

METSAT TOPICS OF INTEREST FOR WRC 2003

This document provides a summary of radio frequency topics from the Space Frequency Coordination Group (SFCG's) objectives for the 2003 World Radiocommunication Conference (WRC-03) for agenda items concerning metsat and Earth exploration satellite frequency allocations. **CGMS members should urge their administrations to consider these objectives when making proposals to WRC-03.**

METSAT TOPICS OF INTEREST FOR WRC 2003

**Excerpts from SFCG Resolution 18-1R3
of
Importance to CGMS**

*SPACE FREQUENCY
COORDINATION GROUP*

Resolution 18-1R3

**SFCG OBJECTIVES FOR
WORLD RADIOCOMMUNICATION CONFERENCES**

The SFCG,

CONSIDERING

- a) that its member agencies are vitally interested in achieving changes to the ITU Radio Regulations (RR) in order to enhance future space science system operations;
- b) that changes to the RR can only be accomplished at World Radiocommunication Conferences (WRCs);
- c) that the 1992 Additional Plenipotentiary Conference of the ITU decided that WRCs would be scheduled at regular intervals beginning in 1993;
- d) that on the agendas of all of these WRCs, items of interest to SFCG member agencies may be included;
- e) that it is essential for SFCG member agencies to coordinate their conference preparations and to provide the necessary rationale for their requirements in order to achieve the desired results at WRCs;

RESOLVES

1. that consideration of SFCG WRC Objectives for the next and subsequent competent conferences identified in Annex 1 is vital for member agencies;
2. that, in preparation for WRCs, Annex 1 shall be up-dated in the light of conference agendas and evolving Objectives;

3. that Annex 2 shall list items of interest to SFCG members for consideration at a future conference, but not yet sufficiently mature for inclusion in Annex 1;
4. that member agencies will urge their administrations to make proposals to competent WRCs which satisfy these Objectives.

Annex 1 to SFCG Resolution 18-1R3

SFCG WRC-03 Objectives
(for SFCG Members)

Introduction

This document presents the view of the SFCG membership with respect to the agenda items pertaining to the space science services of the 2003 World Radiocommunication Conference (WRC-03). The contents may be used by SFCG Members to inform their Administrations, and to facilitate conference preparation and WRC consideration.

To the extent that information was available at the time of the preparation of this document, the actions of relevant Study Groups of the International Telecommunication Union Radiocommunication Sector (ITU-R) may also be mentioned.

The presentation is organized to align with the agenda of WRC-03 as presented in ITU Council Resolution **1156**. Not all of the items in that agenda are of interest to the SFCG and therefore only those specific agenda items, relating to SFCG issues, are discussed herein. Each Agenda Item, or sub-item thereof, is treated as a separate section of this document.

Agenda Item 1.3 (Identification of harmonized bands for public protection services)

“to consider identification of globally/regionally harmonized bands, to the extent practicable, for the implementation of future advanced solutions to meet the needs of public protection agencies, including those dealing with emergency situations and disaster relief, and to make regulatory provisions, as necessary, taking into account Resolution 645/[GT PLEN-2/5] (WRC-2000)”.

Resolution **114 (WRC-95)** Global harmonization of spectrum for public protection and disaster relief

SFCG Objective

To highlight the importance and restrictions imposed on the 1544-1545 MHz band by modifying the Table of Frequency Allocations of the ITU Radio Regulations.

Supporting Rationale

The SFCG has become aware of an increasing trend for administrations, evident by ITU filings of Mobile-Satellite Service systems, to endeavor to use the 1544 – 1545 MHz band for other than distress and safety communications purposes. While attempting to determine the cause of this trend, it has become apparent that there is a need to highlight the importance and restrictions imposed on this band. It is our belief that separation of this distress and safety communications allocation in the

ITU Radio Regulations Table of Frequency Allocations would achieve the desired results. The following may be considered for inclusion in administrations' proposals to WRC-2003:

MOD 1 535-1 544 MOBILE-SATELLITE (space-to-Earth) S5.SSS

S5.341 S5.351 S5.353A S5.354 S5.355

ADD 1 544-1 545 MOBILE-SATELLITE (space-to Earth)

S5.341 S5.354 S5.355 S5.356

ADD 1 545-1 559 MOBILE-SATELLITE (space-to-Earth) S5.SSS

S5.341 S5.351, S5.354 S5.355 S5.357 S5.37A, S5.359 S5.362A

Agenda Item 1.8 (Unwanted emissions)

“to consider issues related to unwanted emissions:”

Agenda Item 1.8.1

“consideration of the results of studies regarding the boundary between spurious and out-of-band emissions, with a view to including the boundary in Appendix S3”

SFCG Objective

The SFCG wishes to ensure that the boundary between spurious and out-of-band emissions is defined, with a view to including the boundary in Appendix S3.

Supporting Rationale

Definition of the boundary between spurious and out-of-band emissions will greatly assist system designers, in protecting space science services systems.

Agenda Item 1.8.2

“consideration of the results of studies, and proposal of any regulatory measures regarding the protection of passive services from unwanted emissions, in particular from space service transmissions, in response to recommends 5 and 6 of Recommendation 66 (Rev.WRC-2000);”

Recommendation 66 (Rev.WRC-2000) Studies of the maximum permitted levels of unwanted emissions

SFCG Objective

The SFCG wishes to ensure that the systems of the space science passive services will be protected from unwanted emissions, in particular from space service transmissions.

Supporting Rationale (See also CPM Report Chapter 6.1)

Band-by-band studies are required to ensure that space science passive systems will be adequately protected. Such studies are under way in TG 1/7 and SFCG should support the completion of these studies as soon as possible. Active service proponents dominate Task

Group 1/7 proceedings making progress in this area difficult. Greater participation by SFCG members, especially in the area of protecting EESS (passive), is required to ensure a useful outcome from the Task Group.

Agenda Item 1.12 (Issues related to the space science services)

“to consider allocations and regulatory issues related to the space science services in accordance with Resolution 723 (Rev.WRC-2000) and to review all Earth exploration satellite service and space research service allocations between 35 and 38 GHz, taking into account Resolution 730 [COM5/1] (WRC-2000)”

SFCG Objective

B. Allocations between 35 and 38 GHz taking into account Resolution 730 (WRC-2000)

B.2 The band 36-37 GHz is vital in the study of global water circulation and the spaceborne passive sensors operating in this band should be protected from interference from the fixed and mobile services. Protection criteria exist and are given in Recommendation ITU-R SA.1029-1. Therefore, the SFCG should support no change to this vital allocation. However, studies are needed to determine if any limitations are needed on the fixed and mobile services in this band in order to protect the EES (passive) and space research (passive) services. SFCG members should actively support these studies.

Agenda Item 1.13 (Issues related to HAPS)

“to consider regulatory provisions and possible identification of existing frequency allocations for services which may be used by high altitude platform stations, taking into account No. S5.543A and the results of the ITU-R studies conducted in accordance with Resolutions 122 (Rev.WRC-2000) and 734 [COM5/14] (WRC-2000)”

Resolution 122 (Rev.WRC-2000)

Use of the bands 47.2-47.5 GHz and 47.9-48.2 GHz by high altitude platform stations (HAPS) in the fixed service and by other services and the potential use of bands in the range 18-32 GHz by HAPS in the fixed service

Resolution 734 [COM5/14] (WRC-2000)

Feasibility of use by high altitude platform stations in the fixed and mobile services in the frequency bands above 3 GHz allocated exclusively for terrestrial radiocommunication

SFCG Objective

To ensure the protection of the passive sensors in the band 31.3 – 31.8 GHz from interference due to the Earth-to-HAPS links in the 31 – 31.3 GHz band by supporting suitable limitations on HAPS out-of-band emissions in the Radio Regulations.

Supporting Rationale

WRC-2000 made an allocation to HAPS in the band 31 – 31.3 GHz for transmissions in the Earth-to-HAPS direction (i.e., similar to a satellite uplink) limited by footnote **S5.543A/S5.5RRR** to the lower half of the band (31 – 31.15 GHz) until WRC-2003 due to possible interference into the

passive sensors operating in the adjacent band from 31.3 – 31.8 GHz. Current studies agreed by Working Party 4-9S indicate that an out-of-band transmitter power density limit on the order of – 100 dB(W/MHz) would be required to comply with the protection requirements specified in Recommendation ITU-R SA.1029.

Agenda Item 1.20 (Non-GSO MSS service links in bands below 1 GHz)

“to consider additional allocations on a worldwide basis for the non-GSO MSS with service links operating below 1 GHz, in accordance with Resolution 214 (Rev.WRC-2000)”

Resolution 214 (Rev.WRC-2000)

Sharing studies relating to consideration of the allocation of bands below 1 GHz to the non-geostationary mobile-satellite service

SFCG Objective

To protect space science services allocations below 1 GHz that may be considered for allocation to the non-GSO mobile-satellite service.

Supporting Rationale

Non-GSO MSS proponents are desperately seeking allocations below 1 GHz. Based on Resolution 214 (Rev. WRC-2000), space science service allocations such as those for meteorological aids, meteorological-satellites, Earth exploration-satellites, and space operations are all possible targets.

Agenda Item 1.31 (MSS in the 1-3 GHz band)

“to consider the additional allocations to the mobile-satellite service in the 1-3 GHz band, in accordance with Resolutions 226 [COM5/29] (WRC-2000) and 227 COM5/30] (WRC-2000)”

Resolution 226 [COM5/29] (WRC-2000)

Sharing studies for, and possible additional allocations to, the mobile-satellite service (space-to-Earth) in the 1-3 GHz range, including consideration of the band 1 518-1 525 MHz

Resolution 227 [COM5/30] (WRC-2000)

Sharing studies for, and possible additional allocations to, the mobile-satellite service (Earth-to-space) in the 1-3 GHz range, including consideration of the band 1 683-1 690 MHz

SFCG Objective

To protect all space science service allocations, particularly those of the MetSat and MetAids services, between 1 and 3 GHz.

Supporting Rationale

This agenda item specifically has targeted the bands 1518 – 1525 MHz and 1683 – 1690 MHz, but is open to examining other possibilities between 1 and 3 GHz. The band 1675 – 1700 MHz is allocated to both the Met-Aids and Met-Sat services with the Met-Sat allocation extending up to 1710 MHz, and is vital to the operations of the WMO as well as other meteorological services in many administrations. Studies in the ITU-R have shown that MSS (Earth-

to-space) cannot reasonably share with the Met-Sat or Met-Aids services. For example, three independent studies have shown that sharing between the MSS and Met-Sats in the 1683-1690 MHz band would be very difficult due to the hundreds of GVAR/S-VISSR stations, including a number of mobile GVAR earth stations. Therefore, the SFCG should oppose any MSS allocation in the 1675-1710 MHz band. An alternative band that may be feasible for sharing is 1670-1675 MHz, based on minor restrictions to the MSS to ensure no worldwide impact on Met-Sat operations in the band.

Agenda Item 7.2 (Possible Agenda Items for future conferences)

“to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, taking into account Resolution 801/[GT PLEN-2/6] (WRC-2000)”

Resolution 801/[GT PLEN-2/6] (WRC-2000)

Preliminary agenda for the 2005/2006 World Radiocommunication Conference

SFCG Objective

The SFCG supports the following Agenda items for the next conference after WRC-03 as contained in Resolution 801 (WRC-2000)

WRC-05/06 Agenda Item 2.3

“to review studies and consider allocations in the frequency bands above 275 GHz”

REASON:

To provide suitable frequency allocations for passive sensor atmospheric measurements in the EESS (passive) and SRS (passive). There are already spaceborne passive sensors utilizing frequency bands above 275 GHz. Planned and existing instruments include MLS (USA), SMILES (Japan) as well as other sensors which use spectra above 275GHz. WRC-2000 revised footnote S5.565 and the following bands are identified for use:

EESS (passive) and SRS (passive): 275-277 GHz, 294-306 GHz, 316-334 GHz, 342-349 GHz, 363-365 GHz, 371-389 GHz, 416-434 GHz, 442-444 GHz, 496-506 GHz, 546-568 GHz, 624-629 GHz, 634-654 GHz, 659-661 GHz, 684-692 GHz, 730-732 GHz, 851-853 GHz and 951-956 GHz. However, these bands above 275 GHz are not allocated to the services and need to be considered when the Table of Frequency Allocations above 275 GHz is established.

The SFCG member agencies are actively supporting studies on Questions ITU-R 228/3, 264/4, and 235/7:

- to reduce congestion within the radio spectrum through the development of Recommendations characterizing the technical, operational, and propagation considerations of optical systems;
- to examine the possible need for sharing studies as active and passive services operating in the optical bands are brought into greater use.

Work has already begun in four ITU-R working parties. Development of Recommendations relevant to optical communication systems will advance proliferation of the technology thereby reducing

congestion in the radio bands. The proposed use of optical communication systems for space science applications including interplanetary and deep space systems offers an alternative to the use of the already congested radio bands currently allocated to space science. Advancement of the use of optical bands for other services offers the possibility of additional radio bands becoming available for future space science allocations. The technical and operational characteristics identified in the studies of the active and passive services using optical frequencies will differ from those operating in the radio bands. Further, mechanisms of interference in the optical bands may differ from those in the radio bands (e.g. diffuse and specular reflections). Therefore, an examination of the need for sharing studies is warranted.