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**SHARING BETWEEN EESS (PASSIVE) AND VIDEO SAP/SAB LINKS
IN THE BAND 10.6-10.68 GHz**

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EXECUTIVE SUMMARY

This report considered the sharing between the various candidate video SAP/SAB links (ENG/OB) and the EESS (passive) service in the band 10.6-10.68 GHz.

The band 10.6-10.68 GHz is allocated to the Earth Exploration Satellite Service (EESS passive), Radioastronomy and Space Research (passive) services and also to Fixed and Mobile terrestrial services. The CEPT/ERC has previously identified that the following types of SAP/SAB video links (ENG/OB) might be considered within the frequency band 10.0-10.68 GHz:

- cordless cameras,
- portable video links,
- temporary point to point video links.

Therefore the potential interference from video SAP/SAB links in the band 10.6-10.68 GHz, shared between EESS (passive) services and terrestrial links had to be considered.

The report describes the technical characteristics and operational scenarios of both passive services and considered SAP/SAB applications. It then sets the methodology to be used for sharing studies. Resulting calculations of interference potential are provided in section 4 of the report. It should be noted that the sharing studies took into account both point-to-point and point-to-multipoint (mobile) character of SAP/SAB applications.

Because of foreseen developments in passive sensor technology and therefore planned changes to the relevant ITU-R recommendations that establish their protection criteria, section 5 of the report provides insight into how these future developments would impact the result of sharing assessment with video SAP/SAB links.

This report concludes that sharing is not feasible between the EESS (passive) service and cordless cameras or portable video links. Finally, it appears that sharing between the EESS service and temporary point-to-point video SAP/SAB link systems is feasible if the operational number of these links is limited.

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SHARING BETWEEN EESS (PASSIVE) AND VIDEO SAP/SAB LINKS IN THE BAND 10.6-10.68 GHz

1 INTRODUCTION

This report was prepared in response to the concerns over the possible incompatibility between the use of video SAP/SAB links (ENG/OB) and EESS (passive) services in the band 10.6-10.68 GHz. Therefore, this report provides sharing analysis between these systems.

2 PASSIVE SERVICE

2.1 Passive service band

The band 10.6-10.68 GHz is allocated to the Earth Exploration Satellite Service (EESS passive), Radioastronomy and Space Research (passive) services and also to Fixed and Mobile terrestrial services, as illustrated in the excerpt of the ITU Radio Regulations in Table 1 below.

Shared band	Exclusive passive Band
10.60-10.68 GHz	10.68-10.7 GHz
EARTH EXPLORATION-SATELLITE (Passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (Passive) Radiolocation S5.149 S5.482	EARTH EXPLORATION-SATELLITE (Passive) RADIO ASTRONOMY SPACE RESEARCH (Passive) S5.340 S5.483

Table 1: Band allocations

2.2 Use of passive services

The band 10.6-10.7 GHz is of primary interest to measure rain, snow, sea state and ocean wind.

2.3 Required protection criteria

The following three documents establish the interference criteria for passive sensors:

- ITU-R Recommendation SA.513-3, Frequency bands and bandwidths used for satellite passive services;
- ITU-R Recommendation SA.1028-1, Performance criteria for satellite passive remote sensing;
- ITU-R Recommendation SA.1029-1, Interference criteria for satellite remote sensing.

Specifically, the recommendations SA.1028-1 and SA.1029-1 establish the following two protection criteria:

- The first criterion is the acceptable interference power received by the EESS sensor, which is -163 dBW in the reference bandwidth of 20 MHz. This is a maximum interference level from all possible sources.
- The second criterion is the frequency of occurrence limit when the threshold being exceeded. The number of measurement cells lost due to the threshold being exceeded must not exceed 5% in cases where the interference events are random, and 1% when the interference events are systematic. Since the Fixed and Mobile Service are not random, the 1% criteria applies.

2.4 Operational characteristics

Table 2 below shows specifications for two microwave radiometric systems: MEGHA-TROPIC and EOS AMSR-E.

Channel 10.6-10.7 GHz	MEGHA-TROPIC	EOS AMSR-E
Channel bandwidth	100 MHz	100 MHz
Pixel size across track	56.7 km	28 km
Beam efficiency	92%	95%
Incidence angle i at footprint centre	52°	55°
Polarisation (linear)	H, V	H, V
Altitude of the satellite	817 km	705 km
Maximum antenna gain	36 dBi	37 dBi
Reflector diameter	900 mm	1.6 m
Full width of the main beam	6.65°	3.51°
Half power antenna beam width θ_{3dB}	2.66°	1.4°

TABLE 2: SPECIFICATIONS FOR TWO MICROWAVE RADIOMETRIC APPLICATIONS

Beam efficiency is defined as the energy (main polarisation component only) within the main beam, relative to the total energy within all angles (4π steradians). Main beam is defined as the cone $2.5 \times \theta_{3dB}$ full angle ($2.5 \times \theta_{3dB}$ is the half power beam width full angle).

The pixel size across track is computed from the -3 dB contour of the antenna pattern taking into account the satellite altitude and the incidence angle i of the beam boresight.

From a general point of view, the antennas currently used within radiometric applications have quite high beam efficiency. The main lobe is able to concentrate a very high amount of energy. The above EESS sensors are not nadir satellites, but EESS sensors having a conical scan configuration centred on the nadir direction. It is important for the interpretation of surface measurements to maintain a constant ground incidence angle along the entire scan lines. The geometry of conical scan instruments is described in Figure 1. The rotation speed w of the instrument (and not the satellite) is 20 revolutions per minute for the MEGHA-TROPIC satellite and 40 revolutions per minute for EOS AMSR-E.

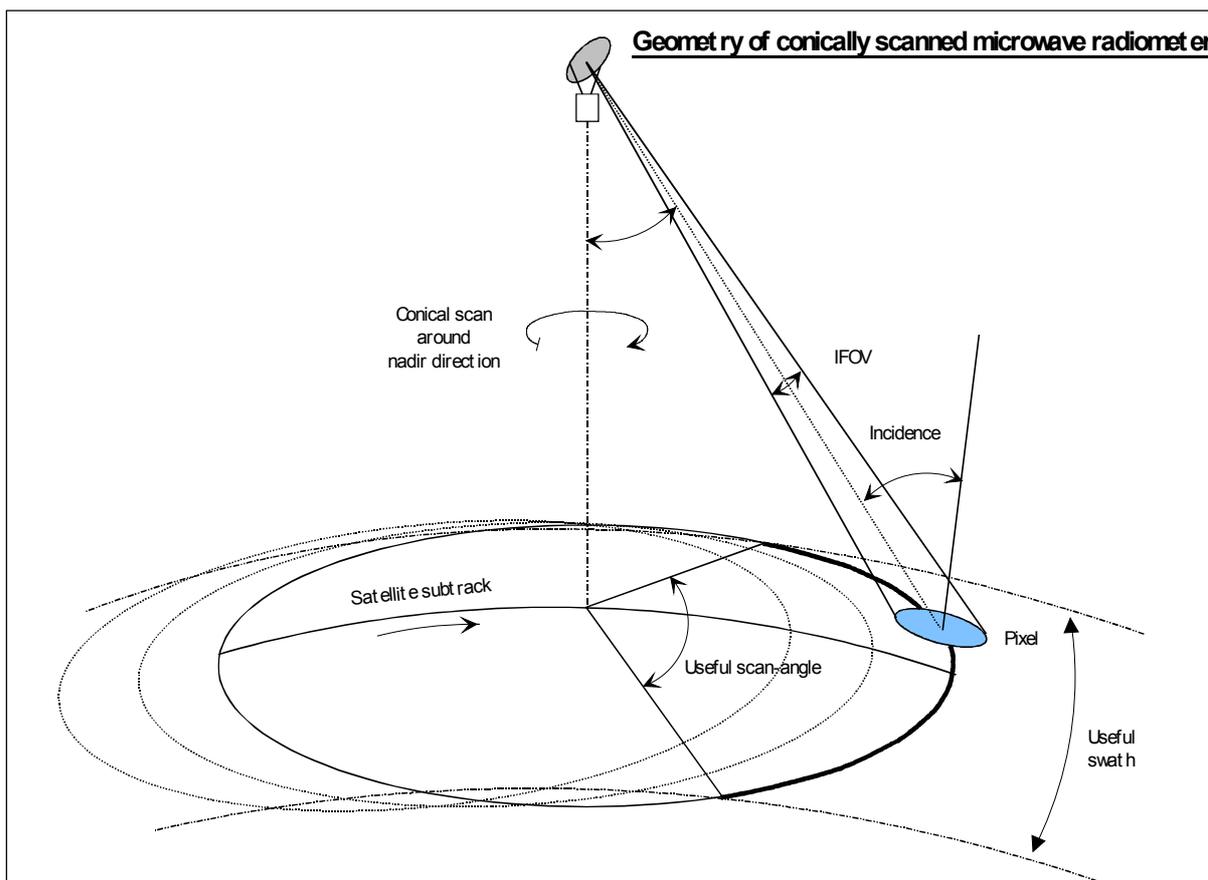


Figure 1: Geometry of conical scan passive microwave radiometers

The typical geometry characteristics of this kind of instruments are the following (for an altitude of about 850 km):

- Ground incidence angle i at footprint centre: around 50° ;
- EESS offset angle to the nadir or half cone angle α to the nadir direction: about 44° ;
- Useful swath of about 1 600 km;
- The scanning period is chosen in order to ensure full coverage and optimum integration time (radiometric resolution).

The following figures 2 and 3 show the antenna radiation patterns for MEGHA-TROPIC and EOS AMSR-E.

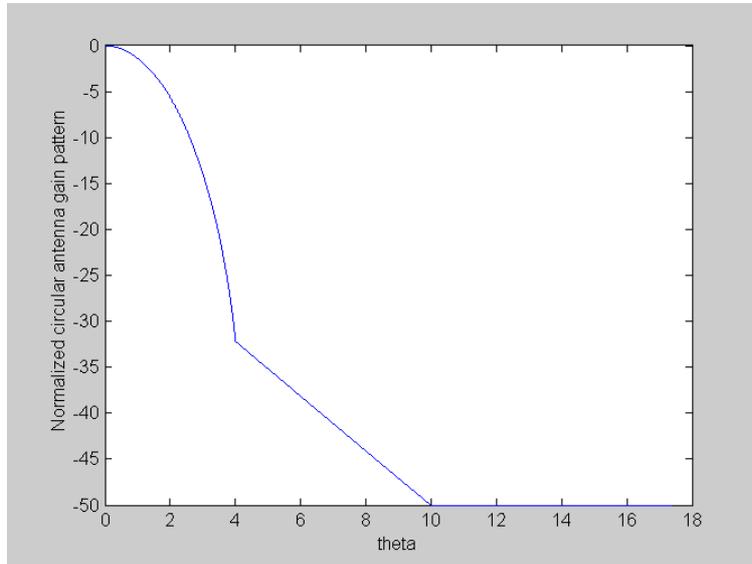


Figure 2: Antenna pattern of the megha-tropic passive microwave radiometer

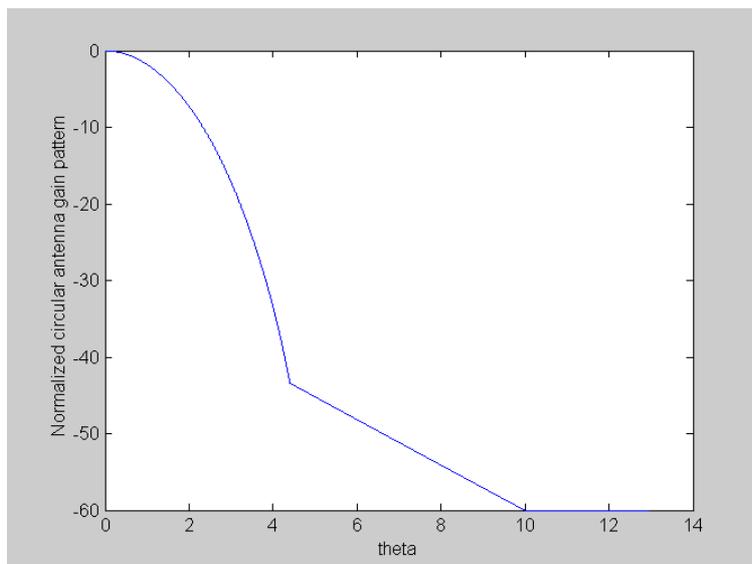


Figure 3: Antenna pattern of the EOS AMSR-E passive microwave radiometer

The above patterns show that the back lobe radiation is very low: -50 dB or -60 dB.

3 SAP/SAB VIDEO LINKS

3.1 Spectrum use and future requirements for SAP/SAB in the band 10.6-10.68 GHz

The following types of SAP/SAB video links (ENG/OB) were originally considered within the subject frequency band:

- cordless cameras,
- portable video links,
- temporary point to point video links.

Various scenarios and future requirements for using SAP/SAB links as well as the resulting spectrum requirements are analysed in the ECC Report 02.

3.2 Provision in the ITU Radio Regulations

According to footnote 5.482, in the band 10.6-10.68 GHz, the maximum eirp of the stations of fixed and mobile services in the subject band, except aeronautical mobile, must be limited to 40 dBW, and the power to the antenna port must not exceed -3 dBW.

3.3 Technical characteristics for video SAP/SAB links

The CEPT/ERC has earlier identified the band 10-10.68 GHz as one of the harmonised tuning ranges for video SAP/SAB link (ENG/OB) equipment. Parameters for such links were defined in the ERC Report 38. The following table 3 shows the technical characteristics for video SAP/SAB links that were assumed for this study.

Type of system	Parameters	Type of antenna
Cordless camera transmitter	Operational distance less than 500m Max eirp = 6 dBW	Omni-directional
Portable video links	Distance less than 2 km Max eirp = 16 dBW	Omni-directional
Temporary point-to-point links	Distance less than 80 km Max eirp = 40 dBW	Parabolic dish of 40 dBi maximum antenna gain (corresponds to a dish of 1.2 m with an efficiency of 50%): the antenna pattern is in accordance with ITU-R F.1245-1

Table 3: Characteristics of video SAP/SAB links assumed for this study (ref. ERC Report 38)

4 INTERFERENCE ASSESSMENT

4.1 Methodology

The first step of the applied methodology is to analyse static interference. It may be described as follows:

- The basic configuration, which consists of placing the terrestrial emissions from video SAP/SAB links within a given pixel observed by the passive sensor. The interference resulting from emissions of all terrestrial transmitters is then compared with the sensor interference threshold.
- In addition to the above cases (single or aggregate case), it is necessary to address some geometry cases between the video SAP/SAB transmitter and the EESS satellite, where a great variety of geometry configurations can be encountered.

The second step of the methodology is then to perform a dynamic simulation in order to know the percentage of time, when the events described in the static interference assessment might occur.

4.2 First step of the calculations: static interference analysis

4.2.1 Calculations with Cordless camera transmitter

Parameter	MEGHA-TROPIC	EOS AMSR-E
EIRP in a bandwidth of 20 MHz for a single camera	6	6
Elevation angle in order to reach the maximum EESS antenna gain	37.7°	35°
Distance camera - EESS sensor in km	1336	1229
Space attenuation in dB	175.5	174.8
EESS antenna gain in dBi	36	37
Received power at the EESS in a bandwidth of 20 MHz in dBW	-133.5	-131.8
EESS interference threshold in a reference bandwidth of 20 MHz (ITU-R SA.1029-1)	-163	-163
Corresponding required spectral attenuation in dB	29.5	31.2

Table 4: Case 1: Cordless camera in the main beam of the EESS sensor (maximum antenna gain)

The above calculations have shown that a single cordless camera transmitter deployed in the EESS pixel is sufficient to exceed the EESS protection criteria.

Parameter	MEGHA-TROPIC	EOS AMSR-E
EIRP in a bandwidth of 20 MHz for a single camera	6	6
Distance camera - EESS sensor in km	817	705
Space attenuation in dB	171.3	170
EESS antenna gain in dBi	-14	-23
Received power at the EESS in a bandwidth of 20 MHz in dBW	-179.3	-187
EESS interference threshold in a reference bandwidth of 20 MHz (ITU-R SA.1029-1)	-163	-163
Corresponding required spectral attenuation in dB	-16.3	-24

Table 5: Case 2: Cordless camera coupled with the side lobe of EESS sensor (back lobe antenna gain applied)

4.2.2 Calculations with Portable video SAP/SAB links

Since the EIRP of portable SAP/SAB video links is 10 dB higher than in case of cordless camera transmitters, and operational scenario is similar to that of the cordless camera, then conclusions may be drawn that:

- A single portable video link located within the EESS pixel is sufficient to exceed the EESS protection criteria;
- Even a limited number of portable video links (4 links) seen in the side lobe of the EESS sensor are sufficient to exceed the EESS protection criteria.

4.2.3 Calculations with temporary point-to-point video SAP/SAB links

Parameter	MEGHA-TROPIC	EOS AMSR-E
EIRP in a bandwidth of 20 MHz for a single PP link	40	40
Elevation angle in order to reach the maximum EESS antenna gain	37.7°	35°
Distance PP link - EESS sensor in km	1336	1229
Space attenuation in dB	175.5	174.8
EESS antenna gain in dBi	36	37
Received power at the EESS in a bandwidth of 20 MHz in dBW	-99.5	-97.8
EESS interference threshold in a reference bandwidth of 20 MHz (ITU-R 1029-1)	-163	-163
Corresponding required spectral attenuation in dB	63.5	65.2

Table 6: Case 1: Main beam of a temporary point-to-point video SAP/SAB link coupled with the main beam of the EESS sensor (maximum antenna gain)

If the transmitters intercept the main lobe of the EESS (passive) sensor, the margin is negative and the data retrieved from the EESS sensor will be corrupted. However, this case is unlikely to occur as the temporary point-to-point links, once in operation, have permanently fixed transmission direction with low elevation angles.

Parameter	MEGHA-TROPIC	EOS AMSR-E
EIRP in a bandwidth of 20 MHz for a single PP link	40	40
PP link antenna discrimination in dB (ITU-R F.1245-1)	50	50
Distance PP link - EESS sensor in km	817	705
Space attenuation in dB	171.3	170
EESS antenna gain in dBi	-14	-23
Received power at the EESS in a bandwidth of 20 MHz in dBW	-195.3	-203
EESS interference threshold in a reference bandwidth of 20 MHz (ITU-R 1029-1)	-163	-163
Corresponding required spectral attenuation in dB	-32.3	-40

Table 7: Case 2: Side lobe of a temporary point-to-point link coupled with the side lobe of the EESS sensor (back lobe antenna gain applies)

In case 2, the side lobes of the point-to-point transmitters illuminate a side lobe of the EESS (passive) sensor. In such a case, the antenna discrimination of temporary point-to-point link transmitter, which is supposed to be 50 dB below the maximum antenna gain, should be taken into account. In that case, it is possible that limited number of temporary point-to-point links might work while coupled with the same EESS pixel without causing interference, as indicated in the above table.

Parameter	MEGHA-TROPIC	EOS AMSR-E
EIRP in a bandwidth of 20 MHz for a single PP link	40	40
Distance PP link - EESS sensor in km	3300	3000
Space attenuation in dB	183.4	182.5
EESS antenna gain in dBi	-14	-23
Received power at the EESS in a bandwidth of 20 MHz in dBW	-157.4	-165.5
EESS interference threshold in a reference bandwidth of 20 MHz (ITU-R 1029-1)	-163	-163
Corresponding required spectral attenuation in dB	+5.6	-2.5

Table 8: Case 3: Main beam of a temporary point-to-point link illuminating the side lobe of the EESS sensor (back lobe antenna gain applies) at the limb

In case 3, it is considered that the main beam of the temporary point-to-point link illuminates a side lobe of the EESS (passive) sensor when the satellite is located at the limb. In that case, it is possible for one kind of instrument, that a limited number of point-to-point video links might work while coupled with the same EESS pixel without causing interference, as indicated in the above table. For MEGHA-TROPIC sensor, the calculation shows that even a single point-to-point video link may cause interference. To reach a definitive conclusion in that case, it is important to determine the probability of occurrence of this event.

It should be noted that the above calculation does not take into account the impact of gaseous absorption, which is about 3dB in case of a link pointing towards the horizon.

Parameter	MEGHA-TROPIC	EOS AMSR-E
EIRP in a bandwidth of 20 MHz for a single PP link	40	40
PP link antenna discrimination in dB (ITU-R F.1245-1)	50	50
Elevation angle in order to reach the maximum EESS antenna gain	37.7°	35°
Distance PP link - EESS sensor in km	1336	1229
Space attenuation in dB	175.5	174.8
EESS antenna gain in dBi	36	37
Received power at the EESS in a bandwidth of 20 MHz in dBW	-144.5	-198
EESS interference threshold in a reference bandwidth of 20 MHz (ITU-R 1029-1)	-163	-163
Corresponding required spectral attenuation in dB	13.5	15.2

Table 9: Case 4: Side lobe of a temporary point-to-point link coupled with the main lobe of the EESS sensor

The above calculations show that even a single temporary point-to-point video link transmitter deployed in the EESS pixel is sufficient to exceed the EESS protection criteria.

4.3 Second step of the calculations: dynamic interference analysis

Simulations were conducted to determine the probability of interference using a time increment of 500 ms in order to get accurate results. Furthermore, it has to be noted that all these simulations presented here only deal with the MEGHA-TROPIC satellite, because the above static cases have shown that it is the worst case.

For these simulations, one or several SAP/SAB terminals are deployed over France and the percentage of time during which the EESS protection criteria is exceeded is determined. Simulations stopped when the cumulative distribution function becomes stable. The whole following results take into account the gaseous absorption (ITU-R P.676-5).

The results of simulations are summarised in Tables 10 to 19 below. Annexes 1 and 2 provide the corresponding whole curves for the dynamic analysis related to respectively the cordless cameras and temporary point-to-point links.

4.3.1 Calculations with cordless cameras

% of cumulative distribution	8.8	8	6	4	2	1	0.1	0.02	0.01	0.001
MEGHA-TROPIC: corresponding interference power received by EESS in dBW (20 MHz bandwidth)	-196	-192	-190	-188	-185	-183	-180	-173	-169	-148

Table 10: Dynamic analysis between cordless cameras and EESS in the band 10.6-10.68 GHz: only one camera operating

% of cumulative distribution	8.8	6	4	2	1	0.1	0.02	0.01	0.002
MEGHA-TROPIC: corresponding interference power received by EESS in dBW (20 MHz bandwidth)	-191	-185	-183	-180	-178	-174	-173	-169	-140

Table 11: Dynamic analysis between cordless cameras and EESS in the band 10.6-10.68 GHz: three cameras operating at the same location

% of cumulative distribution	8	6	4	2	1	0.1	0.001
MEGHA-TROPIC: corresponding interference power received by EESS in dBW (20 MHz bandwidth)	-186	-180	-178	-174	-173	-169	-140

Table 12: Dynamic analysis between cordless cameras and EESS in the band 10.6-10.68 GHz: ten cameras operating at the same location

% of cumulative distribution	8.8	8	6	4	2	1.5	1	0.1	0.03
MEGHA-TROPIC: corresponding interference power received by EESS in dBW (20 MHz bandwidth)	-196	-186	-180	-178	-174	-173	-172	-169	-140

Table 13: Dynamic analysis between cordless cameras and EESS in the band 10.6-10.68 GHz: ten cameras operating at different locations

% of cumulative distribution	9.4	9	8	7.3	1.5	1	0.1	0.01	0.04
MEGHA-TROPIC: corresponding interference power received by EESS in dBW (20 MHz bandwidth)	-196	-180	-174	-173	-163	-162	-160	-127	-126

Table 14: Dynamic analysis between cordless cameras and EESS in the band 10.6-10.68 GHz: one hundred cameras operating at different locations

According to the above tables, there is a limited risk that the EESS satellite experiences interference when some cordless cameras are in operation (the threshold of -163 dBW must not be exceeded no more 1 % of time for a bandwidth of 20 MHz) at the same time. However, when many cordless cameras are in operation, the EESS sensor experiences harmful interference, as shown in table 14.

4.3.2 Calculations with Portable video links

Since the EIRP of portable SAP/SAB video links is 10dB higher than in case of cordless camera transmitters then, there is a great risk that the EESS satellite experiences interference when some portable video links are in operation. In that case, the -163 dBW threshold will be exceeded during more than 1% of the time (see Tables 12 and 13).

4.3.3 Calculations with temporary point to point links

% of cumulative distribution	7.8	7.7	6	4	2	1	0.1	0.09	0.01	0.0008
MEGHA-TROPIC: corresponding interference power received by EESS in dBW (20 MHz bandwidth)	-212	-208	-205	-200	-197	-195	-183	-173	-160	-151

Table 15: Dynamic analysis between temporary point to point links and EESS in the band 10.6-10.68 GHz: only one link operating

% of cumulative distribution	8.2	8	6	4	2	1	0.1	0.09	0.01	0.006
MEGHA-TROPIC: corresponding interference power received by EESS in dBW (20 MHz bandwidth)	-206	-204	-199	-196	-193	-190	-175	-173	-155	-153

Table 16: Dynamic analysis between temporary point to point links and EESS in the band 10.6-10.68 GHz: three links operating at the same location

% of cumulative distribution	8.2	8.1	6	4	2	1	0.2	0.1	0.003
MEGHA-TROPIC: corresponding interference power received by EESS in dBW (20 MHz bandwidth)	-202	-197	-193	-190	-188	-185	-173	-161	-147

Table 17: Dynamic analysis between temporary point to point links and EESS in the band 10.6-10.68 GHz: ten links operating at the same location

% of cumulative distribution	9.1	9	8.9	8	6	4	1	0.3	0.1	0.01	0.003
MEGHA-TROPIC: corresponding interference power received by EESS in dBW (20 MHz bandwidth)	-211	-210	-208	-198	-194	-190	-185	-173	-158	-148	-145

Table 18: Dynamic analysis between temporary point to point links and EESS in the band 10.6-10.68 GHz: ten links operating at different locations

% of cumulative distribution	13.2	10	1.8	1	0.4	0.1	0.01	0.002
MEGHA-TROPIC: corresponding interference power received by EESS in dBW (20 MHz bandwidth)	-195	-185	-173	-172	-163	-144	-134	-133

Table 19: Dynamic analysis between temporary point to point links and EESS in the band 10.6-10.68 GHz: one hundred cameras operating at different location

According to the above tables, there is no risk that the EESS satellite experiences interference when several temporary point-to-point links are in operation (the threshold of -163 dBW must not be exceeded for more than 1 % of time for a bandwidth of 20 MHz).

5 INTERFERENCE ASSESSMENT USING REVISED ITU-R RECOMMENDATIONS

5.1 Revised ITU-R recommendations

All these above results are based upon the ITU-R recommendations, which were in force at the time of completing this study. It has to be noted that these recommendations have been revised in February 2002 by ITU-R Working Party 7C and the corresponding revisions had been approved by the Study Group 7 in February 2003.

The revisions of these two recommendations contain the following criteria:

- The permissible interference level is -156 dBW in a reference bandwidth of 100 MHz for sharing conditions circa 2003 (this threshold is equivalent to the one contained in SA.1029-1). However, for scientific requirements that are technically achievable by sensors in the next 5-10 years, the permissible interference level is -166 dBW in a reference bandwidth of 100 MHz, which is 10 dB more stringent than the current level. Therefore, in the following calculations, the threshold is -173 dBW in a reference bandwidth of 20 MHz.
- The data availability (percentage of area or time for which accurate data is available for a specified sensor measurement area or sensor measurement time) is 99.9%.

5.2 Updated results

According to the new figures contained in the revised recommendations, the sharing results may be modified accordingly, as shown in the following sections.

5.2.1 Cordless camera transmitter

Parameter	MEGHA-TROPIC	EOS AMSR-E
EIRP in a bandwidth of 20 MHz for a single camera	6	6
Case 1: Camera coupled with the main beam of the EESS sensor (maximum antenna gain)		
Corresponding required spectral attenuation in dB	39.5	41.2
Case 2: Camera coupled with the side lobe of the EESS sensor (back lobe antenna gain applies)		
Corresponding required spectral attenuation in dB	-6.3	-14

**Table 20: Compatibility analysis with cordless camera transmitter
(using revised recommendation ITU-R SA.1029-1)**

In conclusion:

- A single cordless camera video link located within the EESS pixel is exceeding the EESS protection criteria.
- Even a very limited number of cordless camera video links (4 links) seen in the side lobe of the EESS sensor are exceeding the EESS protection criteria.

5.2.2 Portable video links

Since the EIRP of portable video SAP/SAB links is 10dB higher than in case of cordless camera transmitters, then the same calculation given in Table 18 is applicable by tightening by 10 dB the results. Then, a single portable video links in the side lobe of the EESS sensor is sufficient to exceed the EESS protection criteria.

5.2.3 Temporary point-to-point video links

Parameter	MEGHA-TROPIC	EOS AMSR-E
EIRP in a bandwidth of 20 MHz for a single ENG/OB	40	40
Case 1: Main beam of PP link coupled with the main beam of the EESS sensor (maximum antenna gain)		
Corresponding required spectral attenuation in dB	73.5	75.2
Case 2: Side lobe of PP link coupled with the side lobe of the EESS sensor (back lobe antenna gain applies)		
Corresponding required spectral attenuation in dB	-22.3	-30
Case 3: Main beam of PP link coupled with the side lobe of the EESS sensor (back lobe antenna gain applies) at the limb		
Corresponding required spectral attenuation in dB	+15.6	+7.5
Case 4: Side lobe of PP link coupled with the main lobe of the EESS sensor		
Corresponding required spectral attenuation in dB	+ 23.5	+ 25.2

Table 21: Compatibility analysis with temporary point-to-point links (using revised recommendation ITU-R SA.1029-1)

In conclusion:

- A single temporary point-to-point link located within the main beam of the EESS is sufficient to exceed the EESS protection criteria.
- The percentage of data interfered by will depend on the number of temporary point-to-point link deployed.

5.2.4 Dynamic case

According to the above tables in §4.3 and the updated criteria given in 5.1, the following results can be derived.

Concerning the cordless cameras, when a very few cordless camera will be in operation, the EESS (passive) sensor would experience interference (threshold of -173 dBW not to be exceeded no more than 0.1 % of the time in a reference bandwidth of 20 MHz).

Concerning the temporary point to point links, when several (about 10) temporary point to point links will be in operation, the EESS (passive) sensor would experience interference.

6 CONCLUSIONS

- ⇒ The analysis presented in this report was based on the operational characteristics and scenarios of video SAP/SAB (ENG/OB) links contained in the available CEPT/ERC Report 38 (eirp, transmitter spectrum mask, total bandwidth of 20 MHz for one single ENG/OB device, antenna discrimination). The protection criteria for EESS (passive) services were derived from the available and ITU-R recommendations being updated.
- ⇒ Concerning the operation of portable video links, the above calculations have shown that the EESS (passive) sensor experience harmful interference if a very limited number of terminals are deployed. Therefore, sharing is not feasible between EESS (passive) and cordless portable video links in the band 10.6-10.68 GHz.
- ⇒ Concerning the operation of cordless camera, the above calculations have shown that the risk of interference is limited using the ITU-R Recommendations currently in force if the number of deployed cordless camera is limited. Therefore, the feasibility of sharing is questionable due to the nature of this application.

- ⇒ For future EESS systems the impact will be more significant, therefore, the sharing between cordless camera and EESS will not be feasible.
- ⇒ Concerning temporary point-to-point video links, dynamic calculations have shown that percentage of data corrupted by the deployment of a single link is acceptable using the ITU-R Recommendations currently in force. However, for future EESS system the impact will be more significant, therefore, the deployment of temporary point-to-point links would have to be very limited in the future, so that the percentage of data interfered stays below 0.1%

ANNEX 1
DYNAMIC ANALYSIS BETWEEN CORDLESS CAMERAS AND EESS IN THE BAND 10.6-10.68 GHz

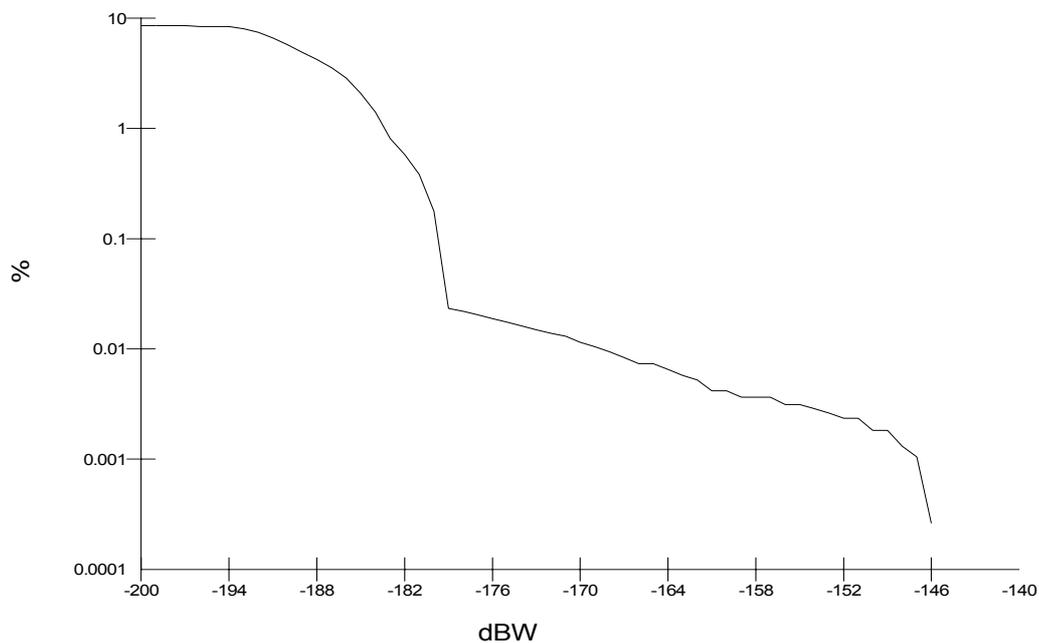


Figure A1.1: Dynamic analysis between cordless cameras and EESS in the band 10.6-10.68 GHz: only one camera operating

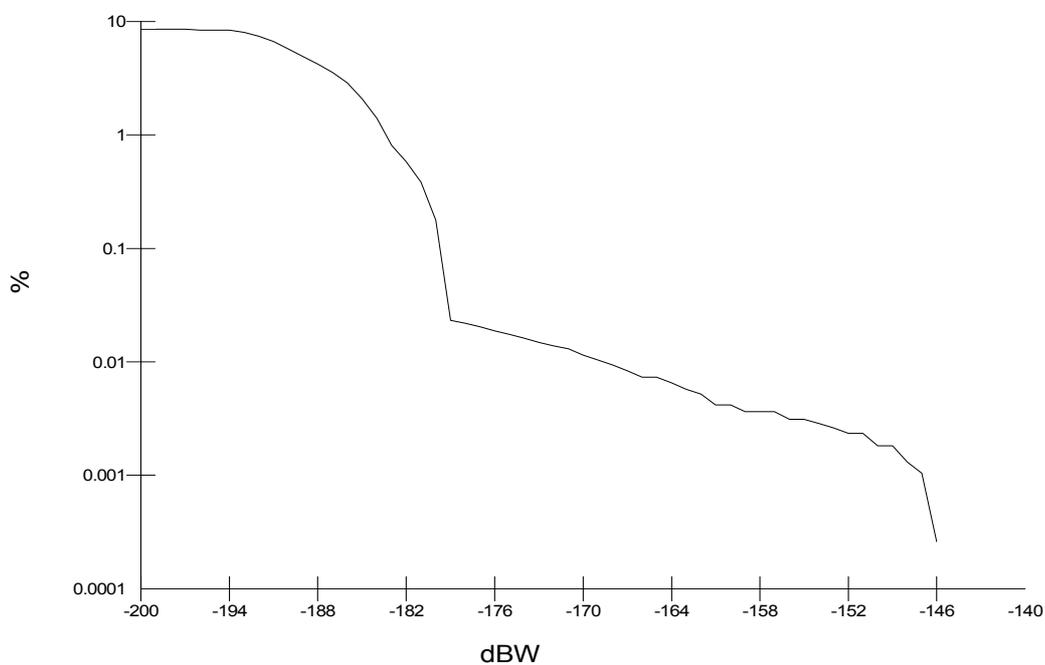


Figure A1.2: Dynamic analysis between cordless cameras and EESS in the band 10.6-10.68 GHz: three cameras operating at the same location

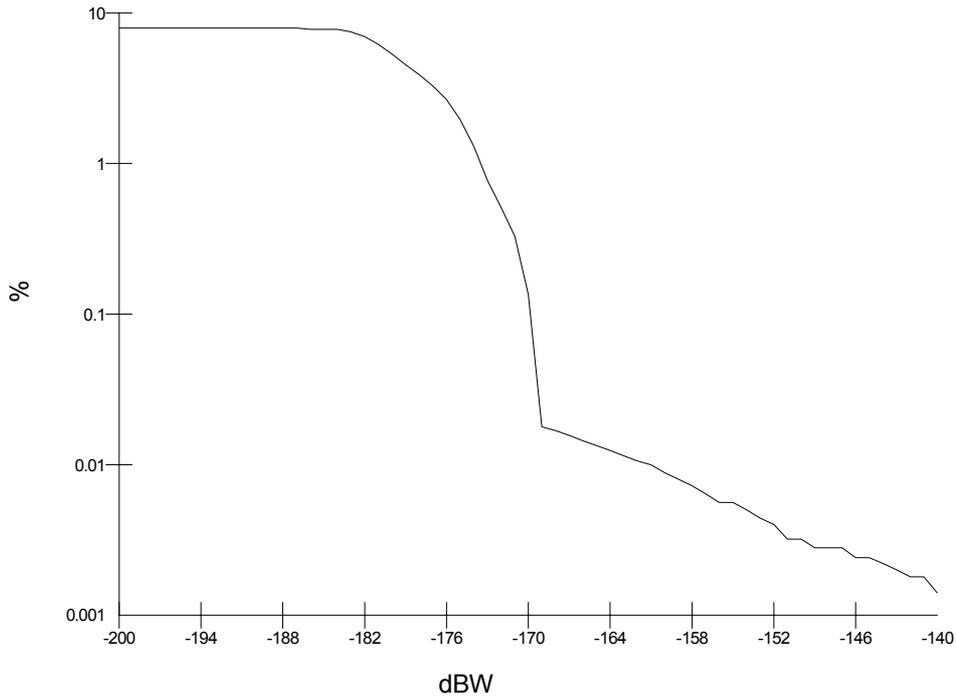


Figure A1.3: Dynamic analysis between cordless cameras and EESS in the band 10.6-10.68 GHz: ten cameras operating at the same location

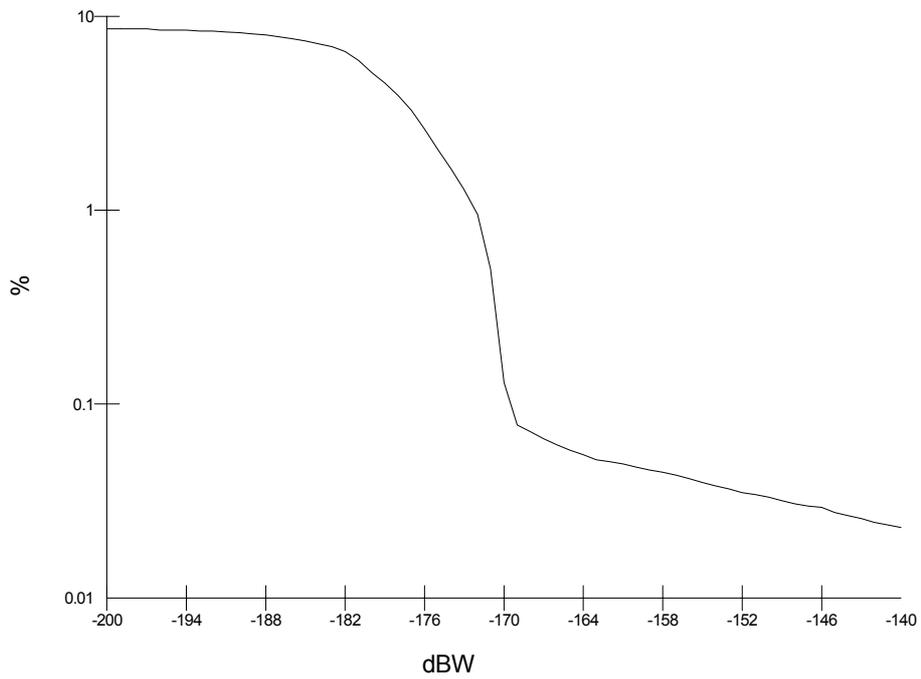
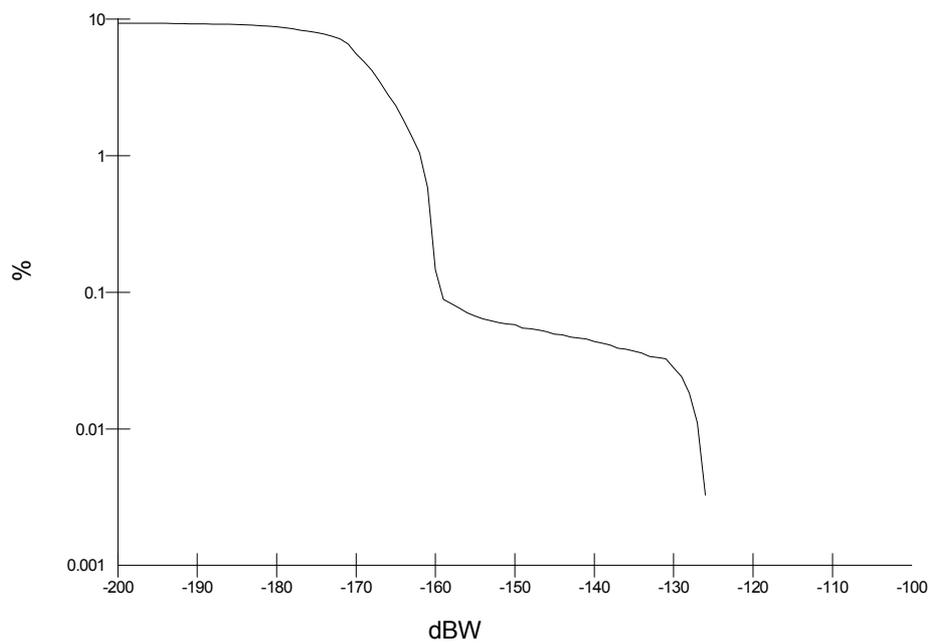


Figure A1.4: Dynamic analysis between cordless cameras and EESS in the band 10.6-10.68 GHz: ten cameras operating at different locations



**Figure A1.5: Dynamic analysis between cordless cameras and EESS in the band 10.6-10.68 GHz:
one hundred cameras operating at different locations**

ANNEX 2
DYNAMIC ANALYSIS BETWEEN TEMPORARY POINT TO POINT LINKS AND EESS
IN THE BAND 10.6-10.68 GHz

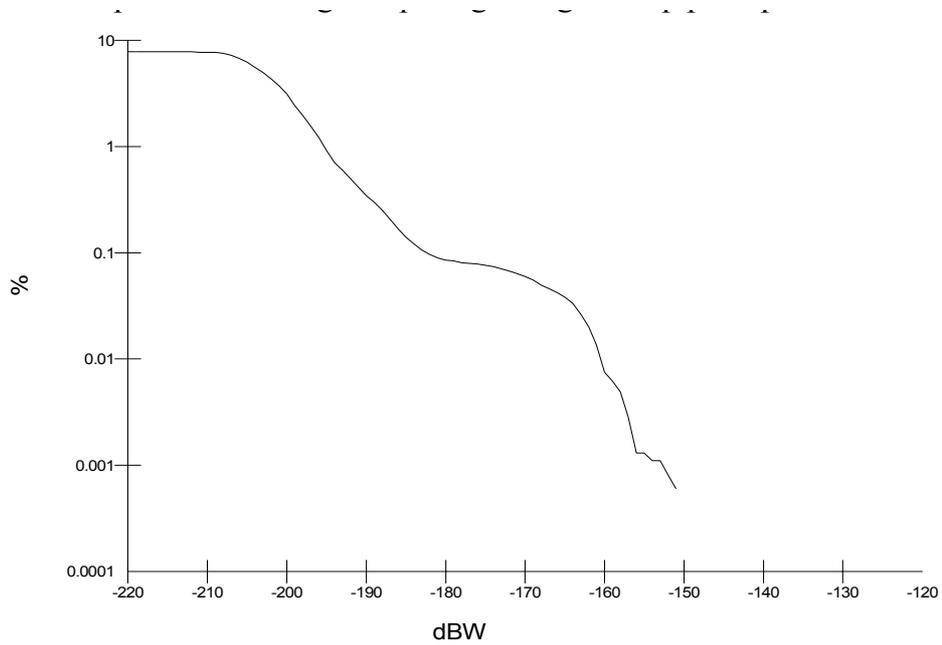


Figure A2.1: Dynamic analysis between temporary point to point links and EESS in the band 10.6-10.68 GHz: only one link operating

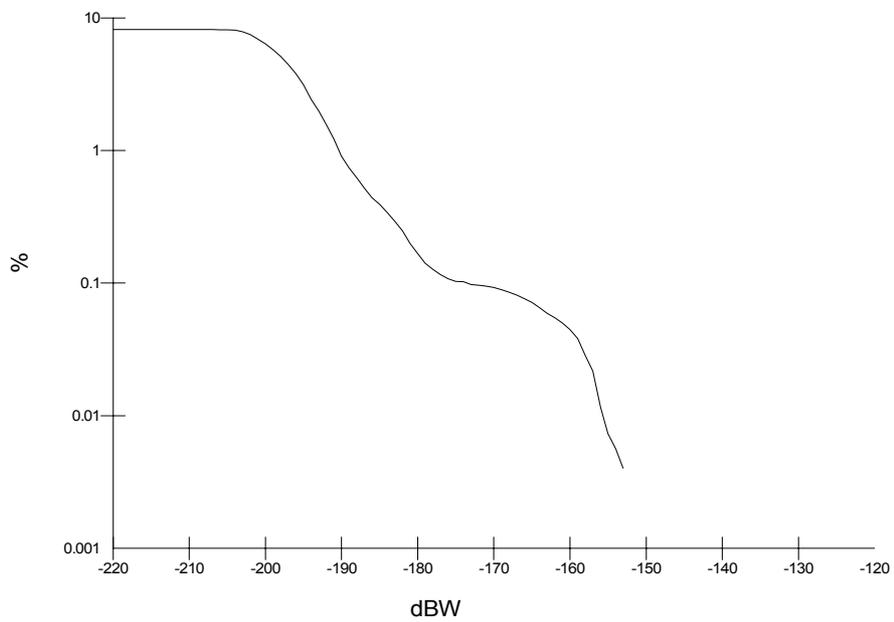


Figure A2.2: Dynamic analysis between temporary point to point links and EESS in the band 10.6-10.68 GHz: three links operating at the same location

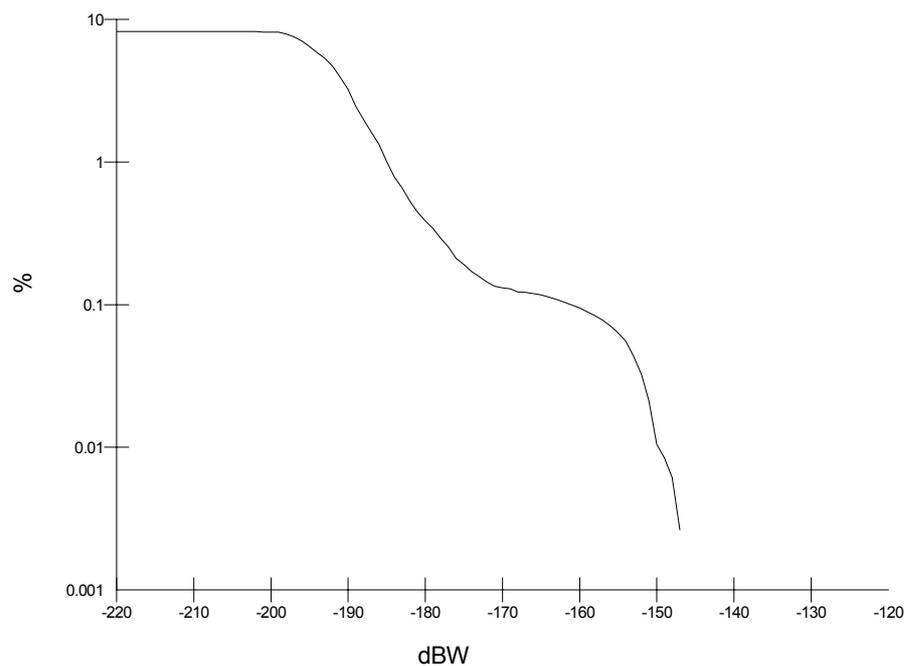


Figure A2.3: Dynamic analysis between temporary point to point links and EESS in the band 10.6-10.68 GHz: ten links operating at the same location

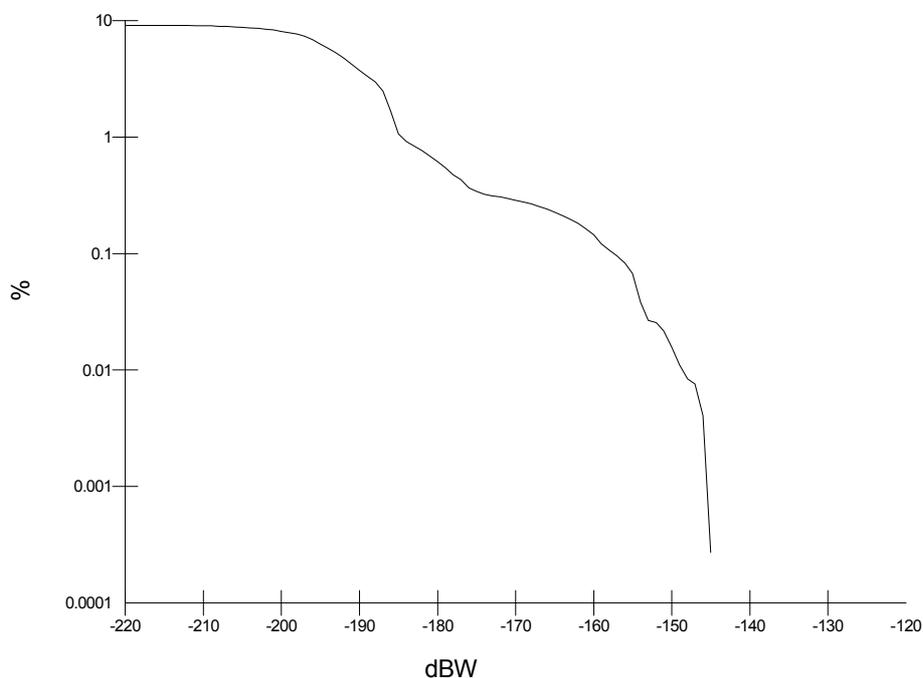


Figure A2.4: Dynamic analysis between temporary point to point links and EESS in the band 10.6-10.68 GHz: ten links operating at different location

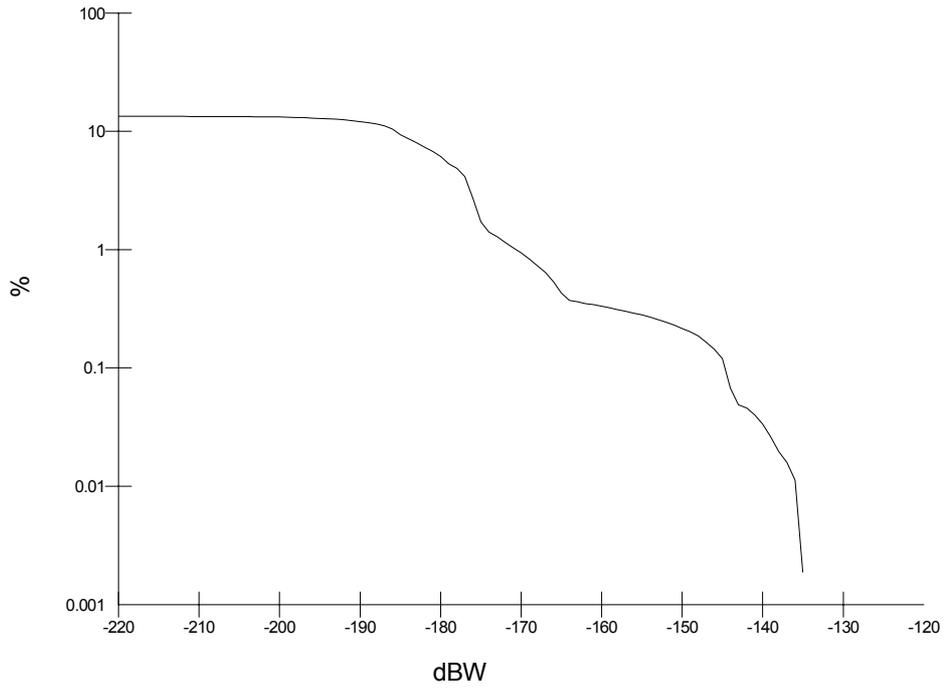


Figure A2.5: Dynamic analysis between temporary point to point links and EESS in the band 10.6-10.68 GHz: one hundred links operating at different location