

## EUROPEAN COMMON PROPOSALS

### PART 25

#### **Agenda Item 1.25 – High Density systems in the Fixed-Satellite Service**

##### **Introduction**

Satellite systems are a key medium for delivery of future telecommunication services enabling broadband communication to rapidly be established over wide areas.

The majority of the bands covered by Agenda Item 1.25 are allocated, on a primary basis, to other services than the fixed-satellite service (FSS), in particular to the fixed service (FS). Therefore, except where CEPT has taken specific decisions, the European common proposals below also ensure the future development of these non-FSS services.

Europe considers that a High Density application in the fixed-satellite service (HDFSS) is one which operates on a system in the FSS, deploying a large number of ubiquitous earth stations. Satellite systems can be of any orbital type, such as GSO or non-GSO, and using any of the available technologies. High Density applications in the FSS are generally characterized as follows:

- flexible, rapid and ubiquitous deployment of earth stations (terminals);
- high frequency reuse;
- small terminal antenna size;
- low cost terminals.

As a consequence of some of these characteristics, Europe considers that it may not be always practicable to coordinate HDFSS earth stations on an individual site by site basis.

Europe generally supports that HDFSS bands be made available on a global basis.

##### **Proposals**

## ARTICLE 5

**MOD EUR/1.25/1**

### 15.63-18.6 GHz

Allocation to services		
Region 1	Region 2	Region 3
<p><b>17.3-17.7</b> FIXED-SATELLITE (Earth-to-space) 5.516 <b>(space-to-Earth) MOD 5.484A</b> <b>ADD 5.HDFSS</b> Radiolocation 5.514</p>	<p><b>17.3-17.7</b> FIXED-SATELLITE (Earth-to-space) 5.516 BROADCASTING-SATELLITE Radiolocation 5.514 5.515 5.517</p>	<p><b>17.3-17.7</b> FIXED-SATELLITE (Earth-to-space) 5.516 <b>(space-to-Earth) MOD 5.484A</b> <b>ADD 5.HDFSS</b> Radiolocation 5.514</p>
<p><b>17.7-18.1</b> FIXED FIXED-SATELLITE (space-to-Earth) <b>MOD 5.484A</b> (Earth-to-space) 5.516 MOBILE</p>	<p><b>17.7-17.8</b> FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.516 BROADCASTING-SATELLITE Mobile 5.518 5.515 5.517</p>	<p><b>17.7-18.1</b> FIXED FIXED-SATELLITE (space-to-Earth) <b>MOD 5.484A</b> (Earth-to-space) 5.516 MOBILE</p>

**Reason :** *As a result of the difficulties to make available suitable spectrum for HDFSS in the range 17.7-19.7 GHz (See **EUR/1.25/4** and **5**), this proposed allocation would enable the development of HDFSS below 19.7 GHz. The ITU-R studies have shown that it would be compatible with the other allocations in this band, in particular with the BSS feeder link Plans of Appendix 30A. This proposed allocation would also complement the BSS allocation in Region 2, by increasing the amount of downlink spectrum for HDFSS.*

**ADD EUR/1.25/2**

**5.HDFSS** The bands 17.3-17.7 GHz (in Regions 1 and 3), 19.7-20.2 GHz, 39.5-40.5 GHz, 47.5-47.9 GHz, 48.2-48.54 GHz and 49.7-50.2 GHz] are available for high density applications in the fixed-satellite service (space-to-Earth). The bands 27.5-27.8285 GHz, 28.4445-28.8365 GHz and 29.4525-30 GHz are available for high density application in the fixed-satellite service (Earth-to-space).

**Reason:** *Consequential to above proposal EUR/1.25/1 and to proposals EUR/1.25/4 to EUR/1.25/10. Making these frequency bands available for HDFSS is not intended to preclude the use of these bands by other services to which these bands are allocated nor by other applications in the fixed-satellite service.*

**MOD EUR/1.25/3**

**5.484A** The use of the bands 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth) in Region 2, 12.2-12.75 GHz (space-to-Earth) in Region 3, 12.5-12.75 GHz (space-to-Earth) in Region 1, 13.75-14.5 GHz (Earth-to-space), 17.3-17.8 GHz (space-to-Earth) in Regions 1 and 3, 17.8-18.6 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 27.5-28.6 GHz (Earth-to-space), 29.5-30 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. **5.43A** does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated. (WRC-2000)

**MOD EUR/1.25/4**


**15.63-18.6 GHz**

Allocation to services		
Region 1	Region 2	Region 3
<b>17.7-18.1</b> FIXED FIXED-SATELLITE (space-to-Earth) <b>MOD 5.484A</b> (Earth-to-space) 5.516 MOBILE	<b>17.7-17.8</b> FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.516 BROADCASTING-SATELLITE Mobile 5.518 5.515 5.517 <hr/> <b>17.8-18.1</b> FIXED FIXED-SATELLITE (space-to-Earth) <b>MOD 5.484A</b> (Earth-to-space) 5.516 MOBILE	<b>17.7-18.1</b> FIXED FIXED-SATELLITE (space-to-Earth) <b>MOD 5.484A</b> (Earth-to-space) 5.516 MOBILE
<b>18.1-18.4</b>	FIXED FIXED-SATELLITE (space-to-Earth) <b>MOD 5.484A</b> (Earth-to-space) 5.520 MOBILE 5.519 5.521	
<b>18.4-18.6</b>	FIXED FIXED-SATELLITE (space-to-Earth) <b>MOD 5.484A</b> MOBILE	

**Reason:** The modification proposed only concerns the modification of No. 5.484A which is a consequential change of EUR/1.12/1. In the band 17.7-19.7 GHz, terrestrial services are already highly developed in many parts of the world. Therefore CEPT is opposing to make these bands available for HDFSS.

**NOC EUR/1.25/5**

**18.6-22.21 GHz**

Allocation to services		
Region 1	Region 2	Region 3
<b>18.6-18.8</b> EARTH EXPLORATION-SATELLITE (passive)  FIXED FIXED-SATELLITE (space-to-Earth) 5.522B MOBILE except aeronautical mobile Space research (passive) 5.522A 5.522C	<b>18.6-18.8</b> EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.522B MOBILE except aeronautical mobile SPACE RESEARCH (passive) 5.522A	<b>18.6-18.8</b> EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.522B MOBILE except aeronautical mobile Space research (passive) 5.522A
	FIXED FIXED-SATELLITE (space-to-Earth) 5.523A MOBILE	
	FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.523B 5.523C 5.523D 5.523E MOBILE	

**Reason:** In the band 17.7-19.7 GHz, terrestrial services are already highly developed in many parts of the world. Therefore CEPT is opposing to make these bands available for HDFSS.



18.6-22.21 GHz

Allocation to services		
Region 1	Region 2	Region 3
<p><b>19.7-20.1</b>                      FIXED-SATELLITE                      (space-to-Earth) 5.484A  <b>ADD 5.HDFSS</b>                      Mobile-satellite (space-to-Earth)                      5.524</p>	<p><b>19.7-20.1</b>                      FIXED-SATELLITE                      (space-to-Earth) 5.484A  <b>ADD 5.HDFSS</b>                      MOBILE-SATELLITE                      (space-to-Earth)                      5.524 5.525 5.526 5.527 5.528                      5.529</p>	<p><b>19.7-20.1</b>                      FIXED-SATELLITE                      (space-to-Earth) 5.484A  <b>ADD 5.HDFSS</b>                      Mobile-satellite (space-to-Earth)                      5.524</p>
<p><b>20.1-20.2</b></p>	<p>FIXED-SATELLITE (space-to-Earth) 5.484A                      MOBILE-SATELLITE (space-to-Earth)                      5.524 5.525 5.526 5.527 5.528</p>	<p><b>ADD 5.HDFSS</b></p>

**Reason:** *These bands are not used by terrestrial services. Therefore, very limited constraints would be imposed to the ubiquitous deployment of HDFSS earth stations.*

24.75-29.9 GHz

Allocation to services		
Region 1	Region 2	Region 3
27.5-28.5	FIXED 5.537A FIXED-SATELLITE (Earth-to-space) 5.484A 5.539 MOBILE 5.538 5.540	<b>ADD 5.HDFSS</b>
28.5-29.1	FIXED FIXED-SATELLITE (Earth-to-space) 5.484A 5.523A 5.539 <b>ADD 5.HDFSS</b> MOBILE Earth exploration-satellite (Earth-to-space) 5.541 5.540	
29.1-29.5	FIXED FIXED-SATELLITE (Earth-to-space) 5.523C 5.523E 5.535A 5.539 5.541A <b>ADD 5.HDFSS</b> MOBILE Earth exploration-satellite (Earth-to-space) 5.541 5.540	
<b>29.5-29.9</b> FIXED-SATELLITE (Earth-to-space) 5.484A 5.539 <b>ADD 5.HDFSS</b> Earth exploration-satellite (Earth-to-space) 5.541 Mobile-satellite (Earth-to-space)  5.540 5.542	<b>29.5-29.9</b> FIXED-SATELLITE (Earth-to-space) 5.484A 5.539 <b>ADD 5.HDFSS</b> MOBILE-SATELLITE (Earth-to-space) Earth exploration-satellite (Earth-to-space) 5.541 5.525 5.526 5.527 5.529 5.540 5.542	<b>29.5-29.9</b> FIXED-SATELLITE (Earth-to-space) 5.484A 5.539 <b>ADD 5.HDFSS</b> Earth exploration-satellite (Earth-to-space) 5.541 Mobile-satellite (Earth-to-space)  5.540 5.542

**Reason:** *The bands 27.5-27.8285 GHz, 28.4445-28.8365 GHz and 29.4525-29.5 GHz are shared with terrestrial services in the Radio Regulations. However, CEPT has already taken the decision to give the priority to FSS in these bands. The band 29.5-30 GHz is not used by terrestrial services. Therefore, very limited constraints would be imposed to the ubiquitous deployment of HDFSS earth stations in this band.*

**MOD EUR/1.25/8**

**29.9-34.2 GHz**

Allocation to services		
Region 1	Region 2	Region 3
<b>29.9-30</b>	FIXED-SATELLITE (Earth-to-space) 5.484A 5.539 MOBILE-SATELLITE (Earth-to-space) Earth exploration-satellite (Earth-to-space) 5.541 5.543 5.525 5.526 5.527 5.538 5.540 5.542	<b>ADD 5.HDFSS</b>



**Reason:** The band 29.5-30 GHz is not used by terrestrial services. Therefore, very limited constraints would be imposed to the ubiquitous deployment of HDFSS earth stations.

**MOD EUR/1.25/9**

**34.2-40 GHz**

Allocation to services		
Region 1	Region 2	Region 3
<b>39.5-40</b>	FIXED FIXED-SATELLITE (space-to-Earth) 5.551AA MOBILE MOBILE-SATELLITE (space-to-Earth) Earth exploration-satellite (space-to-Earth) <b>MOD 5.547</b>	<b>ADD 5.HDFSS</b>



**MOD EUR/1.25/10**

**40-40.5 GHz**

Allocation to services		
Region 1	Region 2	Region 3
<b>40-40.5</b>	EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth exploration-satellite (space-to-Earth)	<b>ADD 5.HDFSS</b>



**Reason:** The band 39.5-40.5 GHz is shared with terrestrial services in the Radio Regulations. However, its use is currently limited, hence CEPT is proposing that this band be made available for HDFSS.



**MOD EUR/1.25/11**

**5.547** The bands 31.8-33.4 GHz, 37-40 GHz, 40.5-43.5 GHz, 51.4-52.6 GHz, 55.78-59 GHz and 64-66 GHz are available for high-density applications in the fixed service (see Resolutions **75 (WRC-2000)** and **79 (WRC-2000)**). Administrations should take this into account when considering regulatory provisions in relation to these bands.

**Reason:** *Since not all of the mentioned bands in the second sentence of No. 5.547 (namely the band 40.5 – 42 GHz) are being proposed as being available for HDFSS as well as the CEPT proposal (EUR/1.32/9) for the deletion of Resolution 84 under Agenda Item 1.32 requires a consequential modification of No. 5.547.*

**MOD EUR/1.25/12**

**34.2-40 GHz**

Allocation to services		
Region 1	Region 2	Region 3
37-37.5	FIXED MOBILE SPACE RESEARCH (space-to-Earth) <b>MOD 5.547</b>	
37.5-38	FIXED FIXED-SATELLITE (space-to-Earth) 5.551AA MOBILE SPACE RESEARCH (space-to-Earth) Earth exploration-satellite (space-to-Earth) <b>MOD 5.547</b>	
38-39.5	FIXED FIXED-SATELLITE (space-to-Earth) 5.551AA MOBILE Earth exploration-satellite (space-to-Earth) <b>MOD 5.547</b>	

**Reason:** *Consequential to Proposal EUR/1.25/10.*



**40.5-51.4 GHz**

<b>Allocation to services</b>		
<b>Region 1</b>	<b>Region 2</b>	<b>Region 3</b>
<b>40.5-41</b> FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile <b>MOD 5.547</b>	<b>40.5-41</b> FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile Mobile-satellite (space-to-Earth) <b>MOD 5.547</b>	<b>40.5-41</b> FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile <b>MOD 5.547</b>
<b>41-42.5</b> FIXED FIXED-SATELLITE (space-to-Earth) 5.551AA BROADCASTING BROADCASTING-SATELLITE Mobile <p style="text-align: center;"><b>MOD 5.547 5.551F 5.551G</b></p>		

**Reason:** *The band 40.5-42.5 GHz is shared with terrestrial services. It has been made available by WRC-2000 for HDFS use and is planed for such use in many countries. Therefore no further change is proposed to this band, as reflected in the proposed modification to No. 5.547.*

40.5-51.4 GHz

Allocation to services		
Region 1	Region 2	Region 3
47.2-47.5	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE 5.552A	
47.5-47.9	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 <b>ADD</b> (space-to Earth) <b>ADD</b> 5.HDFSS <b>ADD</b> 5.RAS <b>ADD</b> 5.FSS MOBILE	
47.9-48.2	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE 5.552A	
48.2-48.54	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 <b>ADD</b> (space-to Earth) <b>ADD</b> 5.HDFSS <b>ADD</b> 5.RAS <b>ADD</b> 5.FSS MOBILE	
48.54-49.44	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE 5.149 5.340 5.555	
49.44-50.2	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 <b>ADD</b> (space-to Earth) <b>ADD</b> 5.HDFSS <b>ADD</b> 5.RAS <b>ADD</b> 5.FSS MOBILE	

**Reason:** As a result of the difficulties to make available suitable spectrum for HDFSS in the range 37.5-42.5 GHz on a global basis, this proposed allocation would enable the development of HDFSS in 47.2-50.2 GHz, increasing the amount of downlink spectrum for HDFSS. The sharing studies conducted within ITU-R have concluded that appropriate pfd limits (see EUR/1.25/17) ensure the FSS (space-to-Earth) to operate while protecting the terrestrial services.

**ADD EUR/1.25/15**

**5.FSS** The use of the bands 47.5-47.9 GHz, 48.2-48.54 GHz and 49.44-50.2 GHz by the fixed-satellite service (space-to-Earth) is limited to geostationary satellites.

*Reason:* The studies carried out to support the allocation of the FSS (space-to-Earth) in these sub-bands were limited to the geostationary satellites.

**ADD EUR/1.25/16**

**5.RAS** The power flux-density in the band 48.94-49.04 GHz produced by any geostationary space station in the fixed-satellite service (space-to-Earth) operating in the bands 48.2-48.54 GHz and 49.44-50.2 GHz shall not exceed – 151.8 dBW/m<sup>2</sup>/500 kHz at any radio-astronomy station.

*Reason:* Consequential to above proposals **EUR/1.25/2** and **EUR/1.25/14** and to studies in ITU-R.

**MOD EUR/1.25/17**

TABLE 21-4 (end)

Frequency band	Service*	Limit in dB(W/m <sup>2</sup> ) for angle of arrival ( $\delta$ ) above the horizontal plane			Reference bandwidth				
		0°-5°	5°-25°	25°-90°					
42-42.5 GHz	Fixed-satellite (non-geostationary-satellite orbit) Broadcasting-satellite (non-geostationary-satellite orbit)	-120 <sup>10, 16, 17, 18</sup>	$-120 + 0.75(\delta - 5)$ <sup>10, 16, 17, 18</sup>	-105 <sup>10, 16, 17, 18</sup>	1 MHz				
42-42.5 GHz	Fixed-satellite (geostationary-satellite orbit) Broadcasting-satellite (geostationary-satellite orbit)	-127 <sup>16, 17, 18</sup>	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="text-align: center;"><b>5°-20°</b></td> <td style="text-align: center;"><b>20°-25°</b></td> </tr> <tr> <td style="text-align: center;"><math>-127 + (4/3)(\delta - 5)</math><sup>16, 17, 18</sup></td> <td style="text-align: center;"><math>-107 + 0.4(\delta - 20)</math><sup>16, 17, 18</sup></td> </tr> </table>	<b>5°-20°</b>	<b>20°-25°</b>	$-127 + (4/3)(\delta - 5)$ <sup>16, 17, 18</sup>	$-107 + 0.4(\delta - 20)$ <sup>16, 17, 18</sup>	-105 <sup>16, 17, 18</sup>	1 MHz
<b>5°-20°</b>	<b>20°-25°</b>								
$-127 + (4/3)(\delta - 5)$ <sup>16, 17, 18</sup>	$-107 + 0.4(\delta - 20)$ <sup>16, 17, 18</sup>								
47.5-47.9 GHz, 48.20-48.54 GHz, 49.44-50.2 GHz	Fixed-satellite (geostationary-satellite orbit)	-115	$-115 + 0.5(\delta - 5)$	-105	1 MHz				

*Reason:* Consequential to above proposal **EUR/1.25/2** and to studies in ITU-R.

**MOD EUR/1.25/18**

**TABLE 22-1B** (WRC-2000)

**Limits to the  $epfd_{\downarrow}$  radiated by non-geostationary-satellite systems  
in the fixed-satellite service in certain frequency bands<sup>3, 6, 8</sup>**

Frequency band (GHz)	$epfd_{\downarrow}$ (dB(W/m <sup>2</sup> ))	Percentage of time during which $epfd_{\downarrow}$ may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter and reference radiation pattern <sup>7</sup>
17.3-17.8 GHz in Regions 1 and 3; 17.8-18.6 in all Regions	-175.4	0	40	1 m Recommendation ITU-R S.1428
	-175.4	90		
	-172.5	99		
	-167	99.714		
	-164	99.971		
	-164	100		
	-161.4	0	1 000	
	-161.4	90		
	-158.5	99		
	-153	99.714		
-150	99.971			
-150	100			
-178.4	0	40	2 m Recommendation ITU-R S.1428	
-178.4	99.4			
-171.4	99.9			
-170.5	99.913			
-166	99.971			
-164	99.977			
-164	100			
-164.4	0	1 000		
-164.4	99.4			
-157.4	99.9			
-156.5	99.913			
-152	99.971			
-150	99.977			
-150	100			
-185.4	0	40	5 m Recommendation ITU-R S.1428	
-185.4	99.8			
-180	99.8			
-180	99.943			
-172	99.943			
-164	99.998			
-164	100			
-171.4	0	1 000		
-171.4	99.8			
-166	99.8			
-166	99.943			
-158	99.943			
-150	99.998			
-150	100			

*Reason:* These changes are intended to quantify No. 22.2. Moreover, as far as the table 22-3 is concerned, the modification proposed also aims at protecting the feeder-links operating in accordance with the Plans of Appendix 30A (see No. 22.5F.2). The extension of the limits to the 17.7-17.8 GHz band in Regions 1 and 3 aims at keeping the consistency in the whole 17.3-18.6 GHz band. With the new allocation of FSS (space-to-Earth), the regulatory situation with respect to FSS (space-to-Earth) and BSS would be identical in the whole 17.3-18.6 GHz band: there would be, then, no justification to have no limit only in the 17.7-17.8 GHz band.

TABLE 22-3 (WRC-2000)

**Limits to the  $epfd_{is}$  radiated by non-geostationary-satellite systems in the fixed-satellite service in certain frequency bands<sup>18</sup>**

Frequency band (GHz)	$epfd_{is}$ (dB(W/m <sup>2</sup> ))	Percentage of time during which $epfd_{is}$ level may not be exceeded	Reference bandwidth (kHz)	Reference antenna beamwidth and reference radiation pattern <sup>19</sup>
10.7-11.7 (Region 1) 12.5-12.75 (Region 1) 12.7-12.75 (Region 2)	-160	100	40	4° Recommendation ITU-R S.672-4, $L_s = -20$
17.3-17.8 (in Regions 1 and 3); 17.8-18.4 (in all Regions)	-160	100	40	4° Recommendation ITU-R S.672-4, $L_s = -20$

*Reason:* These changes are intended to quantify No. 22.2. Moreover, as far as the table 22-3 is concerned, the modification proposed also aims at protecting the feeder links operating in accordance with the Plans of Appendix 30A (see No. 22.5F.2). The extension of the limits to the 17.7-17.8 GHz band in Regions 1 and 3 aims at keeping the consistency in the whole 17.3-18.6 GHz band. With the new allocation of FSS (space-to-Earth), the regulatory situation with respect to FSS (space-to-Earth) and BSS would be identical in the whole 17.3-18.6 GHz band: there would be, then, no justification to have no limit only in the 17.7-17.8 GHz band.

TABLE 22-4B (WRC-2000)

**Operational limits to the  $epfd_{\downarrow}$  radiated by non-geostationary-satellite systems in the fixed-satellite service in certain frequency bands<sup>20, 24</sup>**

Frequency band (GHz)	$epfd_{\downarrow}$ (dBW/m <sup>2</sup> )	Percentage of time during which $epfd_{\downarrow}$ may not be exceeded	Reference bandwidth (kHz)	Geostationary-satellite system receive earth station antenna gain (dBi)	Orbital inclination of geostationary satellite (degrees)
19.7-20.2	-157	100	40	≥ 49	≤ 2.5
	-157	100	40	≥ 43 <sup>24</sup>	≤ 2.5
	-155	100	40	≥ 49	> 2.5 and ≤ 4.5
19.7-20.2	-143	100	1 000	≥ 49	≤ 2.5
	-143	100	1 000	≥ 43 <sup>24</sup>	≤ 2.5
	-141	100	1 000	≥ 49	> 2.5 and ≤ 4.5
17.8-18.6	-164	100	40	≥ 49	≤ 2.5
	-162	100	40	≥ 49	> 2.5 and ≤ 4.5
17.8-18.6	-150	100	1 000	≥ 49	≤ 2.5
	-148	100	1 000	≥ 49	> 2.5 and ≤ 4.5
17.3-17.8 in Regions 1 and 3	-164	100	40	≥ 49	≤ 2.5
	-162	100	40	≥ 49	> 2.5 and ≤ 4.5
17.3-17.8 in Regions 1 and 3	-150	100	1000	≥ 49	≤ 2.5
	-148	100	1000	≥ 49	> 2.5 and ≤ 4.5

*Reason:* These changes are intended to quantify No. 22.2. Moreover, as far as the table 22-3 is concerned, the modification proposed also aims at protecting the feeder links operating in accordance with the Plans of Appendix 30A (see No. 22.5F.2). The extension of the limits to the 17.7-17.8 GHz band in Regions 1 and 3 aims at keeping the consistency in the whole 17.3-18.6 GHz band. With the new allocation of FSS (space-to-Earth), the regulatory situation with respect to FSS (space-to-Earth) and BSS would be identical in the whole 17.3-18.6 GHz band: there would be, then, no justification to have no limit only in the 17.7-17.8 GHz band.

## APPENDIX 30A

**MOD EUR/1.25/21**

### ARTICLE 7 (WRC-2000)

**Coordination, notification and recording in the Master International Frequency Register of frequency assignments to stations in the fixed-satellite service (space-to-Earth) in Regions 1 and 3 in the band 17.3-18.1 GHz, and in Region 2 in the band 17.7-18.1 GHz to stations in the fixed-satellite service (Earth-to-space) in Region 2 in the band 17.8-18.1 GHz and to stations in the broadcasting-satellite service in Region 2 in the band 17.3-17.8 GHz when frequency assignments to feeder links for broadcasting-satellite stations in the 17.3-18.1 GHz band in Regions 1 and 3 or in the band 17.3-17.8 GHz in Region 2 are involved**

**MOD EUR/1.25/22**

**Section I – Coordination of transmitting space or earth stations in the fixed-satellite service or transmitting space stations in the broadcasting-satellite service with assignments to broadcasting-satellite service feeder links**

7.1 The provisions of No. 9.7<sup>14</sup> and the associated provisions under Articles 9 and 11 are applicable to transmitting space stations in the fixed-satellite service in Regions 1 and 3 in the band 17.3-18.1 GHz and in Region 2 in the band 17.7-18.1 GHz, to transmitting earth stations in the fixed-satellite service in Region 2 in the band 17.8-18.1 GHz and to transmitting space stations in the broadcasting-satellite service in Region 2 in the band 17.3-17.8 GHz.

**MOD EUR/1.25/23**

**Section II – Coordination with assignments in conformity with the appropriate Regional feeder-link Plan in Appendix 30A**

7.3 Administrations planning to implement assignments for receiving earth stations in all Regions in the band 17.3-18.1 GHz in the fixed-satellite service (space-to-Earth) or in the band 17.3-17.8 GHz in the broadcasting-satellite service should evaluate the level of interference, assessed on the basis of coordination contours calculated in accordance with Appendix 7, which may be caused by a feeder-link earth station located on the territory of another administration and included in the service area of an assignment to a broadcasting-satellite service feeder-link space station which is in conformity with the appropriate Regional feeder-link Plan. Should the administration planning receiving earth stations find that interference may be caused by such a feeder-link earth station, it may request the administration responsible for the feeder-link earth station to indicate the geographical

coordinates, the antenna characteristics and the elevation angle of the horizon around its existing and planned feeder-link earth stations.

***Reason:*** *The current available procedures applicable to the 17.7-18.1 GHz band to BSS and FSS (space-to-Earth) have to be extended to the proposed allocated band for FSS (space-to-Earth) (17.3-17.7 GHz).*

**Consequential changes:**

If the allocation of the band 17.3-17.7 GHz to the FSS (space-to-Earth) is decided by the WRC-03, the consequential changes may have to be considered, such as:

APPENDIX 5 (WRC-2000)



TABLE 5-1 (continued)

Reference of Article 9	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
No. 9.7 GSO/GSO (cont.)		3) 17.3-20.2 GHz, and 27.5-30 GHz  4) All frequency bands, other than those in § 1), 2) and 3), allocated to a space service, and the bands in § 1), 2) and 3) where the radio service of the proposed network or affected networks is other than the FSS, or in the case of coordination of space stations operating in the opposite direction of transmission	i) Bandwidth overlap, and  ii) any network in the FSS with a space station within an orbital arc of $\pm 8^\circ$ of the nominal orbital position of a proposed network in the FSS  Value of $\Delta T/T$ exceeds 6%	Appendix 8	the network of this administration will not be affected because value of $\Delta T/T$ calculated by the method in § 2.2.1.2 and 3.2 of Appendix 8 do not exceed 6%. When the Bureau, at the request of an administration, studies this information pursuant to No. 9.42, the calculation method given in § 2.2.1.2 and 3.2 of Appendix 8 shall be used

Reference of Article 9	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
No. 9.7A GSO earth station/ non-GSO system	A specific earth station in a GSO satellite network in the FSS in respect of a non-GSO satellite system in the FSS	10.7-11.7 GHz (space-to-Earth) 11.7-12.2 GHz (space-to-Earth) in Region 2 12.2-12.75 GHz (space-to-Earth) in Region 3 12.5-12.75 GHz (space-to-Earth) in Region 1 17.3-17.8 GHz (space-to-Earth) in Region 1 and 3, 17.8-18.6 GHz (space-to-Earth), and 19.7-20.2 GHz (space-to-Earth)	<ul style="list-style-type: none"> <li>i) Bandwidths overlap; and</li> <li>ii) the GSO satellite network has specific receive earth stations which meet all of the following conditions: <ul style="list-style-type: none"> <li>a) earth station antenna maximum isotropic gain greater than or equal to 64 dBi for the frequency bands 10.7-12.75 GHz or 68 dBi for the frequency bands 17.3-17.8 GHz, 17.8-18.6 GHz and 19.7-20.2 GHz;</li> <li>b) <math>G/T</math> of 44 dB/K or higher;</li> <li>c) emission bandwidth of 250 MHz or higher for the frequency bands below 12.75 GHz or 800 MHz or higher for the frequency bands 17.3-17.8 GHz or above 17.8 GHz; and</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>i) Check by using the assigned frequencies and bandwidths;</li> <li>ii) use the maximum antenna gain (<math>G</math>), the lowest total receiving system noise temperature (<math>T</math>), and the emission bandwidth of the specific receive earth station as given in the Appendix 4 data; and</li> </ul>	The threshold/condition for coordination does not apply to typical receive earth stations operating in GSO satellite networks

Reference of Article 9	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
No. 9.7A GSO earth station/ non-GSO system ( <i>cont.</i> )			<p>iii) the equivalent power flux-density, <math>epfd_{\downarrow}</math>, from the non-GSO satellite system exceeds:</p> <p>a) in the frequency band 10.7-12.75 GHz:</p> <p>–174.5 dB(W/(m<sup>2</sup> · 40 kHz)) for any percentage of time for non-GSO satellite systems with all satellites only operating at or below 2 500 km altitude, or –202 dB(W/(m<sup>2</sup> · 40 kHz)) for any percentage of the time for non-GSO satellite systems with any satellites operating above 2 500 km altitude;</p> <p>b) in the frequency bands 17.3-17.8 GHz, 17.8-18.6 GHz or 19.7-20.2 GHz:</p> <p>–157 dB(W/(m<sup>2</sup> · MHz)) for any percentage of time for non-GSO satellite systems with all satellites only operating at or below 2 500 km altitude, or –185 dB(W/(m<sup>2</sup> · MHz)) for any percentage of the time for non-GSO satellite systems with any satellites operating above 2 500 km altitude</p>	<p>iii) use the <math>epfd_{\downarrow}</math> radiated by the non-GSO FSS satellite system into the earth station employing the very large antenna when this antenna is pointed towards the wanted GSO satellite</p>	

Reference of Article 9	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
No. <b>9.7B</b> Non-GSO system/GSO earth station	A non-GSO satellite system in the FSS in respect of a specific earth station in a GSO satellite network in the FSS	10.7-11.7 GHz (space-to-Earth) 11.7-12.2 GHz (space-to-Earth) in Region 2 12.2-12.75 GHz (space-to-Earth) in Region 3 12.5-12.75 GHz (space-to-Earth) in Region 1 17.3-17.8 GHz (space-to-Earth) in Region 1 and 3, 17.8-18.6 GHz (space-to-Earth), and 19.7-20.2 GHz (space-to-Earth)	<ul style="list-style-type: none"> <li>i) Bandwidths overlap; and</li> <li>ii) the GSO satellite network has specific receive earth stations which meet all of the following conditions: <ul style="list-style-type: none"> <li>a) earth station antenna maximum isotropic gain greater than or equal to 64 dBi for the frequency bands 10.7-12.75 GHz or 68 dBi for the frequency bands 17.3-17.8 GHz, 17.8-18.6 GHz and 19.7-20.2 GHz;</li> <li>b) <math>G/T</math> of 44 dB/K or higher;</li> <li>c) emission bandwidth of 250 MHz or higher for the frequency bands below 12.75 GHz or 800 MHz or higher for the frequency bands 17.3-17.8 GHz or above 17.8 GHz; and</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>i) Check by using the assigned frequencies and bandwidths;</li> <li>ii) use the maximum antenna gain (<math>G</math>), the lowest total receiving system noise temperature (<math>T</math>), and the emission bandwidth of the specific receive earth station as given in the Appendix 4 data;</li> </ul>	The threshold/condition for coordination do not apply to typical receive earth stations operating in GSO satellite networks

Reference of Article 9	Case	Frequency bands (and Region) of the service for which coordination is sought	Threshold/condition	Calculation method	Remarks
No. <b>9.7B</b> Non-GSO system/GSO earth station ( <i>cont.</i> )			iii) the $epfd_{\downarrow}$ from the non-GSO satellite system exceeds: <ul style="list-style-type: none"> <li>a) in the frequency band 10.7-12.75 GHz:               <ul style="list-style-type: none"> <li>-174.5 dB(W/(m<sup>2</sup> · 40 kHz)) for any percentage of time for non-GSO satellite systems with all satellites only operating at or below 2 500 km altitude, or</li> <li>-202 dB(W/(m<sup>2</sup> · 40 kHz)) for any percentage of the time for non-GSO satellite systems with any satellites operating above 2 500 km altitude;</li> </ul> </li> <li>b) in the frequency bands 17.3-17.8 GHz, 17.8-18.6 GHz or 19.7-20.2 GHz:               <ul style="list-style-type: none"> <li>-157 dB(W/(m<sup>2</sup> · MHz)) for any percentage of time for non-GSO satellite systems with all satellites only operating at or below 2 500 km altitude, or</li> <li>-185 dB(W/(m<sup>2</sup> · MHz)) for any percentage of the time for non-GSO satellite systems with any satellites operating above 2 500 km altitude</li> </ul> </li> </ul>	iii) use the $epfd_{\downarrow}$ radiated by the non-GSO FSS satellite system into the earth station employing the very large antenna when this antenna is pointed towards the wanted GSO satellite	

*Reason:* So as to cover the case of the coordination of two GSO networks of the FSS (except earth stations operating in opposite directions of transmission), it is proposed to modify table 5-1 of Appendix 5 as follow (N.B.: the case of the coordination of two GSO networks, at least one being of the BSS is already covered in the draft ECP with the proposed modification of the Article 7 of Appendix 30A):

## APPENDIX 30A (WRC-2000)

### ARTICLE 4 (WRC-2000)

#### **Procedures for modifications to the Region 2 feeder-link Plan or for additional uses in Regions 1 and 3**

**MOD EUR/1.25/25**

#### **4.1 Provisions applicable to Regions 1 and 3**

4.1.1 An administration proposing to include a new or modified assignment in the feeder-link Lists shall seek the agreement of those administrations whose services are considered to be affected, i.e. administrations<sup>MOD 4</sup>:

#### **4.2 Provisions applicable to Region 2**

4.2.2 An administration proposing a modification to the characteristics of a frequency assignment in conformity with the Region 2 feeder-link Plan, or the inclusion of a new frequency assignment in that Plan, shall seek the agreement of those administrations<sup>MOD8, 9</sup>:

*Reason:* Studies have shown that a satisfactory regulatory situation would result of the extension to the band 17.3-17.7 GHz of the provisions applicable to the band 17.7-18.1 GHz as far as the sharing between FSS (space-to-Earth) in Regions 1 and 3 and BSS feeder-links is concerned.

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<sup>4</sup> Agreement with administrations having a frequency assignment in the bands 14.5-14.8 GHz or 17.7-18.1 GHz to a terrestrial station, or having a frequency assignment in the band 17.3-18.1 GHz to an earth station in the fixed-satellite service (space-to-Earth), or having a frequency assignment in the band 17.3-17.8 GHz in the broadcasting-satellite service shall be sought under No. **9.17**, No. **9.17A** or No. **9.19**, respectively.

<sup>8</sup> Agreement with administrations having a frequency assignment in the bands 17.7-17.8 GHz to a terrestrial station or in the bands 17.3-17.8 GHz to an earth station in the fixed-satellite service (space-to-Earth) shall be sought under No. **9.17** or No. **9.17A**, respectively.