

ITUEvents

1st ITU Inter-regional Workshop on WRC-23 preparation

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#ITUWRC

Satellite Issues

WRC-23 agenda item 1.17

Study of technical and operational issues, and regulatory provisions for satellite-to-satellite links in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz

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Outlines

WRC-23 agenda item 1.17

Resolution 773 (WRC-19)

Background and motivation

Organization of the work in WP 4A

Concept of operations

Status of the Studies

WRC-23 agenda item 1.17

1.17 to determine and carry out, on the basis of the ITU-R studies in accordance with Resolution 773 (WRC-19), the appropriate regulatory actions for the provision of inter-satellite links in specific frequency bands, or portions thereof, by adding an inter-satellite service allocation where appropriate.

Resolution 773 (WRC-19) – Study of technical and operational issues, and regulatory provisions for satellite-to-satellite links in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz

Responsible Group:

WP 4A

Contributing Groups:

WP 3M WP 5B

WP 4B WP 5C

WP 4C WP 7B

WP 5A WP 7C

Resolution 773 (WRC-19)

Study of technical and operational issues and regulatory provisions for satellite-to-satellite links in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz

Resolves to invites the ITU Radiocommunication Sector

- 1 to develop the technical and operational characteristics of different types of space stations that plan satellite-to-satellite transmissions in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz, taking into account considering e) above;
- 2 to study the technical and operational characteristics, including spectrum requirements, off-axis equivalent isotropically radiated power (e.i.r.p.) values and out-of-band emission limits, for transmissions between space stations in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz;
- 3 to study sharing and compatibility between satellite-to-satellite links intending to operate between space stations in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz and current and planned stations of the FSS and other existing services allocated in same frequency bands and adjacent frequency bands, including passive services, with a view to ensuring protection of the primary services referred to in recognizing further i);
- 4 to develop, for different types of space stations, the technical conditions and regulatory provisions for satellite-to-satellite operations in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz, or portions thereof, including new ISS allocations, as appropriate, taking into account the results of the studies above,

invites administrations

to participate in the studies and to provide input contributions,

invites the 2023 World Radiocommunication Conference

to consider the results of the above studies and take necessary actions, as appropriate,



Background and motivation

- *Growing interest for utilizing satellite-to-satellite links for a variety of applications including, but not limited to, relaying data to/from Earth using a GSO or non-GSO FSS space station that is operating at an orbital altitude greater than that of the non-GSO user space station generating the data*
- *Most of these non-GSO missions are in Low Earth Orbit (LEO), the user space station download is mostly related to the short-duration access they have to their respective ground stations, normally about 10 minutes per orbit. This limits the observing/measuring capacity of the on-board instruments below their capability.*
- *Satellite-to-satellite operation could permit a near continuous connectivity*

Organization of the work in WP 4A

WRC-23 Agenda item 1.17:

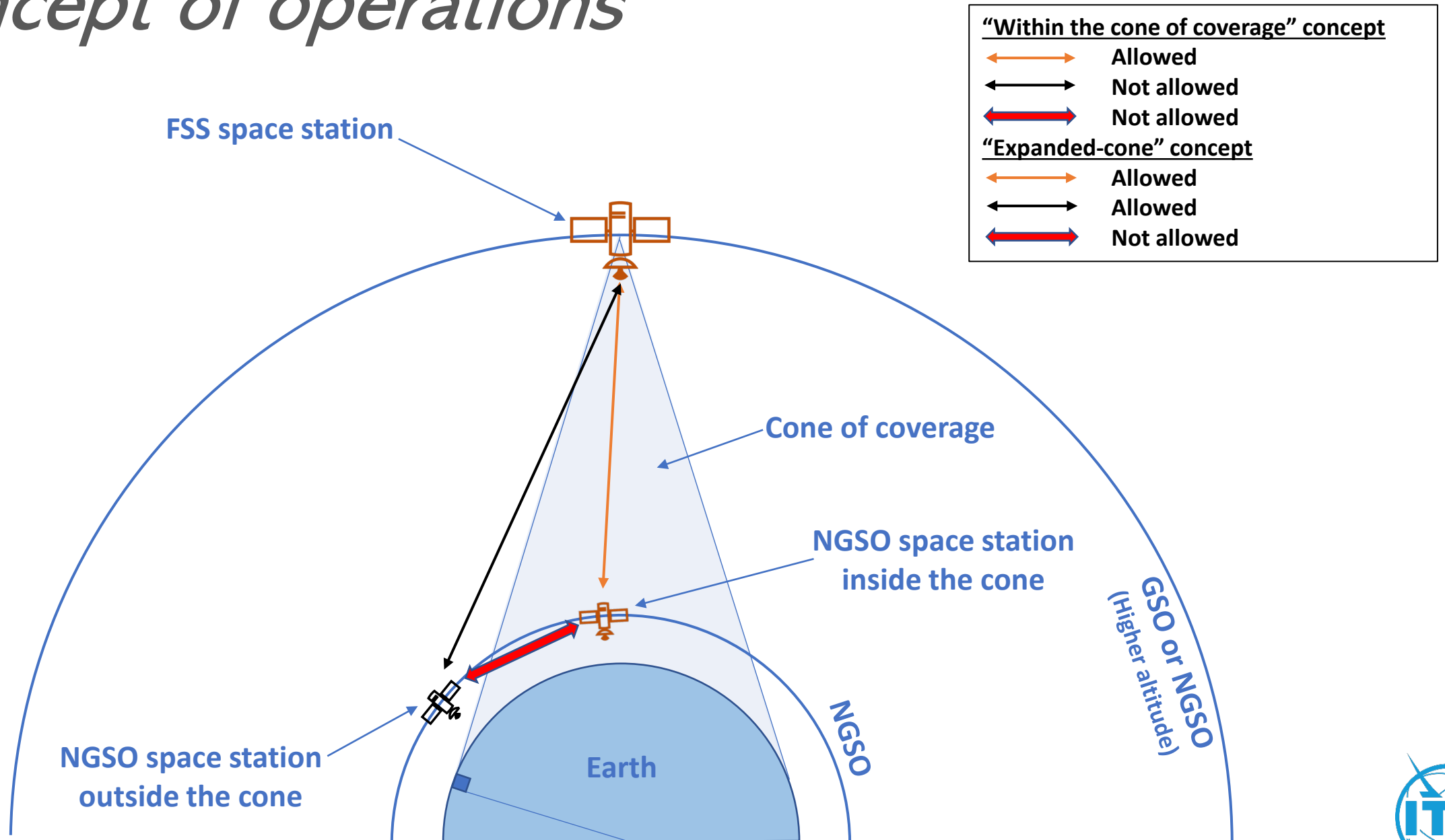
SWG 4A1c

Main activities:

- *Development of the Working Document towards Draft CPM text for WRC-23 Agenda item 1.17 ([4A/522 Annex 27](#)) (**working in progress**);*
- *Development of the Working Document on WRC-23 Agenda Item 1.17 (**working in progress**):*
 - *Main document ([4A/522 Annex 17](#)) that contains summary of the sharing and compatibility studies that are being carried;*
 - *Annex 1 ([4A/522 Annex 18](#)) that contains technical and operational characteristics of the incumbent services*
 - *Annex 2 ([4A/522 Annex 19](#)) that contains detailed sharing and compatibility studies for the “**within the cone of coverage**” concept of operations*
 - *Annex 3 ([4A/522 Annex 20](#)) that contains detailed sharing and compatibility studies for the “**Expanded-cone**” concept of operations*
- *Update the AI 1.17 Work Plan in each meeting, considering what happens in the meeting and what is expected for the next meeting ([4A/522 Annex 34](#));*



Concept of operations



Status of the studies in the band 27.5-30 GHz

Interfered-with Service	Frequency bands	“Within the cone” concept		“Expanded-cone” concept	
		NGSO to GSO FSS	NGSO to NGSO FSS	NGSO to GSO FSS	NGSO to NGSO FSS
Fixed Service (FS)	27.5-29.5 GHz	✓	✓	✓	
Mobile Service (MS)	27.5-29.5 GHz	✓	✓		
HAPS downlink to receiver	27.9-28.2 GHz (see FN 5.537A - HAPS use in 24 countries)	✓	✓	✓	
GSO FSS (Earth-to-space)	27.5-30 GHz	✓	✓		
Non-GSO FSS (Earth-to-space) other than MSS feeder links	27.5-29.1 GHz, 29.5-30 GHz	✓	✓		
Non-GSO FSS (Earth-to-space) limited to MSS feeder links	29.1-29.5 GHz (FN 5.535A)	✓		✓	
GSO MSS (Earth-to-space)	29.5-30 GHz (FN 5.525, 5.526, 5.527, 5.529)	✓	✓		
Non-GSO MSS (Earth-to-space)	29.5-30 GHz (FN 5.525, 5.526, 5.527, 5.529)	✓	✓		

✓ *Studies received.*

Status of the studies in the bands 18.1-18.6 GHz & 18.8-20.2 GHz

Interfered-with Service	Frequency bands	“Within the cone” concept		“Expanded-cone” concept	
		GSO FSS to NGSO	NGSO FSS to NGSO	GSO FSS to NGSO	NGSO FSS to NGSO
Fixed Service (FS)	18.1-18.6 GHz, 18.8-19.7 GHz, 19.7-20.2 GHz (FN 5.524)	✓	✓		
Mobile Service (MS)	18.1-18.6 GHz, 18.8-19.7 GHz, 19.7-20.2 GHz (FN 5.524)	✓	✓		
GSO FSS (Earth-to-space) limited to BSS feeder links	18.1-18.4 GHz (FN 5.520)	✓	✓		
GSO FSS (space-to-Earth)	18.1-18.6 GHz, 18.8-20.2 GHz	✓	✓		
Non-GSO FSS (space-to-Earth) other than MSS feeder links	18.1-18.6 GHz, 18.8-20.2 GHz	✓	✓		
Non-GSO FSS (Earth-to-space) limited to MSS feeder links	19.3-19.6 GHz (FN 5.523B)	✓	✓		
Non-GSO FSS (space-to-Earth) limited to MSS feeder links	19.3-19.7 GHz (FN 5.523D)	✓	✓	✓	✓
GSO MSS (space-to-Earth)	19.7-20.1 GHz in Region 2 & 20.1-20.2 GHz in all Regions	✓	✓		
Non-GSO MSS (space-to-Earth)	19.7-20.1 GHz in Region 2 & 20.1-20.2 GHz in all Regions	✓	✓		
GSO METSAT (space-to-Earth)	18.1-18.3 GHz in all Regions, 18.3-18.4 GHz in Regions 1 & 3 (FN 5.519)	✓	✓		
EESS (passive)/SRS (passive)	OBEE into 18.6-18.8 GHz	✓	✓	✓	✓

✓ Studies received.

Status of the studies in the band 11.7-12.7 GHz

Interfered-with Service	Frequency bands	“Within the cone” concept		“Expanded-cone” concept	
		GSO FSS to NGSO	NGSO FSS to NGSO	GSO FSS to NGSO	NGSO FSS to NGSO
Fixed Service (FS)	11.7-12.7 GHz				
Mobile Service (MS)	11.7-12.2 GHz in Regions 1 & 3 12.2-12.7 GHz in all Regions				
Broadcasting Service (BS)	11.7-12.5 GHz in Regions 1 & 3, 12.2-12.7 GHz in Region 2				
GSO FSS (Earth-to-space)	12.5-12.7 GHz in Region 1				
Other GSO FSS (space-to-Earth)	12.5-12.7 GHz in Region 1, 11.7-12.2 GHz in Region 2, 12.2-12.5 GHz in Region 3				
Non-GSO FSS (Earth-to-space)	12.5-12.7 GHz in Region 1				
Non-GSO FSS (space-to-Earth)	11.7-12.7 GHz				
GSO BSS (space-to-Earth)	11.7-12.5 GHz in Region 1, 12.2-12.7 GHz in Region 2, 11.7-12.2 GHz & 12.5-12.7 GHz in Region 3	✓			

✓ *Studies received.*