforts to improve spectrum efficiency
- Need for balanced regulatory framework



(1) See https://www.itu.int/en/ITU-R/space/Pages/epfdData.aspx

Work on Revising Recommendation ITU-R S.1503-3

- Work started in June 2019
- Discussed at every WP 4A since & within Correspondence Group (CG) S.1503
- Two documents attached to the WP 4A Chairman's Report:
  - Annex 4: PDRR S.1503 with those items agreed and stable within WP 4A
  - Annex 7: WD towards PDRR S.1503 with those items under discussion
- CG S.1503 considered technical aspects to those items under discussion, such as:
  - Satellite selection (alpha table)
  - Duty cycle
  - Time-frame transmission scheme
  - Consideration of non-WCG geometries
  - Run time improvements
- No agreement on these items within CG S.1503 (see Meeting Report and Summary Records)
- Questions raised in CG S.1503 but outside terms of reference:
  - Are further regulatory procedures required to support the validation process?
  - Whether to consider further the allocation of tasks between administrations and the BR?
  - Whether more should be done to consider measurement of parameters?

Moving the work forward

- Have had significant and detailed technical discussions on a range of innovative ideas by an impressive group of experts, but no revision since 2019
- Could we do more regular updates of packages (such as the C1s in the PDRR) that are:
  - Stable and agreed
  - Retain the balance of facilitating operation of non-GSO while protecting GSO?
- Resolution ITU-R 1-8 allows more frequent updates than 2 years in some circumstances
  - Recommendation ITU-R P.452 has had 11 updates in 27 years: in the 1990s 4 updates in 7 years
- Do we need to synchronise revisions with WRCs?
  - Sometimes yes, as in the mods in the PDRR that relate to existing RR Appendix 4 data items
  - In the future maybe no, because new parameters can go in the system operating XML file
- Deletion of material no longer required is important for long-term management of the Recommendation to reduce “technical debt”
- Prototyping of ideas in software can assist in testing them and ensuring algorithm text is implementable, clear and unambiguous

Role of the ITU and WP 4A

- Strong support for role of the ITU as use of software by the BR gives transparency to process and clarity of status of a non-GSO filing
- To do its job, the BR needs to have the best tools available
  - Both regulatory and software tools
- Our job is to provide it with these tools
- Old saying “perfect is the enemy of good”
- Could consider an approach based on:

Improve. Release. Iterate.

- WP 4A has the skills and expertise to do this